DOCUMENT RESUME

ED 456 171 UD 034 268

AUTHOR Kirby, Douglas
TITLE Emerging Answers: Research Findings on Programs To Reduce Teen Pregnancy.
INSTITUTION National Campaign To Prevent Teen Pregnancy, Washington, DC.
SPONS AGENCY David and Lucile Packard Foundation, Los Altos, CA.; Robert Wood Johnson Foundation, Princeton, NJ.; William and Flora Hewlett Foundation, Palo Alto, CA.; Target Stores/Dayton Hudson Corp.; Mott (C.S.) Foundation, Flint, MI.
ISBN ISBN-1-58671-037-0
PUB DATE 2001-05-00
NOTE 242p.; Foreword by Sarah Brown. Also supported by the Summit and Turner Foundations.
AVAILABLE FROM National Campaign To Prevent Teen Pregnancy, 1776 Massachusetts Avenue, NW, #200, Washington, DC 20036 ($15). Tel: 202-478-8500; Fax: 202-478-8588; e-mail: campaign@teenpregnancy.org; Web site: http://www.teenpregnancy.org).
PUB TYPE Reports - Descriptive (141)
EDRS PRICE MF01/PC10 Plus Postage.
DESCRIPTORS Acquired Immune Deficiency Syndrome; *Adolescents; *Comprehensive School Health Education; Contraception; Early Parenthood; *Pregnancy; Program Effectiveness; Program Evaluation; Secondary Education; Sex Education; *Sexuality; *Youth Programs
IDENTIFIERS Abstinence; Condoms; Risk Reduction; *Risk Taking Behavior; Sexually Transmitted Diseases

ABSTRACT

This report summarizes three bodies of research on teenage pregnancy and programs to reduce the risk of teenage pregnancy. Studies included in this report were completed in 1980 or later, conducted in the United States or Canada, targeted adolescents, employed an experimental or quasi-experimental design, had a sample size of at least 100 in the combined treatment and control group, and measured the impact on sexual or contraceptive behavior, pregnancy, or childbearing. Six chapters focus on: (1) "Making the Case for Prevention Efforts: Adolescent Risk-Taking Behavior and Its Consequences"; (2) "Looking for Reasons Why: The Antecedents of Adolescent Sexual Behavior"; (3) "Assessing the Evidence: Factors Affecting the Strength of Research Results"; (4) "Emerging Answers: The Behavioral Impact of Programs To Reduce Adolescent Sexual Risk-Taking"; (5) "Looking Forward: Conclusions about the State of Research and the Effectiveness of Programs"; and (6) "Bringing It Home: Applying These Research Results in Communities." (Chapters contain references.) (SM)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 456 171

THE NATIONAL CAMPAIGN TO PREVENT TEEN PREGNANCY

Emerging Answers

Research Findings on Programs to Reduce Teen Pregnancy

Douglas Kirby, Ph.D.

May 2001

UD034268

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

I. Sanden
Nat. Campaign to Prevent Teen Pregnancy

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

2

BEST COPY AVAILABLE

The National Campaign to Prevent Teen Pregnancy Board of Directors

Chairman
Thomas H. Kean
Former Governor of New Jersey and President, Drew University

President
Isabel V. Sawhill
Senior Fellow, The Brookings Institution

Campaign Director
Sarah Brown

Carol Mendez Cassell
Director, Community Coalition Partnership Programs for the Prevention of Teen Pregnancy, CDC

Linda Chavez
President, Center for Equal Opportunity

Annette Cumming
Executive Director and Vice President, The Cumming Foundation

Frankie Sue Del Papa
Attorney General, State of Nevada

William Galston
School of Public Affairs, University of Maryland

David Gergen
Editor-at-Large, *U.S. News & World Report*

Whoopi Goldberg
Actress

Katharine Graham
Chairman of the Executive Committee, The Washington Post Company

David A. Hamburg, M.D.
President Emeritus, Carnegie Corporation of New York and Visiting Scholar, Department of Psychiatry Weill Medical College, Cornell University

Alexine Clement Jackson
National President, YWCA of the USA

Judith E. Jones
Clinical Professor, Columbia University School of Public Health

Nancy Kassebaum Baker
Former U.S. Senator

Douglas Kirby
Senior Research Scientist, ETR Associates

John D. Macomber
Principal, JDM Investment Group

Sister Mary Rose McGeady
President and Chief Executive Officer, Covenant House

Jody Greenstone Miller
Venture Partner, MAVERON, LLC

John E. Pepper
Chairman, Board of Directors, Procter & Gamble Company

Bruce Rosenblum
Executive Vice President, Television, Warner Brothers

Stephen W. Sanger
Chairman and Chief Executive Officer General Mills, Inc.

Victoria P. Sant
President, The Summit Foundation

Kurt L. Schmoke
Former Mayor of Baltimore and Partner, Wilmer, Cutler and Pickering

Vincent Weber
Partner, Clark & Weinstock

Judy Woodruff
Prime Anchor and Senior Correspondent, CNN

Andrew Young
Former Ambassador to the U.N. and Co-Chair, GoodWorks International

Trustees Emeriti

Charlotte Beers
Chairman, J. Walter Thompson

Irving B. Harris
Chairman, The Harris Foundation

Barbara Huberman
Director of Training, Advocates for Youth

Sheila Johnson
Executive Vice President of Corporate Affairs, BET, Inc.

Leslie Kantor
Vice President of Education, Planned Parenthood of New York City

C. Everett Koop, M.D.
Former U.S. Surgeon General

Judy McGrath
President, MTV

Kristin Moore
President, Child Trends, Inc.

Hugh Price
President, National Urban League, Inc.

Warren B. Rudman
Former U.S. Senator and Partner, Paul, Weiss, Rifkind, Wharton & Garrison

Isabel Stewart
National Executive Director, Girls Inc.

THE
NATIONAL
CAMPAIGN TO
PREVENT TEEN PREGNANCY

Emerging Answers

RESEARCH FINDINGS ON PROGRAMS TO REDUCE TEEN PREGNANCY

Douglas Kirby, Ph.D.

MAY 2001

Campaign Acknowledgments

The National Campaign gratefully acknowledge its many funders. Special thanks go to the David and Lucile Packard Foundation, the Robert Wood Johnson Foundation, the Summit Foundation, and the William and Flora Hewlett Foundation for generously supporting all of the Campaign's activities. Thanks also to the Turner Foundation and the Target Group of Stores for their support of Campaign publications and to the Charles Stewart Mott Foundation for its support of our research activities.

The National Campaign would also like to extend special appreciation to our Senior Editor, John Hutchins, for his unflagging dedication and tireless hard work on this project. Although this is an authored paper, its publication would simply not have been possible without John's guidance and editorial insight. John is a graceful and thoughtful editor and his talent is reflected throughout this manuscript. The Campaign also wishes to thank Bill Albert, our Director of Communications and Publications, and Ingrid Sanden, our Communications and Publications Assistant, for their many contributions to *Emerging Answers* and for helping shepherd this publication carefully through to production. Lastly, the Campaign extends warm appreciation to Christine Flanigan for her careful attention to the demographic information provided in this and many other Campaign publications.

Author's Acknowledgments

The author would like to express a great deal of appreciation to John Hutchins and Sarah Brown for innumerable constructive suggestions for both the full volume and the summary, for their careful editing of both manuscripts, and for their continuous encouragement and support throughout the writing and editing of this volume. Without a doubt, this volume is more accurate, clear, and easy to read because of their efforts. Thanks also to Christine Flanigan for finding and checking statistics and to Ingrid Sanden for carefully editing the tables and references. And, finally, many thanks to the members of the National Campaign's Effective Programs and Research Task Force who read successive versions of this volume, offered many suggestions, and made sure that the reporting was accurate and balanced. In the end, however, the review's findings and conclusions are my own.

© Copyright 2001 by the National Campaign to Prevent Teen Pregnancy. All rights reserved.

ISBN: 1-58671-037-0

Suggested citation: Kirby, D. (2001). *Emerging Answers: Research Findings on Programs to Reduce Teen Pregnancy.* Washington, DC: National Campaign to Prevent Teen Pregnancy.

Design: *amp&rsand graphic design, inc.*
1700 Connecticut Avenue, NW, Suite 401
Washington, DC 20009

EFFECTIVE PROGRAMS AND RESEARCH TASK FORCE

Chair

DOUGLAS KIRBY, PH.D.
Senior Research Scientist
ETR Associates

Members

CHRISTINE BACHRACH, PH.D.
Chief, Demographic and Behavioral Sciences Branch
National Institute of Child Health and Human Development

ROBERT W. BLUM, M.D., PH.D.
Professor and Director
Division of General Pediatrics and Adolescent Health
Department of Pediatrics
University of Minnesota

CLAIRE BRINDIS, DR.P.H.
Director
Center for Reproductive Health Policy Research
Institute for Health Policy Studies
University of California at San Francisco

SHERYLL D. CASHIN, J.D.
Associate Professor of Law
Georgetown University Law Center

JACQUELINE E. DARROCH, PH.D.
Senior Vice President and Vice President for Research
The Alan Guttmacher Institute

CYNTHIA A. GÓMEZ, PH.D., ED.M.
Assistant Professor, Department of Medicine
University of California at San Francisco
Center for AIDS Prevention Studies

SAUL D. HOFFMAN, PH.D.
Professor
Department of Economics
University of Delaware

REBECCA A. MAYNARD, PH.D.
University Trustee Professor of Education and Social Policy
University of Pennsylvania

JOE S. MCILHANEY, JR., M.D.
President
The Medical Institute for Sexual Health

SARA MCLANAHAN, PH.D.
Professor
Office of Population Research
Princeton University

BRENT MILLER, PH.D.
Professor and Head
Department of Family and Human Development
Utah State University

KRISTIN MOORE, PH.D.*
President
Child Trends, Inc.

SUSAN PHILLIBER, PH.D.
Senior Partner
Philliber Research Associates

MICHAEL RESNICK, PH.D.
Professor and Director
National Teen Pregnancy Prevention Research Center
University of Minnesota

FREYA SONENSTEIN, PH.D.*
Director, Population Studies Center
The Urban Institute

FELICIA H. STEWART, M.D.
Adjunct Professor, Department of Obstetrics, Gynecology and Reproductive Sciences
Co-Director, Center for Reproductive Health Policy Research
University of California at San Francisco

STAN WEED, PH.D.
Director
Institute for Research & Evaluation

BRIAN L. WILCOX, PH.D.*
Director
Center on Children, Families, and the Law
University of Nebraska

BARBARA WOLFE, PH.D.*
Director
Institute for Research on Poverty
Department of Economics
University of Wisconsin at Madison

* Former Task Force members who participated in the initial development and review of this report

Foreword

As Doug Kirby notes in his Author's Preface (p. v), much has changed for the better in the four years since the National Campaign published his first review of evaluation research on programs to prevent teen pregnancy, *No Easy Answers*, in 1997. Teen pregnancy and birth rates have been steadily declining, efforts to prevent teen pregnancy at both the national and local levels have increased, and, as this report shows, the quality of evaluation research in this field has improved, bringing with it clear evidence that several different kinds of programs can reduce teen sexual risk-taking and pregnancy. This is good news for all of us who care about young people — and about the next generation of children who deserve to be raised by adult parents.

From our founding in 1996, the National Campaign has believed that "getting the facts straight" is critically important in our field — a field that is subject to so much controversy and conflict. Under the guidance of the National Campaign's Task Force on Effective Programs and Research (EPR), which Dr. Kirby chairs, we have published a series of research reports on such topics as parental and family influence in adolescent sexual behavior, the role of peers in teens' sexual decision-making, and the effectiveness of media campaigns. However, the National Campaign's most requested research publication by far has been Dr. Kirby's *No Easy Answers*, which is a testament both to the quality of his work and to the intense interest among program developers and political leaders alike in finding out "what works." I anticipate that this long-awaited update of the research, with the more hopeful title of *Emerging Answers*, will prove to be as influential and popular as its predecessor.

This report summarizes three bodies of research. First, it examines the current statistics on teen pregnancy, childbearing, sexually transmitted diseases, and related problems (Chapter 1). Second, it identifies and summarizes the important risk and protective factors associated with teen sexual behavior (Chapter 2). Third, it discusses how to assess evaluation research and then reviews numerous evaluations of specific programs designed to reduce sexual risk-taking, teen pregnancy, and HIV and other STDs (Chapters 3 and 4). It concludes with recommendations about program implementation and evaluation (Chapters 5 and 6). The summary, included in this volume on pages 1-11, is also available as a separately-published pamphlet.

I offer a few comments here to put this report in context. Dr. Kirby's review focuses on organized programs. As such, the efforts of parents, families, and other caring individuals are not chronicled or assessed here. Nor does he review the efficacy of specific contraceptive methods or of programs designed specifically to reduce pregnancies and births among teens who are already mothers. In addition, this review is narrowly focused on the effect these programs have on reducing teen pregnancy and behavior that leads to teen pregnancy; it does not examine what other results the programs might produce. In particular, many of the programs discussed in this review may very well have had positive effects for their communities that have not been measured or may not be measurable — for instance, enhancing teens' self-esteem or building a sense of common purpose in a community. Moreover, many creative programmatic approaches to reducing adolescent pregnancy have not yet been evaluated and therefore could not be included in this review.

On behalf of the National Campaign, I would like to express our great appreciation to Doug Kirby for producing this excellent research review. We commend him for his diligence in searching high and low for relevant studies (published and unpublished), for his unwavering commitment to being fair and evenhanded in his assessment of the research, for his meticulous attention to detail, and, most of all, for his great wisdom and good humor throughout an extensive process of review and editing. We also extend our deep appreciation to the National Campaign's Task Force on Effective Programs and Research (see the list after the title page), a distinguished and diverse group of researchers and experts, under whose auspices this review was developed.

It should be noted here that Doug Kirby, who is a Senior Research Scientist at ETR Associates, has a well-deserved reputation as a high-quality evaluation researcher himself, and, as a consequence, a number of his own studies of programs appear in this review. In addition, in the interest of full disclosure, Dr. Kirby thought it was important to make it clear that ETR Associates, a nonprofit organization that provides educational resources, training, and research in health promotion, developed the *Reducing the Risk* and *Safer Choices* curricula, two of the sex and HIV education programs this review concludes have the strongest evidence of effectiveness. ETR Associates continues to market these curricula. In addition, several members of the National Campaign's Task Force on Effective Programs and Research were also involved in some of the studies reviewed in this report.

Although we believe that having accurate, research-based information can only help communities make good decisions about preventing teen pregnancy, the National Campaign recognizes that communities choose to develop particular prevention programs for many reasons other than research — including, for example, compatibility with religious traditions, available resources, community standards, and the personal values and beliefs of the leaders in charge. In this context, I would add that it is crucial for such leaders to understand that community-based programs are only part of the solution to the teen pregnancy challenge and that no single effort can be expected to solve this problem by itself. Teen pregnancy is, after all, a very complex problem, influenced by many factors, including individual biology, parents and family, peers, schools and other social institutions, religion and faith communities, the media, and the list goes on. In an ideal world, we would mount efforts to engage the help of ***all*** these forces, particularly popular culture, schools, faith communities, parents, and other adults. But we are a long way from doing so, and many communities mistakenly believe that modest

community programs can do this single-handedly. In many instances, these programs are fragile and poorly-funded; even apparently "effective" programs often achieve only modest results; and not all teens at risk of pregnancy are enrolled in programs. The simple point is that no single approach can solve this problem alone, whether it be a national media campaign, a new move in faith communities to address this problem, or a well-designed community program. Advocates of any *single* approach — especially, in the context of this review, community programs — should therefore be modest in both their promises and their expectations.

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, they should be encouraged by declining rates and new research showing that some programs are making a difference. They should continue to explore many ways to address the various causes of teen pregnancy. They should replicate those programs that have the best evidence for success, build their efforts around the common elements of successful programs, and continue to explore, develop, and evaluate innovative and promising approaches.

Sarah Brown
Director
National Campaign to
Prevent Teen Pregnancy
May 2001

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 teen sexual risk-taking failed either to measure or to find sustained long-term impact on behavior. Among the few programs that appeared to have longer-term impact, none had been evaluated two or more times by independent researchers and found to be effective. Indeed, the two replications of programs that had previously shown positive effects on behavior failed to corroborate those initial positive findings. In general, the research evidence indicated that there were "no easy answers" to markedly reducing teen pregnancy in this country.

Now, four years later, the research findings are definitely more positive, and there are at least five important reasons to be more optimistic that we can craft programs that help to reduce teen pregnancy. First, teen pregnancy, abortion, and birth rates began to decrease about 1991 and have continued to decline every year since then. Not only have these rates maintained their downward trend, but teen birth rates are now at their lowest recorded level ever. Second, larger, more rigorous studies of some sex and HIV education programs have found sustained positive effects on behavior for as long as three years. Third, there is now good evidence that one program that combines both sexuality education and youth development (i.e., the *Children's Aid Society-Carrera Program*) can reduce pregnancy for as long as three years. Fourth, both service learning programs (i.e., voluntary community service with group discussions and reflection) and sex and HIV education programs (i.e., *Reducing the Risk*) have now been found to reduce sexual risk-taking or pregnancy in several settings by independent research teams. Fifth, there is emerging evidence that some shorter, more modest clinic interventions involving educational materials coupled with one-on-one counseling may increase contraceptive use. All of these findings are most encouraging. Of course, it is still very challenging to design or operate programs that actually reduce adolescent sexual risk-taking and pregnancy over prolonged periods of time. However, we now know it is possible, and we have clearer guidelines for how to do it.

This report is, in many respects, a second edition of *No Easy Answers*. Much of the

content and organization remains the same. However, the methodological criteria for inclusion of studies has changed, more studies have been reviewed, and there are important new findings. Given the stronger and more consistent research findings demonstrating program effectiveness, we have entitled it *Emerging Answers.*

Douglas Kirby, Ph.D.
May 2001

11

Table of Contents

Foreword i

Author's Preface v

Summary 1
Emerging Answers: Research Findings on Programs to Reduce Teen Pregnancy

Chapter One 13
Making the Case for Prevention Efforts:
Adolescent Risk-Taking Behavior and its Consequences

Chapter Two 25
Looking for Reasons Why: The Antecedents of Adolescent Sexual Behavior

Chapter Three 73
Assessing the Evidence: Factors Affecting the Strength of Research Results

Chapter Four 83
Emerging Answers: The Behavioral Impact of Programs to
Reduce Adolescent Sexual Risk-Taking

Chapter Five 169
Looking Forward: Conclusions About the State of Research
and the Effectiveness of Programs

Chapter Six 177
Bringing It Home: Applying These Research Results in Communities

Summary

Emerging Answers: Research Findings on Programs to Reduce Teen Pregnancy

Introduction

When the National Campaign to Prevent Teen Pregnancy released its first major report, *No Easy Answers: Research Findings on Programs to Reduce Teen Pregnancy* (Kirby, 1997), it wasn't clear that the recent modest reductions in rates of teen pregnancy and childbearing noted at the time were going to continue. Four years later, there is good news to report: teen pregnancy and childbearing rates have continued their significant decline for several years among all racial and ethnic groups and in all parts of the United States. The credit for this welcome trend goes, of course, to teens themselves who have obviously changed their behavior for the better. Evaluation research completed since *No Easy Answers* was published offers additional good news: more programs to prevent teen pregnancy are making a real difference in encouraging teens to remain abstinent or use contraception when they have sex. As a result of these encouraging trends in the rates and in the research, this updated research review is entitled *Emerging Answers.*

However, what was true in 1997 is still true today: teen pregnancy and childbearing remain very serious problems in the United States. Even with recent declines, the United States still has the highest teen pregnancy and birth rates among comparable industrialized nations, twice as high as Great Britain and ten times as high as the Netherlands, for instance. In other words, this is no time to be complacent; there's still a long way to go.

Not surprisingly, people from all over the country still come to the National Campaign with one principal question: "What can I do in my community to prevent teen pregnancy — what really works?" This new research review helps answer that question more definitively. However, it is important from the outset to note some of its limitations. The full report, which is summarized here, discusses only those programs that have been subjected to evaluation research that meets certain methodological criteria (see below). It does not discuss what parents can do; it does not evaluate the role of broad cultural values and norms; and it does not review the relative efficacy of vari-

ous methods of contraception. And the paper examines only primary prevention programs; it does not review interventions to prevent second pregnancies and births among teen mothers, although some of the conclusions would apply to these pregnancies and births as well. In addition, it is crucial for leaders to understand that although effective programs can help reduce teen pregnancy — a few quite substantially — it is naive to think that they can completely solve the problem by themselves. Indeed, no single approach to preventing teen pregnancy can provide a 100% solution.

Nonetheless, prevention programs can be an important part of the answer, and it is encouraging that research is revealing more about what makes the successful ones work. The research reviewed here offers some important "emerging answers" about what effective programs look like. It summarizes what has, and has not, worked in many communities. Of course, local decisions about programming are often affected by more than research, including such important considerations as community values, available resources, complementary services already available, the preferences of teens and parents, and local politics. Fortunately, a number of manuals to help communities put all these pieces together are available, including the National Campaign's *Get Organized: A Guide to Preventing Teen Pregnancy.*

The following summary outlines some facts that explain why communities must remain vigilant about teen pregnancy, childbearing, and STDs, outlines the criteria for including studies in this review, discusses some of the antecedents of teen sexual risk-taking, and, finally, summarizes the findings of the research review and their implications for communities.

The Problem of Teen Pregnancy

The recent and steady decline in teen pregnancy and birth rates in the United States should provide encouragement that continued progress is possible. However, there remain compelling reasons to increase prevention efforts:

- Despite the declining rates, more than four in ten teen girls still get pregnant at least once before age 20, which translates into nearly 900,000 teen pregnancies per year.
- Despite a leveling off of sexual activity among teens, about two-thirds of all students have sex before graduating from high school — potentially exposing themselves to pregnancy and STDs.
- When teens give birth, their future prospects become more bleak. They become less likely to complete school and more likely to be single parents, for instance. Their children's prospects are even worse — they have less supportive and stimulating home environments, poorer health, lower cognitive development, worse educational outcomes, more behavior problems, and are more likely to become teen parents themselves.
- Despite indications of better use of contraception by sexually active teens (particularly of condoms at first sex), many do not use contraceptives correctly and consistently every time they have sex.
- As a result of sexual risk-taking, about one in four sexually experienced teens contract an STD each year — some of which are incurable, including HIV, which is, of course, life-threatening.
- Despite recent encouraging trends in teen pregnancy, it is important to remember that each year a new set of teens arrives on the scene, meaning that efforts to prevent teen pregnancy must

be constantly renewed. In addition, between 2000 and 2010, the population of teen girls aged 15-19 is expected to increase by nearly 10 percent — which means that even declining *rates* may not necessarily mean fewer *numbers* of teen pregnancies and births.

The Criteria for Inclusion in this Review

Evaluation studies included in Emerging Answers had to meet certain scientific criteria. While *No Easy Answers* used publication in a peer-reviewed journal as the primary qualification for including a study, this review relies on an expanded set of methodological criteria. This change was made for two reasons: (1) some studies employed rigorous research methods but, for a variety of reasons, were never published in peer-reviewed journals, and (2) a few studies published in peer-reviewed journals employed very weak methods and provided misleading results. To be included in *Emerging Answers*, a program evaluation had to meet multiple criteria, the most important of which were to have:

- been completed in 1980 or later,
- been conducted in the United States or Canada,
- been targeted at adolescents of middle school or high school age (roughly 12-18),
- employed an experimental or quasi-experimental design,
- had a sample size of at least 100 in the combined treatment and control group, and
- measured impact on sexual or contraceptive behavior, pregnancy, or childbearing.

Antecedents to Sexual Risk-Taking, Pregnancy, and Childbearing

The reasons behind teen pregnancy are complex, varied, and overlapping. In fact, from a review of at least 250 studies, *Emerging Answers* culls more than 100 precursors or "antecedents" to early teen sexual intercourse, poor contraceptive use, pregnancy, and childbearing. These risk factors fall under such categories as community disadvantage; family structure and economic disadvantage; family, peer, and partner attitudes and behavior; and characteristics of teens themselves, including biology, detachment from school, other behaviors that put young people at risk, emotional distress, and sexual beliefs, attitudes, and skills. While all teens are at some risk, some teens are at much higher risk than others. These antecedents can be used to identify those youth at higher risk of sexual risk-taking and to guide the development of effective programs. No single program could — or should — try to address all of these antecedents; yet, at the same time, effective programs are more likely to focus intentionally on several of them in a clear, purposeful way.

Because the reasons behind teen pregnancy vary, so do the types of programs adults design to combat the problem. When most people think of preventing teen pregnancy, they probably conjure images of sex or abstinence education classes or clinics that offer contraceptive services. Although the most important antecedents of teen pregnancy and childbearing relate directly to sexual attitudes, beliefs, and skills, many influential family, community, cultural, and individual factors closely associated with teen pregnancy actually have little to do directly with sex (such as growing up in a poor community, having little attachment to one's parents, failing at school, and being depressed).

In fact, one program with strong evidence for success in reducing teen pregnany concentrates on the *non-sexual* antecedents of teen pregnancy. Simply put, the antecedents to teen pregnancy come in two categories: those that are sexual in nature (such as attitudes toward sex and contraception) and those that are not.

Findings on Programs

With these two categories of antecedents in mind, one can divide programs to prevent teen pregnancy into three types: those that focus on sexual antecedents, those that focus on non-sexual antecedents, and those that do both. *Emerging Answers* organizes its findings on programs into these three broad categories — and then into several sub-categories — and offers conclusions about the research in each. Of course, given the great diversity of programs that exist, any typology will be inadequate to the task of capturing all the various ways that programs can be defined.

Programs That Focus on the *Sexual Antecedents* of Teen Pregnancy

Curricula-Based Programs

- Abstinence-Only Programs
- Sex and HIV Education Programs

Sex and HIV Education Programs for Parents and Families

Clinic or School-Based Programs to Provide Reproductive Health Care or to Improve Access to Condoms or Other Contraceptives

- Family Planning Clinics and Services
- Protocols for Clinic Appointments and Supportive Activities
- Other Clinic Characteristics and Programs
- School-Based and School-Linked Clinics
- School Condom-Availability Programs

Community-Wide Initiatives with Many Components

Programs That Focus on *Non-Sexual* Antecedents

Early Childhood Programs

Youth Development Programs for Adolescents

- Service Learning Programs
- Vocational Education and Employment Programs
- Other Youth Development Programs

Programs That Focus on *Both* Sexual and Non-Sexual Antecedents

Programs with Both Sexuality and Youth Development Components

Programs that Focus on Sexual Antecedents of Teen Pregnancy

Programs that focus on the sexual antecedents of teen pregnancy are divided in this review into four groups: curricula-based programs for young people (including abstinence education and sex education) that are typically offered in schools, sex and HIV education programs for parents and families, programs to improve access to condoms and other contraceptives, and multi-component, community-wide initiatives that have a strong emphasis on sex education or contraceptive services.

Curricula-Based Programs

According to recent national surveys, nearly every teenager in this country receives some form of sex or abstinence education, but the curricula vary widely in both focus and intensity. This review places curricula into two groups: abstinence-only education and sex or HIV education (sometimes also called abstinence-plus or comprehensive sex education). There has been a great growth in the former category since the 1996 welfare reform law made $85 million in federal and state funding available each year for absti-

nence-until-marriage interventions. However, in practice, curricula-based programs don't really divide neatly into these two groups; they actually exist along a continuum. For instance, while all abstinence-only programs focus on abstinence as the only truly healthy and correct choice for young people, some also discuss condoms and other contraception, focusing primarily on their failure rates; others mention the protective uses of condoms in a medically accurate manner, while still stressing abstinence. Similarly, many sexuality education programs describe abstinence as the safest, and often the best, choice for teens but also encourage the use of condoms and other contraception for sexually active teens. A few — particularly those for high-risk, sexually active youth — focus primarily on consistent use of contraceptives, especially condoms.

Abstinence-Only Programs

Very little rigorous evaluation of abstinence-only programs has been completed; in fact, only three studies met the criteria for this review. The primary conclusion that can be drawn from these three studies is that the evidence is not conclusive about abstinence-only programs. None of the three evaluated programs showed an overall positive effect on sexual behavior, nor did they affect contraceptive use among sexually active participants. However, given the paucity of the research and the great diversity of abstinence-only programs that is not reflected in these three studies, one should be very careful about drawing conclusions about abstinence-only programs in general. Fortunately, results from a well-designed, federally-sponsored evaluation of Title V-funded abstinence programs should be available within the next two years.

Sex and HIV Education Programs

A large body of evaluation research clearly shows that sex and HIV education programs included in this review do not increase sexual activity — they do not hasten the onset of sex, increase the frequency of sex, nor increase the number of sexual partners. To the contrary, some sex and HIV education programs delay the onset of sex, reduce the frequency of sex, or reduce the number of sexual partners. In fact, since the publication of *No Easy Answers*, two independent studies have found that one particular curriculum, *Reducing the Risk*, delayed the onset of intercourse. (*Reducing the Risk* also increased the use of condoms or contraceptives among some groups of youth). This is the first time that research on replications of a sex education program has confirmed initial findings of effectiveness.

Other sex and HIV education programs — including *Safer Choices; Becoming a Responsible Teen; Making a Difference: An Abstinence Approach to STD, Teen Pregnancy, and HIV/AIDS Prevention*; and *Making a Difference: A Safer Sex Approach to STD, Teen Pregnancy, and HIV/AIDS Prevention* — have also been shown to delay sex or increase condom or other contraceptive use and thereby to decrease unprotected sex sub stantially. The studies of these four curricula employed experimental designs and found positive behavioral effects for at least 12 to 31 months. All five of these sex and HIV education curricula have also been identified by the Centers for Disease Control and Prevention (CDC) as having strong evidence of success.

The programs that have changed teens' sexual behavior share ten necessary characteristics (see sidebar on the next page). The absence of even one of these characteristics appears to make a program appreciably less likely to be effective.

10 Characteristics of Effective Sex and HIV Education Programs

The curricula of the most effective sex and HIV education programs share ten common characteristics. These programs:

1. Focus on reducing one or more sexual behaviors that lead to unintended pregnancy or HIV/STD infection.
2. Are based on theoretical approaches that have been demonstrated to influence other health-related behavior and identify specific important sexual antecedents to be targeted.
3. Deliver and consistently reinforce a clear message about abstaining from sexual activity and/or using condoms or other forms of contraception. This appears to be one of the most important characteristics that distinguishes effective from ineffective programs.
4. Provide basic, accurate information about the risks of teen sexual activity and about ways to avoid intercourse or use methods of protection against pregnancy and STDs.
5. Include activities that address social pressures that influence sexual behavior.
6. Provide examples of and practice with communication, negotiation, and refusal skills.
7. Employ teaching methods designed to involve participants and have them personalize the information.
8. Incorporate behavioral goals, teaching methods, and materials that are appropriate to the age, sexual experience, and culture of the students.
9. Last a sufficient length of time (i.e., more than a few hours).
10. Select teachers or peer leaders who believe in the program and then provide them with adequate training.

Generally speaking, short-term curricula — whether abstinence-only or sexuality education programs — do not have measurable impact on the behavior of teens.

Sex and HIV Education Programs for Parents and Families

Most parents want to impart their values about sexuality to their children. But because parents often have difficulty talking with their children about sexual topics, a number of educational programs have been developed to improve parent/child communication. Many studies have demonstrated short-term increases in parent/child communication, as well as increases in parent comfort with that communication, although the positive effects dissipate with time. Neither of the two studies that measured whether these programs delayed the onset of sexual intercourse found statistically significant effects, but the characteristics of the studies might have obscured possible program impact. This does not mean that parental influence and parent/child communication are not important. In fact, other research confirms the importance of parent/child "connectedness," for instance, in reducing risky sexual behavior among teens.

Programs Designed to Improve Access to Condoms or Other Contraceptives

Many community family planning clinics, school-based health clinics, and school-linked clinics offer services to teens,

including access to condoms and other contraceptives. With regard to family planning clinics in particular, it is clear that they provide many adolescents with contraceptive services, which presumably prevent pregnancies among those teens. Nonetheless, because the long-term impact of family planning services on the frequency of sexual behavior is not known, the number of teen pregnancies prevented by family planning services is difficult to estimate.

However, there are clearer findings regarding particular clinic protocols or programs within health or family planning clinics. These programs — in which youth were provided with information about abstinence, condoms, and/or contraception; were engaged in one-on-one discussions about their own behavior; were given clear messages about sex and condom or contraceptive use; and were provided condoms or contraceptives — consistently increased the use of condoms and contraception without increasing sexual activity.

Many studies of schools with health clinics and schools with condom-availability programs have consistently shown that the provision of condoms or other contraceptives through schools *does not* increase sexual activity. Studies also show that substantial proportions of sexually experienced students have obtained contraceptives from these programs. However, given the relatively wide availability of contraceptives in most communities, most school-based clinics, especially those that did not focus on pregnancy or STD prevention, did not appear to markedly increase the school-wide use of contraceptives — that is, there appeared to be a "substitution effect," meaning that teens merely switched from getting contraception from a source outside of school to getting it in school. By contrast, two studies suggested that school-based or school-linked clinics *did* increase use of contraception when they focused much more on contraception, gave clear messages about abstinence and contraception, and provided or prescribed contraceptives.

While studies of school condom-availability programs consistently demonstrated that the programs did not increase sexual activity, they provided conflicting results about their impact upon school-wide use of condoms. These differences may reflect methodological limitations, differences in the availability of condoms in the community, or differences in the programs themselves.

Taken together, these studies suggest that family planning clinic protocols or programs, school-based and school-linked clinics, and condom-availability programs in schools that increased condom or other contraceptive use shared common characteristics. They focused primarily (or solely) upon reproductive health and provided young people with a combination of educational materials (however modest), the opportunity for one-on-one counseling or discussions, a clear message about abstinence and condom or contraceptive use, and actual condoms or other contraceptives.

Community-Wide Initiatives with Many Components

In the past two decades, recognizing the complexity of the problem of teen pregnancy, more communities have put in place multi-component efforts to reduce rates of teen pregnancy. These initiatives typically combine such interventions as media campaigns, increased access to family planning and contraception services, sex education classes for teens, and training in parent/child communication. The research evidence on these initiatives is mixed. Each of the studies reviewed in the report measured effects on teens throughout the community, not just on those teens directly served by programs. The two most effective programs were the most intensive ones, and, in fact, when the

interventions ceased, the use of condoms or pregnancy rates returned to pre-program levels, suggesting that such programs need to be maintained in order to have continuing effects. However, one of these two effective programs did not show positive results when it was tried again in a different community. The bottom line seems to be that it is very hard to change adolescent sexual or contraceptive behavior throughout an entire community. When such change is accomplished, it takes intense effort, which must be sustained.

Programs That Focus on Non-Sexual Antecedents

Programs in this category focus on broader reasons behind why teens get pregnant or cause a pregnancy, including disadvantaged families and communities, detachment from school, work, or other important social institutions, and lack of close relationships with parents and other caring adults. For instance, research suggests that teens who are doing well in school and have educational and career plans for the future are less likely to get pregnant or cause a pregnancy. Increasingly, programs to prevent teen pregnancy concentrate on helping young people develop skills and confidence, focus on education, and take advantage of job opportunities and mentoring relationships with adults — thereby helping them create reasons to make responsible decisions about sex. These efforts include service learning, vocational education and employment programs, and youth development programs, broadly defined. Early childhood programs also focus on non-sexual antecedents that may have an impact on the later sexual behavior of their participants.

Early Childhood Programs

Only one study evaluating an early childhood program met the criteria for this review. In the study of the *Abecedarian Project*, infants in low-income families were randomly assigned to a full-time, year-round day care program focused on improving intellectual and cognitive development or to regular infant day care. In elementary school, they were again randomly assigned to a three-year parent involvement program or to a normal school environment. The children were followed until age 21. The kids in the preschool program delayed childbearing by more than a year in comparison with the control group; they also performed higher on a number of intellectual and academic measures. While this is encouraging, it is only one study with a small sample, albeit with a strong scientific design.

Youth Development Programs for Adolescents

Service Learning Programs

Service learning programs include two parts: (1) voluntary service by teens in the community (e.g., tutoring, working in nursing homes, and fixing up parks and recreation areas), and (2) structured time for preparation and reflection before, during, and after service (e.g., group discussions, journal writing, and papers). Sometimes the service is part of an academic class. Service learning programs may have the strongest evidence of any intervention that they reduce actual teen pregnancy rates while the youth are participating in the program. Among the programs with the best evidence of effectiveness are the *Teen Outreach Program* and *Reach for Health* service learning program. Although the research does not clearly indicate why service learning is so successful, several possibilities seem plausible: participants develop relationships with program facilitators, they gain a sense of autonomy and feel more competent in their relationships with peers and adults, and they feel empowered by the knowledge that they can make a difference in the lives of others. All such factors, in turn, may help increase teenagers' motiva-

tion to avoid pregnancy. In addition, participating in supervised activities — especially after school — may simply reduce the opportunities teens have to engage in risky behavior, including unprotected sex.

Vocational Education Programs

Vocational education programs provide young people with remedial, academic, and vocational education sometimes coupled with assistance in getting jobs and other health education and health services. Four studies have evaluated the effect of such programs on teen sexual risk-taking, pregnancy, and childbearing. A strong study of the *Summer Training and Education Program* (STEP) revealed that the program did not have a consistent and significant impact on either sexual activity or use of contraception. Similarly, evaluations of three programs, the *Conservation and Youth Service Corps*, the *Job Corps*, and *JOBSTART*, revealed that they did not affect overall teen pregnancy or birth rates at 15- to 48-month follow-up. Thus, these studies provide rather strong evidence that programs like these four, which offer academic and vocation education and a few support services and are quite intensive, will not decrease pregnancy or birth rates among disadvantaged teens.

Other Youth Development Programs

Two other youth development programs have been evaluated for their effect on teen pregnancy or birth rates. One of them, the *Seattle Social Development Program,* was designed to increase grade schoolers' attachment to school and family by improving teaching strategies and parenting skills. When these students were followed to age 18, those receiving the intervention were less likely to report a pregnancy than the comparison group. This is encouraging, but the evaluation design was not strong.

Programs with Both Sexuality and Youth Development Components

Three studies have examined programs that address both reproductive health and youth development simultaneously. The first study evaluated three programs in Washington state that provided teens with small group and individualized education and skill-building sessions, as well as other individual services. Results indicated that the programs did not delay sex nor increase contraceptive use, but they did decrease the frequency of sex. The second study evaluated different programs in 44 sites in California targeted to the sisters of teen girls who had become pregnant — an interesting strategy that is based on the well-known fact that having an older sister become pregnant increases the chances that younger sister will do the same. The programs offered individual case management and group activities and services. The evaluation showed that the interventions delayed sex and decreased reported pregnancy nine months later.

Finally, a recent and very rigorous study of the comprehensive *Children's Aid Society-Carrera Program* has demonstrated that, among girls, it significantly delayed the onset of sex, increased the use of condoms and other effective methods of contraception, and reduced pregnancy and birth rates. The program did not reduce sexual risk-taking among boys. The *CAS-Carrera Program*, which is long-term, intensive, and expensive, includes many components: (1) family life and sex education, (2) individual academic assessment, tutoring, help with homework, preparation for standardized exams, and assistance with college entrance, (3) work-related activities, including a job club, stipends, individual bank accounts, employment, and career awareness, (4) self-expression through the arts, (5) sports activities, and (6) comprehensive health care, including mental health and reproductive health services and contraception. This is the

first and only study to date that includes random assignment, multiple sites, and a large sample size and that found a positive impact on sexual and contraceptive behavior, pregnancy, and births among girls for as long as three years.

What Does All This Mean?

Just as in 1997, there are still no easy answers to the problem of teen pregnancy. However, recent research suggests that there are programs in each of the three main categories described above with evidence that they reduce sexual risk-taking, pregnancy, and childbearing among teens (see "Programs with Strong Evidence of Success," Chapter 6, p. 179):

- *Programs That Focus on Sexual Antecedents:* Several sex and HIV education programs delay the onset of sex, reduce the frequency of sex, reduce the number of sexual partners among teens, or increase the use of condoms and other forms of contraception. The most successful programs share ten specific characteristics (see p. 91). In addition, several particular protocols and interventions in clinic programs also increase the use of condoms or other forms of contraception.
- *Programs That Focus on Non-Sexual Antecedents:* Certain service learning programs, which do not focus on sexual issues at all, have the strongest evidence that they actually reduce teen pregnancy rates. Other types of youth development programs, especially vocational education, have not reduced teen pregnancy or childbearing.
- *Programs That Focus on Both Sexual and Non-Sexual Antecedents:* A comprehensive, intensive, and long-term intervention, the *Children's Aid Society-Carrera Program*, which includes both youth development and reproductive health components, has been demonstrated to substantially reduce teen pregnancy and birth rates among girls over a long period of time.

These three categories of programs may seem contradictory — one focuses directly on issues of sex and contraception, one addresses non-sexual factors, and the third targets both. But finding effective programs in each category is heartening news — and conforms with what the research says about the antecedents of teen pregnancy and childbearing. If very different approaches prove to be effective, then communities benefit because they have more options from which to choose.

Studies of a number of other types of interventions, including community-wide initiatives and collaboratives, school-based clinics and school condom distribution programs, and some sex and HIV education programs, offer mixed results of effectiveness. In addition, the few rigorous studies of abstinence-only curricula that have been completed to date do not show any overall effect on sexual behavior or contraceptive use. That said, one should not conclude that these various interventions have no value at all or that they should necessarily be abandoned as part of the overall mix of prevention strategies. There may be a variety of such interventions whose value has not yet been identified by rigorous evaluation.

In addition, the research indicates that encouraging abstinence and urging better use of contraception are compatible goals — for at least two reasons. First, the overwhelming weight of evidence shows that sex education that discusses contraception does not increase sexual activity. Second, those programs that emphasize abstinence as the safest and best approach, while also teaching about contraceptives for sexually active youth, do not decrease contraceptive use. In fact, effective programs shared two common attributes: (1) being clearly focused on sexual

behavior and contraceptive use and (2) delivering a clear message about abstaining from sex as the safest choice for teens and using protection against STDs and pregnancy if a teen is sexually active.

So, what should communities do with this information gleaned from the research literature? *Emerging Answers* suggests three strategies for employing promising approaches:

1. The best option is to replicate with fidelity (that is, carefully copy) programs that have been demonstrated to be effective with similar populations of teens.
2. The next best option is to select or design programs with the common characteristics of programs that have been effective with similar populations.
3. If a community cannot do either #1 or #2, it should use a careful, deliberate process to select or design new programs and not just rely on accustomed ways of doing things. A useful strategy is to use a process adopted by many of the people who designed the effective programs reviewed above: develop logic models. A logic model (also called a causal or program model) is a concise, causal description of exactly how certain program activities can be expected to affect particular behaviors by teens. At a minimum, a logic model requires that one be specific about what behavior one wants to change. A logic model identifies in the following order: (a) the behaviors to be changed, (b) the precursors or antecedents of these behaviors (i.e., the individual, family, social, and community factors that predispose teens to risky behaviors), and (c) the particular program activities designed to change these antecedents. This way of thinking and planning usually results in programs that have clear goals and orderly and plausible plans for reaching those goals.

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, they should be encouraged by declining rates and new research showing that some programs are making a difference. They should continue to explore many ways to address the various causes of teen pregnancy. They should replicate those programs that have the best evidence for success, build their efforts around the common elements of successful programs, and continue to explore, develop, and evaluate innovative and promising approaches.

Of course, all young people live in a larger culture that is influenced by such disparate forces as parents, peers, schools, the economy, faith institutions, and the entertainment media. So even as professionals continue to develop, implement, and evaluate better and more effective prevention programs, there is still enough work for other sectors of society to help make adolescence in America a time of education and growing up, not pregnancy and parenting.

Chapter 1

Making the Case for Prevention Efforts: Adolescent Risk-Taking Behavior and Its Consequences

Sexual activity by teens and teen pregnancy are not new phenomena. However, during the past century (and especially the last few decades), several trends changed the prevalence, nature, and outcomes of adolescent sexual activity in the United States. In the past hundred years, for example, the average age of menarche and spermarche decreased, while the average age of marriage substantially increased. In addition, societal values about sex — and even pregnancy and childbearing — before marriage changed considerably. As a result of these and other factors, many young people began having sexual intercourse at an increasingly early age during the 1970s and the 1980s. Consequently, the widening gap between puberty and initiation of intercourse on the one hand, and marriage on the other hand, led to a larger percentage of youth who were sexually experienced at any given age, a greater number of acts of intercourse before marriage, a greater number of sexual partners before marriage, and higher rates of unintended pregnancy, out-of-wedlock births, and sexually transmitted diseases (STDs), including HIV.

Notably, many of these trends among adolescents paralleled similar trends among adults. During the last few decades, adults have also engaged in a greater amount of sex outside of marriage and their out-of-wedlock birth rate rose (U.S. Department of Health and Human Services, 1995). Furthermore, when the birth rate for adults 20 and over rose or fell, the birth rate for adolescents typically did the same (Males, 1993).

The rest of this chapter details specific aspects of these changing trends among teens: sexual activity itself, use of contraception, pregnancies and births, and STDs, including HIV.

Adolescent Sexual Activity

In 1995, the median age of menarche for females was 12.6 years and the median age of marriage was 25.1 (Alan Guttmacher Institute, 2000). For males, the median ages for spermarche and marriage in 1988 were 14.0 and 26.5 respectively (Alan Guttmacher Institute, 1994). Thus, for both male and females, 12.5 years elapse on average

between the time when they become fertile and their sexual feelings intensify and the time when they marry, creating a long period during which they need to avoid unintended premarital pregnancy or STDs either through abstinence from sex or the use of contraception.

The proportion of teens who have ever had sexual intercourse increases steadily with age. In 1995, among girls, the percentage who had ever had sex varied from 25 percent among 15-year-olds to 77 percent among 19-year-olds, while among males, it varied from 27 percent among 15-year-olds to 85 percent among 19-year-olds (Moore, Driscoll, & Lindberg, 1998). Among students in grades 9-12 across the U.S. in 1999, 50 percent reported ever having had sexual intercourse. This ranged from 39 percent among 9th graders to 65 percent among 12 graders (CDC, 2000).

Rates of sexual activity also vary with race and ethnicity, although much of this variation disappears if one controls for poverty and other forms of disadvantage. In 1999, among high school students, 71 percent of African-Americans, 54 percent of Hispanics, and 43 percent of whites had ever had sex (CDC, 2000).

The percentage of all teenagers who had ever had sex by any given age increased substantially during the 1970s and 1980s, but then stabilized during the 1990s. And, among males, the percentage who had ever had sex actually decreased during the 1990s. According to data from the National Survey of Family Growth, the percentage of 15- to 19-year-old females who had ever had sex increased from 29 percent in 1970 to 53 percent in 1988 and then decreased non-significantly to 51 percent in 1995 (Flanigan, 2001; Moore, Driscoll, & Lindberg, 1998). Between 1988 and 1995, the percent of males who had ever had sex decreased from 60 percent to 55 percent (Sonenstein, Ku, Lindberg, et al., 1998). More recent data are available from the Youth Risk Behavior Survey (YRBS), collected from national samples of high school students. According to those data, among female students, the percentage who had ever had sex increased from 48 percent in 1990 to 52 percent in 1995 and then decreased to 48 percent again in 1999, while among males, the percent who had ever had sex decreased continuously from 61 percent in 1990 to 52 percent in 1999 (CDC, 1995; CDC, 1996; CDC, 2000). Regardless of the data source, it is clear that the percent of teen females and males who have ever had sex has stopped increasing, and, especially among males, the percentage has actually decreased (Santelli et al., 2000).

When teenage girls who had not had sex were asked to choose reasons for abstaining from sex, the most common reason was that having sex would be against their religious or moral values. Other common choices were: they wanted to avoid pregnancy; they wanted to avoid getting an STD; and they hadn't met the right partner (Moore, Driscoll, & Lindberg, 1998).

When very young girls do have sex, many report that it was either involuntary or unwanted. For example, in 1995, among girls who were 13- or 14-years-old when they first had sex, 8 percent reported their first sexual experience was involuntary, and an additional 31 percent indicated it was unwanted (Moore, Driscoll, & Lindberg, 1998).

Among male and female teenagers who have ever had sex, many only do so sporadically. Sexually experienced unmarried adolescents have sex during two-thirds of the months each year on average, but one-quarter of these adolescents have sex during fewer than half the months in a year (Alan Guttmacher Institute, 1994). Among high school students in 1999, 50 percent had ever had sex, but only 36 percent had sex during

the previous three months (CDC, 2000). Because of this sporadic 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 sexual intercourse with more than one sexual partner during any given period of time — that is, they most commonly practice premarital serial monogamy (Alan Guttmacher Institute, 1994). Furthermore, about 70 percent of sexually experienced teen females and 54 percent of sexually experienced teen males have either zero or one sexual partner each year. However, 13 percent of sexually experienced females and 20 percent of sexually experienced males have three or more partners each year and, therefore, are at greater risk, especially of STDs (Moore, Driscoll, & Lindberg, 1998). For most sexually active teenagers, their numbers of partners accumulate over time, so if they initiate intercourse at early ages, they have a greater number of sexual partners before marriage.

At least in part because they initiate intercourse earlier, African-American and Hispanic teenagers have more sexual partners than white teenagers by any given age. For example, among all high school students in 1999, 16 percent had previously had sexual intercourse with four or more sexual partners. However, 34 percent of non-Hispanic black, 17 percent of Hispanic, and 12 percent of non-Hispanic white students had four or more partners (CDC, 2000).

Some sexually active teens have sexual partners close to their own ages, but not all do. For instance, among teen males with recent sexual partners, one-quarter have female partners who are the same age, 46 percent have partners 1-3 years younger, and 22 percent have partners 1-3 years older. Only 2 percent have partners 4 or more years younger, and 5 percent have partners 4 or more years older (Abma & Sonenstein, 2001). Among 15- to 19-year-old sexually experienced females, 39 percent had their first sexual experience with a male three or more years older (Moore, Driscoll, & Lindberg, 1998). When girls have sex with much older males, the chances are greater that their first sexual experiences are involuntary or unwanted (Abma, Driscoll, & Moore, 1998).

Use of Contraception

Most sexually experienced teenagers use contraception, at least some of the time. About 71 percent of 15- to 19-year-old females used contraception the first time they had sex, and 68 percent reported using contraception the last time they had sex (Flanigan, 2001).

The apparent trends over time in contraceptive use among teens depend upon the measure of contraceptive use examined, the exact time period, and the data sets examined. Data from the National Survey of Family Growth suggest that among female teenagers there has been a large increase in contraceptive use at first sex from 48 percent in 1982 to 65 percent in 1988 and 71 percent in 1995. Among 15- to 19-year-old females who had sex in the previous three months, the proportion who used contraception at most recent sex decreased between 1988 and 1995. Contraceptive use in the month of interview among teen girls at risk of unintended pregnancy remained constant between 1988 and 1995 at 77 percent (Darroch & Singh, 1999; Flanigan, 2001; Terry & Manlove, 2000).

African-American and white female teens are equally likely to use contraception at their most recent act of sex, but Hispanic female teens are much less likely to do so. According to the 1995 National Survey of Family Growth, 71 percent of white teen females, 70 percent of African-American teen

females, and 53 percent of Hispanic teen females used one or more methods of contraception during their last act of intercourse (Terry & Manlove, 2000). In 1999, among male and female high school students, 55 percent of whites, 70 percent of African-Americans, and 55 percent of Hispanics used a condom the last time they had sex and thereby had some protection against some STDs (CDC, 2000).

Condoms and oral contraceptives are the two most commonly used methods of contraception. Since the mid-1980s, the use of condoms has increased (in part because of the HIV epidemic), while the use of oral contraceptives has declined (Darroch & Singh, 1999). However, small but increasing percentages of teens use hormonal contraceptives such as Depo-Provera or Norplant. These long-acting methods were not available before the 1990s, but, by 1995, they accounted for 9 percent of contraceptive use (Flanigan, 2001).

Condoms are the most commonly used method of contraception at first sex. For example, in 1995, 66 percent of 15- to 19-year-old sexually experienced females had used a condom the first time they had sex (Moore, Driscoll, & Lindberg, 1998), and 94 percent had ever used a condom (Abma, Chandra, et al., 1997).

However, the use of condoms declines with age and sexual experience, and the use of oral contraceptives increases. In 1995, condom use at last sex decreased from 78 percent among 16-year-old boys to 63 percent among 19-year-old boys (Sonenstein, Ku, et al., 1998). Data from the 1999 YRBS reveals similar trends with age (CDC, 2000). Condoms are used disproportionately with casual partners and less commonly with close romantic partners (Pleck, Sonenstein, & Swain, 1988). Furthermore, the longer a sexual relationship between two people lasts, the less likely they are to use condoms (Ku, Sonenstein, & Pleck, 1994).

Like some adults, many teenagers do not consistently use contraceptives properly, thereby exposing themselves to risks of pregnancy or STDs. For example, among 15- to 19-year-old girls relying upon oral contraceptives as their main contraceptive, only 70 percent took a pill every day (Abma, Chandra, et al., 1997). Among 15- to 19-year-old girls relying on only coitus-dependent methods of contraception, only 62 percent used the method during every act of intercourse (Abma, Chandra, et al., 1997). Similarly, among sexually experienced teen boys using condoms, only 45 percent used a condom during every act of intercourse in the last year (Sonenstein, Ku, et al., 1998).

When adolescents were asked why they did not use contraception when they had sex, one of the most frequent responses is that they did not expect or plan to have sex and, therefore, were not prepared (Kirby, Brener, et al., 1999; Kirby, Waszak, & Ziegler, 1989; Princeton Survey Research Associates, 1996). Adolescents say far less frequently that they can't afford birth control, don't know where to get it, can't get it, or don't know how to use it.

Pregnancies and Births

The U.S. teen pregnancy rate is very high. In 1996, among all females aged 15-19, about 97 per 1,000 became pregnant (Henshaw, 1999). The rate is higher for 18- to 19-year-olds (153 per 1,000) than for 15- to 17-year-olds (62 per 1,000). For both age groups combined, these pregnancy rates represent about 880,170 teenage pregnancies annually. In addition, there were about 24,830 pregnancies among adolescents 14 or younger, for a grand total of about 905,000 pregnancies to youth under age 20 (Henshaw, 1999).

The U.S. rate is much higher than those in other western industrialized countries with available data. For example, the U.S. rate of 97 pregnancies per 1,000 girls is nearly twice as high as rates for Canada (52) and England and Wales (55), four to five times as high as rates in France (23) and Germany (19), and approximately seven times the teen pregnancy rates in Italy, Spain, and the Netherlands, all of which have a rate of 14 per 1,000 (Flanigan, 2001; Singh & Darroch, 2000).

The overall 1996 teen pregnancy rate has returned to about the same level as it was in the early 1970s, when it was first measured (Darroch & Singh, 1999). However, it has fluctuated considerably during these last three decades. In 1972, the rate was 95 per 1,000. It then increased gradually to 111 per 1,000 in 1980, decreased slightly to 107 per 1,000 in 1987, increased rapidly to 117 per 1,000 in 1990, and then decreased to 97 per 1,000 in 1996 (Henshaw, 1999).

These changes over time in U.S. pregnancy rates have roughly paralleled changes in *some* other western countries (e.g., England and Wales) (Singh & Darroch, 2000). Furthermore, the decrease in the U.S. pregnancy rate since 1990 has roughly paralleled declines in pregnancy rates in *numerous* other western countries, suggesting that similar forces may be at work.

The increases in pregnancy rates during the 1970s and 1980s reflected the increases in the proportion of 15- to 19-year-old females who engaged in sexual intercourse. Among *sexually experienced* females aged 15-19, the pregnancy rate has *decreased* from 254 per 1,000 in 1972 to 197 per 1,000 in 1995 (Alan Guttmacher Institute, 1994; Darroch & Singh, 1999). This decrease reflects, in large part, greater use of contraception among sexually experienced youth (Darroch & Singh, 1999).

The decrease in the 1990s in the pregnancy rate among all youth, both sexually experienced and inexperienced, probably reflects both a decrease in sexual behavior among teens and an improvement in contraceptive use among sexually experienced teens. However, because of a variety of methodological problems and limitations, it is difficult to know what proportion of the decrease in pregnancy is due to less sexual intercourse and what proportion is due to improved contraceptive use (Darroch & Singh, 1999; Flanigan, 2001).

Although roughly 9 percent of females aged 15-19 become pregnant each year, the cumulative proportion of any cohort of teen females who become pregnant increases during each year of their lives. Thus, more than 40 percent of girls in the United States become pregnant before they reach 20 years of age, and many become pregnant a second time before their twentieth birthday (National Campaign to Prevent Teen Pregnancy, 2001).

The U.S. teen pregnancy rates vary considerably by race and ethnicity. Whereas the pregnancy rate in 1996 for non-Hispanic white 15- to 19-year-old girls was 66 per 1,000, it was 179 per 1,000 among African-Americans and 165 per 1,000 among Hispanics (Darroch & Singh, 1999). Once again, however, much of this variation in teen pregnancy rates reflects differences in levels of poverty.

While the teenage pregnancy rate is, by definition, based upon female teenagers, this does not mean that the males involved in these pregnancies are teenagers. In 1994, 51 percent of the male partners of teen girls who became pregnant were within two years of their partners' ages, 29 percent were 3-5 years older, and 19 percent were six or more years older (Darroch, Landry, and Oslak, 1999). Similarly, in 1994, while the pregnancy rate for 15- to 19-year-old females was

110 per 1,000, the corresponding rate for teen males was only 52 per 1,000 (Darroch, Landry, & Oslak, 1999). This difference in pregnancy rates between the two genders was large for both 15- to 17-year-old teens (86 per 1,000 females versus 29 per 1,000 males) and for 18- to 19-year-old teens (146 per 1,000 females versus 87 per 1,000 males).

In 1994, of all teenage pregnancies that did not end in miscarriages, about 78 percent were unintended (Henshaw, 1998). That year, about 35 percent of teen pregnancies were terminated by abortion, 43 percent resulted in unintended births, and 22 percent resulted in intended births (Henshaw, 1998). The percent of pregnancies resulting in births decreased during most of the 1970s, remained stable during most of the 1980s, and increased somewhat during the late 1980s and early 1990s (Henshaw, 1999). Consistent with these trends, the percent of teen pregnancies ending in abortion also decreased between 1987 and 1994 (Henshaw, 1998).

Consistent with the high pregnancy rate, the teen birth rate is also very high. The birth rate in the United States in 1999 was 50 births per 1,000 15- to 19-year-old females (Ventura et al., 2001). It is higher for 18- to 19-years-olds (80 per 1,000) than for 15- to 17-year-olds (29 per 1,000).

The U.S. teen birth rate is also much higher than that in other western industrialized countries. In 1995, the U.S. birth rate was 57 per 1,000 — in contrast to birth rates of 24 per 1,000 in Canada, 28 per 1,000 in England and Wales (the highest in western Europe), and 6 per 1,000 in the Netherlands (the lowest) (Henshaw, 1999; Singh & Darroch, 2000).

Like the U.S. teen pregnancy rate, the U.S. teen birth rate varies considerably by race and ethnicity. Whereas the birth rate in 1999 was 34 per 1,000 for non-Hispanic whites, it was 81 per 1,000 for African-Americans and 93 per 1,000 among Hispanics (Ventura et al., 2001).

The overall teen birth rate in 1999 was an all-time low (Ventura et al., 2001). However, this obscures important trends. Birth rates declined quite dramatically between the mid-1950s and 1976, further decreased ever so slightly until 1987, increased rapidly until 1991, and then decreased again. Recent decreases occurred initially among second births to teens and then among first births as well. They also occurred among all three major racial/ethnic groups, but the decreases between 1991 and 1999 were greatest among blacks (30 percent decline), second greatest among non-Hispanic whites (22 percent decline) and least among Hispanics (12 percent decline) (Ventura et al., 2001).

Between 1992 and 1997, the rate of second births among teen mothers declined even more than the rate of first births among teenagers. However, at 174 second births per 1,000 teen mothers, this rate is still very high (Moore et al., 1999). The first birth rate for teens was 39 per 1,000 in 1999, the lowest level since 1985 (Ventura et al., 2001).

Among *unmarried* adolescents aged 15 to 19, the birth rate rose from 22 per 1,000 in 1970 to 40 per 1,000 in 1999 (Ventura et al., 2001). This represents a steady increase until 1994, and a slight decrease since then. Similarly, among mothers under age 20, the percent of births that occur out-of-wedlock has risen dramatically — from 15 percent in 1960 to 79 percent in 1999 (Ventura & Bachrach, 2000; Ventura et al., 2001). This large increase in non-marital childbearing has alarmed many people and motivated many efforts to reduce unintended pregnancy among teens.

The increase in non-marital births reflects, in large part, higher pregnancy rates among unmarried teens. It also reflects, in part, less legitimation by marriage — that is, there has been a substantial decrease in marriage among pregnant teenage girls. For example, in the early 1960s, 59 percent of first births that were conceived out-of-wedlock among 15- to 19-year-olds were legitimated by marriage, whereas only 16 percent were legitimated in the early 1990s (Bachu, 1999).

Although 79 percent of teen births are out-of-wedlock, only 29 percent of all out-of-wedlock births are to teenagers (Ventura et al., 2001). In fact, the percentage of all out-of-wedlock births that are to teenagers has actually declined over time, reflecting the fact that the number of out-of-wedlock births among older women has increased even more rapidly than the number among teenagers. It is also true that half of *first* out-of-wedlock births are to teens. Thus, the pattern of giving birth out-of-wedlock often begins during the teen years (National Campaign to Prevent Teen Pregnancy, 2001).

As is the case with pregnancies among teenage females, births among teenage females are disproportionately caused by somewhat older males. Indeed, in 1988, 19 percent of the births to 15- to 19-year-old girls were fathered by males six or more years older than their female partners (Alan Guttmacher Institute, 1994), and 50 percent of births to teens aged 15-17 were fathered by males aged 20 or older (Landry & Forrest, 1995). On the other hand, of all fathers aged 22-29 years, only 2 percent fathered children borne by females aged 15-17 (Lindberg et al., 1997). Because not all 22- to 29-year-old males are fathers, the percentage of 22- to 29-year-old males who father children borne by very young females is even smaller.

The birth rate for 15- to 19-year-old males was 21 per 1,000 in 1999 (Ventura et al., 2001). As with the rate for teen females, it also increased during the late 1980s, peaked in 1994, and is now declining (Ventura et al., 2001).

Consequences of Adolescent Childbearing

Poverty and its related ills are clearly connected with teen pregnancy and childbearing. Poor teens are more likely to get pregnant and have children, and teens who begin families are more likely to be poor. Therefore, poverty and other manifestations of social disorganization can be both the consequences and the causes of teen pregnancy and childbearing.

Poverty and various manifestations of social disorganization are statistically associated with adolescent childbearing, but assumptions about the direction of causality have biased estimates of the consequences of early childbearing. For many years, it was widely believed that poverty and manifestations of social disorganization 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-old girls — give birth, their future prospects decline in a number of ways (Maynard, 1997). They become less likely to complete school, 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 children (Maynard, 1997).

The children of teenaged mothers may bear the greatest brunt of their mothers' young age. In particular, children born to

mothers aged 15-17 in comparison with those born to mothers aged 20 or 21 have less supportive and stimulating home environments, poorer health, lower cognitive development, worse educational outcomes, higher rates of behavior problems, and higher rates of adolescent childbearing themselves (Maynard, 1997).

Finally, adolescent childbearing leads to considerable cost to taxpayers and society more generally. After adjustment for other factors related to teen parenthood, the estimated annual cost to taxpayers of births to young women who became mothers when they were 15-17, instead of 20-21, was at least $6.9 billion in 1996. This estimate includes only five categories of costs: lost tax revenues, increased spending on public assistance, health care for the children, foster care, and the criminal justice system (Maynard, 1997). And there are additional costs associated with young women who gave birth when they were 18- to 19-years-old instead of when they are older. Although the cost per child is lower for the older teen mothers, there are many more 18- to 19-year-old mothers than 15- to 17-year-old mothers. Thus, the aggregate costs to taxpayers of 18- or 19-year-olds giving birth may be substantial.

Sexually Transmitted Diseases

Teen sexual activity also leads to high rates of sexually transmitted diseases (STDs). About three million teenagers acquire an STD every year (Office of National AIDS Policy, 1996). This means that roughly one in eight young people between the ages of 13 and 19 and about one in four of those who have ever had sexual intercourse contract an STD every year (Alan Guttmacher Institute, 1994). In some geographic areas, rates are much higher. For example, in one community, 40 percent of 14- to 19-year-old girls who came to a teen clinic had an STD (Bunnell et al., 1999). In addition, about one-third of all sexually active young people become infected by an STD by age 24 (American School Health Association, 1998). Of course, many have been treated and cured, but others have not. Furthermore, approximately one-quarter of all reported cases of STDs occur among adolescents, and about another one-third occur among young adults aged 20-24 (Eng & Butler, 1997).

Rates of STDs are typically much higher for African-American and Hispanic teens than white teens. For example, in 1997, the rate of gonorrhea among African-American 15- to 19-year-olds was about 24 times higher than the rate among white teens (Division of STD Prevention, 1998). In part, these higher rates reflect greater poverty, less access to health services, larger numbers of sexual partners, and possibly differences in reporting by clinics serving low-income minority youth (Santelli et al., 1999).

Adolescents have the highest age-specific rates for some STDs, such as chlamydia and gonorrhea (Division of STD Prevention, 1998). When data were analyzed by gender in 1997, 15- to 19-year-old girls had the highest rates of chlamydia and gonorrhea, while the rates for 15- to 19-year-old boys were second only to those for 20- to 24-year-old young men (Division of STD Prevention, 1998).

Such high rates of STDs among teenagers are caused, in part, by the fact that they are less likely to be married than older sexually active people and therefore have more sexual partners. In addition, they may have sex with other partners at higher risk and may be less likely to receive health care for curable STDs. For some STDs, such as chlamydia, adolescent women may also be more physiologically susceptible to infection than older women (Division of STD Prevention, 1998).

Rates of some curable STDs that have been targeted by STD prevention programs have been reduced among adolescents, just as they have been reduced among adults. For example, chlamydia rates among teen women and both gonorrhea and syphilis rates among both genders have declined. These declines have occurred among all three major racial/ethnic groups (Division of STD Prevention, 1998). These data demonstrate that it is possible to reduce STDs among teens. On the other hand, the prevalence of some incurable STDs has increased among teens. For example, since the 1970s, the prevalence of herpes simplex virus type 2 has increased substantially (Fleming et al., 1997).

In 1996, the Office of National AIDS Policy estimated that one-quarter of all new HIV infections occur among young people between the ages of 13 and 21. By the end of 1999, 3,725 13- to 19-year-old teenagers had been reported with AIDS (CDC, 1999). In addition, in the 32 areas with confidential HIV infection reporting, an additional 4,797 teenagers were reported to be HIV-positive. Because of the long and variable time between HIV infection and AIDS, rates of HIV infection provide a more accurate picture of current trends in the epidemic than rates of AIDS. Among teenagers, a majority of these infections occur among girls (56 percent), and many occur through heterosexual contact (CDC, 1999). Among the teenagers who were infected with HIV but did not yet have AIDS and for whom exposure risk was reported, 87 percent of the females and 10 percent of the males contracted HIV from heterosexual contact. Rates of HIV infection are also higher among African-Americans than among whites. Through December 1999, among young people ages 13 to 19 with HIV, 67 percent were African-American youth, while only 26 percent were non-Hispanic whites (CDC, 1999).

The human and monetary costs of STDs are very high. STDs other than HIV can lead to infertility, ectopic pregnancy, cancer, and numerous other health problems. They can also increase the chances of HIV transmission. The Institute of Medicine estimated that the 1994 monetary costs of STDs, other than HIV, among all people, not only adolescents, exceed $10 billion per year (Eng & Butler, 1997). Sadly, because HIV can still lead to death and because treatment for HIV and AIDS is so expensive, the human and monetary costs of HIV and AIDS are extremely high.

Implications for Pregnancy Prevention Programs

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

- Despite the recent 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 and their children. Thus, we should not become complacent about recent progress, but instead should be encouraged, should try harder, and should build upon our success.
- Postponing the initiation of sex or returning to abstinence should be an important goal of comprehensive pregnancy prevention initiatives. Many youth have sex at an early age, thereby making high pregnancy rates possible. Furthermore, the apparent decline in the percent of youth who had ever had sex in the 1990s simply demonstrates that the previous trend toward ever earlier initiation of sex can be halted and possibly reversed. In addition, abstinence is the most effective way to avoid teen pregnancy — and represents the only option

for unmarried teens that some people can support.

- Comprehensive pregnancy prevention initiatives should also promote consistent and correct use of effective methods of contraception for those youth who do have sex. Because a majority of youth initiate sex before they complete their teen years but many of them do not use contraception consistently and correctly, prevention strategies need to improve contraceptive use by teens. During the last few decades, contraceptive use among sexually experienced youth has increased, and their pregnancy rates have declined accordingly, demonstrating that efforts to improve contraceptive use can decrease pregnancy rates. In addition, contraception is an additional preventive approach that many people support in combination with an emphasis upon abstinence.

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

- Whenever appropriate, efforts to prevent pregnancy should also address STDs because (1) the costs of STDs, especially HIV, are high, (2) the desire to avoid STDs, like the concern about pregnancy, causes some adolescents to avoid sex or to use condoms, and (3) abstinence and to a lesser extent condoms protect against both pregnancy and STDs. In addition, the increase in condom use over time demonstrates that condom use, like abstinence, can increase. Programs addressing STDs should emphasize the risks of sex — especially with multiple partners over time — and the consequences of STDs, the effectiveness of abstinence as prevention, the ability of condoms to provide considerable protection against some but not all STDs, and the importance of screening and treatment for those teens who might possibly be infected.

- Because the human costs of teen pregnancy and STDs are large, reducing teen pregnancy and STDs should be a national priority. Because the financial costs of unintended pregnancy, STDs, and HIV are high, especially among high-risk youth, even programs that have a relatively high cost per youth may be cost-effective.

References

Abma, J., Chandra, A., Mosher, W., Peterson, L., & Piccinino, L. (1997). Fertility, family planning, and women's health: New data from the 1995 National Survey of Family Growth. *Vital and Health Statistics, 23*(19).

Abma, J., Driscoll, A., & Moore, K. (1998). Young women's degree of control over first intercourse: An exploratory analysis. *Family Planning Perspectives, 30*(1), 12-18.

Abma, J., & Sonenstein, F. (2001). Sexual activity and contraceptive practices among teenagers in the United States, 1988 and 1995. *Vital and Health Statistics Series, 23*(21).

Alan Guttmacher Institute. (1994). *Sex and America's teenagers.* New York: Author.

Alan Guttmacher Institute. (2000). *Fulfilling the promise: Public policy and U.S. family planning clinics.* New York: Author.

American School Health Association. (1998). *Sexually transmitted diseases in America: How many cases and at what cost?* Menlo Park, CA: Kaiser Family Foundation.

Bachu, A. (1999). Trends in premarital childbearing: 1930-1994. *Current Population Reports,* P23-197.

Bunnell, R.E., Dahlberg, L., Rolfs, R., Ransom, R., Gershman, K., Fashy, C., Newall, W., Schmid, S., & Stone, K. (1999). High prevalence and incidence of sexually transmitted diseases in urban adolescent females despite moderate risk behaviors. *Journal of Infectious Diseases, 180*(5), 1624-1631.

Centers for Disease Control and Prevention. (1995, February 24). Trends in sexual risk behavior among high school students — United States, 1990, 1991, and 1993. *Morbidity and Mortality Weekly Report, 44*(7), 124-125, 131-132.

Centers for Disease Control and Prevention. (1996, September 27). Youth risk behavior surveillance — United States, 1995. *Morbidity and Mortality Weekly Report, 45*(SS-4).

Centers for Disease Control and Prevention. (1998). Trends in sexual risk behavior among high school students — United States, 1991-1997. *Morbidity and Mortality Weekly Report, 47*(36), 749-752.

Centers for Disease Control and Prevention. (1999). *HIV/AIDS Surveillance Report, 11*(2), 1-44.

Centers for Disease Control and Prevention. (2000). Youth risk behavior surveillance — United States, 1999. *Morbidity and Mortality Weekly Report, 49*(SS-5).

Darroch, J.E., Landry, D.J., & Oslak, S. (1999). Age differences between sexual partners in the United States. *Family Planning Perspectives, 31*(4), 160-167.

Darroch, J.E., & Singh, S. (1999). *Why is teenage pregnancy declining? The roles of abstinence, sexual activity and contraceptive use.* Occasional Report, No. 1. New York: Alan Guttmacher Institute.

Division of STD Prevention. (1998). *Sexually transmitted disease surveillance, 1997.* Atlanta: Centers for Disease Control and Prevention.

Eng, T.R., & Butler, W.T. (eds). (1997). *The hidden epidemic: Confronting sexually transmitted diseases.* Washington DC: National Academy Press.

Flanigan, C. (2001). *What's behind the good news: The decline in teen pregnancy rates during the 1990s.* Washington, DC: National Campaign to Prevent Teen Pregnancy.

Fleming, D.T., McQuillan, G.M., Johnson, R.E., Nahmias, A.J., Aral, S.O., Lee, F.K., & St. Louis, M.E. (1997). Herpes simplex virus type 2 in the United States: 1976-1994. *New England Journal of Medicine, 337,* 1105-1111.

Henshaw, S.K. (1998). Unintended pregnancy in the United States. *Family Planning Perspectives, 30*(1), 24-29, 46.

Henshaw, S.K. (1999). *U.S. teenage pregnancy statistics with comparative statistics for women aged 20-24.* New York: Alan Guttmacher Institute.

Kirby, D., Brener, N.D., Brown, N.L., Peterfreund, N., Hillard, P., & Harrist, R. (1999). The impact of condom distribution in Seattle schools on sexual behavior and condom use. *American Journal of Public Health, 89*(2), 182-187.

Kirby, D., Waszak, C., & Ziegler, J. (1989). *An assessment of six school-based clinics: Services, impact, and potential.* Washington, DC: Center for Population Options.

Ku, L., Sonenstein, F.L., & Pleck, J.H. (1994). The dynamics of young men's condom use during and across relationships. *Family Planning Perspectives, 26*(6), 246-251.

Landry, D., & Forrest, J.D. (1995). How old are U.S. fathers? *Family Planning Perspectives, 27*(4), 159-165.

Lindberg, L.D., Sonenstein, F., Ku, L., & Martinez, G. (1997). Age differences between minors who give birth and their adult partners. *Family Planning Perspectives, 29*(2), 61-66.

Males, M. (1993). School-age pregnancy: Why hasn't prevention worked? *Journal of School Health, 63*(10), 429-432.

Maynard, R.A. (Ed.) (1997). *Kids having kids: Economic costs and social consequences of teen pregnancy.* Washington, DC: The Urban Institute.

Moore, K.A., Driscoll, A.K., & Lindberg, L.D. (1998). *A statistical portrait of adolescent sex, contraception, and childbearing.* Washington, DC: National Campaign to Prevent Teen Pregnancy.

Moore, K.A., Papillo, A.R., Williams, S., Jager, J., & Jones, F. (1999). *Facts at a glance.* Washington DC: Child Trends.

National Campaign to Prevent Teen Pregnancy. (1997). *Whatever happened to childhood? The problem of teen pregnancy in the United States.* Washington, DC: Author.

Office of National AIDS Policy. (1996). *Youth and HIV/AIDS: An American agenda.* Washington, DC: Author.

Pleck, J.H., Sonenstein, F.L., & Swain, S.O. (1988). Adolescent males' sexual behavior and contraceptive use: Implications for male responsibility. *Journal of Adolescent Research, 3*, 275-284.

Princeton Survey Research Associates. (1996). *Kaiser Family Foundation survey on teens and sex: What they say teens today need to know and who they listen to.* Menlo Park, CA: Kaiser Family Foundation.

Santelli, J.S., DiClemente, R.J., Miller, K.S., & Kirby, D. (1999). Sexually transmitted diseases, unintended pregnancy, and adolescent health promotion. *Adolescent State of the Art Reviews, 10*(1), 87-180.

Santelli, J.S., Lindberg, L.D., Abma, J., McNeeley, C.S., & Resnick, M. (2000). Adolescent sexual behavior: Estimates and trends from four nationally representative surveys. *Family Planning Perspectives, 32*(4), 156-165, 194.

Singh, S., & Darroch, J. (2000). Adolescent pregnancy and childbearing: Levels and trends in developed countries. *Family Planning Perspectives, 32*(1), 14-23.

Sonenstein, F.L., Ku, L., Lindberg, L.D., Turner, C.F., & Pleck, J.H. (1998). Changes in sexual behavior and condom use among teenaged males: 1988 to 1995. *American Journal of Public Health, 88*(6), 956-959.

Terry, E., & Manlove, J. (2000). *Trends in sexual activity and contraceptive use among teens.* Washington, DC: National Campaign to Prevent Teen Pregnancy.

U.S. Department of Health and Human Services. (1995). *Report to Congress on out-of-wedlock childbearing.* Hyattsville, MD: Author.

Ventura, S.J., & Bachrach, C.A. (2000). Nonmarital childbearing in the United States, 1940-99. *National Vital Statistics Reports, 48*(16).

Ventura, S.J., Martin. J.A., Curtin, S.C., Menacker, F., & Hamilton, B.E. (2001). Births: Final data for 1999. *National Vital Statistics Reports, 49*(1).

Chapter 2

Looking for Reasons Why: The Antecedents of Adolescent Sexual Behavior

Logic and experience suggest that the more we know about the causes of risky sexual behavior, the more success we'll have in designing sound programs to reduce such behavior. Fortunately, for many years, researchers have tried to define the factors in the lives of young people that influence whether they will have sex, use contraception, or become pregnant (or cause a pregnancy). These factors are often called "antecedents." Antecedents that *increase* the chances of sexual risk-taking and pregnancy are called "risk factors." Those that *reduce* the chances are called "protective factors." Some antecedents relate directly to sexuality (e.g., onset of puberty and teens' beliefs about premarital sex), and others do not (e.g., levels of poverty and parents' attitudes about education).

By definition, all antecedents must be correlated with (that is, be associated with) the outcome behavior in question (e.g., initiation of sex, use of contraception, or pregnancy), and they must occur *before* that behavior. Because the antecedents of a behavior must be correlated with that behavior and must occur prior to it, then often, but not always, they *causally* affect that behavior. In the field of adolescent sexual behavior, common sense sometimes tells us that particular antecedents are, in fact, *causally* related to certain sexual behaviors by teens. For example, community poverty is an antecedent of pregnancy as well as a causal factor, because community poverty reduces employment and career opportunity, which in turn reduce youths' motivation to pursue education and jobs and to avoid early childbearing. Conversely, community wealth and opportunity increase motivation to pursue education and careers and avoid early childbearing. Similarly, hormonal changes and puberty are antecedents of sexual initiation, and common sense tells us these phenomena increase young people's sexual desire, increase their sexual attractiveness to others, and increase their chances of having sex. However, sometimes causality (as opposed to mere association) is *not* well-established by either research or common sense. For example, smoking cigarettes is associated with early initiation of intercourse, but it is unlikely to *cause* early intercourse. Rather, youth who engage in a variety of risk-taking

behaviors may be more likely *both* to smoke cigarettes and to engage in early sex.

Why should we care about the antecedents of adolescent sexual and contraceptive behavior, pregnancy, and childbearing? There are two simple and important reasons. First, the antecedents can be used to identify particular groups of young people who are especially likely to initiate sex early, fail to use contraception effectively, become pregnant, or bear children. These youth can then be targeted with more intensive interventions to help reduce their sexual risk-taking. It is important to add here that when identifying the highest risk youth, antecedents should be reasonably highly *correlated* with sexual risk-taking behavior, but they need not be *causally* related. For example, programs might target youth who engage in other unhealthy or delinquent behavior, such as smoking, drinking and driving, or other illegal activity, because these youth may be more likely to engage in sexual risk-taking.

Second, knowledge about antecedents should be used to design more effective interventions. Neither parents — nor anyone else — can *constantly* monitor children to make sure that they do not engage in unprotected sex. In the final analysis, young people make their own decisions about having sex and using contraception. However, parents and other adults need to take steps to influence those factors that are both highly and *causally* related with adolescent sexual and contraceptive behavior — that is, they need to focus upon those factors that make a difference. If they don't, then they are unlikely to be effective in helping teens delay sex, increase contraceptive use, or reduce their chances of pregnancy.

Because antecedents can be used both to identify young people at greater risk of unprotected sex and pregnancy and to design more effective programs, understanding the most important antecedents becomes critical. If people who develop programs focus on *unimportant* antecedents, then they are likely to target youth at lower risk of unprotected sex and/or their programs will not concentrate on those factors known to affect sexual risk-taking. Such programs will probably be much less effective than if they had been built upon the most important antecedents.

Clusters of Antecedents

The chart on the next page presents some of the most important clusters of antecedents of adolescent sexual activity, use of contraception, pregnancy, and childbearing. It summarizes and simplifies the much more detailed picture that is presented in the tables at the end of the chapter (2.1-2.7). (For more information about the methods and criteria used to identify and select studies, see p. 35 or Kirby, 1999.) The chart opposite and Tables 2.1-2.7 reveal that a large number of antecedents have been linked to one or more sexual or contraceptive behaviors, pregnancy, and childbearing. In fact, depending on how precisely the antecedents are defined, more than 100 different ones are identified among numerous research studies and across the seven tables. They describe not only individual teens themselves (both their biological and psychosocial attributes) but also important people and institutions within their environment — their partners, peers, families, schools, religious affiliations, communities, and even states — as well as the teens' relationships to them. Together, the antecedents in these tables paint a rich, detailed, and complex portrait.

In part *because* so many antecedents are related to teens' sexual behavior, few antecedents are *very highly* related to behavior — that is, in general, the more factors linked to sexual behavior, the weaker the effect of any single one. Rather, most of the antecedents are weakly or, in some instances,

Important Antecedents of Adolescent Sexual Behavior, Use of Contraception, Pregnancy, and Childbearing[1]

Community

Community disadvantage and disorganization
- + High level of education
- – High unemployment rate
- + High income level
- – High crime rate

Family

Structure and economic advantage of the teenagers' families
- + Two (vs. one) parents
- – Changes in parental marital status
- + High level of parents' education
- + High parental income level

Positive family dynamics and attachment
- + Parental support and family connectedness
- + Sufficient parental supervision and monitoring

Family attitudes about and modeling of sexual risktaking and early childbearing
- – Mother's early age at first sex and first birth
- – Single mother's dating and cohabitation behaviors
- + Conservative parental attitudes about premarital sex or teen sex
- + Positive parental attitudes about contraception
- – Older sibling's early sexual behavior and age of first birth

Peer

Peer attitudes and behavior
- + High grades among friends
- – Peers' substance use and delinquent and non-normative behavior
- – Sexually active peers (or perception thereof)
- + Positive peer norms or support for condom or contraceptive use

Partner

Partner attitudes
- + Partner support for contraception

Teen

Biological antecedents
- – Older age and greater physical maturity
- – Higher hormone levels

Ethnicity
- + Being white (vs. black or Hispanic)

Attachment to and success in school
- + Good school performance
- + Educational aspirations and plans for the future

Attachment to religious institutions
- + Frequent religious attendance

Problem or risk-taking behaviors
- – Tobacco, alcohol, or drug use
- – Problem behaviors or delinquency
- – Other risk behaviors

Emotional distress
- – Higher level of stress
- – Depression
- – Suicide ideation

Characteristics of relationship with partners
- – Early and frequent dating
- – Going steady, having a close relationship
- – Greater number of romantic partners
- – Having a partner 3 or more years older

Sexual abuse
- – History of prior sexual coercion or abuse

Sexual beliefs, attitudes, and skills
- + Conservative attitudes toward premarital sex
- + Greater perceived susceptibility to pregnancy, STDs/HIV
- + Importance of avoiding pregnancy, childbearing, & STDs
- + Greater knowledge about contraception
- + More positive attitudes about contraception
- + Greater perceived self-efficacy in using condoms or contraception

1 "+" denotes a protective factor; "–" denotes a risk factor.

moderately related to behavior. And some of these antecedents are undoubtedly causally related to *each other*. In particular, some of the more distal antecedents (i.e., theoretically "distant" from the teen) affect the more proximal sexual antecedents (i.e., "closer in" to the individual and his or her behavior). For example, community levels of education, employment, and opportunity (distal antecedents) may affect individual teens' educational goals, perceived costs of early childbearing, and motivation to avoid early childbearing (proximal antecedents). Similarly, the sexual beliefs and behaviors of family members, peers, and partners undoubtedly affect teens' sexual beliefs and behavior. In other words, many of the more distal non-sexual antecedents first affect the more proximal sexual antecedents, which in turn affect sexual behavior.

While nearly all youth are at some point in their lives at some risk of engaging in sex, failing to use contraception effectively, and becoming pregnant, the risk and protective factors identified in the tables and discussed below substantially increase or decrease the risks of these events. As noted above, few of the antecedents are critically important. Some teens with few risk factors and many protective factors nevertheless engage in unprotected sex; and some teens with many risk factors and few protective factors avoid unprotected sex. Nevertheless, as the number of risk factors in a given teen's life increases and as the number of protective factors diminishes, that teen's chances of engaging in unprotected sex and becoming pregnant (or creating a pregnancy) increase.

These antecedents support a wide variety of theories about adolescent sexual risk-taking behavior — for instance, theories involving economic disadvantage and opportunity (Billy, Brewster, & Grady, 1994), theories involving parent child-rearing practices and parent values about adolescent sexuality (Jaccard, Dittus, & Litardo, 1999), biological theories (Miller et al., 1998), theories suggesting that sexual risking-taking is part of a larger syndrome of risk-taking or deviant behavior (Costa et al., 1995), and sociopsychological theories of rational behavior (Fishbein et al., 1991). However, the antecedents summarized in these tables clearly demonstrate that no single theoretical perspective is sufficient; the total picture is much more complex.

The communities teens live in influence their sexual behavior. When teens live in poor communities with less advantage and opportunity and more disorganization, they are more likely to engage in sex at an earlier age and to become pregnant. More specifically, when the adults in their communities have lower levels of education, are less likely to be employed, have lower incomes, and engage in higher rates of crime, then these teens are more likely to engage in sex and become pregnant than teens in communities with higher levels of education and income and lower rates of unemployment and crime. In communities with higher levels of education, employment, and income, adults may place greater emphasis upon obtaining higher education, pursuing careers, and avoiding early childbearing; they may also provide role models for these behaviors, and the communities more generally may provide opportunities for education and careers. This does not mean that teens in communities with high levels of education, high employment, high income, and little crime never engage in unprotected sex. It simply means they are less likely to do so, or do so less frequently.

Similarly, the characteristics of a teen's family are important as well in determining risk. When teens have parents with low levels of education and income, they are more likely to engage in sex at an earlier age, to fail to use contraception consistently, and to become pregnant than teens in families with high levels of education and income. This

may be due, in part, to the greater emphasis that more educated and wealthier parents place upon obtaining an education, pursuing a career, and avoiding early childbearing, in part to the greater resources they may have to support the teens' education and career planning, and in part to other reasons.

When teens live with both parents and have close relationships with them, they are less likely to engage in unprotected sex and become pregnant. More specifically, when teens live with both parents (instead of only one parent or neither parent), they are less likely to engage in sex, more likely to use contraception if they have sex, and less likely to become pregnant or cause a pregnancy. Furthermore, if teens believe they have considerable parental support, feel connected to their parents, and are appropriately supervised or monitored by their parents, they become less likely to have unprotected sex and become pregnant.

If family members, especially parents, either express values or model behavior consistent with sexual risk-taking or early childbearing, then teens are more likely to engage in unprotected sex and become pregnant. Parents can do this in a variety of ways, including having permissive attitudes about premarital sex or teen sex, having negative attitudes about contraception, having sex outside of marriage themselves, cohabitating, giving birth outside of marriage, or having given birth at an early age. Similarly, if the *siblings* of teens model early childbearing by giving birth at an early age, then the teens, themselves, are more likely to engage in unprotected sex and become pregnant.

If parental values about sex and parental sexual behavior and childbearing experience influence teen behavior, then it would seem plausible that the amount of parent-child communication about these topics should also be related to teen behavior. However, as Tables 2.1-2.7 suggest, studies about the impact of parent-child communication about these topics are far more mixed — some found it to be a protective factor, while others did not. A couple of studies even found it to be a risk factor, perhaps because parents may *anticipate* that their teens are going to initiate sex and then decide to talk to them about sex and contraception. When their teens do initiate sex, it appears that greater communication about sexuality may have contributed to teen sexual behavior, when, in fact, the teens' impending sexual debut led to both the parent-child discussions about sex followed soon by actual initiation of sex. To complicate matters further, some studies indicate that the strength (or even existence) of the relationship between parent-child communication and sexual risk-taking depends upon the gender of the teen, the gender of the parent, the closeness of the parent-child relationship, the parents' values, the characteristics of the communication process, and other factors (Miller et al., 1998). So while parents do have an impact upon their teens' sexual behavior, the actual causal impact of parent-child communication has not been fully delineated.

Not surprisingly, peers also influence the sexual behavior of teens. When a teen's peers obtain poor grades, are unattached to school, and engage in a variety of negative behaviors, then the teen is more likely to engage in sex. When peers get good grades, are more attached to school, and engage in fewer negative behaviors, a teen is less likely to become pregnant. Furthermore, when teens believe that their peers are having sex, they become more likely to have sex themselves, and when they believe their peers support condom or contraceptive use, they become more likely to use condoms or other contraceptives.[1]

1 For research on the impact of peers and how to influence that impact, see *Peer Potential: Making the Most of How Teens Influence Each Other* (Bearman et al., 1999).

Turning to the teens themselves, as everyone knows, the older teens become, the more likely they are to have sex and to become pregnant, reflecting many important changes that come with increasing age. Some are biological, including physical maturity and higher hormone levels, which may lead to a greater desire for love, intimacy, and sex or to greater sexual attractiveness. Others are social — for instance, more pressure from others to have sex; changes in perceived norms about sexual and contraceptive behavior; and the increased opportunity to have sex that comes with greater freedom and independence more generally. While these biological antecedents associated with older age cannot be changed by programmatic interventions, they can be used to identify higher risk youth. Furthermore, some of the social factors associated with being older (e.g., greater pressure to have sex) may be amenable to change.

As the previous chapter noted, both African-Americans and Hispanics have sex at an earlier age than whites and are also more likely to become pregnant and bear children at an earlier age. This reflects, in large part, differences in community levels of education, poverty, and opportunity, rather than race or ethnicity per se. When family and community characteristics associated with race and ethnicity are held constant, the impact of race and ethnicity diminishes considerably — but not entirely — in these studies. Differences in cultural values help explain their residual difference. For example, Hispanic families may give greater importance to family and may be more accepting of early childbearing than non-Hispanic white families.

Schools — and the relationships that teens have with schools — also influence teens' sexual behavior. Attachment to school and success in school reduce the chances that teens will engage in unprotected sex and become pregnant. When teens feel close to their schools, believe that academic achievement is important, get good grades, do not drop out of school, or have plans for higher education beyond high school, they initiate sex later, use contraception more effectively, and are less likely to become pregnant or bear children. In short, such positive feelings increase motivation to avoid risky sexual behavior. Attachment to faith communities may also reduce the chances that teens will engage in sex, although the evidence supporting this relationship is less strong. Teens who describe themselves as more religious, who attend religious services more frequently, and have a stronger religious affiliation are less likely to initiate sex by any given age. However, the direction of causality is not entirely clear, for 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 their churches, synagogues, or mosques and be less likely to attend services.

Using alcohol and drugs, engaging in other problem or risk-taking behaviors, and suffering from emotional distress (including depression) all increase teens' chances of engaging in unprotected sex and becoming pregnant. These antecedents are significantly related to one another and may represent either more general personality traits or exposure to higher risk environments. There are at least two common interpretations for the relationship between substance use and risky sexual behavior: (1) they are all part of a general inclination to take risks and of an environment that supports such behavior, and (2) drug and alcohol use diminishes both inhibitions and rational decision-making, thereby actually increasing the incidence of unprotected sex. Both interpretations are probably valid.

Not surprisingly, early romantic involvement increases the chance of early sexual activity. When teens begin dating at an early age, date frequently, have a greater number

of romantic partners, and go steady at an early age, they become more likely to initiate sex at an earlier age. In part, these early romantic relationships may provide both greater opportunity and greater 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, then the teen is especially likely to engage in sex. The impact of this antecedent is quite large, especially among middle school youth.

Prior sexual abuse is also an important risk factor for early initiation of sex, poor contraceptive use, pregnancy, and childbearing. Youth who have been sexually abused undoubtedly have been exposed to a variety of risk factors. In addition, the past sexual abuse may warp what teens understand as appropriate sexual and contraceptive behavior and may reduce their ability to refrain from sex or to use contraception.

Finally, teens' own sexual beliefs, attitudes, and skills affect their sexual behavior, of course. In fact, these antecedents in general are the most *strongly* related to sexual behavior. When teens have permissive attitudes toward premarital sex, perceive personal and social benefits and few costs to having sex, do not care if their friends know they have had sex, lack the confidence in their ability to avoid sex, have less concern about pregnancy or STDs, and intend to have sex, then, not surprisingly, they are more likely to engage in sex. When sexually active teens do not accept the fact that they are having sex, do not perceive they are at risk of pregnancy, do not perceive that pregnancy would have a negative effect on their lives, are less knowledgeable about contraception, and have more negative attitudes toward contraception, then they are less likely to use contraception. Similarly, when teens initiate sex earlier, have more sexual partners, are ambivalent about pregnancy and childbearing, are less motivated to use contraception, and do not always use contraception, then they are more likely to become pregnant. These sexual beliefs, attitudes, and skills can together be called the "sexual psychosocial" antecedents of teen sexual risk-taking behavior.

These sexual psychosocial antecedents are particularly important for four reasons. First, they are well-supported by sociopsychological theory (Fishbein et al., 1991). Second, they are very proximal to sexual and contraceptive behavior — that is, they are more directly linked conceptually with sexual behavior than other non-sexual antecedents, such as community level of poverty. Third, as noted above, they are more highly related to some of the sexual and contraceptive behaviors than most of the other antecedents. And, finally, as will be demonstrated later in this report, some of these sexual psychosocial antecedents have formed the theoretical basis for most of the sex and HIV education programs that have succeeded in reducing sexual risk-taking. For all these reasons, sexual psychosocial antecedents should be an important focus of certain types of pregnancy prevention and STD/HIV prevention programs, particularly sex and HIV education programs.

Summary Themes

At least three overarching observations can be made about all these clusters of antecedents. First, teens, like all people, are strongly influenced by their physical and social environments — by their families (especially their parents), by their peers and friends, by their romantic partners (if they have any), by their schools and faith communities, and by their communities more generally. All of these groups influence teens by emphasizing particular beliefs and norms, modeling certain behaviors, providing opportunities for particular behaviors, and

sometimes directly applying pressure to engage or not engage in specific behaviors.

Second, a substantial proportion of all the risk factors involve some form of disadvantage, disorganization, or dysfunction — disadvantaged communities with high unemployment, low income, and high crime rates; poorly educated, low-income families with only one parent; parents who provide insufficient support for and monitoring of their teens; friends who do poorly in school, use drugs, and engage in unprotected sex; and teens themselves who are not attached to family, school, or church and are emotionally distressed, use drugs, and have been sexually coerced or abused.

Third, attachment to people or groups who express protective values and model positive behaviors reduces sexual risk-taking. When youth are more strongly attached to their parents, to their schools, or to their faith communities, they are less likely to engage in unprotected sex. In general, parents, schools, and faith communities discourage youth from engaging in sex in the first place and then also discourage unprotected sex. Consequently, when youth are more strongly attached to their parents, schools, or faith communities, they are more likely to behave consistently with these values. For example, teens who belong to either Catholic or fundamentalist Protestant churches, which have strong norms against premarital sex, are less likely to engage in sex than youth who belong to other Protestant churches that have less strict norms. Nonetheless, attachment is not *always* a good thing. Being very popular with peers (who often have less conservative attitudes about sex than parents, schools, or faith communities) and having high-risk peers are both associated with earlier initiation of sex. Therefore, it is attachment to individuals or groups of people who express and model *low-risk* norms that is protective.

Limitations of These Research Findings

It would be ideal if one could estimate accurately the relative causal effects of each of the antecedents on behavior. Unfortunately, this is not possible for at least three methodological reasons: (1) most studies focus on only a small subset of the antecedents and are therefore limited in their ability to assess the relative importance of all antecedents; (2) when studies measure only one aspect of poverty or social disorganization, the estimated effect is increased by the other manifestations of poverty or social disorganization with which the measured aspect is correlated; and (3) few studies can demonstrate causality very well. Therefore, accurate estimates of the relative causal effect of each antecedent are not available.

It is also true that the magnitude of the effect of particular antecedents may vary at different times. Our society is changing rapidly. In recent years, for example, there has been considerable immigration from other countries, greater employment opportunity during an economic expansion, welfare reform, more widespread use of the internet, greater knowledge about the spread and risks of HIV/AIDS, a more conservative climate regarding sexuality, and greater knowledge about and access to emergency contraceptives and long-acting contraceptives. These changes and others affect the relative importance of these antecedents at different points in time.

Furthermore, different antecedents may be important for different groups of youth. For example, among middle-class youth with ample educational and employment opportunities, the most important antecedents may be skills to resist peer pressure to have sex or use drugs or alcohol. Among youth in disadvantaged communities, the most important risk factors may be lack of educational and economic opportunity, little belief in the

future, and little motivation to avoid early childbearing. Among girls, the sexual norms and values of peers may have a greater impact than among boys.

These important caveats do not mean that people designing programs should not focus on antecedents. What they do mean is that people designing programs should be aware of these limitations and to the extent feasible should identify through their own research the important antecedents of sexual risk-taking for the group of youth they are targeting with their particular programs.

Implications of Theories and Antecedents for Pregnancy Prevention Programs

Taken together, these theories and antecedents related to adolescent sexual behavior have strong implications for the design and targeting of pregnancy prevention programs:

- On the one hand, most youth are at risk of unprotected sex and pregnancy. Given that about four-fifths of young people have sex while still in their teens and given that many do not always use condoms and other forms of contraception consistently or effectively, pregnancy and STDs are real risks in the lives of most teens. Thus, *all* teens need appropriate education about the value of delaying sex as well as accurate information about 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 antecedents outlined here can help programs target high-risk teens with more intensive — and effective — interventions. Because some of the more important antecedents are readily measurable (e.g., gender, age, ethnicity, income level, school performance, and engagement in other risk-taking behavior), they can be used to identify teens most in need of help.
- In addition, these antecedents should provide the basis for developing interventions. Programs should focus upon those antecedents that (1) are the most highly and causally related to sexual risk-taking behavior and (2) are amenable to change by the program. After all, programs are less likely to change behavior if the selected antecedents have no impact upon behavior, or if the programs cannot change the important antecedents selected.
- Given that there are a large number of antecedents linked to teen pregnancy, each one with only a modest impact on sexual behavior, creating powerful programs to reduce pregnancy is very challenging. The fact that many important antecedents are manifestations of social disadvantage and disorganization (which are difficult to change) makes the challenge even greater. Consequently, it is not likely that there are any simple, easy-to-implement prevention programs — "magic bullets" — that will substantially change adolescent sexual behavior and pregnancy rates. Few programs, after all, can modify more than a few risk or protective factors at a time.
- To reduce pregnancy markedly, communities may have to address many antecedents among different groups (e.g., teens, their families, schools, and communities), and they may have to address both the sexual and non-sexual antecedents. In practice, at the community level this may mean that a patchwork of programs can be effective, if each addresses a specific set of antecedents that in the aggregate improve most of the most important antecedents.

- 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 non-sexual antecedents, and because these sexual psychosocial antecedents can be modified, pregnancy prevention initiatives should include sex and HIV education programs and other sexuality-focused interventions that address these antecedents as effectively as possible. Given that teens' sexual beliefs, attitudes, and behavior are affected by the modeling of sexual and contraceptive behavior and pregnancy by parents, siblings, and peers, pregnancy prevention initiatives should also encourage these groups to model appropriate sexual behavior, as well as encourage the media to present more responsible models of sexual behavior by parents, teens, and siblings.
- Because some non-sexual antecedents are modestly related to pregnancy, and because some of them can also be modified by programs, they should also be addressed by some interventions.
- Given that both sexual and non-sexual antecedents need to be addressed, adults and community organizations that both *do* and *do not* address sexuality directly can make an important difference in helping teens avoid pregnancy. In other words, while focusing on sexual antecedents may be the most direct and effective way to reduce the risk of teen pregnancy, it is not *required* of every program. There are other ways to help.

Chapter Notes

Criteria for the Inclusions of Studies on Antecedents

The following seven tables present antecedents that selected research studies have found to be related to different adolescent sexual and contraceptive behaviors, pregnancy, and childbearing. Those antecedents were identified in more than 250 studies that met the following criteria:

- Met the scientific standards requisite for inclusion in professional journals or publications.
- Published in 1980 or later.
- Analyzed data collected from U.S. adolescents, most of whom were 19 or younger.
- Used a sample size of at least 100.
- Measured the relationship between the antecedents and one or more of the following sexual behaviors: initiation of sex, frequency of sexual intercourse, number of sexual partners, use of condoms, use of any type of contraception, pregnancy, or childbearing. (Studies that measured only out-of-wedlock pregnancy or childbearing were not included.)

The procedures employed to identify these antecedents are described more fully elsewhere (Kirby, 1999). These tables also benefitted considerably from previous reviews (e.g., Miller, 1995; Moore et al., 1995; Santelli & Beilenson, 1992).

Space considerations and the large number of studies reviewed prevented the inclusion of every reference for every significant antecedent for every study in the tables. Four criteria guided the inclusion of references in the tables: (1) if a study included multivariate analyses, the variables found significant in the multivariate analyses were included, but those found significant in only bivariate analyses were not; (2) if a data set had a large and representative sample, all the significant antecedents in these multivariate analyses were included; (3) if a given antecedent had only a few references supporting it, all were included, even if the sample was not nationally representative; and (4) if more than a few studies found an antecedent significant, then more than a few (but not all) references for that antecedent were included.

These tables were designed to provide an overall picture of the antecedents of sexual and contraceptive behaviors, pregnancy, and childbearing, not to be a thorough analysis of any particular antecedent. Thus, a variable was included as an antecedent if one or more studies found it to be significantly

related to any of the outcome behaviors, even if other studies failed to do so. By reporting only the relationships that were significant, a bias is, of course, introduced — and this bias only compounds the natural tendency of authors to report relationships that are significant and not to report those that are not. Consequently, some of the variables included in the tables might be significant antecedents for only particular groups of youth, might have been significant at only a particular point in time, or might be significant only when the antecedent is measured in a particular way or when other variables were (or were not) controlled in the study. And, of course, it is probable that a few of the antecedents were found to be significant only because of chance. On the other hand, many of the antecedents were found to be significant in multiple studies, thereby replicating their importance across multiple groups of adolescents at different times.

Table 2.1: Antecedents of Initiation of Sex

Environment/Context

Community:

+ **Rural area** (Lammers et al., 2000)
+/– **Higher percent black or Hispanic vs. white** (Billy, Brewster, & Grady, 1994; Brewster, Billy, & Grady, 1993; Gibbs, 1986)
+ **Higher percent foreign born** (Billy, Brewster, & Grady, 1994)
+ **Higher percent with college education** (Brewster, Billy, & Grady, 1993)
– **Higher divorce rates** (Brewster, Billy, & Grady, 1993)
– **Higher rate of residential turnover** (Brewster, Billy, & Grady, 1993; Gibbs, 1986)
– **Higher percent of working females working full time** (Billy, Brewster, & Grady, 1994)
– **Higher unemployment rate** (Brewster, 1994)
+ **Higher family income** (Brewster, Billy, & Grady, 1993)
+ **Higher percent religious adherents** (Billy, Brewster, & Grady, 1994)
– **Higher crime rate** (Billy, Brewster, & Grady, 1994)
+ **Greater neighborhood monitoring by adults in community** (Small & Luster, 1994)
+ **Greater number of clinics** (Brewster, Billy, & Grady, 1993)
– **Higher teen non-marital birth rate** (Brewster, Billy, & Grady, 1993)

School:

+ **Parochial school** (Resnick et al., 1997)

Religious Institution:

+ **Catholic or fundamentalist Protestant vs. Protestant and other** (Brewster et al., 1998)

Family:

+ **Higher parental education** (Billy, Brewster, & Grady, 1994; Brewster, 1994; Brewster et al., 1998; Forste & Heaton, 1988; Grady, Hayward, & Bill, 1989; Hayward, Grady, & Billy, 1992; Lauritsen, 1994; Miller et al., 1997; Moore, Morrison, & Glei, 1995; Santelli et al., 2000; Zelnik, Kantner, & Ford, 1981)
+ **Two (vs. one) parents** (Afxentiou & Hawley, 1997; Bearman & Brückner, 1999; Billy, Brewster, & Grady, 1994; Blum et al., 2000; Brewster, 1994; Brewster et al., 1998; Day, 1992; Dorius & Barber, 1998; Flewelling & Bauman, 1990; Forste & Heaton, 1988; Hogan & Kitagawa, 1985; Inazu & Fox, 1980; Ku, Sonenstein, & Pleck, 1993a; Lammers et al., 2000; Little & Rankin, forthcoming; Lock & Vincent, 1995; Meschke et al., 2000; Miller & Bingham, 1989; Miller et al., 1997; Moore, Morrison, & Glei, 1995; Murry, 1992; Newcomer & Udry, 1987; Raine et al., 1999; Rodgers, 1983; Santelli et al., 2000; Thornton & Camburn, 1987; Udry & Billy, 1987; Upchurch et al., 1998; Whitbeck, Simons, & Kao, 1994)
– **Divorce or change to single-parent household** (Capaldi, Crosby, & Stoolmiller, 1996; Devine, Long, & Forehand, 1993; Dorius, Heaton, & Steffen, 1993; Miller et al., 1997; Newcomer & Udry, 1987; Wu & Martinson, 1993)
– **Working mother during ages 5-15** (Billy, Brewster, & Grady, 1994; Mott et al., 1996)
+ **Higher income level** (Afxentiou & Hawley, 1997; Blum et al., 2000; Brewster, Billy, & Grady, 1993; Hayward, Grady, & Billy, 1992; Hogan & Kitagawa, 1985; Inazu & Fox, 1980; Lammers et al., 2000; Little & Rankin, forthcoming)
– **Intergenerational receipt of welfare** (Moore, Morrison, & Glei, 1995)

continued

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

Table 2.1: Antecedents of Initiation of Sex *continued*

Family: *continued*

+ **Health insurance** (Bearman & Brückner, 1999)
– **Greater number of siblings** (Benson & Torpy, 1995; Hogan & Kitagawa, 1985)
– **Being a younger sibling** (Haurin & Mott, 1990; Rodgers, 1983; Rodgers & Rowe, 1988; Widmer, 1997)
+ **Greater family religiosity** (Billy, Brewster, & Grady, 1994; Inazu & Fox, 1980)
– **Recent family suicide attempts** (Resnick et al., 1997)
+ **Older mother's age at first sex** (Mott et al., 1996; Newcomer & Udry, 1984)
+ **Older mother's age at first birth** (Ku, Sonenstein, & Pleck, 1993a; Newcomer & Udry, 1984; Widmer, 1997)
– **Single mother's dating behavior** (Whitbeck, Simons, & Kao, 1994)
– **Single mother's cohabitation** (Inazu & Fox, 1980)
– **An older sibling who had sex** (East & Felice, 1992; East, Felice, & Morgan, 1993; Haurin & Mott, 1990; Widmer, 1997)
– **An older sister who gave birth as an adolescent** (East, Felice, & Morgan, 1993; East, 1996a; East, 1996b; Hogan & Kitagawa, 1985)
+ **Conservative parental attitudes about teen or premarital sex** (Baker, Thalberg, & Morrison, 1988; Blum, Buehring, & Rinehart, 2000; Cvetkovich & Grote, 1981; Dittus & Jaccard, 2000; Gibson & Kempf, 1990; Halpern et al., 2000; Hovell et al., 1994; Jaccard & Dittus, 1991; Jaccard, Dittus, & Gordon, 1996; Jaccard, Dittus, & Litardo, 1999; Little & Rankin, forthcoming; Resnick et al., 1997; Shah & Zelnik, 1981; Thomson, 1982; Weinstein & Thornton, 1989; Widmer, 1997)
+ **Conservative parental attitudes about contraception** (Resnick et al., 1997)

Peer:

– **Older age of peer group and close friends** (Bearman & Brückner, 1999)
– **Peers with poor grades and high non-normative behavior** (Bearman & Brückner, 1999)
+ **Friends with good grades and little non-normative behavior** (Bearman & Brückner, 1999)
– **Peers with lower achievement orientation** (Meschke et al., 2000)
+ **Close friends' closeness to parents** (Bearman & Brückner, 1999)
– **Deviant life trajectories of peers** (Bearman & Brückner, 1999; Brewster, 1994)
+ **Peers with positive attitudes about preventive health** (Boyer, Tschann, & Shafer, 1999)
– **Peers who drink alcohol** (Blum, Buehring, & Rinehart, 2000; Kinsman et al., 1998)
– **Peers with permissive attitudes toward premarital sex** (Carvajal et al., 1999; Gibson & Kempf, 1990; Little & Rankin, forthcoming)
– **Sexually active peers** (Alexander & Hickner, 1997; Benda & DiBlasio, 1991; East, 1994; East & Felice, 1992; East, Felice, & Morgan, 1993; Jaccard, Dittus, & Litardo, 1999; Kinsman et al., 1998; Little & Rankin, forthcoming; Lock & Vincent, 1995; Marin et al., 1997; Miller et al., 1997; Rodgers & Rowe, 1990; Stanton, Li, Black, et al., 1994; Whitaker & Miller, 2000)

Individual

Biological:

– **Being male** (AGI, 1994; Benson & Torpy, 1995; Boyer, Tschann, & Shafer, 1999; Ford & Norris, 1993; Kinsman et al., 1998; Raine et al., 1999)

continued

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

Table 2.1: Antecedents of Initiation of Sex *continued*

Biological: *continued*

– **Older age** (AGI, 1994; Bearman & Brückner, 1999; Brewster et al., 1998; Dorius, Heaton, & Steffen, 1993; Inazu & Fox, 1980; Jaccard, Dittus, & Litardo, 1999; Lock & Vincent, 1995; Newcomer & Baldwin, 1992; Raine et al., 1999; Santelli et al., 2000; Stanton, Li, Black, et al., 1994)

– **Having specific dopamine receptor genes** (Miller, Pasta, et al., 1998)

– **Higher testosterone levels in both genders** (Halpern et al., 1993; Halpern, Udry, & Suchindran, 1997; Lauritsen & Swicegood, 1997; Udry, 1988; Udry & Billy, 1987)

+ **Older pubertal development and timing** (Benson & Torpy, 1995; Capaldi, Crosby, & Stoolmiller, 1996; Dittus & Jaccard, 2000; Flannery, Rowe, & Gulley, 1993; Halpern et al., 1993; Phinney et al., 1990; Rowe & Rodgers, 1994; Udry & Cliquet, 1982; Zabin et al., 1986)

+ **Older age of menarche** (Billy, Brewster, & Grady, 1994; Brewster et al., 1998; Gibbs, 1986; Miller et al., 1997)

– **Greater physical maturity (appears older than most)** (Capaldi, Crosby, & Stoolmiller, 1996; Resnick et al., 1997)

Race/Ethnicity:

– **Race (black vs. white)** (Blum et al., 2000; Braverman & Strasburger, 1993; Inazu & Fox, 1980; Miller et al., 1997; Mott et al., 1996; Santelli et al., 2000; Upchurch et al., 1998; Warren et al., 1998)

– **Ethnicity (Hispanic vs. white)** (Aneshensel et al., 1990; Halpern et al., 2000)

+ **Ethnicity (Asian Pacific Islander vs. white)** (Hou & Basen-Engquist, 1997)

Relationship with Family:

– **Being a younger (rather than older) sibling** (Rodgers & Rowe, 1990)

+ **Higher quality of family interactions, childrearing practices, support of parents, connectedness** (Bearman & Brückner, 1999; Dittus & Jaccard, 2000; Inazu & Fox, 1980; Jaccard, Dittus, & Gordon, 1996; Jensen, DeGaston, & Wee, 1994; Jessor et al., 1983; Karofsky, Zeng, & Kosorok, 2000; Luster & Small, 1994; Miller et al., 1997; Resnick et al., 1997; Smith, 1997; Turner et al., 1993)

+ **More appropriate parental supervision and monitoring** (Dorius & Barber, 1998; Ensminger, 1990; Hogan & Kitagawa, 1985; Miller et al., 1986; Romer et al., 1999; Small & Luster, 1994; Whitbeck et al., 1992)

+/– **Greater parent/child communication about sex and birth control** (East, 1996b, Fox & Inazu, 1980; Jaccard & Dittus, 1991; Jaccard, Dittus, & Gordon, 1996; Leland & Barth, 1993; Miller, Levin, et al., 1998; Moore, Peterson, & Furstenberg, 1986; Mueller & Powers, 1990; Murry, 1992; Nagy, DiClemente, & Adcock, 1995; Newcomer & Udry, 1985; Whitaker & Miller, 2000; Widmer, 1997)

Attachment to and Success in School:

+ **Enrolled in school** (Brewster et al., 1998)

+ **Greater school attendance** (Resnick et al., 1997)

+ **Better educational performance** (Billy, Brewster, & Grady, 1994; Gibbs, 1986; Gibson & Kempf, 1990; Halpern et al., 2000; Lammers et al., 2000; Miller & Sneesby, 1988; Ohannessian & Crockett, 1993; Raine et al., 1999; Resnick et al., 1997)

+ **Either very high or very low intelligence scores** (Halpern et al., 2000)

+ **Greater connectedness to school** (Resnick et al., 1997)

+ **Greater participation in school clubs** (Halpern et al., 2000)

+ **Greater importance of academic achievement** (Jessor et al., 1983)

+ **Plans to attend college** (Blum, Buehring, & Rinehart, 2000; Halpern et al., 2000)

continued

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

Table 2.1: Antecedents of Initiation of Sex *continued*

Attachment to and Success in School: *continued*

– **Fighting at school** (Miller et al., 1997)

+ **Received AIDS education** (Ku, Sonenstein, & Pleck, 1993a)

+/– **Received sex education** (Billy, Brewster, & Grady, 1994; Dawson, 1986; Furstenberg, Moore, & Peterson, 1985; Ku, Sonenstein, & Pleck, 1993a; Marsiglio & Mott, 1986; Zelnik & Kim, 1982)

Attachment to Faith Communities:

+ **Greater religiosity** (Billy, Brewster, & Grady, 1994; Ku et al., 1998; Lammers et al., 2000; Resnick et al, 1997)

+ **Having a religious affiliation** (Bearman & Brückner, 1999)

+ **Having a conservative religious affiliation** (Beck, Cole, & Hammond, 1991; Miller & Olson, 1988; Weinbender & Sossignol, 1996)

+ **More frequent attendance** (Billy, Brewster, & Grady, 1994; Halpern et al., 1994; Halpern et al., 2000; Miller et al., 1997; Miller & Olson, 1988; Mott et al., 1996)

Relationships with Peers:

+ **Not being part of a peer group** (Bearman & Brückner, 1999)

– **Being popular with peers** (Bearman & Brückner, 1999)

– **Greater importance of popularity** (Meschke et al., 2000)

– **More social activities with peers** (Boyer, Tschann, & Shafer, 1999)

– **Engaging in physical fights** (Harvey & Spigner, 1995; Miller et al., 1997)

+ **More social bonding** (McBride et al., 1995)

Relationships with Romantic Partners:

– **Dating alone** (Meschke et al., 2000)

– **Having a romantic relationship, going steady with a boy/girlfriend, closeness of relationship with partner** (Blum, Buehring, & Rinehart, 2000; Halpern et al., 2000; Little & Rankin, forthcoming; Lock & Vincent, 1995; Rosenthal et al., 1997; Thornton, 1990)

– **Having a relationship with an older romantic partner** (Leitenberg & Saltzman, 2000; Marin et al., 2000)

– **Greater number of romantic partners** (Bearman & Brückner, 1999)

Healthy Behaviors:

+ **Greater participation in sports** (Miller, Sabo, et al., 1998)

+ **Greater involvement in other healthy behaviors** (Crosby, Yarber, & Kanu, 1998; Harvey & Spigner, 1995)

Problem or Risk-Taking Behaviors:

– **Greater impulsivity** (Halpern et al., 2000; White & Johnson, 1988)

– **Tobacco use** (Dorius, Heaton, & Steffen, 1993; Harvey & Spigner, 1995; Raine et al., 1999)

– **Substance use** (Boyer, Tschann, & Shafer, 1999; Capaldi, Crosby, & Stoolmiller, 1996; Crosby, Yarber, & Kanu, 1998; Dorius, Heaton, & Steffen, 1993; Harvey & Spigner, 1995; Kinsman et al., 1998; Kowaleski-Jones & Mott, 1998; Little & Rankin, forthcoming; Lowry et al., 1994; Mott et al., 1996; The National Center on Addiction and Substance Abuse at Columbia University, 1999; Smith, 1997; Weinbender & Rossignol, 1996)

continued

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

Table 2.1: Antecedents of Initiation of Sex *continued*

Problem or Risk-Taking Behaviors: *continued*

- **Greater involement in delinquent behaviors** (Capaldi, Crosby, & Stoolmiller, 1996; Devine, Long, & Forehand, 1993; Gibbs, 1986; Harvey & Spigner, 1995; Ketterlinus et al., 1992; Miller et al., 1997; Mott et al., 1996; Rosenbaum & Kandel, 1990)
- **Running away from home** (Kowaleski-Jones & Mott, 1998)
- **Greater involvement in general unconventional behavior** (Costa et al., 1995; Rosenbaum & Kandel, 1990; Rowe, Rodgers, & Meseck-Bushey, 1989)

Other Behaviors:

- **Paid work more than 20 hours/week** (Resnick et al., 1997)
- **Watching a larger proportion of TV with sexual content** (Brown & Newcomer, 1991).

Emotional Well-Being and Distress:

+ **Higher self-esteem** (Miller, Christensen, & Olson, 1987; Orr et al., 1989)
+ **Higher decision-making autonomy** (Halpern et al., 2000)
- **Greater perceived risk of untimely death** (Halpern et al., 2000; Resnick et al., 1997)
- **Greater level of stress** (Harvey & Spigner, 1995)
- **Higher level of depression** (Kowaleski-Jones & Mott, 1998)
- **Suicidal ideation** (Benson & Torpy, 1995)
- **Receipt of help for emotional problems** (Kowaleski-Jones & Mott, 1998)

Sexual Beliefs, Attitudes, Skills, and Behaviors:

- **Viewing of TV shows with sexual content** (Brown & Newcomer, 1991)
- **More stereotypical gender roles** (Foshee & Bauman, 1992; Lock & Vincent, 1995)
- **More permissive attitudes toward premarital sex and abstinence** (Carvajal et al., 1999; Christopher, Johnson, & Roosa, 1993; Gibson & Kempf, 1990; Lock & Vincent, 1995; Miller et al., 1986; Miller, Norton, et al., 1998; Thomson, 1982)
- **More perceived personal and social benefits to sex** (Blum, Buehring, & Rinehart, 2000)
+ **More perceived personal and social costs to sex** (Blum, Buehring, & Rinehart, 2000)
- **Belief that boys gain respect if have sex** (Kinsman et al., 1998)
+ **Greater desire to have friends believe youth is virgin** (Stanton, Li, Black, et al., 1994)
+ **Greater feelings of guilt if were sexually active** (Stanton, Li, Black et al., 1994)
+ **Greater perceived costs of pregnancy** (Blum, Buehring, & Rinehart, 2000)
+ **Greater embarrassment if pregnant** (Halpern et al., 2000)
+ **Greater perceived risk or concern about STDs or AIDS** (Boyer, Tschann, & Shafer, 1999; Harvey & Spigner, 1995; Stanton, Li, Black, et al., 1994)
+ **Greater self-efficacy to refrain from sex** (Robinson, Telljohann, & Price, 1999)
+ **Same-sex attraction or behavior** (Resnick et al., 1997)
- **Dating at an early age or frequent dating** (Dorius, Heaton, & Steffen, 1993; Miller et al., 1997; Murry, 1992; Thornton, 1990)
- **Ever kissed or necked** (Blum, Buehring, & Rinehart, 2000)
- **Greater intention to have sex** (Kinsman, et al., 1998; Miller & Norton, 1998)

continued

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

Table 2.1: Antecedents of Initiation of Sex *continued*

Sexual Beliefs, Attitudes, Skills, and Behaviors: *continued*

+ **Pledge of virginity** (Bearman & Brückner, 2001; Blum, Buehring, & Rinehart, 2000; Resnick et al., 1997)

Sexual Abuse:

– **Sexual pressure, coercion, and abuse** (Boyer & Fine, 1992; Browning & Laumann, 1997; Gershenson et al., 1989; Marin et al., 2000; Miller, Monson, & Norton, 1995; Moore, Nord, & Peterson, 1989; Silverman & Amaro, 2000; Small & Luster, 1994; Stock et al., 1997)

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

Table 2.2: Antecedents of Frequency of Sexual Intercourse

Environment/Context

Community:

- – **Higher ratio of unmarried men to women** (Billy, Brewster, & Grady, 1994)
- – **Higher high school dropout rate** (Billy, Brewster, & Grady, 1994)
- – **Higher level of unemployment** (Ku, Sonenstein, & Pleck, 1993b)
- – **Higher residential turnover** (Billy, Brewster, & Grady, 1994)
- – **Higher percent of family planning patients under 20** (Billy, Brewster, & Grady, 1994)

School:

- + **Receipt of AIDS education in school** (Ku et al., 1998)

Family:

- + **Higher maternal education** (Ku et al., 1998)
- + **Two (vs. one) parents** (Billy, Brewster, & Grady, 1994; Ku et al., 1998)
- – **Parental divorce** (Devine, Long, & Forehand, 1993)
- + **More conservative parental attitudes about teen or premarital sex** (Benda & DiBlasio, 1994; Dittus & Jaccard, 2000; Jaccard, Dittus, & Gordon, 1996; Miller, Forehand, & Kotchick, 1999)
- – **Having an older sister who gave birth as an adolescent** (Cox, Emans, & Bithoney, 1993; East, 1996a; East, Felice, & Morgan, 1993; Friede et al., 1986; Hogan & Kitagawa, 1985)

Peer:

- – **Sexually active peers** (Benda & DiBlasio, 1991; Benda & DiBlasio, 1994)

Individual

Biological:

- – **Being male** (Benda & Corwyn, 1996; DiBlasio & Benda, 1990)
- + **Older age of menarche** (Billy, Brewster, & Grady, 1994)
- + **Older age** (Benda & Corwyn, 1996; Ku et al., 1998; Miller, Forehand, & Kotchick, 1999)

Race/Ethnicity:

+/– **Race (black vs. white)** (Ku et al., 1998; Warren et al., 1998)

Relationship with Family:

- + **Better quality of family interactions and connectedness** (Benda & Corwyn, 1996; DiBlasio & Benda, 1990; Dittus & Jaccard, 2000; Jaccard, Dittus, & Gordon, 1996; Miller, Forehand, & Kotchick, 1999)
- + **More appropriate parental supervision and monitoring** (Benda & Corwyn, 1996; Benda & DiBlasio, 1994; Miller, Forehand, & Kotchick, 1999)

Relationship with School:

- + **Greater educational investment** (Ohannessian & Crockett, 1993)
- + **Higher academic performance and lower school failure** (DiBlasio & Benda, 1990; Ku et al., 1998)

continued

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

Table 2.2: Antecedents of Frequency of Sexual Intercourse *continued*

Relationship with School: *continued*

+ **Received AIDS education** (Ku, Sonenstein, & Pleck, 1992)
+ **Participation in sports** (Sabo et al., 1998)

Attachment to Faith Communities:

+ **Greater religiosity** (DiBlasio & Benda, 1990; DuRant & Sanders, 1989; Ku, Sonenstein, & Pleck, 1992)

Relationships with Partners:

+ **Greater female power in the relationship** (Jorgensen, King, & Torrey, 1980)

Problem or Risk-Taking Behaviors:

– **Alcohol use** (Bailey, Camlin, & Ennett, 1998)
– **Drug use** (Bailey, Camlin, & Ennett, 1998; DiBlasio & Benda, 1990)
– **Greater involvement in other problem behaviors** (DiBlasio & Benda, 1990)

Emotional Well-Being and Stress:

– **Suicide attempts** (Burge et al., 1995)

Sexual Beliefs, Attitudes, Skills, and Behaviors:

+ **Older age of first sex** (DuRant & Sanders, 1989; Thornton, 1990)
+ **Greater worry about AIDS** (Ku, Sonenstein, & Pleck, 1992)
– **More permissive attitudes toward premarital sex** (Ku et al., 1998)
– **More permissive attitudes about abortion** (Ku et al., 1998)
– **Greater number of years being sexually active** (DuRant & Sanders, 1989)

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

Table 2.3: Antecedents of Number of Sexual Partners

Environment/Context

Community:

– **Living in an urban area** (Santelli et al., 1998)

School:

+ **Taught AIDS education** (Ku, Sonenstein, & Pleck, 1992)

Family:

– **Parental divorce** (Devine, Long, & Forehand, 1993)

– **Higher parental income level** (Ku, Sonenstein, & Pleck, 1992)

+ **Greater religiosity** (Ku, Sonenstein, & Pleck, 1992)

+ **More conservative parental attitudes about teen or premarital sex** (Luster & Small, 1997; Miller, Forehand, & Kotchick, 1999; Shah & Zelnik, 1981; Thornton & Camburn, 1989)

Peer:

– **More communication about HIV** (Holtzman & Rubinson, 1995)

– **Sexually active peers** (Whitaker & Miller, 2000)

Partner:

– **Greater difference in age of first partner** (Weber et al., 1992)

Individual

Biological:

– **Being male** (Durbin et al., 1993; Ford & Norris, 1993; Holtzman & Rubinson, 1995)

– **Older age** (Holtzman & Rubinson, 1995; Miller, Forehand, & Kotchick, 1999; Richter et al., 1993; Santelli et al., 1998)

Race/Ethnicity:

– **Race (black vs. white)** (Durbin et al., 1993; Holtzman & Rubinson, 1995; Santelli et al., 1998; Shrier et al., 1997; Warren et al., 1998)

– **Ethnicity (Hispanic vs. white)** (Santelli et al., 1998)

– **Greater acculturation by Hispanics** (Ford & Norris, 1993)

Relationship with Family:

+ **Greater general communication** (Miller, Forehand, & Kotchick, 1999)

+ **More appropriate parental supervision and monitoring** (Luster & Small, 1997; Miller, Forehand, & Kotchick, 1999)

+/– **Greater parent/child communication about sex, condoms, or AIDS** (Holtzman & Rubinson, 1995; Leland & Barth, 1993; Whitaker & Miller, 2000)

– **Physical abuse** (Luster & Small, 1997)

continued

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

Table 2.3: Antecedents of Number of Sexual Partners *continued*

Relationship with Faith Communities:

+ **Greater religious attendance** (Seidman, Mosher, & Aral, 1994; Thornton & Camburn, 1989)
+ **Having a conservative religious affiliation** (Ku, Sonenstein, & Pleck, 1992)

Relationship with Community:

+ **Having a mentor** (Beier, Rosenfeld, et al., 2000)
+ **Greater level of social support** (St. Lawrence et al., 1994)

Teen Relationships with Partners:

+ **Being married** (Santelli et al., 1998)
– **Dating violence** (Valois, Oeltmann, Waller, & Hussey, 1999)

Healthy Behaviors:

+ **Greater involvement in healthy behaviors** (Crosby, Yarber, & Kanu, 1998)
+ **Greater participation in sports** (Sabo et al., 1998)

Problem or Risk-Taking Behaviors:

– **More traditional attitudes toward masculinity** (Pleck, Sonenstein, & Ku, 1993b)
– **Substance use** (Crosby, Yarber, & Kanu, 1998; Lowry et al., 1994; Middleman et al., 1995; Millstein & Moscicki, 1995; The National Center on Addiction and Substance Abuse at Columbia University, 1999; Richter et al., 1993; Santelli et al., 1998; Shrier et al., 1997; Valois, Oeltmann, Waller, & Hussey, 1999)
– **Physical fighting** (Valois, Oeltmann, Waller, & Hussey, 1999)
– **Carrying weapons** (Valois, Oeltmann, Waller, & Hussey, 1999)
– **Greater involvement in other problem behaviors** (Richter et al., 1993)

Sexual Beliefs, Attitudes, Skills, and Behaviors:

+ **Older age of first sex (or years since first sex)** (Durbin et al., 1993; Shrier et al., 1997; Santelli et al., 1998; Seidman, Mosher, & Aral, 1994; Thornton, 1990; Weber et al., 1992)
+/– **Greater knowledge about AIDS** (Holtzman & Rubinson, 1995; Weinman, Smith, & Mumford, 1992)
+ **Greater perceived susceptibility to STDs/AIDS** (Catania et al., 1989; Ku, Sonenstein, & Pleck, 1992)
+ **More conservative attitudes and norms toward number of sexual partners** (Basen-Engquist & Parcel, 1992, Catania et al., 1989)
+ **Sexual communication skills** (Catania et al., 1989)

Sexual Abuse:

– **Sexual abuse** (Browning & Laumann, 1997; Luster & Small, 1994; Luster & Small, 1997; Silverman & Amaro, 2000; Stock et al., 1997)

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

Table 2.4: Antecedents of Use of Condoms

Environment/Context

Family:

+ **Higher parental education** (Brewster et al., 1998; Murphy & Boggess, 1998)
+ **Higher income level** (Wilson et al., 1994)

Peers:

+ **Greater peer norms and support for condom use** (Boyer, Tschann, & Shafer, 1999; DiClemente et al., 1996; Whitaker & Miller, 2000)
+ **Greater peer use of condoms** (DiClemente, 1990; Stanton, Li, Black, et al, 1994; Whitaker & Miller, 2000)

Partner:

– **Partner 3 or more years older** (Miller, Clark, & Moore, 1997)
+ **Greater partner support for condom use** (Murphy & Boggess, 1998; Pendergrast, DuRant, & Gaillard, 1992; Pleck, Sonenstein, & Ku, 1991)
– **Greater partner sexual experience** (Ku, Sonenstein, & Pleck, 1994)
– **Higher risk status of partner** (Ku, Sonenstein, & Pleck, 1994)

Individual

Biological:

– **Older age** (DiClemente et al., 1996; Goodwin, 1990; Hingson et al., 1990; Ku, Sonenstein, & Pleck, 1994; Murphy & Boggess, 1998; Pendergrast, DuRant, & Gaillard, 1992; Pleck, 1989; Pleck, Sonenstein, & Swain, 1988; Reitman et al., 1996; Richter et al., 1993; Rickman et al., 1994; Shrier et al., 1997)
+ **Being male** (Brown, DiClemente, & Park, 1992; DiClemente et al., 1996; Shrier et al., 1997)

Race/Ethnicity:

+/– **Race (black vs. white)** (CDC, 1996; Hingson et al., 1990; Marsiglio, 1993; Murphy & Boggess, 1998; Warren et al., 1998)
– **Ethnicity (Hispanic vs. white)** (Ku, Sonenstein, & Pleck, 1994; Murphy & Boggess, 1998)

Relationship with Family:

+/– **Greater parent-child communication about sex, condoms, or birth control** (Leland & Barth, 1993; Miller, Levin, et al., 1998; Romer et al., 1999; Whitaker & Miller, 2000; Whitaker et al., 1999; Wilson et al., 1994)
+ **More appropriate parental supervision and monitoring** (Miller, Forehand, & Kotchick, 1999)

Attachment to and Success in School:

+ **Higher educational performance** (Pleck, Sonenstein, & Swain, 1988; St. Lawrence, 1993)
+ **Plans to attend college** (Pleck, Sonenstein, & Swain, 1988)

Religiosity:

– **Roman Catholic vs. Protestant & other** (Brewster et al., 1998)

continued

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

Table 2.4: Antecedents of Use of Condoms *continued*

Relationships with Partners:

+ **More discussions about sexual risk** (Whitaker et al., 1999)
– **Steady close romantic relationship** (Pleck, Sonenstein, & Swain, 1988)

Relationships with Partners: *continued*

– **Longer relationship** (Ku, Sonenstein, & Pleck, 1994)
– **Being married** (Ku, Sonenstein, & Pleck, 1994)

Healthy Behaviors:

+ **Greater participation in sports and exercise** (Crosby, Yarber, & Kanu, 1998; Sabo et al., 1998)

Problem or Risk-Taking Behaviors:

– **Alcohol use** (Bailey, Camlin, & Ennett, 1998; Goodwin, 1990; Hingson et al., 1990)
– **Drug use** (Bailey, Camlin, & Ennett, 1998; Crosby, Yarber, & Kanu, 1998; Goodwin, 1990; Hingson et al., 1990; Lowry et al., 1994; Middleman et al., 1995; Richter et al., 1993; Shrier et al., 1997; Sonenstein, Pleck, & Ku, 1989)
– **Greater involvement in general risk-taking** (Brown, DiClemente, & Park, 1992; Richter et al., 1993)

Emotional Well-Being and Distress:

+ **Greater internal locus of control** (St. Lawrence, 1993)
+ **Greater impulse control** (DiClemente et al., 1996)
+ **Greater self-control** (St. Lawrence, 1993)
+ **More social support** (St. Lawrence et al., 1994)

Sexual Beliefs, Attitudes, Skills, and Behaviors:

+ **Greater acceptance of non-traditional gender roles by men and women** (Pleck, Sonenstein, & Ku, 1993b)
– **Greater desire to have friends believe one is virgin** (Stanton, Li, Black, et al, 1994)
+ **Older age of first sex** (Ku, Sonenstein, & Pleck, 1994; Murphy & Boggess, 1998; Shrier et al., 1997)
– **Higher frequency of sex** (DiClemente et al., 1996; Ku, Sonenstein, & Pleck, 1994)
– **Greater number of sex partners** (Goodwin, 1990; Sonenstein, Pleck, & Ku, 1989; Wilson et al., 1994)
– **Sex with a prostitute** (Sonenstein, Pleck, & Ku, 1989)
– **Use of alcohol or drugs before sex** (Hou & Basen-Engquist, 1997)
+ **Received STD education** (Pendergrast, DuRant, & Gaillard, 1992)
+ **Discussed AIDS with their physician** (Goodwin, 1990)
+ **Discussed AIDS with others** (Hingson et al., 1990)
+ **Greater knowledge about AIDS** (Ku, Sonenstein, & Pleck, 1992)
+ **Knowing someone who was HIV-positive** (Hingson et al., 1990; Rickman et al., 1994)
+ **Greater knowledge about condoms** (Reitman et al., 1996; Wilson et al., 1994)
+ **Greater perceived male responsibility for pregnancy prevention** (Murphy & Boggess, 1998; Pleck, Sonenstein, & Ku, 1991; Pleck, Sonenstein, & Swain, 1988)
– **Stronger belief that causing a pregnancy was a sign of manhood** (Murphy & Boggess, 1998)

continued

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

Table 2.4: Antecedents of Use of Condoms *continued*

Sexual Beliefs, Attitudes, Skills, and Behaviors: *continued*

+ **Greater perceived susceptibility to pregnancy/STDs/HIV** (Hingson et al., 1990; Ku, Sonenstein, & Pleck, 1992; Murphy & Boggess, 1998; Pleck, Sonenstein, & Ku, 1991; Pleck, Sonenstein, & Ku, 1993a; Reitman et al., 1996)
+ **Greater motivation to avoid AIDS** (Ku, Sonenstein, & Pleck, 1992)
+ **Greater importance of avoiding STDs** (Wilson et al., 1994)
+ **Stronger belief that condoms are effective in reducing STDs/HIV** (Hingson et al., 1990)
+ **More positive attitudes toward condoms and other forms of contraception** (Hingson et al., 1990; Reitman et al., 1996)
– **Greater embarrassment and barriers to getting condoms** (Murphy & Boggess, 1998; Sieving et al., 1997)
– **Higher perceived barriers or costs of using condoms (e.g., reduce pleasure)** (Catania et al., 1989; DiClemente et al., 1992; Hingson et al., 1990; Murphy & Boggess, 1998; Pendergrast, DuRant, & Gaillard, 1992; Pleck, Sonenstein, & Ku, 1991)
+ **Greater perceived self-efficacy in using condoms** (Boyer, Tschann, & Shafer, 1999; DiClemente et al., 1992; Pendergrast, DuRant, & Gaillard, 1992; Sieving et al., 1997; Reitman et al., 1996)
+ **Greater self-efficacy to demand condom use** (DiClemente et al., 1996)
+ **Stronger sexual communication skills** (Catania et al., 1989)
+ **Greater motivation to use condoms** (Bailey, Camlin, & Ennett, 1998)
+ **Greater intent to use condoms** (Brown, DiClemente, & Park, 1992)
+ **Carry condoms** (Hingson et al., 1990)
+ **Previous condom use** (St. Lawrence, 1993)

Sexual Abuse:

– **Sexual abuse** (Silverman & Amaro, 2000)

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

Table 2.5: Antecedents of Use of Contraception

Environment/Context

Community:

+ **Better neighborhood quality** (Hogan, Astone, & Kitagawa, 1985)

Family:

+ **Higher parental education** (Brewster et al., 1998; Hayward, Grady, & Billy, 1992; Manning, Longmore, & Giordano, 2000)
+ **Two (vs. one) parents** (Forste & Heaton, 1988; Gispert et al., 1984; Manning, Longmore, & Giordano, 2000; Moore, Morrison, & Glei, 1995)
+ **Higher income level** (AGI, 1994; Hogan, Astone, & Kitagawa, 1985; Galavotti & Lovick, 1989)
– **Mother's receipt of welfare** (Moore, Morrison, & Glei, 1995)
+ **More positive parental values about contraception** (Baker, Thalberg, & Morrison, 1988; Jorgensen & Sonstegard, 1984; Thomson, 1982)

Peers:

– **Substance use** (Kowaleski-Jones & Mott, 1998)

Partner:

– **Much older male** (Darroch, Landry, & Oslak, 1999b)
+ **Greater partner support for contraceptive use** (Kastner, 1984; Weisman et al., 1991; Whitley & Schofield, 1985- 86)
+ **Agreement with partner about contraceptive method** (Brindis et al., 1998)

Individual

Biological:

+ **Older age** (AGI, 1994; Glei, 1999; Ku, Sonenstein, & Pleck, 1994; Santelli et al., 2000; Scher, Emans, & Grace, 1982)

Race/Ethnicity:

+/– **Race (black vs. white)** (Manning, Longmore, & Giordano, 2000; Marsiglio, 1993)
– **Ethnicity (Hispanic vs. white)** (AGI, 1994; Manning, Longmore, & Giordano, 2000)

Relationship with Family:

+ **Appropriate family strictness and discipline** (Cvetkovich & Grote, 1981)
+ **Greater parental monitoring** (Luster & Small, 1994)
+ **Greater parental connectedness and support** (Dittus & Jaccard, 2000; Gispert et al., 1984; Jaccard, Dittus, & Gordon, 1996; Luster & Small, 1994)
+/– **Greater parent-child communication about sex, condoms, or other forms of birth control** (Handelsman, Cabral, & Weisfeld, 1987; Inazu & Fox, 1980; Jaccard, Dittus, & Gordon, 1996; Kastner, 1984; Newcomer & Udry, 1985; Thomson, 1982)

Attachment to and Success in School:

– **Dropped out of school** (Darroch, Landry, & Oslak, 1999)

continued

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

Table 2.5: Antecedents of Use of Contraception *continued*

Attachment to and Success in School: *continued*

+ **Plans to attend college** (Scher, Emans, & Grace, 1982)
+ **Received sex education** (Manning, Longmore, & Giordano, 2000)

Attachment to Faith Communities:

– **More frequent attendance** (Collins & Robinson, 1986)

Relationships with Partners:

+ **Going steady** (Manning, Longmore, & Giordano, 2000)
+ **Monogamous relationships** (Whitley & Schofield, 1985-86)
+ **Greater female power in the relationship** (Jorgensen, King, & Torrey, 1980)
+ **Discussed contraception with partner** (Collins & Robinson, 1986)

General Skills and Personality Traits:

+ **Higher level of cognitive development** (Holmbeck et al., 1994)
+ **Greater problem-solving skills** (Flaherty et al., 1983)
+ **More future orientation** (Whitley & Schofield, 1985-86)
+ **Greater egocentrism** (Holmbeck et al., 1994)

Healthy Behaviors:

+ **Greater participation in sports** (Sabo et al., 1998)
+ **Greater involvement in other healthy behaviors** (Costa et al., 1995; Fortenberry, Costa, & Jessor, 1997)

Problem or Risk-Taking Behaviors:

– **Greater general risk-taking** (Costa et al., 1996)
– **Greater sensation-seeking** (Arnett, 1990)
+ **Greater general psychosocial conventionality** (Costa et al., 1996)

Emotional Well-Being and Distress:

+ **Stronger self-image and self-esteem** (Holmbeck et al., 1994)
– **Depression** (Kowaleski-Jones & Mott, 1998)

Sexual Beliefs, Attitudes, Skills, and Behaviors:

+ **Received sex education** (Dawson, 1986; Mauldon & Luker, 1996; Marsiglio & Mott, 1986; Zelnik & Kim, 1982)
+ **Greater acceptance of non-traditional gender roles for women** (Kowaleski-Jones & Mott, 1998)
+ **Greater importance of avoiding pregnancy** (Philliber et al., 1986; Weisman et al., 1991; Zabin, Astone, & Emerson, 1993)
+ **Perception of positive side effects of oral contraceptives** (Weisman et al., 1991)
– **More permissive attitude toward premarital sex** (Collins & Robinson, 1986; Morrison, 1989)
– **Pledge of virginity** (Bearman & Brückner, 2001)
+ **Older age of first sex** (Galavotti & Lovick, 1989; Manning, Longmore, & Giordano, 2000; Melchert & Burnett, 1990; Scott-Jones & Turner, 1988)

continued

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

Table 2.5: Antecedents of Use of Contraception *continued*

Sexual Beliefs, Attitudes, Skills, and Behaviors: *continued*

+ **Greater wantedness of first sex** (Abma, Driscoll, & Moore, 1998)
+ **Greater frequency of sex** (Collins & Robinson, 1986; Morrison, 1989; Whitley & Schofield, 1985-86)
+ **Greater acceptance of own sexual behavior** (Whitley & Schofield, 1985-86)
+ **Greater knowledge about contraception** (Morrison, 1989; Scott-Jones & Turner, 1988)
+ **More positive attitudes toward contraception** (Jorgensen & Sonstegard, 1984; Kastner, 1984; Morrison, 1989; Philliber et al., 1986; Weisman, 1991; Whitley & Schofield, 1985-86)
+ **Greater comfort and satisfaction with contraceptive method** (Brindis et al., 1998; Shea, Herceg-Baron, & Furstenberg, 1984)
+ **Greater perceived susceptibility to pregnancy/STDs/HIV** (Arnett, 1990; Philliber et al., 1986)
+ **Previous contraceptive history and experience** (Gorosh, 1982; Marsiglio, 1993; Weisman et al., 1991)
+ **Greater number of visits to a family planning clinic** (Brindis et al., 1994)
+ **Greater satisfaction with family planning clinic visit** (Shea, Herceg-Baron, & Furstenberg, 1984; Scher, Emans, & Grace, 1982)

Sexual Abuse:

– **Sexual abuse** (Boyer & Fine, 1992; Luster & Small, 1994; Silverman & Amaro, 2000; Stock et al., 1997)

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

Table 2.6: Antecedents of Pregnancy[1]

Environment/Context

State:

– **Restrictive laws regarding contraceptive licensing, advertising, or selling** (Lundberg, 1990; Lundberg & Plotnick, 1995)

+ **Coordinated programs and policies for addressing teen pregnancy** (Moore et al., 1994)

Community:

+ **Higher community socio-economic status** (Hogan & Kitagawa, 1985; Mayer & Jencks, 1989)

– **Greater residential mobility** (Singh, 1986)

– **Higher level of unemployment** (Ku, Sonenstein, & Pleck, 1993b)

– **Higher violent crime rate** (Moore et al., 1994)

– **Higher teenage suicide rate** (Singh, 1986)

– **Higher levels of community stress** (Singh, 1986)

School:

+ **Catholic (vs. public) school** (Manlove, 1998)

– **Higher percent of minority students** (Manlove, 1998)

– **Higher percent of students receiving free lunch** (Manlove, 1998)

+ **Learning-focused school setting** (Kasen, Cohen, & Brook, 1998)

– **Higher school dropout rates** (Singh, 1986)

– **Higher rates of school vandalism** (Chandy et al., 1994)

Family:

+ **Foreign language spoken at home** (Lundberg & Plotnick, 1995)

+ **Higher parental education** (Chandy et al., 1994; Hayward, Grady, & Billy, 1992; Lundberg & Plotnick, 1995; Plotnick, 1992; Roosa et al., 1997)

– **Larger family size** (Hogan & Kitagawa, 1985; Lundberg & Plotnick, 1995)

+ **Two (vs. one) parents** (Barnett, Papini, & Gbur, 1991; Chandy et al., 1994; Hogan & Kitagawa, 1985; Lundberg & Plotnick, 1995; Manlove, 1998; Murry, 1992)

+ **Higher income level** (AGI, 1994; Barnett, Papini, & Gbur, 1991; Hogan & Kitagawa, 1985; Ireson, 1984; Manlove, 1998; Murry, 1992)

– **Partial coverage with public health insurance** (Bearman & Brückner, 1999)

– **Older sister who was an adolescent parent** (East, 1996a; Hogan & Kitagawa, 1985)

+ **Greater parental disapproval of teen sex or use of contraception** (Dittus & Jaccard, 2000; Resnick et al., 1997)

Peers:

+ **Friends with good grades** (Kasen, Cohen, & Brook, 1998)

+ **Friends and peers with good grades and little non-normative behavior** (Bearman & Brückner, 1999)

– **Friends who are teen mothers** (Holden et al., 1993)

continued

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

1 Includes antecedents of males who impregnate females.

Table 2.6: Antecedents of Pregnancy[1] *continued*

Partner:

– **Male partner 3 or more years older** (Darroch, Landry, & Oslak, 1999; Miller, Clark, & Moore, 1997)

Individual

Biological:

– **Older age** (AGI, 1994; Bearman & Brückner, 1999; Darroch, Landry, & Oslak, 1999; Guagliardo, Huang, & D'Angelo, 1999; Pierre et al., 1998; Spingarn & DuRant, 1996)

– **Greater physical development** (Dittus & Jaccard, 2000)

Race/Ethnicity:

– **Race (black vs. white)** (AGI, 1994; Bearman & Brückner, 1999)

– **Ethnicity (Hispanic vs. white)** (AGI, 1994)

Relationship with Family:

+ **Greater teen/family connectedness** (Barnett, Papini, & Gbur, 1991; Bearman & Brückner, 1999; Dittus & Jaccard, 2000; Resnick et al., 1997; Scott, 1993)

+ **Appropriate parental supervision and monitoring** (Hogan & Kitagawa, 1985)

+/– **Greater parent/child communication about sex** (Adolph et al., 1995; Barnett, Papini, & Gbur, 1991; Baumeister, Flores, & Marin, 1995; Leland & Barth, 1993; Murry, 1992)

– **Physical abuse** (Chandy et al., 1994)

– **General maltreatment by family** (Smith, 1996)

Attachment to and Success in School:

+ **Positive attitude toward school** (Plotnick, 1992)

+ **Higher school performance** (Ireson, 1984; Holden et al., 1993; Manlove, 1998; Robbins, Kaplan, & Martin, 1985)

– **School dropout** (Manlove, 1998; Murry, 1992)

+ **Higher education plans** (Manlove, 1998; Plotnick, 1992)

Religiosity:

– **Mainstream Protestant versus other** (Bearman & Brückner, 1999; Lundberg & Plotnick, 1995)

+ **Protestant, Catholic, or Jewish versus none** (Plotnick, 1992)

Relationships with Peers:

+ **Being a member of the leading crowd** (Bearman & Brückner, 1999)

Relationships with Partners:

– **Dating or dating at an early age** (Hogan & Kitagawa, 1985)

– **Being married** (AGI, 1994; Barnett, Papini, & Gbur, 1991; Darroch, Landry, & Oslak, 1999a)

– **Greater number of sexual partners** (Pierre et al., 1998)

Healthy Behaviors:

+ **Greater participation in sports** (Sabo et al., 1998)

continued

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

1 Includes antecedents of males who impregnate females.

Table 2.6: Antecedents of Pregnancy[1] *continued*

Problem or Risk-Taking Behaviors:

- – **Alcohol use** (Pierre et al., 1998; Spingarn & DuRant, 1996)
- – **Substance use** (Guagliardo, Huang, & D'Angelo, 1999; Pierre et al., 1998; Spingarn & DuRant, 1996)
- – **Greater involvement in other risk behaviors** (Pierre et al., 1998; Resnick, Chambliss, & Blum, 1993; Spingarn & DuRant, 1996)
- – **Greater involvement in delinquent behaviors** (Kasen, Cohen, & Brook, 1998; Pierre et al., 1998)

Emotional Well-Being and Distress:

- + **Greater positive self-concept** (Pete-McGadney, 1995)
- – **Attempted suicide** (Pierre et al., 1998)

Sexual Beliefs, Attitudes, Skills, and Behaviors:

- + **Sex education** (Zelnik & Kim, 1982)
- + **More egalitarian gender and family roles** (Plotnick, 1992)
- + **Greater sex role competencies** (Ireson, 1984)
- – **Stronger belief that causing a pregnancy was a sign of manhood** (Resnick, Chambliss, & Blum, 1993)
- + **Greater perceived negative consequences of pregnancy** (Resnick et al., 1997)
- – **Greater perceived ease of childbearing and parenting** (Holden et al., 1993)
- – **Same-sex sexual behavior** (Vermont Department of Health, 1997)
- + **Older age of first sex** (Bearman & Brückner, 1999; Melchert & Burnett, 1990; Murry, 1992; Spingarn & DuRant, 1996)
- – **Greater number of years since first sex** (Resnick et al., 1997)
- – **Greater number of sexual partners** (Bearman & Brückner, 1999; Guagliardo, Huang, & D'Angelo, 1999; Spingarn & DuRant, 1996)
- + **Greater motivation to use contraception** (Landry et al., 1986)
- + **Greater use of condoms** (Guagliardo, Huang, & D'Angelo, 1999)
- + **Greater use of contraception** (Barnett, Papini, & Gbur, 1991; Bearman & Brückner, 1999; Glei, 1999; Holden et al., 1993; Murry, 1992; Pierre et al., 1998; Resnick et al., 1997)
- – **History of STDs** (Guagliardo, Huang, & D'Angelo, 1999)

Sexual Abuse:

- – **Sexual abuse** (Boyer & Fine, 1992; Kenney, Reinholtz, & Angelini, 1997; Nagy, DiClemente, & Adcock, 1995; Pierre et al., 1998; Silverman & Amaro, 2000; Stock et al., 1997)

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

1 Includes antecedents of males who impregnate females.

Table 2.7: Antecedents of Childbearing[2]

Environment/Context

State:

+ **Higher education level** (Moore et al., 1994)
– **Higher levels of female labor force participation** (Moore et al., 1994)
– **Higher crime rate** (Moore et al., 1994)
+ **Higher level of state funding for family planning** (Anderson & Cope, 1987; Forrest, Hermalin, & Henshaw, 1981; Moore et al., 1994; Singh, 1986)
+ **Higher level of state funding for abortion** (Moore et al., 1994)

Community:

– **Higher ratio of males to females** (Ku, Sonenstein, & Pleck, 1993b)
– **Higher level of unemployment** (Ku, Sonenstein, & Pleck, 1993b)
+ **Higher community income** (Brooks-Gunn et al., 1993)
+ **More high-status workers** (Crane, 1991)
+ **More community opportunities** (Bickel et al., 1997)
– **Higher levels of community stress** (Singh, 1986)
– **Greater community social disogranization** (Billy, Brewster, & Grady, 1994)

School:

+ **Private religious school** (Zill, Nord, & Loomis, 1995)
– **High minority enrollment** (Zill, Nord, & Loomis, 1995)
+ **Higher levels of safety** (Moore et al., 1998)
– **Higher school dropout rates** (Singh, 1986)
+ **College prep program (vs. vocational or general)** (Zill, Nord, & Loomis, 1995)

Family:

+ **Parent education** (Zill, Nord, & Loomis, 1995)
+ **Greater family emphasis upon responsibility** (Hanson, Myers, & Ginsburg, 1987)
– **Having an older sister who gave birth as an adolescent** (Cox, Emans, & Bithoney, 1993; East et al., 1996a; East, Felice, & Morgan, 1993; Friede et al., 1986; Hogan & Kitagawa, 1985)
+ **Higher maternal educational level** (An, Haveman, & Wolfe, 1993; Brooks-Gunn et al., 1993; Kahn & Anderson, 1992; Manlove et al., 2000; Thornberry, Smith, & Howard, 1997)
+ **Two (vs. one) parents** (Manlove et al., 2000; Moore et al., 1998; Stouthamer-Loeber & Wei, 1998; Zill, Nord, & Loomis, 1995)
+ **Presence of an adequate father figure** (Gohel, Diamond, & Chambers, 1997)
+ **Presence of a grandparent in the home** (Astone & Washington, 1994)
– **Marital disruptions or remarriages** (An, Haveman, & Wolfe, 1993; Manlove et al., 2000; Wu, 1994)
+ **Higher family income level** (Brooks-Gunn et al., 1993, Zill, Nord, & Loomis, 1995)
– **Mother was a teen mother** (Gohel, Diamond, & Chambers, 1997; Kahn & Anderson, 1992; Manlove et al., 2000; Thornberry, Smith, & Howard, 1997)
+ **More negative parental view of early parenthood** (Gohel, Diamond, & Chambers, 1997)

continued

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

2 Includes antecedents of males who father children.

Table 2.7: Antecedents of Childbearing[2] *continued*

Peers:

– **A best friend who has been pregnant** (Landry et al., 1986)

Partner:

– **Older age of male partner** (Ku, Sonenstein, & Pleck, 1993a; Landry & Forrest, 1995; Males & Chew, 1996)

Individual

Biological:

– **Older age** (Darroch, Landry, & Oslak, 1999; Ventura, Curtin, & Mathews, 1998)

+ **Older age of menarche** (Kahn & Anderson, 1992)

Race/Ethnicity:

– **Race (black vs. white)** (An, Haveman, & Wolfe, 1993; Brooks-Gunn et al., 1993; Manlove et al., 2000; Moore, et al., 1998; Thornberry, Smith, & Howard, 1997; Zill, Nord, & Loomis, 1995)

– **Ethnicity (Hispanic vs. white)** (Aneshensel et al., 1990; Manlove et al., 2000; Moore et al., 1998; Thornberry, Smith, & Howard, 1997)

Relationship with Family:

+ **Greater family social support** (Thornberry, Smith, & Howard, 1997)

+ **Greater parent involvement in adolescent's education** (Manlove, 1995)

– **Living away from home** (Landry et al., 1986)

– **Having run away from home** (Kowaleski-Jones & Mott, 1998)

Attachment to and Success in School:

– **Changed schools multiple times** (Moore et al., 1998)

+ **Greater school involvement** (Moore et al., 1998; Zill, Nord, & Loomis, 1995)

+ **Higher school performance** (Moore et al., 1998; Plotnick & Butler, 1991; Stouthamer-Loeber & Wei, 1998; Thornberry, Smith, & Howard, 1997; Zill, Nord, & Loomis, 1995)

– **School dropout** (Manlove et al., 2000)

+ **Higher educational aspirations** (Moore et al., 1998; Plotnick & Butler, 1991)

+ **Higher parental college expectations for teen** (Thornberry, Smith, & Howard, 1997)

Religiosity:

+ **Having a religious affiliation** (An, Haveman, & Wolfe, 1993; Manlove et al., 2000)

Relationship to Community:

+ **Youth participation in a stable community** (Bickel et al., 1997)

Relationships with Peers:

– **Perceived by peers as controversial or aggressive in elementary school** (Underwood, Kupersmidt, & Coie, 1996)

+ **More popular in elementary school** (Underwood, Kupersmidt, & Coie, 1996)

– **Membership in a gang** (Thornberry, Smith, & Howard, 1997)

continued

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

2 Includes antecedents of males who father children.

Table 2.7: Antecedents of Childbearing[2] *continued*

Teen Relationships with Partners:

– **Being married** (AGI, 1994; Darroch, Landry, & Oslak, 1999)

Healthy Behaviors:

+/– **Participation in sports** (Sabo et al., 1998)

General Skills and Personality Traits:

+ **Greater internal locus of control** (Kowaleski-Jones & Mott, 1998)

Emotional Well-Being and Distress

+ **Higher self-esteem** (Kowaleski-Jones & Mott, 1998; Plotnick & Butler, 1991; Robinson & Frank, 1994)

– **Depression** (Kowaleski-Jones & Mott, 1998)

– **Receipt of help for emotional problems** (Kowaleski-Jones & Mott, 1998)

Sexual Beliefs, Attitudes, Skills, and Behaviors:

+ **More non-traditional attitudes toward family and gender roles** (Plotnick & Butler, 1991)

+ **Older age of first sex** (Manlove et al., 2000; Smith, 1997; Thornberry, Smith, & Howard, 1997)

– **Greater desire to have a child or ambivalence about having one** (Gohel, Diamond, & Chambers, 1997; Hanson, Morrison, & Ginsberg, 1989; Nesmith et al., 1997; Zabin, 1994a; Zabin, Astone, & Emerson, 1993)

Sexual Abuse:

– **Sexual abuse** (Browning & Laumann, 1997)

Problem or Risk-Taking Behaviors

– **More permissive attitudes toward risk-taking** (Kowaleski-Jones & Mott, 1998)

– **Substance use** (Kowaleski-Jones & Mott, 1998; Thornberry, Smith, & Howard, 1997)

– **Greater involvement in delinquent behavior** (Stouthamer-Loeber & Wei, 1998)

– **Greater involvement in non-sexual risk-taking behaviors** (Serbin et al., 1991)

+ = a protective factor; – = a risk factor; +/– = a protective factor in some studies and a risk factor in others

2 Includes antecedents of males who father children.

References

Abma, J., Driscoll, A., & Moore, K. (1998). Young women's degree of control over first intercourse: An exploratory analysis. *Family Planning Perspectives, 30*(1), 12-18.

Adolph, C., Remos, D.E., Linton, K.L., & Grimes, D.A. (1995). Pregnancy among Hispanic teenagers: Is good parental communication a deterrent? *Contraception, 51*(5), 303-306.

Afxentiou, D., & Hawley, C.B. (1997). Explaining female teenagers' sexual behavior and outcomes: A bivariate probit analysis with selectivity correction. *Journal of Family and Economic Issues, 18*, 91-106.

Alan Guttmacher Institute. (1994). *Sex and America's teenagers.* New York, NY: Author.

Alexander, E., & Hickner, J. (1997). First coitus for adolescents: Understanding why and when. *Journal of the American Board of Family Practice, 10*(2), 96-103.

An, C.B., Haveman, R., & Wolfe, B. (1993). Teen out-of-wedlock births and welfare receipt: The role of childhood events and economic circumstances. *The Review of Economics and Statistics, 75*(2), 195-208.

Anderson, J.E., & Cope, L.G. (1987). The impact of family planning program activity on fertility. *Family Planning Perspectives, 19*(4), 152-157.

Aneshensel, C.S., Becerra, R.M., Fielder, E.P., & Schuler, R.H. (1990). Onset of fertility-related events during adolescence: A prospective comparison of Mexican-American and non-Hispanic white females. *American Journal of Public Health, 80*(8), 959-963.

Arnett, J. (1990). Contraceptive use, sensation seeking, and adolescent egocentrism. *Journal of Youth and Adolescence, 19*(2), 171-180.

Astone, N.M., & Washington, M.L. (1994). The association between grandparental coresidence and adolescent childbearing. *Journal of Family Issues, 15*(4), 574-589.

Bailey, S.L., Camlin, C.S., & Ennett, S.T. (1998). Substance use and risky sexual behavior among homeless and runaway youth. *Journal of Adolescent Health, 23*(6), 378-388.

Baker, S.A., Thalberg, S.P., & Morrison, D.M. (1988). Parents' behavioral norms as predictors of adolescent sexual activity and contraceptive use. *Adolescence, 23*(90), 265-282.

Barnett, J.K., Papini, D.R., & Gbur, E. (1991). Familial correlates of sexually active pregnant and nonpregnant adolescents. *Adolescence, 26*(102), 457-472.

Basen-Engquist, K., & Parcel, G.S. (1992). Attitudes, norms, and self-efficacy: A model of adolescents' HIV-related sexual risk behavior. *Health Education Quarterly, 19*(2), 263-277.

Baumeister, L.M., Flores, E., & Marin, B.V. (1995). Sex information given to Latina adolescents by parents. *Health Education Research, 10*(2), 233-239.

Bearman, P.S., & Brückner, H. (1999). *Power in numbers: Peer effects on adolescent girls' sexual debut and pregnancy.* Washington, DC: The National Campaign to Prevent Teen Pregnancy.

Bearman, P.S., Brückner, H., Brown, B.B., Theobald, W., & Philliber, S. (1999). *Peer potential: Making the most of how teens influence each other.* Washington, DC: The National Campaign to Prevent Teen Pregnancy.

Bearman, P.S., & Brückner, H. (2001). Promising the future: Virginity pledges and the transition to first intercourse. *American Journal of Sociology, 106*(4), 859-912.

Beck, S.H., Cole, B.S., & Hammond, J.A. (1991). Religious heritage and premarital sex: Evidence from a national sample of young adults. *Journal for the Scientific Study of Religion, 30*, 173-180.

Beier, S.R., Rosenfeld, W.D., Spitalny, K.C., Zansky, S.H., & Bontempo, A.N. (2000). The potential role of an adult mentor in influencing high-risk behaviors in adolescents. *Archives of Pediatrics and Adolescent Medicine, 154*, 327-331.

Benda, B.B., & Corwyn, R.F. (1996). Testing a theoretical model of adolescent sexual behavior among rural families in poverty. *Child and Adolescent Social Work Journal, 13*(6), 469-494.

Benda, B.B., & DiBlasio, F.A. (1991). Comparison of four theories of adolescent sexual exploration. *Deviant Behavior*, *12*(3), 235-257.

Benda, B.B., & DiBlasio, F.A. (1994). An integration of theory: Adolescent sexual contacts. *Journal of Youth and Adolescence*, *23*(3), 403-420.

Benson, M.D., & Torpy, E.F. (1995). Sexual behavior in junior high school students. *Obstetrics and Gynecology*, *85*(2), 279-284.

Bickel, R., Weaver, S., Williams, T., & Lange, L. (1997.) Opportunity, community, and teen pregnancy in an Appalachian state. *Journal of Educational Research*, *90*(3), 175-181.

Billy, J.O.G., Brewster, K.L., & Grady, W.R. (1994). Contextual effects on the sexual behavior of adolescent women. *Journal of Marriage and the Family*, *56*(2), 387-404.

Blum, R.W., Beuhring, T., & Rinehart, P.M. (2000). *Protecting teens: Beyond race, income and family structure.* Minneapolis, MN: Center for Adolescent Health, University of Minnesota.

Blum, R.W., Beuhring, T., Shew, M.L., Bearinger, L.H., Sieving, R.E., & Resnick, M.D. (2000). The effects of race, income, and family structure on adolescent risk behavior. *American Journal of Public Health*, *90*(12), 1879-84.

Boyer, C.B., Tschann, J.M., & Shafer, M. (1991). Predictors of risk for sexually transmitted diseases in ninth grade urban high school students. *Journal of Adolescent Research*, *14*(4), 448-465.

Boyer, D., & Fine, D. (1992). Sexual abuse as a factor in adolescent pregnancy and child maltreatment. *Family Planning Perspectives*, *24*(1), 4-11, 19.

Braverman, P., & Strasburger, V.C. (1993). Adolescent sexual activity. *Clinical Pediatrics*, *32*(11), 658-668.

Brewster, K.L. (1994). Race differences in sexual activity among adolescent women: The role of neighborhood characteristics. *American Sociological Review*, *59*(3):408-424.

Brewster, K.L., Billy, J.O.G., & Grady, W.R. (1993). Social context and adolescent behavior: The impact of community on the transition to sexual activity. *Social Forces*, *71*(3), 713-740.

Brewster, K.L., Cooksey, E.C., Guilkey, D.K., & Rindfuss, R.R. (1998). The changing impact of religion on the sexual and contraceptive behavior of adolescent women in the United States. *Journal of Marriage and the Family*, *60*, 493-504.

Brindis, C., Starbuck-Morales, S., Wolfe, A.L., & McCarter, V. (1994). Characteristics associated with contraceptive use among adolescent females in school-based family planning programs. *Family Planning Perspectives*, *26*(4), 160-164.

Brindis, C., Boggess, J., Katsuranis, F., Mantell, M., McCarter, V., & Wolfe, A. (1998). A profile of the adolescent male family planning client. *Family Planning Perspectives*, *30*(2), 63-66, 88.

Brooks-Gunn, J., Duncan, G.J., Klebanov, P.K., & Sealand, N. (1993). Do neighborhoods influence child and adolescent development? *American Journal of Sociology*, *99*(2), 353-395.

Brown, J.D., & Newcomer, S.F. (1991). Television viewing and adolescents' sexual behavior. *Journal of Homosexuality*, *21*(1-2), 77-91.

Brown, L.K., DiClemente, R.J., & Park, T. (1992). Predictors of condom use in sexually active adolescents. *Journal of Adolescent Health*, *13*(8), 651-657.

Browning, C.R., & Laumann, E.O. (1997). Sexual contact between children and adults: A life course perspective. *American Sociological Review*, *62*(4), 540-560.

Burge, V., Felts, M., Chenier, T., & Parrillo, A.V. (1995). Drug use, sexual activity, and suicidal behavior in U.S. high school students. *Journal of School Health*, *65*(6), 222-227.

Capaldi, D.M., Crosby, L., & Stoolmiller, M. (1996). Predicting the timing of first sexual intercourse for at-risk adolescent males. *Child Development*, *67*(2), 344-359.

Carvajal, S., Parcel, G.S., Basen-Engquist, K., Banspach, S.W., Coyle, K.K., & Kirby, D.B. (1999). Psychosocial predictors of the delay of sexual intercourse by adolescents. *Health Psychology*, *18*(5), 443-452.

Catania, J., Coates, T., Kegeles, S., Peterson, J., Marin, B., & Fullilove, M. (1989). *Predicting risk behavior in a random household probability*

sample: The "Amen" Study. San Francisco, CA: University of California, Center for AIDS Prevention Studies.

Centers for Disease Control and Prevention. (1996). CDC surveillance summaries. *Morbidity and Mortality Weekly Report, 45*(No. SS-4), 64-65.

Chandy, J.M., Harris, L., Blum, R.W., & Resnick, M.D. (1994, December). Female adolescents of alcohol misusers: Sexual behaviors. *Journal of Youth and Adolescence, 23*(6), 695-709.

Christopher, F.S., Johnson, D.C., & Roosa, M. (1993). Family, individual, and social correlates of early Hispanic adolescent sexual expression. *The Journal of Sex Research, 30*(1), 54-61.

Collins, J.K., & Robinson, L. (1986). The contraceptive knowledge, attitudes and practice of unmarried adolescents. *Australian Journal of Sex, Marriage and Family, 7*(3), 132-152.

Costa, F.M., Jessor, R., Donovan, J.E., & Fortenberry, J.D. (1995). Early initiation of sexual intercourse: The influence of psychosocial unconventionality. *Journal of Research on Adolescence, 5*(1), 93-121.

Costa, F.M., Jessor, R., Fortenberry, J.D., & Donovan, J.E. (1996). Psychosocial conventionality, health orientation, and contraceptive use in adolescence. *Journal of Adolescent Health, 18*(6), 404-16.

Cox, J., Emans, S.J., & Bithoney, W. (1993). Sisters of teen mothers: Increased risk for adolescent parenthood. *Journal of Adolescent and Pediatric Gynecology, 6*, 138-142.

Crane, J. (1991). Effects of neighborhoods on dropping out of school and teenage childbearing. In C. Jencks, & P.E. Peterson (Eds.), *The urban underclass.* Washington DC: The Brookings Institute.

Crosby, R.A., Yarber, W.L., & Kanu, A.J. (1998). Relationship of HIV/STD sexual risk behaviors to other health behaviors among a sample of Indiana rural youth. *The Health Education Monograph, 16*(2), 51-59.

Cvetkovich, G., & Grote, B. (1981). Psychosocial maturity and teenage contraceptive use: An investigation of decision-making and communication skills. *Population and Environment, 4*(4), 211-226.

Darroch, J.E., Landry, D.J., & Oslak, S. (1999). Age differences between sexual partners in the United States. *Family Planning Perspectives, 31*(4), 160-167.

Dawson, D.A. (1986). The effects of sex education on adolescent behavior. *Family Planning Perspectives, 18*(4), 162-170.

Day, R.D. (1992). The transition to first intercourse among racially and culturally diverse youth. *Journal of Marriage and the Family, 54*(4), 749-762.

Devine, D., Long, P., & Forehand, R. (1993). A prospective study of adolescent sexual activity: Description, correlates, and predictors. *Advances in Behaviour Research and Therapy, 15*(3), 185-209.

DiBlasio, F.A., & Benda, B.B. (1990). Adolescent sexual behavior: Multivariate analysis of a social learning model. *Journal of Adolescent Research, 5*(4), 449-466.

DiClemente, R.J. (1990). The emergence of adolescents as a risk group for human immunodeficiency virus infection. *Journal of Adolescent Research, 5*(1), 7-17.

DiClemente, R.J., Durbin, M., Siegel, D., Krasnovsky, F., Lazarus, N., & Comacho, T. (1992). Determinants of condom use among junior high school students in a minority, inner-city school district. *Pediatrics, 89*(2), 197-202.

DiClemente, R.J., Lodico, M., Grinstead, O.A., Harper, G., Rickman, R.L., Evans, P.E., & Coates, T.J. (1996). African-American adolescents residing in high-risk urban environments do use condoms: Correlates and predictors of condom use among adolescents in public housing developments. *Pediatrics, 98*(2, part 1), 269-278.

Dittus, P.J., & Jaccard, J. (2000). Adolescents' perceptions of maternal disapproval of sex: Relationship to sexual outcomes. *Journal of Adolescent Health, 26*(4), 268-278.

Dorius, G., & Barber, B. (1998). *Parental support and control and the onset of sexual intercourse.* Unpublished manuscript.

Dorius, G.L., Heaton, T.B., & Steffen, P. (1993). Adolescent life events and their association with the onset of sexual intercourse. *Youth and Society, 25*(1), 3-23.

Durbin, M., Diclemente, R.J., Siegel, D., Krasnovsky, F., Lazarus, N., & Camacho, T. (1993). Factors associated with multiple sex partners among junior high school students. *Journal of Adolescent Health*, *14*(3), 202-207.

DuRant, R.H., & Sanders, J.M. (1989). Sexual behavior and contraceptive risk taking among sexually active adolescent females. *Journal of Adolescent Health Care*, *10*(1), 1-9.

East, P.L. (1996a). The younger sisters of child-bearing adolescents: Their attitudes, expectations, and behaviors. *Child Development*, *67*(2), 267-282.

East, P.L. (1996b). Do adolescent pregnancy and childbearing affect younger siblings? *Family Planning Perspectives*, *28*(4), 148-153.

East, P.L., & Felice, M.E. (1992). Pregnancy risk among the younger sisters of pregnant and child-bearing adolescents. *Journal of Developmental and Behavioral Pediatrics*, *13*(2), 128-136.

East, P.L., Felice, M.E., & Morgan, M. (1993). Sisters' and girlfriends' sexual and childbearing behavior: Effects on early adolescent girls' sexual outcomes. *Journal of Marriage and the Family*, *55*(4), 953-963.

Ensminger, M.E. (1990). Sexual activity and problem behaviors among black, urban adolescents. *Child Development*, *61*, 2032-2046.

Fishbein, M., Bandura, A., Triandis, H.C., Kanfer, F.H., Becker, M.H., & Middlestadt, S.E. (1991, October). *Factors influencing behavior and behavior change*. Final report to the Theorist's Workshop, Washington, DC.

Flaherty, E.W., Marecek, J., Olsen, K., & Wilcove, G. (1983). Preventing adolescent pregnancy: An interpersonal problem-solving approach. *Prevention in Human Services*, *2*(3), 49-64.

Flannery, D., Rowe, D., & Gulley, B. (1993). Impact of pubertal status, timing, and age on adolescent sexual experience and delinquency. *Journal of Adolescent Research*, *8*(1), 21-40.

Flewelling, R.L., & Bauman, K.E. (1990). Family structure as a predictor of initial substance use and sexual intercourse in early adolescence. *Journal of Marriage and the Family*, *52*(1), 171-181.

Ford, K., & Norris, A.E. (1993). Urban Hispanic adolescents and young adults: Relationship of acculturation to sexual behavior. *Journal of Sex Research*, *30*(4), 316-323.

Forste, R.T., & Heaton, T.B. (1988). Initiation of sexual activity among female adolescents. *Youth and Society*, *19*(3), 250-268.

Forrest, J.D., Hermalin, A.I., & Henshaw, S.K. (1981). The impact of family planning clinic programs on adolescent pregnancy. *Family Planning Perspectives*, *13*(3), 109-116.

Fortenberry, J.D., Costa, F.M., Jessor, R., & Donovan, J.E. (1997). Contraceptive behavior and adolescent lifesytles: A structural modeling approach. *Journal of Research on Adolescence*, *7*(3), 307-329.

Foshee, V., & Bauman, K. (1992). Gender stereotyping and adolescent sexual behavior: A test of temporal order. *Journal of Applied Social Psychology*, *22*(20), 1561-1579.

Fox, G.L., & Inazu, J.K. (1980). Patterns and outcomes of mother-daughter communication about sexuality. *Journal of Social Issues*, *36*(1), 7-29.

Friede, A., Hogue, C.J., Doyle, L., Hammerslough, C.R., Sniezek, J.E., & Arrighi, H. (1986). Do sisters of childbearing teenagers have increased rates of childbearing? *American Journal of Public Health*, *76*(10), 1221-1224.

Furstenberg, F.F., Moore, K.A., & Peterson, J.L. (1985). Sex education and sexual experience among adolescents. *American Journal of Public Health*, *75*(11), 1131-1132.

Galavotti, C., & Lovick, S.R. (1989). School-based clinic use and other factors affecting adolescent contraceptive behavior. *Journal of Adolescent Health Care*, *10*(6), 506-512.

Gershenson, H.P., Musick, J.S., Ruch-Ross, H.S., Magee, V., Rubino, K.K., & Rosenberg, D. (1989). The prevalence of coercive sexual experience among teenage mothers. *Journal of Interpersonal Violence*, *4*(2), 204-219.

Gibbs, J.T. (1986). Psychosocial correlates of sexual attitudes and behaviors in urban early adolescent females: Implications for intervention. *Journal of Social Work and Human Sexuality*

(Special Issue — Adolescent sexualities: Overviews and principles of intervention); 5(1), 81-97.

Gibson, J.W., & Kempf, J. (1990). Attitudinal predictors of sexual activity in Hispanic adolescent females. *Journal of Adolescent Research, 5*(4), 414-430.

Gispert, M., Brinich, P., Wheeler, K., & Krieger, L. (1984). Predictors of repeat pregnancies among low-income adolescents. *Hospital and Community Psychiatry, 35*(7), 719-723.

Gohel, M., Diamond, J.J., & Chambers, C.V. (1997). Attitudes toward sexual responsibility and parenting: An exploratory study of young urban males. *Family Planning Perspectives, 29*(6), 280-283.

Goodwin, F.K. (1990). Which kids use condoms — or don't. *Journal of the American Medical Association, 264*(11), 1389.

Gorosh, M. (1982). Patterns of contraceptive use among female adolescents. *Journal of Adolescent Health Care, 3*(2), 96-102.

Grady, W.R., Hayward, M.D., & Billy, J.O.G. (1989). *A dynamic model of premarital pregnancy in the U.S.* Final report to the Office of Population Affairs. Washington, DC: U.S. Department of Health and Human Services.

Guagliardo, M.F., Huang, Z., & D'Angelo, L.J. (1999). Fathering pregnancies: Marking health-risk behaviors in urban adolescents. *Journal of Adolescent Health, 24*(1), 10-15.

Halpern, C.T., Joyner, K., Udry, R., & Suchindran, C. (2000). Smart teens don't have sex (or kiss much either). *Journal of Adolescent Health, 26*(3), 213-225.

Halpern, C.T., Udry, J.R., Campbell, B., & Suchindran, C. (1993). Testosterone and pubertal development as predictors of sexual activity: A panel analysis of adolescent males. *Psychosomatic Medicine, 55*(5), 436-447.

Halpern, C.T., Udry, J.R., Campbell, B., Suchindran, C., & Mason, G.A. (1994). Testosterone and religiosity as predictors of sexual attitudes and activity among adolescent males: A biosocial model. *Journal of Biosocial Science, 26*(2), 217-234.

Halpern, C.T., Udry, J.R., & Suchindran, C. (1997). Testosterone predicts initiation of coitus in adolescent females. *Psychosomatic Medicine, 59*(2), 161-171.

Handelsman, C.D., Cabral, R.J., & Weisfeld, G.E. (1987). Sources of information and adolescent sexual knowledge and behavior. *Journal of Adolescent Research, 2*(4), 455-463.

Hanson, S.L., Morrison, D.R., & Ginsberg, A.L. (1989). The antecedents of teenage fatherhood. *Demography, 26*, 579-596.

Hanson, S.L., Myers, D.E., & Ginsburg, A.L. (1987). The role of responsibility and knowledge in reducing teenage out-of-wedlock childbearing. *Journal of Marriage and the Family, 49*(2), 241-256.

Harvey, S.M., & Spigner, C. (1995). Factors associated with sexual behavior among adolescents: A multivariate analysis. *Adolescence, 30*(18), 153-264.

Haurin, R.J., & Mott, F.L. (1990). Adolescent sexual activity in the family context: The impact of older siblings. *Demography, 27*, 537-557.

Hayward, M.D., Grady, W.R., & Billy, J.O.G. (1992). The influence of socioeconomic status on adolescent pregnancy. *Social Science Quarterly, 73*(4), 750-772.

Hingson, R.W., Strunin, L., Berlin, B.M., & Heeren, T. (1990). Beliefs about AIDS, use of alcohol, drugs and unprotected sex among Massachusetts adolescents. *American Journal of Public Health, 80*(3), 295-299.

Hogan, D.P., Astone, N.M., & Kitagawa, E.M. (1985). Social and environmental factors influencing contraceptive use among Black adolescents. *Family Planning Perspectives, 17*(4), 165-169.

Hogan, D.P., & Kitagawa, E.M. (1985). The impact of social status, family structure, and neighborhood on the fertility of Black adolescents. *American Journal of Sociology, 90*(4), 825-855.

Holden, G.W., Nelson, P.B., Velasquez, J., & Ritchie, K.L. (1993). Cognitive, psychosocial, and reported sexual behavior differences between pregnant and nonpregnant adolescents. *Adolescence, 28*(111), 557-572.

Holmbeck, G.N., Crossman, R.E., Wandrei, M.L., & Gasiewski, E. (1994). Cognitive development, egocentrism, self-esteem, and adolescent contraceptive knowledge, attitudes, and behavior. *Journal of Youth and Adolescence, 23*(2), 169-193.

Holtzman, D., & Rubinson, R. (1995). Parent and peer communication effects on AIDS-related behavior among U.S. high school students. *Family Planning Perspectives, 27*(6), 235-240.

Hou, S.I., & Basen-Engquist, K. (1997). Human immunodeficiency virus risk behavior among white and Asian/Pacific Islander high school students in the United States: Does culture make a difference? *Journal of Adolescent Health, 20*(1), 68-74.

Hovell, M., Sipan, C., Blumberg, E., Atkins, C., Hofstetter, C.R., & Kreitner, S. (1994). Family influences on Latino and Anglo adolescents' sexual behavior. *Journal of Marriage and the Family, 56*(4), 973-986.

Inazu, J.K., & Fox, G.L. (1980). Maternal influence on the sexual behavior of teen-age daughters: Direct and indirect sources. *Journal of Family Issues, 1*(1), 81-99.

Ireson, D.J. (1984). Adolescent pregnancy and sex roles. *Sex Roles, 11*(3-4), 189-201.

Jaccard. J., & Dittus, P. (1991). *Parent-teen communication: Toward the prevention of unintended pregnancies.* New York, NY: Springer-Verlag.

Jaccard, J., Dittus, P.J., & Gordon, V.V. (1996). Maternal correlates of adolescent sexual and contraceptive behavior. *Family Planning Perspectives, 28*(4), 159-165, 185.

Jaccard, J., Dittus, P.J., & Litardo, H.A. (1999). Parent-adolescent communication about sex and birth control: Implications for parent-based interventions to reduce unintended adolescent pregnancy. In W. Miller & L. Severy (Eds.), *Advances in population: Psychological perspectives.* London: Kingsley Publishers.

Jensen, L.C., DeGaston, J.F., & Wee, S.E. (1994). Societal and parental influences on adolescent sexual behavior. *Psychological Reports, 75*(2), 928-930.

Jessor, R., Costa, F., Jessor, L., & Donovan, J.E. (1983). Time of first intercourse: A prospective study. *Journal of Personality and Social Psychology, 44*(3), 608-626.

Jorgensen, S.R., King, S.L., & Torrey, B.A. (1980). Dyadic and social network influences on adolescent exposure to pregnancy risk. *Journal of Marriage and the Family, 42*(1), 141-155.

Jorgensen, S.R., & Sonstegard, J.S. (1984). Predicting adolescent sexual and contraceptive behavior: An application and test of the Fishbein model. *Journal of Marriage and the Family, 46*(1), 43-55.

Kahn, J.R., & Anderson, K.E. (1992). Intergenerational patterns of teenage fertility. *Demography, 29*(1), 39-57.

Karofsky, P.S., Zeng, L., & Kosorok, M.R. (2000). Relationship between adolescent-parental communication and initiation of first intercourse by adolescents. *Journal of Adolescent Health, 28*(1), 41-45.

Kasen, S., Cohen, P., & Brook, J.S. (1998). Adolescent school experiences and dropout, adolescent pregnancy, and young adult deviant behavior. *Journal of Adolescent Research, 13*(1), 49-72.

Kastner, L.S. (1984). Ecological factors predicting adolescent contraceptive use: Implications for intervention. *Journal of Adolescent Health Care, 5*(2), 79-86.

Kenney, J.W., Reinholtz, C., & Angelini, P.J. (1997). Ethnic differences in childhood and adolescent sexual abuse and teenage pregnancy. *Journal of Adolescent Health, 21*(1), 3-10.

Kinsman, S.B., Romer, D., Furstenberg, F.F., & Schwarz, D.F. (1998). Early sexual initiation: The role of peer norms. *Pediatrics, 102*(5), 1185-1192.

Kirby, D. (1999). *Looking for reasons why: The antecedents of adolescent sexual risk-taking, pregnancy, and childbearing.* Washington, DC: National Campaign to Prevent Teen Pregnancy.

Kowaleski-Jones, L., & Mott, F. (1998). Sex, contraception and childbearing among high-risk youth: Do different factors influence males and females? *Family Planning Perspectives, 30*(4), 163-169.

Ku, L., Sonenstein, F.L., & Pleck, J.H. (1992). The association of AIDS education and sex education with sexual behavior and condom use among teenage men. *Family Planning Perspectives, 24*(3), 100-106.

Ku, L., Sonenstein, F.L., & Pleck, J.H. (1993a). Factors influencing first intercourse for teenage men. *Public Health Reports, 108*(6), 680-694.

Ku, L., Sonenstein, F.L., & Pleck, J.H. (1993b). Neighborhood, family, and work: Influences on the premarital behaviors of adolescent males. *Social Forces, 72*(2), 479-503.

Ku, L., Sonenstein, F.L., & Pleck, J.H. (1993c). Young men's risk behaviors for HIV infection and sexually transmitted diseases, 1988 through 1991. *American Journal of Public Health, 83*(11), 1609-1615.

Ku, L., Sonenstein, F.L., & Pleck, J.H. (1994). The dynamics of young men's condom use during and across relationships. *Family Planning Perspectives, 26*(6), 246-251.

Ku, L., Sonenstein, F.L., Lindberg, L.D., Bradner, C.H., Boggess, S., & Pleck, J.H. (1998). Understanding changes in sexual activity among young metropolitan men: 1979-1995. *Family Planning Perspectives, 30*(6), 256-262.

Lammers, C., Ireland, M., Resnick, M., & Blum, R. (2000). Influences on adolescents' decisions to postpone onset of sexual intercourse: A survival analysis of virginity among youths aged 13 to 18 years. *Journal of Adolescent Health, 26*(1), 42-48.

Landry, D.J., & Forrest, J.D. (1995). How old are U.S. fathers? *Family Planning Perspectives, 27*(4), 159-161.

Landry, E., Bertrand, J.T., Cherry, F., & Rice, J. (1986). Teen pregnancy in New Orleans: Factors that differentiate teens who deliver, abort, and successfully contracept. *Journal of Youth and Adolescence, 15*(3), 259-274.

Lauritsen, J.L. (1994). Explaining race and gender differences in adolescent sexual behavior. *Social Forces, 72*(3), 859-883.

Lauritsen, J.L., & Swicegood, C.G. (1997). The consistency of self-reported initiation of sexual activity. *Family Planning Perspectives, 29*(5), 215-221.

Leitenberg, H., & Saltzman, H. (2000). A statewide survey of age at first intercourse for adolescent females and age of their male partners: Relation to other risk behaviors and statutory rape implications. *Archives of Sexual Behavior, 29*(3), 203-15.

Leland, N.L., & Barth, R.P. (1993). Characteristics of adolescents who have attempted to avoid HIV and who have communicated with parents about sex. *Journal of Adolescent Research*, 8(1), 58-76.

Little, C.B., & Rankin, A. (forthcoming). Why do they start? Explaining reported early-teen sexual activity. *Sociological Forum.*

Lock, S.E., & Vincent, M.L. (1995). Sexual decision-making among rural adolescent females. *Health Values: The Journal of Health Behavior, Education and Promotion, 19*(1), 47-58.

Lowry, R., Holtzman, D., Truman, B.I., Kann, L., Collins, J.L., & Kolbe, L.J. (1994). Substance use and HIV-related sexual behaviors among U.S. high school students: Are they related? *American Journal of Public Health, 84*(7), 1116-1120.

Lundberg, S. (1990). Effects of state welfare, abortion, and family planning policies on premarital childbearing among white adolescents. *Family Planning Perspectives, 22*(6), 246-251.

Lundberg, S., & Plotnick, R.D. (1995). Adolescent premarital childbearing: Do economic incentives matter? *Journal of Labor Economics, 13*(2), 177-200.

Luster, T., & Small, S.A. (1994). Factors associated with sexual risk-taking behaviors among adolescents. *Journal of Marriage and the Family, 56*(3), 622-632.

Luster, T., & Small, S.A. (1997). Sexual abuse history and number of sex partners among female adolescents. *Family Planning Perspectives, 29*(5), 204-211.

Males, M., & Chew, K.S. (1996). The ages of fathers in California adolescent births. *American Journal of Public Health, 86*(4), 565-568.

Manlove, J. (1995). *Early motherhood on an intergenerational perspective: The experiences of a British cohort.* Unpublished manuscript.

Manlove, J. (1998). The influence of high school dropout and school disengagement on the risk of school-age pregnancy. *Journal of Research on Adolescence, 8*(2), 187-220.

Manlove, J., Terry, E., Gitelson, L., Papillo, A.R., & Russel, S. (2000). Explaining demographic trends in teenage fertility, 1980-1995. *Family Planning Perspectives, 32*(4), 166-175.

Manning, W.D., Longmore, M.A., & Giordano, P.C. (2000). The relationship context of contraceptive use at first intercourse. *Family Planning Perspectives, 32*(3), 104-110.

Marin, B.V., Coyle, K.K., Gomez, C.A., Carvajal, S.C., & Kirby, D.B. (2000). Older boyfriends and girlfriends increase risk of sexual initiation in young adolescents. *Journal of Adolescent Health, 27*(6), 409-418.

Marsiglio, W. (1993). Adolescent males' orientation toward paternity and contraception. *Family Planning Perspectives, 25*(1), 22-31.

Marsiglio, W., & Mott, F. (1986). The impact of sex education on sexual activity, contraceptive use, and premarital pregnancy among American teenagers. *Family Planning Perspectives, 18*(4), 151-162.

Mauldon, J., & Luker, K. (1996). The effects of contraceptive education on method use at first intercourse. *Family Planning Perspectives, 28*(1), 19-24, 41.

Mayer, S.E., & Jencks, C. (1989). Growing up in poor neighborhoods: How much does it matter? *Science, 243*(4897), 1441-1445.

McBride, C.M., Curry, S.J., Cheadle, A., Anderman, C., Wagner, E.H., Diehr, P., & Psaty, B. (1995). School-level application of a social bonding model to adolescent risk-taking behavior. *Journal of School Health, 65*(2), 63-68.

Melchert, T., & Burnett, K.F. (1990). Attitudes, knowledge, and sexual behavior of high-risk adolescents: Implications for counseling and sexuality education. *Journal of Counseling and Development, 68*(3), 293-298.

Meschke, L.L., Zweig, J.M., Barber, B.L., & Eccles, J.S. (2000). Demographic, biological, psychological, and social predictors of the timing of first intercourse. *Journal of Research on Adolescence, 10*(3), 315-338.

Middleman, A.B., Faulkner, A.H., Woods, E.R., Emans, S.J., & DuRant, R.H. (1995). High-risk behaviors among high school students in Massachusetts who use anabolic steroids. *Pediatrics, 96*(2, Part 1), 268-272.

Miller, B.C. (1995). Risk factors for adolescent nonmarital childbearing. In *Report to Congress on out-of-wedlock childbearing* (pp. 217-227). Washington, DC: U.S. Department of Health and Human Services.

Miller, B.C., & Bingham, C.R. (1989). Family configuration in relation to the sexual behavior of female adolescents. *Journal of Marriage and the Family, 51*(2), 499-506.

Miller, B.C., Christensen, R.B., & Olson, T.D. (1987). Adolescent self-esteem in relation to sexual attitudes and behavior. *Youth and Society, 19*(1), 93-111.

Miller, B.C., Monson, B.H., & Norton, M.C. (1995). The effects of forced sexual intercourse on white female adolescents. *Child Abuse and Neglect, 19*(10), 1289-1301.

Miller, B.C., McCoy, J.K., Olson, T.D., & Wallace, C.M. (1986). Parental discipline and control attempts in relation to adolescent sexual attitudes and behavior. *Journal of Marriage and the Family, 48*, 503-512.

Miller, B.C., Norton, M.C., Curtis, T., Hill, E.J., Schvaneveldt, P., & Young, M.H. (1997). The timing of sexual intercourse among adolescents: Family, peer, and other antecedents. *Youth and Society, 29*(1), 54-83.

Miller, B.C., Norton, M.C., Fan, I., & Christopherson, C.R. (1998). Pubertal development, parental communication, and sexual values in relation to adolescent sexual behaviors. *Journal of Early Adolescence, 18*(1), 27-52.

Miller, B.C., & Olson, T.D. (1988). Sexual attitudes and behavior of high school students in relation to background and contextual factors. *Journal of Sex Research, 24*, 194-200.

Miller, B.C., & Sneesby, K.R. (1988). Educational correlates of adolescents' sexual attitudes and behavior. *Journal of Youth and Adolescence, 17*(6), 521-530.

Miller, K.E., Sabo, D.F., Farrell, M.P., Barnes, G.M., & Melnick, M,J. (1998). Athletic participation and sexual behavior in adolescents: The different world of boys and girls. *Journal of Health and Social Behavior, 39*(2), 108-123.

Miller, K.S., Clark, L.F., & Moore, J.S. (1997). Sexual initiation with older male partners and subsequent HIV risk behavior among female adolescents. *Family Planning Perspectives, 29*(5), 212-214.

Miller, K.S., Forehand, R., & Kotchick, B.A. (1999). Adolescent sexual behavior in two ethnic minority samples: The role of family variables. *Journal of Marriage and the Family, 61*(1), 85-90.

Miller, K.S., Levin, M.L., Whitaker, D.J., & Xu, X. (1998). Patterns of condom use among adolescents: The impact of mother-adolescent communication. *American Journal of Public Health, 88*(10), 1542-1544.

Miller, W.B., Pasta, D.J., MacMurray, J., Chiu, C., Wu, H., & Comings, D.E. (1998). Dopamine receptor genes are associated with age at first sexual intercourse. *Journal of Biosocial Science, 31*(part 1), 17-28.

Millstein, S.G., & Moscicki, A.B. (1995). Sexually-transmitted disease in female adolescents: Effects of psychosocial factors and high-risk behaviors. *Journal of Adolescent Health, 17*(2), 83-90.

Moore, K.A, Blumenthal, C., Sugland, B.W., Hyatt, B., Snyder, N.O., & Morrison, D.R. (1994). *State variation in rates of adolescent pregnancy and childbearing.* Washington, DC: Child Trends, Inc.

Moore, K.A., Morrison, D.R., & Glei, D.A. (1995). Welfare and adolescent sex: The effects of family history, benefit levels, and community context. *Journal of Family and Economic Issues (Theme issue — Family economic policy: The intergenerational effects of welfare), 16*(2-3), 207-237.

Moore, K.A., Manlove, J., Glei, D.A., & Morrison, D.R. (1998). Nonmarital school-age motherhood: Family, individual, and school characteristics. *Journal of Adolescent Research, 13*(4), 433-457.

Moore, K.A., Nord, C.W., & Peterson, J.L. (1989). Nonvoluntary sexual activity among adolescents. *Family Planning Perspectives, 21*(3), 110-114.

Moore, K.A., Peterson, J.L., & Furstenberg, F.F. (1986). Parental attitudes and the occurrence of early sexual activity. *Journal of Marriage and the Family, 48*, 777-782.

Morrison, D.M., (1989). Predicting contraceptive efficacy: A discriminant analysis of three groups of adolescent women. *Journal of Applied Social Psychology, 19*(17, part 1), 1431- 1452.

Mott, F.L., Fondell, M.M., Hu, P.N., Kowaleski-Jones, L., & Menaghan, E.G. (1996). The determinants of first sex by age 14 in a high-risk adolescent population. *Family Planning Perspectives, 28*(1), 13-18.

Mueller, K.E., & Powers, W.G. (1990). Parent-child sexual discussions: Perceived communicator style and subsequent behavior. *Adolescence, 25*(98), 469-482.

Murphy, J.J., & Boggess, S. (1998). Increased condom use among teenage males, 1988-1995: The role of attitudes. *Family Planning Perspectives, 30*(6), 276-280, 303.

Murry, V.M. (1992). Incidence of first pregnancy among Black adolescent females over three decades. *Youth and Society, 23*(4), 478-506.

Nagy, S., DiClemente, R.J., & Adcock, A.G. (1995). Adverse factors associated with forced sex among southern adolescent girls. *Pediatrics, 96*, 944-946.

National Center on Addiction and Substance Abuse. (1999). *Dangerous liaisons: Substance abuse and sex.* Washington, DC: National Center on Addiction and Substance Abuse.

Nesmith, J.D., Klerman, L.V., Oh, M.K., & Feinstein, R.A. (1997). Procreative experiences and orientations toward paternity held by incarcerated adolescent males. *Journal of Adolescent Health, 20*(3), 198-203.

Newcomer, S.F., & Baldwin, W. (1992). Demographics of adolescent sexual behavior, contraception, pregnancy, and STDs. *Journal of School Health, 62*(7), 265-270.

Newcomer, S.F., & Udry, J.R. (1984). Mothers' influence on sexual behavior of their teenage children. *Journal of Marriage and the Family, 46*, 477-485.

Newcomer, S.F., & Udry, J.R. (1985). Parent-child communication and adolescent sexual behavior. *Family Planning Perspectives, 17*(4), 169-174.

Newcomer, S.F., & Udry, J.R. (1987). Parental marital status effects on adolescent sexual behavior. *Journal of Marriage and the Family, 49*(2), 235-240.

Ohannessian, C., & Crockett, L. (1993). A longitudinal investigation of the relationship between educational investment and adolescent sexual activity. *Journal of Adolescent Research, 8*(2), 167-182.

Orr, D.P., Wilbrandt, M.L., Brack, C.J., Rauch, S.P., & Ingersoll, G.M. (1989). Reported sexual behaviors and self-esteem among young adolescents. *American Journal of Diseases of Children, 143*, 86-90.

Pendergrast, R.A., DuRant, R.H., & Gaillard, G.I. (1992). Attitudinal and behavioral correlates of condom use in urban adolescent males. *Journal of Adolescent Health, 13*(2), 133-139.

Pete-McGadney, J. (1995). Differences in adolescent self-concept as a function of race, geographic location, and pregnancy. *Adolescence, 30*(117), 95-105.

Philliber, S., Namerow, P.B., Kaye, J.W., & Kunkes, C.H. (1986). Pregnancy risk-taking among adolescents. *Journal of Adolescent Research, 1*(4), 463-481.

Phinney, V.G., Jensen, L.C., Olsen, J.A., & Cundick, B. (1990). The relationship between early development and psychosexual behaviors in adolescent females. *Adolescence, 25*(98), 321-332.

Pierre, N., Shrier, L.A., Emans, S.J., & DuRant, R.H. (1998). Adolescent males involved in pregnancy: Associations of forced sexual contact and risk behaviors. *Journal of Adolescent Health, 23*(6), 364-369.

Pleck, J.H. (1989). Correlates of black adolescent males' condom use. *Journal of Adolescent Research (Special issue: Black adolescents), 4*(2), 247-253.

Pleck, J.H., Sonenstein, F.L., & Ku, L. (1991). Adolescent males' condom use: Relationships between perceived cost-benefits and consistency. *Journal of Marriage and the Family, 53*(3), 733-745.

Pleck, J.H., Sonenstein, F.L., & Ku, L. (1993a). Changes in adolescent males' use of and attitudes toward condoms, 1988-1991. *Family Planning Perspectives, 25*(3), 106-110, 117.

Pleck, J.H., Sonenstein, F.L., & Ku, L.C. (1993b). Masculine ideology: Its impact on adolescent males' heterosexual relationships. *Journal of Social Issues, 49*(3), 11-29.

Pleck, J.H., Sonenstein, F.L., & Swain, S.O. (1988). Adolescent males' sexual behavior and contraceptive use: Implications for male responsibility. *Journal of Adolescent Research, 3*(3-4), 275-284.

Plotnick, R.D., & Butler, S.S. (1991). Attitudes and adolescent nonmarital childbearing: Evidence from the National Longitudinal Survey of Youth. *Journal of Adolescent Research, 6*(4), 470-492.

Plotnick, R.D. (1992). The effects of attitudes on teenage premarital pregnancy and its resolution. *American Sociological Review, 57*, 800-811.

Raine, T.R., Jenkins, R., Aarons, S.J., Woodward, K., Fairfax, J.L., El-Khorazaty, M.N., & Herman, A. (1999). Sociodemographic correlates of virginity in seventh-grade black and Latino students. *Journal of Adolescent Health, 24*(5), 304-312.

Reitman, D., St. Lawrence, J.S., Jefferson, K.W., Alleyne, E., Brasfield, T.L., & Shirley, A. (1996). Predictors of African American adolescents' condom use and HIV risk behavior. *AIDS Education and Prevention, 8*(6), 499-515.

Resnick, M.D., Bearman, P.S., Blum, R.W., Bauman, K.E., Harris, K.M., Jones, J., Tabor, J., Beuhring, T., Sieving, R.E., Shew, M., Ireland, M., Bearinger, L.H., & Udry, J.R. (1997). Protecting adolescents from harm: Findings from the National Longitudinal Study on Adolescent Health. *Journal of American Medical Association, 278*(10), 823-832.

Resnick, M.D., Chambliss, S., & Blum, R.W. (1993). Health risk behaviors of urban adolescent males involved in pregnancy. *Families in Society: Journal of Contemporary Human Services, 74*, 366-374.

Richter, D.L., Valois, F.G., McKeown, R.E., & Vincent, M.L. (1993). Correlates of condom use and number of sexual partners among high school adolescents. *Journal of School Health, 63*(2), 91-96.

Rickman, R.L., Lodico, M., DiClemente, R.J., Morris, R., Baker, C., & Huscroft, S. (1994). Sexual communication is associated with condom use by sexually active incarcerated adolescents. *Journal of Adolescent Health, 15*(5), 383-388.

Robbins, C., Kaplan, H.B., & Martin, S.S. (1985). Antecedents of pregnancy among unmarried adolescents. *Journal of Marriage and the Family, 47*(3), 567-583.

Robinson, K.L., Telljohann, S.K., & Price, J.H. (1999). Predictors of sixth graders engaging in sexual intercourse. *Journal of School Health, 69*(9), 369-375.

Robinson, R.B., & Frank, D.I. (1994). The relation between self-esteem, sexual activity, and pregnancy. *Adolescence, 29*(113), 27-35.

Rodgers, J.L. (1983). Family configuration and adolescent sexual behavior. *Population and Environment, 6*, 73-83.

Rodgers, J.L., & Rowe, D.C. (1988). Influence of siblings on adolescent sexual behavior. *Developmental Psychology, 24*(5), 722-728.

Rodgers, J.L., & Rowe, D.C. (1990). Adolescent sexual activity and mildly deviant behavior: Sibling and friendship effects. *Journal of Family Issues, 11*(3), 274-293.

Romer, D., Stanton, B., Galbraith, J., Feigelman, S., Black, M.M., & Li, X. (1999). Parental influence on adolescent sexual behavior in high-poverty settings. *Archives of Pediatrics & Adolescent Medicine, 153*(10), 1055-1062.

Roosa, M.W., Tein, J.Y., Reinholtz, C., & Angelini, P.J. (1997). The relationship of childhood sexual abuse to teenage pregnancy. *Journal of Marriage and the Family, 59*(1), 119-130.

Rosenbaum, E., & Kandel, D.B. (1990). Early onset of adolescent sexual behavior and drug involvement. *Journal of Marriage and the Family, 52*(3), 783-798.

Rosenthal, S.L., Burklow, K.A., Lewis, L.M., Succop, P.A., & Biro, F.M. (1997). Heterosexual romantic relationships and sexual behaviors of young adolescent girls. *Journal of Adolescent Health, 21*(4), 238-243.

Rowe, D.C., & Rodgers, J.L. (1994). A social contagion model of adolescent sexual behavior: Explaining race differences. *Social Biology, 41*(2), 1-18.

Rowe, D.C., Rodgers, J.L., & Meseck-Bushey, S. (1989). An 'epidemic' model of sexual intercourse prevalences for black and white adolescents. *Social Biology, 36*, 127-145.

Sabo, D., Miller, K., Farrell, M., Barnes, G., & Melnick, M. (1998). *The Women's Sports Foundation report: Sport and teen pregnancy.* East Meadow, NY: Women's Sports Foundation.

Santelli, J.S., & Beilenson, P. (1992). Risk factors for adolescent sexual behavior, fertility, and sexually transmitted diseases. *Journal of School Health*, 62(7), 271-279.

Santelli, J.S., Brener, N.D., Lowry, R., Bhatt, A., & Zabin, L.S. (1998). Multiple sexual partners among U.S. adolescents and young adults. *Family Planning Perspectives, 30*(6), 271-275.

Santelli, J.S., Lowry, R., Brener, N.D., & Robin, L. (2000). The association of sexual behaviors with socioeconomic status, family structure, and race/ethnicity among U.S. adolescents. *American Journal of Public Health, 90*(10), 1582-1588.

Scher, P.W., Emans, S.J., & Grace, E.M. (1982). Factors associated with compliance to oral contraceptive use in an adolescent population. *Journal of Adolescent Health Care, 3*(2), 120-123.

Scott, J.W. (1993). African American daughter-mother relations and teenage pregnancy: Two faces of premarital teenage pregnancy. *Western Journal of Black Studies, 17*(2), 73-81.

Scott-Jones, D., & Turner, S.L. (1988). Sex education, contraceptive and reproductive knowledge, and contraceptive use among Black adolescent females. *Journal of Adolescent Research, 3*(2), 171-187.

Seidman, S.N., Mosher, W.D., & Aral, S.O. (1994). Predictors of high-risk behavior in unmarried American women: Adolescent environment as risk factor. *Journal of Adolescent Health, 15*(2), 126-132.

Serbin, L.A., Peters, P.L., McAffer, F.J., & Schwartzman, A.E. (1991). Childhood aggression and withdrawal as predictors of adolescent pregnancy, early parenthood, and environmental risk for the next generation. *Canadian Journal of Behavioral Science*, *23*(3), 318-331.

Shah, F., & Zelnik, M. (1981). Parent and peer influence on sexual behavior, contraceptive use, and pregnancy experience of young women. *Journal of Marriage and the Family*, *43*, 339-348.

Shea, J.A., Hercog-Baron, R., & Furstenberg, F.F. (1984). Factors associated with adolescent use of family planning clinics. *American Journal of Public Health, 74*(11), 1227-1230.

Shrier, L.A., Emans, S.J., Woods, E.R., & DuRant, R.H. (1997). The association of sexual risk behaviors and problem drug behaviors in high school students. *Journal of Adolescent Health*, *20*(5), 377-383.

Sieving, R., Resnick, M.D., Bearinger, L., Remafedi, G., Taylor, B.A., & Harmon, B. (1997). Cognitive and behavioral predictors of sexually transmitted disease risk behavior among sexually active adolescents. *Archives of Pediatrics and Adolescent Medicine*, *151*(3), 243- 251.

Silverman, J.G., & Amaro, H. (2000). The relationship between sexual abuse and sexual risk among high school students: Findings from the 1997 Massachusetts Youth Risk Behavior Survey. *Maternal and Child Health Journal, 4*(2), 125-134.

Singh, S. (1986). Adolescent pregnancy in the United States: An interstate analysis. *Family Planning Perspectives, 18*(5), 210-220.

Small, S.A., & Luster, T. (1994). Adolescent sexual activity: An ecological risk-factor approach. *Journal of Marriage and the Family*, *56*(1), 181-192.

Smith, C.A. (1996). The link between childhood maltreatment and teenage pregnancy. *Social Work Research*, *20*(3), 131-141.

Smith, C.A. (1997). Factors associated with early sexual activity among urban adolescents. *Social Work, 42*(4), 334-346.

Sonenstein, F.L., Pleck, J.H., & Ku, L.C. (1989). Sexual activity, condom use, and AIDS awareness among adolescent males. *Family Planning Perspectives*, *21*(4), 152-158.

Spingarn, R.W., & DuRant, R.H. (1996). Male adolescents involved in pregnancy: Associated health risk and problem behaviors. *Pediatrics*, *98*(2, Part I), 262-268.

St. Lawrence, J.S. (1993). African-American adolescents' knowledge, health-related attitudes, sexual behavior, and contraceptive decisions: Implications for the prevention of adolescent HIV infection. *Journal of Consulting and Clinical Psychology*, *61*(1), 104-112.

St. Lawrence, J.S., Brasfield, T.L., Jefferson, K.W., Allyene, E., & Shirley, A. (1994). Social support as a factor in African-American adolescents' sexual risk behavior. *Journal of Adolescent Research*, *9*(3), 292-310.

Stanton, B., Li, X., Black, M., Ricardo, I., Galbraith, J., Kaljee, L., & Feigelman, S. (1994). Sexual practices and intentions among pre-adolescent and early adolescent low-income, urban African-Americans. *Pediatrics*, *93*(6), 966-973.

Stock, J.L., Bell, M.A., Boyer, D.K., & Connell, F.A. (1997). Adolescent pregnancy and sexual risk-taking among sexually abused girls. *Family Planning Perspectives*, *29*(5), 200-203, 227.

Stouthamer-Loeber, M., & Wei, B.S. (1998). The precursors of young fatherhood and its effect on delinquency of teenage males. *Journal of Adolescent Health*, *22*(1), 56-65.

Thomson, E. (1982). Socialization for sexual and contraceptive behavior: Moral absolutes verses relative consequences. *Youth and Society*, *14*(1), 103-128.

Thornberry, T.P., Smith, C.A., & Howard, G.J. (1997). Risk factors for teenage fatherhood. *Journal of Marriage and the Family*, *59*(3), 505-522.

Thornberry, T.P., Wei, E.H., Stouthamer-Loeber, M., & Van Dyke, J. (undated). *Teenage fatherhood and delinquent behavior.* Washington, DC: U.S. Department of Justice, Office of Juvenile Justice and Delinquency Prevention.

Thornton, A. (1990). The courtship process and adolescent sexuality. *Journal of Family Issues*, *11*(3), 239-273.

Thornton, A., & Camburn, D. (1987). The influence of the family on premarital sexual attitudes and behavior. *Demography, 24*(3), 323-340.

Thornton, A., & Camburn, D. (1989). Religious participation and adolescent sexual behavior and attitudes. *Journal of Marriage and the Family, 51*(3), 641-653.

Turner, R.A., Irwin, C.E., Jr., Tschann, J.M., & Millstein, S.G. (1993). Autonomy, relatedness, and the initiation of health risk behaviors in early adolescence. *Health Psychology, 12*(3), 200-208.

Udry, J.R. (1988). Biological predispositions and social control in adolescent sexual behavior. *American Sociological Review, 53*, 709-722.

Udry, J.R., & Billy, J.O.G. (1987). Initiation of coitus in early adolescence. *American Sociological Review, 52*, 841-855.

Udry, J.R., & Cliquet, R.L. (1982). A cross-cultural examination of the relationship between ages at menarche, marriage, and first birth. *Demography, 19*, 53-56.

Underwood, M.K., Kupersmidt, J.B., & Coie, J.D. (1996). Childhood peer sociometric status and aggression as predictors of adolescent childbearing. *Journal of Research on Adolescence, 6*(2), 201-223.

Upchurch, D.M., Levy-Storms, L., Sucoff, C.A., & Aneshensel, C.S. (1998). Gender and ethnic differences in the timing of first sexual intercourse. *Family Planning Perspectives, 30*(3), 121-127.

Valois, R.F., Oeltmann, J.E., Waller, J., & Hussey, J.R. (1999). Relationship between number of sexual intercourse partners and selected health risk behaviors among public high school adolescents. *Journal of Adolescent Health, 25*(5), 328-335.

Ventura, S.J., Curtin, S.C., & Mathews, T.J. (1998). *Teenage births in the United States: National and state trends, 1990-1996. National Vital Statistics System.* Hyattsville, MD: National Center for Health Statistics.

Vermont Department of Public Health. (1997, April 9). Gay, lesbian, and bisexual students at risk. In *Nuggets: News, notes and findings from the VDH Office of Alcohol and Drug Abuse Programs.* Montpelier, VT: Author.

Warren, C.W., Santelli, J.S., Everett, S.A., Kann, L., Collins, J.L., Cassell, C., Morris, L., & Kolbe, L.J. (1998). Sexual behavior among U.S. high school students, 1990-1995. *Family Planning Perspectives, 30*(4), 170-172, 200.

Weber, F.T., Gearing, J., Davis, A., & Conlon, M. (1992). Prepubertal initiation of sexual experiences and older first partner predict promiscuous sexual behavior of delinquent adolescent males — Unrecognized child abuse? *Journal of Adolescent Health, 13*(7), 600-605.

Weinbender, M.L., & Rossignol, A.M. (1996). Lifestyle and risk of premature sexual activity in a high school population of Seventh Day Adventists: Valuegenesis 1989. *Adolescence, 31*(122), 265-281.

Weinman, M.L., Smith, P.B., & Mumford, D.M. (1992). A comparison between a 1986 and 1989 cohort of inner-city adolescent females on knowledge, beliefs, and risk factors for AIDS. *Journal of Adolescence, 15*(1), 19-28.

Weinstein, M., & Thornton, A. (1989). Mother-child relations and adolescent sexual attitudes and behaviors. *Demography, 26*(4), 563-577.

Weisman, C.S., Plichta, S., Nathanson, C.A., Chase, G.A., Ensminger, M.E., & Robinson, J.C. (1991). Adolescent women's contraceptive decision making. *Journal of Health and Social Behavior, 32*(2), 130-144.

Whitaker, D.J., & Miller, K.S. (2000). Parent-adolescent discussions about sex and condoms: Impact of peer influences of sexual risk behavior. *Journal of Adolescent Research, 15*(2), 251-273.

Whitaker, D.J., Miller, K.S., May, D.C., & Levin, M.L. (1999). Teenage partners' communication about sexual risk and condom use: The importance of parent-teenager discussions. *Family Planning Perspectives, 31*(3), 117-121.

Whitbeck, L., Hoyt, D., Miller, M., & Kao, M. (1992). Parental support, depressed affect, and sexual experiences among adolescents. *Youth and Society, 24*(2), 166-177.

Whitbeck, L., Simons, R.M., & Kao, M. (1994). The effects of divorced mothers' dating behaviors and sexual attitudes on the sexual attitudes and behaviors of their adolescent children. *Journal of Marriage and the Family, 56*(3), 615-621.

White, H.R., & Johnson, V. (1988). Risk-taking as a predictor of adolescent sexual activity and use of contraception. *Journal of Adolescent Research*, *3*(3-4), 317-331.

Whitley, B.E., & Schofield, J.W. (1985-1986). A meta-analysis of research on adolescent contraceptive use. *Population and Environment*, *8*(3-4), 173-203.

Widmer, E.D. (1997). Influence of older siblings on initiation of sexual intercourse. *Journal of Marriage and the Family*, *59*(4), 928-938.

Wilson, M.D., Kastrinakis, M., D'Angelo, L.J., & Getson, P. (1994). Attitudes, knowledge, and behavior regarding condom use in urban black adolescent males. *Adolescence*, *29*(113), 13-26.

Wu, L.L. (1994). *Effects of family structure and income on the risk of a premarital birth* (Center for Demography and Ecology Working Paper No. 94-07). Madison, WI: University of Wisconsin.

Wu, L.L., & Martinson, B.B. (1993). Family structure and the risk of a premarital birth. *American Sociological Review*, *58*, 210-232.

Zabin, L.S. (1994). Adolescent sexual behavior and childbearing. *Women's Health Issues*, *4*(2), 73-75.

Zabin, L.S., Astone, N.M., & Emerson, M,R. (1993). Do adolescents want babies? The relationship between attitudes and behavior. *Journal of Research on Adolescence*, *3*(1), 67-86.

Zabin, L.S., Hardy, J.B., Smith, E.A., & Hirsch, M. (1986). Substance use and its relation to sexual activity among inner-city adolescents. *Journal of Adolescent Health Care*, *7*, 320-331.

Zelnik, M., Kantner, J.F., & Ford, K. (1981). *Sex and pregnancy in adolescence*. Beverly Hills, CA: Sage Publications.

Zelnik, M., & Kim, Y. (1982). Sex education and its association with teenage sexual activity, pregnancy, and contraceptive use. *Family Planning Perspectives*, *14*(3), 117-118, 123-126.

Zill, N., Nord, C.W., & Loomis, L.S. (1995). *Adolescent time use, risky behavior, and outcomes: An analysis of national data*. Rockville, MD: Westat, Inc.

Chapter 3

Assessing the Evidence: Factors Affecting the Strength of Research Results

The research presented in Chapters 1 and 2 on adolescent sexual activity and the antecedents of sexual behavior can help people design programs to reduce teen pregnancy by helping define teens at high risk and by suggesting the risk and protective factors that programs should strive to change. However, only good evaluation of programs themselves can provide evidence for whether or not those programs actually have the desired effect on behavior.

Strengths and Limitations of Evaluation Methods

This chapter discusses some of the criteria for judging the strength of evidence from evaluation studies. Many studies have examined the effects of programs on sexual behavior and pregnancy, but both the quality of the research methods employed and the strength of the resulting evidence have varied enormously. Because of that variation, the quality of the research methods and the strength of the evidence should be thoughtfully considered when assessing the results. Results that come from strong, well-designed studies are generally taken more seriously than results from poorly designed ones.

All the studies included in this review have used experimental or quasi-experimental designs to measure the impact of specific programs. By definition, experimental designs randomly assign study participants to intervention and control groups and then compare the two groups, while quasi-experimental designs do *not* randomly assign study participants to either group but do compare the intervention group with a comparison group of purportedly similar youth. Both types of studies include youth in both program and either control or comparison groups, use some method of making the program and comparison groups similar before program implementation, track individual youths over time, and then link their pretest and posttest scores.

Studies employing experimental or quasi-experimental designs are very different from those based on national surveys of youth 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 relationships. Similarly, studies based on data aggregated at the census tract, county, or state levels also have poor measures of participation in various programs, have difficulty controlling for spurious relationships, and sometimes have very small sample sizes (e.g., studies of the 50 states). Thus, neither of these two groups of studies is reviewed in this paper.

Studies using experimental or quasi-experimental designs have at least three important strengths not typically found in studies using national survey data or aggregated data. First, they evaluate specific programs with known program characteristics. Second, they can clearly distinguish between who did and did not receive the intervention. Third, such studies typically control for other factors that may have affected the results. Thus, this group of studies has greater potential ability to assess the actual causal impact of specific programs than studies based upon national surveys or aggregated data.

However, even those studies employing experimental or quasi-experimental designs vary greatly in their adherence to the following important principles of research methodology. Some incorporate most of these principles and, therefore, yield high quality results; those that do not are more likely to produce biased results. This chapter identifies ten principles of good research methods, estimates the extent to which each principle is met by the research studies reviewed in this volume, and estimates how violation of each principle would bias the overall results of these studies. For specific information about how particular studies in this review adhere to these principles, see the detailed study descriptions in Tables 4.1-4.14 in Chapter 4.

1. Sampling of Programs.

In order to be confident that the findings from a group of somewhat similar evaluated programs apply to other programs of the same type, the evaluated programs must be a representative sample of the larger group of programs. Otherwise, conclusions based on the sample cannot be generalized to the larger group of programs. For example, evaluations of several sex education programs employing particular strategies for changing behavior probably do not help us understand sex education programs that take very different approaches.

There are so many different approaches to reducing adolescent sexual risk-taking that even the many evaluations in this review cannot possibly represent all of the various types of programs adequately. There are undoubtedly some approaches to reducing teen pregnancy and STDs that have never been evaluated, and there are other types of programs for which there are only a few evaluations (e.g., abstinence-only programs or school condom-availability programs). The key point here is that one must be very careful when drawing inferences about types of programs with only a few existing studies. The problem with generalizing the results from a small group of studies is heightened by the fact that some programs may work only in some settings with some youth but not in others. Additional studies are often needed to learn about the effects of programs across many different types of youth.

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 have a real focus on specific outcomes. Thus, these evaluations are likely to overstate the positive results that might emerge when the same programs are adopted and replicated in other settings by other organizations. This bias

may be offset slightly by the fact that some programs may be evaluated prematurely (before formative evaluation has led to program improvements) and by the fact that some programs may not be implemented with fidelity when they are evaluated.

2. Random Assignment.

The evaluation design that demonstrates causality most conclusively is one using random assignment of individual youth, groups of youth (e.g., classrooms), or entire schools or communities. Random assignment is especially important because adolescents who voluntarily participate in interventions are typically different in either subtle or not-so-subtle ways from those who do not. These differences are what is meant by "selection bias." For example, youth who voluntarily participate in an abstinence-only program may be more inclined to be abstinent than their same-aged peers, and youth who visit a health center for contraception may already be more motivated to use contraception than other sexually experienced young people. Therefore, youth who do not voluntarily participate in an abstinence-only programs may be a biased comparison group for those youth who do volunteer, and sexually active youth who don't attend a family planning clinic may be a biased comparison group for those who do attend.

Furthermore, youth who receive permission from their parents to participate in programs are likely to be different in many ways from those who do not receive such permission. Even when participation is not determined primarily by either the teens or their parents, selection biases occur. For example, school-wide and community-wide programs are disproportionately likely to be implemented in schools or communities where there is the greatest need and where there is greater sexual risk-taking.

Of the studies in Tables 4.1-4.14 measuring impact upon behavior, about one-third employed random assignment while the rest used a quasi-experimental design without random assignment. This means that self-selection biases or other kinds of biases may affect the results of two-thirds of the studies. These biases could either obscure actual positive program effects or erroneously suggest positive program effects when they did not actually occur. On the other hand, in the studies reviewed in this volume, possible biases produced by lack of random assignment should not be great for two reasons: (1) the studies with the weakest quasi-experimental designs were excluded from this review, and (2) most important conclusions are confirmed by one or more studies with experimental designs.

It should also be noted that the control groups in nearly all these studies typically received other instruction or services, rather than nothing at all. For example, in some studies, the control groups received the standard sex education course for that institution, instead of the new or experimental intervention. Or, youth who did not receive subsidized family planning services from a clinic received such services from a private physician or obtained non-prescription contraceptives from a drug store. Thus, these studies typically measure only the *incremental* effect of the intervention and *not* the cumulative effect of that intervention plus whatever sexuality education or reproductive health services the youth might have received. If the cumulative effect of *all* education and services were measured, results would undoubtedly be stronger.

3. Sample Size.

Rigorous studies include a sufficiently large sample size. The sample size needed varies according to several factors, such as the variability in the outcome measure, the magnitude of the effect that needs to be

detected, and the chosen level of statistical significance (a measure of how confident one can be in the results). However, a growing body of experience suggests that a combined sample of at least 500 or even 1,000 is commonly needed. Much larger sample sizes may be needed if (1) groups of youth (e.g., classrooms or entire schools) rather than individual youth are assigned to intervention or comparison groups, (2) the intervention has a modest effect, (3) some of the sample's subgroups need to be examined separately — for instance, those who are sexually experienced versus those who are not or males versus females, or (4) highly skewed variables with very asymmetrical distributions (e.g., pregnancy or birth rates) are being measured.

Large samples are needed for at least three reasons. Most important, if the sample size is too small, then a program may produce programmatically significant results, but those results may not be statistically significant because of insufficient statistical power. Second, when sample sizes are too small and when researchers search for significant findings, then anomalous results are more likely to occur. Third, when sample sizes are too small, the *magnitude* of effect is unknown because much of the apparent effect could have been caused by chance.

Many published evaluations of programs to reduce adolescent risk-taking have been based on small sample sizes. Thus, some of these programs may have had programmatically significant results that were not found to be statistically significant, some may have produced anomalous results that are reported as statistically significant program effects, and some may have had significant effects whose magnitude was unknown.

4. Long-Term Follow-Up.

Studies need to conduct long-term follow-up with program participants. The desired length of the follow-up varies depending on different characteristics of the study (e.g., the outcomes being measured, the length of time before they become apparent, and the length of time they are likely to endure). Experience in this field suggests that follow-up for at least one year is important, but follow-up of less duration can provide information about short-term effects.

There are at least two important reasons why long-term follow-up is needed. First, it can detect effects that are not apparent in short periods of time. This is particularly true for studies measuring the impact of programs trying to delay the initiation of intercourse. If young people are tracked for much less than 12 to 18 months, then too few youth in most control groups will initiate intercourse to allow for the treatment group to emerge as doing measurably better than the control group — that is, the program may actually delay intercourse, but that delay would not be observed because the follow-up period was too short. Second, some program effects (e.g., increase in participants' knowledge) are likely to diminish substantially with time, and, thus, we cannot assume that positive short-term results will endure. And, of course, if short-term results do not endure, then they may have only a very limited impact upon the goals of reducing adolescent pregnancy and STD rates over a longer period of time.

Relatively few studies have measured long-term effects, although their number is increasing. A few published studies attempting to measure impact upon initiation of sex clearly did not measure behavior for a long enough period of time and, therefore, may have incorrectly concluded that programs were not effective. For this reason, these studies are not included in this review, even though they were published. Many studies did meet the criteria for inclusion in this volume, but measured only relatively short-term

effects on behavior. These studies are somewhat informative, although they tell us little about the programs' long-term impact on rates of teen pregnancy.

5. Measurement of Pregnancy Versus Sexual and Contraceptive Behaviors.

Given the programmatic goal of reducing pregnancy, the single best outcome measure for a program would logically be a measure of pregnancy rates. Several studies have, in fact, measured the impact of programs on pregnancy rates. However, there are at least two methodological problems with using pregnancy rates as an outcome measure. First, regardless of how they are measured, pregnancy rates are a very insensitive measure of program impact. For example, if a program reduces the pregnancy rate per year from 100 per 1,000 to 80 per 1,000, that is a 20 percent reduction, which would suggest a very successful program. However, that decrease represents a difference of only 20 pregnancies per 1,000 (or 2 percentage points), and a very large sample size (e.g., more than 6,000) would be required to find that change to be statistically significant. To even a greater extent, this same problem applies to birth rates. Second, pregnancy rates are often hard to determine and may, therefore, be an inaccurate measure. If pregnancy rates are estimated from self-reported data, pregnancies are likely to be under-reported (Fu et al., 1998; Jones & Forrest, 1992). This is especially true for males who do not know of pregnancies they have caused and for females who have ended their pregnancies by abortion and are reluctant to report it. Moreover, it is commonly impossible to estimate pregnancy rates for study participants from vital records. While birth rates can sometimes be determined from birth certificates, public records rarely yield abortion rates (and therefore pregnancy rates).

Studies can also examine the program impact on birth rates. However, if a program's goal is to reduce pregnancy, measuring the impact on birth rates as a proxy for pregnancy rates does not take into account the program's impact on abortion rates. As such, results may be misleading. For example, if a program's only effect is to decrease the rate of abortion, the pregnancy rate would remain the same while the birth rate would increase. If only birth rates were examined, one could reach the erroneous conclusion that the pregnancy rate had increased due to the program when, in fact, it had not. A few studies have employed very large sample sizes and have properly analyzed self-reports of pregnancies or births or have estimated birth rates from vital records. A few other studies have failed to recognize the issues of statistical power and have conducted misleading analyses of pregnancy or birth rates.

Because of the limitations of the pregnancy and birth rate measures, other measures of behavioral change are often used. Because the single most important antecedent of pregnancy is the frequency of unprotected sexual activity, this measure and its constituent components are often used to measure the impact of programs. Frequently measured components include age of initiation of intercourse, frequency of intercourse, use of contraception (at first sex, at last sex, or consistency of use), and actual frequency of sex without contraception. Typically, these behaviors can only be estimated from data that individuals report about themselves. Although some under- and over-reporting of these behaviors undoubtedly exists, these data are generally believed to be reasonably reliable and valid. Furthermore, when under- or over-reporting occurs, these biases are believed to cancel each other out in good experimental designs (Sonenstein, 1996).

On the other hand, under-reporting of sexual risk-taking in both intervention and

comparison groups may not always cancel each other out. The resulting bias is most likely to occur when participants become close to intervention staff, when intervention staff administer the surveys, and when large incentives are provided to study participants to complete the surveys. To the extent that this bias occurs, under-reporting would probably be higher in the intervention groups and favor more desirable program results.

6. Measurement of Behavior.

Given the goal of reducing adolescent pregnancy, studies should measure actual sexual and contraceptive behavior or pregnancy, rather than proximal antecedents of those behaviors such as *intent* to have sex or *intent* to use contraception. 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 weak proxies for actual behaviors. For example, many adolescents intend to use contraception every time they have sex, but many do not actually do so.

Many studies have examined program impact on proximal antecedents of behavior rather than on behavior itself. Although such studies can inform the development of programs, they are not included in this review.

7. Proper Statistical Analyses.

Studies should conduct proper statistical analyses of the collected data. This includes, for example, stating precisely the hypotheses to be tested before conducting the tests of significance, conducting the proper statistical tests, correcting for clustering if respondents are randomly assigned by group instead of individually, accounting for multiple tests of significance, especially when numerous tests are conducted, and then reporting all the results of the tests of hypotheses, regardless of whether they are positive or negative.

Many studies in this field have failed to conduct proper statistical analyses. For example, some apparently did not specify hypotheses before testing them, a few appear to have searched for and reported only desirable results without reporting negative results, some failed to adjust for group clustering, and most failed to account for multiple tests of significance. All of these statistical problems would tend to bias studies in favor of more desirable results. This may be quite a large bias.

8. Publication of Results.

If evaluation studies are conducted well, researchers should attempt to publish all the important results, regardless of whether those results are positive or negative. Otherwise, the published literature may be very biased. Consider the following example. Given that the federal government, many states, and several foundations have funded the implementation and evaluation of pregnancy prevention, HIV prevention, and youth development programs in many communities throughout the country, many evaluations are underway at any point in time. For the sake of argument, let's say that as many as 100 studies with experimental or quasi-experimental designs are completed during any five-year period of time. If each of these 100 studies examines 10 different behavioral outcomes, then as many as 1,000 behavioral outcomes could be examined across the studies. If these outcomes are examined for two different sub-groups (e.g., males and females), then 2,000 outcomes will be examined. *By chance alone*, 5 percent (100) of these outcomes will be statistically significant at the .05 level of significance, and, of these, again by chance alone, half (50, or 10 per year) will be in the desired direction. If *only* these studies are published, then the literature will obviously be very

biased in favor of the programs — even though those positive results may only be the result of chance.

In sum, the large number of studies being conducted at any point in time, 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 partially counter this bias, greater emphasis should be given to studies that (1) are large, well-funded, and well-designed, (2) have advisory boards that include experts in the field, and (3) are widely known while in progress, because such studies are more likely to publish results regardless of whether they are positive or negative.

9. Replication of Studies.

A program achieving positive results in one study should be replicated by others elsewhere and re-evaluated in order to learn more about the true impact of the model. This is important because many factors unique to the first evaluation may be responsible for producing the positive results. For instance, the teacher(s) may have been particularly charismatic, the program may have met the particular needs only 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 tried in another setting without these factors present, the results may not be so positive. So far, a few programs have been replicated and evaluated in other sites. The earlier positive findings were confirmed in some cases and were not confirmed in others. Whenever possible, effective programs should be replicated and studied before being adopted in statewide or nationwide initiatives.

10. Independent External Evaluators.

Evaluations of impact should ideally be conducted by independent third parties who do not have a direct stake in the results of the evaluation. People who evaluate their own programs are not dishonest, but they sometimes strongly believe in the efficacy of their programs and spend greater effort searching for elusive positive results rather than elusive negative results. Thus, their reported results may be biased. This cautionary perspective is supported by a respected literature about "experimenter effects" that underscores the need for independent (or blinded) evaluations. Many of the studies reviewed here were conducted by people who helped design the programs evaluated and undoubtedly had personal interests in the outcomes. This may have biased the results in favor of more positive results.

Conducting studies that meet even most of these principles requires considerable time and resources. In fact, doing so may take five or more years: 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 youth; one or more years to actually run the program with a sufficient number of youth; two years to collect long-term follow-up data; and one or more years to clean the data, conduct statistical analyses, and write reports. In addition, conducting studies with these methodological principles requires very knowledgeable and competent staff and sometimes hundreds of thousands, if not millions, of dollars to cover all costs.

Consequently, this discussion of methodological principles is not meant to suggest that it is easy, possible, or even desirable to incorporate every principle into each study. For some studies, it may be ethically unacceptable or administratively impossible to randomly assign participants to program and control groups or to have large sample

sizes, for instance. In other studies, it may be ethically and theoretically possible to incorporate these principles, but insufficient resources may make it impossible to do so. Moreover, the fields of pregnancy and STD prevention 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 the very real limitations of the research in this field, we should be very encouraged by the incredible progress that has been made recently in research methods employed. For example, twenty years ago there were only a few studies of sex education programs. 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. By contrast, many studies now use random assignment, have large sample sizes, measure long-term effects of a year or more, measure a variety of sexual and contraceptive behaviors, use proper statistical tests, and report both positive and negative results (c.f., Kirby, 1999). A few have even replicated previous studies and reported similar positive results. Thus, we should be very encouraged by this progress and can now have much greater confidence in the reported results of research findings.

Implications of Methodological Strengths and Limitations

These ten criteria and the actual methodological strengths and limitations of the studies in this field have important implications for this review, for selecting programs to be replicated, and for future research:

- The limitations of the evaluations, coupled with possible biases both big and small that operate in both directions (but probably disproportionately favor desired results), reduce our ability to make definitive statements about either specific programs or types of programs. Generalizations should be made cautiously.
- The quality of the evaluation design and of the resulting research evidence should be given considerable weight when assessing reported program results and when selecting programs for replication.
- Despite great progress, there still exists a real need for more evaluations with rigorous designs, proper statistical analyses, and accurate reporting of results. Many examples of rigorous research and progress in research methods over the decades demonstrate that such studies can be conducted. Public and private funders need to fully recognize the time and resources necessary to conduct these rigorous studies.
- Although few studies meet all ten 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 Chapter 4 takes into account these limitations and patterns; a study-by-study summary of the characteristics of each evaluation can be found in the chapter's tables.
- When positive results are achieved in an evaluation, the program should be put in place and evaluated with different staff and different research teams and with different types of youth in different locations — all in an effort to confirm the

original findings. When the positive results of the first study are found again by one or more subsequent studies, then it is wise to consider the widespread dissemination of that program. Even then, attention should be given to the particular groups and conditions in which the program is found to be effective.

References

Fu, H., Darroch, J.E., Henshaw, S.K., & Kolb, E. (1998). Measuring the extent of abortion underreporting in the 1995 National Survey of Family Growth. *Family Planning Perspectives, 30*(3), 128-133, 138.

Jones, E.J., & Forrest, J.D. (1992). Underreporting of abortion in surveys of U.S. women: 1976 to 1988. *Demography, 29*(1), 113-126.

Kirby, D. (1999). Reflections on two decades of research on teen sexual behavior and pregnancy. *Journal of School Health, 69*(3), 89-94.

Sonenstein, F.L. (1996). *Measuring sexual risk behaviors.* Paper presented a meeting of the American Enterprise Institute, Washington, DC.

Chapter 4

Emerging Answers: The Behavioral Impact of Programs to Reduce Adolescent Sexual Risk-Taking

Having set the stage in the previous chapters by describing the scope of the problem of teen pregnancy, the antecedents of teen sexual and contraceptive behavior, and the criteria for assessing evaluation research, this chapter turns to the main business of this report: reviewing and summarizing evaluations of programs to prevent teen pregnancy and sexual risk-taking. This chapter first explains the criteria that studies had to meet to be included in the review. It then presents a typology for grouping the various prevention programs that have been evaluated. And, finally, the findings of the evaluations themselves are presented. General conclusions about particular types of programs can be found at the end of each section; detailed descriptions of each study can be found in the tables. Overall conclusions about both the findings and future directions for research are in Chapter 5.

Criteria for Selection of Studies for This Review

Except where noted, this review focuses *only* on those studies meeting certain methodological criteria.[1] The six most important criteria are presented below. A fuller explanation of these criteria, as well as of other less important criteria are presented at the end of this chapter (p. 115). The six primary criteria are:

- The study was conducted in 1980 or later.
- The study was conducted in the United States or Canada.
- The study targeted adolescents of middle school or high school age (roughly 12-18).
- The study used an appropriate experimental or quasi-experimental design.

1 The first edition of the National Campaign's research review, *No Easy Answers: Research Findings on Programs to Reduce Teen Pregnancy* (1997), used publication in a peer-reviewed journal as the principal criterion for inclusion of a study. However, this volume uses methodological criteria for inclusion for two reasons: (1) some studies have employed rigorous research methods, but for a variety of reasons were never published in peer-reviewed journals, and (2) a few studies published in peer-reviewed journals employed very weak methods and provided misleading results that could bias interpretation of findings. Using methodological criteria for inclusion, instead of a publication criterion, improved both the number and quality of studies reviewed.

- The sample size was at least 100 in the combined treatment and control group. This minimum number applies to the actual statistical analyses measuring impact on behavior.
- The study measured impact on sexual or contraceptive behavior or pregnancy or childbearing.

A Typology of Programs that May Reduce Teen Pregnancy and STDs

Innumerable programs have been developed to reduce adolescent pregnancy and STDs, including HIV. They are found in schools; in health, family planning, and STD clinics; and in community organizations working with youth (including faith communities). Some are designed to support and encourage abstinence; others to improve knowledge, attitudes, and skills about contraception; some to improve access to contraception; and still others to improve education, life skills, and life opportunities more generally. Some focus on preventing first pregnancies; some target subsequent pregnancies; and others concentrate on STDs, particularly HIV. Some target adolescents, while others target parents of adolescents. Some focus on sexually inexperienced youth, others on the sexually experienced. Some use structured curricula with groups of youth, others provide one-on-one instruction or counseling, and still others use community-wide media approaches. 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 create any single typology to organize programs to prevent teen pregnancy.

However, one useful way to categorize prevention programs is by the behavioral antecedents that they target (for more on antecedents, see Chapter 2). Accordingly, this review first divides programs and their respective evaluations into those that focus primarily on sexual antecedents of adolescent sexual and contraceptive behavior, those that focus primarily upon non-sexual antecedents, and those that address both. Within these three broad categories, programs are divided into seven major groups and several subgroups (see box below).

Programs Focusing Primarily on Sexual Antecedents

Curriculum-based sexuality education programs in any setting

- Abstinence-only education programs
- Sexuality and HIV education programs

Sex and HIV education programs for parents and their families

Clinic or school-based programs designed to provide reproductive health care or to improve access to condoms or other contraceptives

- Family planning clinics and services
- Protocols for clinic appointments and supportive activities
- Other clinic characteristics and programs
- School-based and school-linked clinics
- School condom-availability programs

Community-wide pregnancy or HIV prevention initiatives with multiple components

Programs Focusing Primarily on Non-Sexual Antecedents

Early childhood programs

Youth development programs for adolescents

- Service learning programs
- Vocational education and employment programs
- Other youth development programs

Programs Focusing on Both Sexual and Non-Sexual Antecedents

Multi-component programs with both sexuality and youth development components

Programs that Focus Primarily on Sexual Antecedents

Curriculum-Based Sexuality Education Programs

Most adolescents in this country know a lot about the risks of unprotected sexual intercourse and about methods of reducing those risks. For example, nearly all youth know that unprotected sexual intercourse can lead to pregnancy or STDs, and most know that condoms provide some protection against pregnancy and STDs and can be obtained at stores. They learn this and other information from a variety of sources, including school sex and HIV education programs, the media, their parents and other adults, their friends, and others. Presumably, this information does reduce the amount of unprotected sex among teenagers. For example, after knowledge about HIV was disseminated throughout the country in the 1980s, adolescents markedly increased their use of condoms (Sonenstein, Pleck, & Ku, 1989). However, there remain the following important questions: Given some adolescent knowledge about these topics, does additional instruction about these topics or other aspects of sexuality affect teenagers' sexual behavior in positive or negative ways? If yes, what are the characteristics of programs that have positive effects?

This section will examine the effects of programs that stress abstinence as the only acceptable choice for preventing pregnancy (often called abstinence-only programs) and programs that discuss both abstinence and methods of protection against pregnancy and STDs (broader programs often called sexuality education or abstinence-plus programs). This latter group can be further divided into those that address *both* pregnancy and STDs/HIV (sometimes called sexuality education programs) and those that focus primarily on STD/HIV prevention (appropriately called HIV education programs).

In regard to their emphasis on only abstinence versus abstinence *and* the use of protection against pregancy and STDs, programs actually fall along a continuum and no longer clump into distinct groups. Whereas all abstinence-only programs emphasize that abstinence from sexual intercourse is the only truly healthy and safe choice for young people, some talk only about abstinence, some mention condoms and contraception but only emphasize their fallibility, and some offer medically accurate information about the benefits and limitations of condoms and contraceptives while still emphasizing abstinence. This last group of abstinence-only programs is harder to distinguish from sexuality education and HIV education programs, most of which also emphasize abstinence as the safest choice for young people but encourage use of condoms and contraceptives if youth do have sex, and a few of which — especially those for high-risk, sexually active youth — give primary emphasis to consistent condom use.

Abstinence-Only Programs

Despite their common emphasis on abstinence, abstinence-only programs are very diverse in many ways. For example, some faith-based programs may begin with a prayer for God's guidance and teach that it is immoral to have sex before marriage, while most programs — especially with the increased availability of federal funding for abstinence programs since 1996 — are entirely secular. Some programs emphasize that abstinence until marriage is the only truly safe choice, while others encourage youth to postpone sex until an unspecified later age. Some abstinence-only programs are entirely curriculum-based, while others include a wide variety of youth development activities. Some last only one or two sessions, while others last for 15 to 20 sessions. Some

are very didactic, while others engage the participants in group activities, using role-playing and other active-learning strategies to change group norms and teach assertiveness skills.

During most of the 1980s and 1990s, relatively few resources were devoted to evaluating abstinence-only programs. For instance, the federal Title XX Adolescent Family Life Act (AFLA) of 1981 provided funding for the development and implementation of abstinence-only programs and for short-term, low-cost evaluations of these programs; however, it did not provide adequate time or financial support for more rigorous evaluation to measure longer term impact of such programs on sexual behavior. And few other sources of funding were available. Fortunately, this has changed in recent years. The U.S. Department of Health and Human Services' Office of the Assistant Secretary for Planning and Evaluation (ASPE) is currently funding a rigorous evaluation of a number of abstinence-only programs that are receiving federal funding (mainly from the 1996 welfare reform act and administered through Title V). The first results of that evaluation are expected in late 2002.

To date, only three impact studies of abstinence-only programs have been identified that meet the criteria for this review.[2] Of these three, two have been published in peer-reviewed journals (Kirby et al., 1995; St. Pierre et al., 1995). All three studies measured program impact on the initiation of sex or frequency of sex (see the box on page 87 for a summary of the effects and Table 4.1 for descriptions of each study).

One of these studies actually evaluated the impact of three different curricula, *Sex Respect, Teen-Aid*, and *Values and Choices*, which were implemented in junior and senior high schools (Weed et al., 1992). (Notably, Values and Choices was modified to make it more consistent with abstinence-only and Utah state guidelines). Results indicated that after one year, these curricula did not significantly affect the initiation of sex among either junior high school or senior high school students.

Another study measured the impact of *Stay SMART*, a health education unit designed to delay sex and prevent alcohol, cigarette, and marijuana use (St. Pierre et al., 1995). It did not have a consistent and significant impact on the frequency of sexual activity.

The third study was the largest and most rigorous of the three studies. It evaluated the impact of *Postponing Sexual Involvement* (PSI), a relatively short, five-session program that was taught either by adults or peers. PSI was the primary component in a statewide California initiative to delay sex and prevent teen pregnancy. Designed to detect even small changes in behavior, the study included random assignment, very large sample sizes, and measurement of behavior at both three months and 17 months (Kirby et al., 1995). Results demonstrated that the program had no significant impact on the initiation of sex, the frequency of sex among those students who had ever had sex, or the number of sexual partners among those who had had sex. The study examined the impact of PSI on various sub-groups of youth (e.g., determined by

2 Some discerning readers may recognize that there are fewer abstinence-only studies included in this review than in its predecessor, *No Easy Answers*. The reason is that the criteria for inclusion are different in the two reviews. Whereas *No Easy Answers* included all published studies meeting weaker criteria, this review includes all studies meeting stronger, fairer criteria, regardless of whether the studies were published. Four abstinence-only studies that were included in *No Easy Answers* were not included in this volume, primarily because their sample sizes were too small or because they failed to measure initiation of sex for a sufficiently long period of time following completion of the program, and consequently they did not give the programs a fair chance at demonstrating success in delaying initiation of sex.

The Number of Programs with Effects on Sexual and Contraceptive Behaviors by Type of Program

	Abstinence-Only Programs	Sexuality Education Programs	HIV Education Programs	Sum of Sexuality and HIV Education Programs
Initiation of Sex				
Delayed initiation	0	6	3	9
Had no significant impact	3	12	6	18
Hastened initiation	0	1	0	1
Total Number of Programs	*3*	*19*	*9*	*28*
Frequency of Sex				
Decreased frequency	0	2	3	5
Had no significant impact	2	8	5	13
Increased frequency	0	1	0	1
Total Number of Programs	*2*	*11*	*8*	*19*
Number of Sexual Partners				
Decreased number	0	0	3	3
Had no significant impact	1	4	3	7
Increased number	0	0	0	0
Total Number of Programs	*1*	*4*	*6*	*10*
Use of Condoms				
Increased use	0	2	8	10
Had no significant impact	1	5	3	8
Decreased use	0	0	0	0
Total Number of Programs	*1*	*7*	*11*	*18*
Use of Contraception				
Increased use	0	4	0	4
Had no significant impact	1	7	0	7
Decreased use	0	0	0	0
Total Number of Programs	*1*	*11*	*0*	*11*

gender, ethnicity, and grade level) and found no effects on sexual behavior within any of these sub-groups.

Although abstinence-only programs are not designed to affect contraceptive use, some people have expressed concern that if abstinence-only programs discuss contraception primarily in a negative light, then participants will be less likely to use contraception when they do have sex. Accordingly, some people believe that the impact of abstinence-only programs on contraceptive use should also be studied. So far, only the study of PSI has measured that impact. PSI did not discuss contraception in a negative light, and it did not have a significant impact one way or the other on contraceptive use (Kirby et al., 1995).

Similarly, the study of PSI was the only study among these three studies of abstinence-only programs to measure impact on pregnancy. Students who received adult-led PSI were neither more likely nor less likely to report pregnancy during the following 17 months. However, unexpectedly, students who received PSI taught by peers were *more* likely to report being pregnant or causing a pregnancy than their control group (Kirby et al., 1995). The authors could not explain this anomalous finding but did attribute it, in part, to survey responses from a small group of seventh grade males in one school.

The primary conclusion to reach from these three studies is that the evidence is not conclusive about the impact of abstinence-only programs. There are only three studies of abstinence-only programs meeting the criteria for inclusion in this review, and two of them had important methodological limitations. Given this small number of studies, their methodological limitations, and the great diversity of abstinence-only programs that have not been evaluated, one should be careful about making any generalizations about all abstinence-only programs. In particular, one should not conclude that all abstinence-only programs either do or do not delay sex (or do or do not affect contraceptive use).

However, it is also true that these few early results are not encouraging. None of these three studies evaluating the impact of five different curricula found any overall effects on sexual behavior. Furthermore, there do not currently exist any abstinence-only programs with reasonably strong evidence that they actually delay the initiation of sex or reduce its frequency. This may change in the future as rigorous studies currently underway produce their findings (e.g., the federal Title V Abstinence Education Program Evaluation being conducted by Mathematica Policy Research, Inc., and the University of Pennsylvania).[3]

It may be the case that, in some respects, abstinence-only programs are like sexuality and HIV education programs (discussed below) — that is, some abstinence-only programs may be effective at changing behavior and some may not, and particular programmatic characteristics may distinguish effective programs from ineffective ones. If this is true, then communities wishing to put abstinence-only programs in place may increase their chances of selecting effective ones if they choose programs with the common characteristics of effective ***abstinence-based*** sex and HIV education programs described below (see page 91).

Sexuality and HIV Education Programs Covering Both Abstinence and Contraception or Condoms

Sexuality and HIV education programs tend to differ from abstinence-only programs in two ways: first, although abstinence is commonly advocated as the best strategy for school-aged youth, it is not stressed as the only acceptable behavior; and second, the benefits of contraception are described, along with their failure rates and/or side effects. That is, they usually emphasize that abstinence is the safest method for preventing STDs and pregnancy and that using condoms and other methods of contraception provide some protection against STDs and pregnancy and, accordingly, are safer than unprotected sex.

As noted above, in this review, "sex" or "sexuality" education refers to programs that cover protection against both pregnancy and STDs (and possibly other broader sexuality topics), while "HIV" education programs refers to programs that focus primarily on HIV (and some other STDs). Both groups of programs include a wide variety of

3 Recent publicity has focused attention on a study of the effect of virginity pledges, which suggested that, in some circumstances among certain populations, virginity pledges were associated with later initiation of sex (as well as less use of contraception at first sex for those pledgers who did have sex) (Bearman & Brückner, 2001). Virginity pledges are a component of some abstinence-only programs. This study is not discussed in this review because it was ***not*** a program evaluation with an experimental or quasi-experimental design and, therefore, did ***not*** meet the criteria for inclusion. Instead, it was based on survey data from the nationally representative Add Health data set and provides weaker evidence for a causal impact (see Chapter 3, pages 73-74, for a discussion of the differences between analyses of survey data and program evaluation and why studies based on survey data yield weaker evidence for causal effects).

approaches, ranging from programs taught during regular school classes, to programs taught on school campuses after school, to programs taught in homeless shelters and detention centers. They reflect the considerable creativity and differing perspectives of the organizations implementing them.

During debates about sex and HIV education programs throughout the country, people have expressed the concern that if programs talk about condoms and contraception, they may put sexually engaging ideas into the heads of youth, may make it seem safe and easy for youth to have sex, and therefore may actually increase sexual activity. This concern is plausible. Because it is an important issue, many studies have examined this possibility and have consistently found evidence that sex or HIV education does not increase sexual activity.

Other people have argued that if sex and HIV education programs discuss adolescent sexual behavior, its consequences, and methods of protection (including abstinence) frankly and realistically, then youth will be less likely to engage in sex (or, at the very least, will not engage in more sex) and will be more likely to use contraception effectively. This view is supported by multiple studies. More specifically, evaluations of many sex and HIV education programs strongly support the conclusion that these curricula do not increase sexual intercourse, either by hastening the onset of intercourse, increasing the frequency of intercourse, or increasing the number of sexual partners, and that some, but not all, programs can delay and reduce sexual activity (see the box on page 87 for a summary of the effects and Tables 4.2 and 4.3 for summaries of each study).

Twenty-eight studies meeting the criteria discussed above have examined the impact of middle school, high school, or community-based sexuality or HIV education programs on the initiation of intercourse:

- Nine of them (or about one-third) found that the programs delayed the initiation of sex (Aarons et al., 2000; Blake et al., 2000; Coyle et al., 2000; Ekstrand et al., 1996; Howard & McCabe, 1990; Hubbard, Giese, & Rainey, 1998; Jemmott, Jemmott, & Fong, 1998; Kirby, Barth, Leland, & Fetro, 1991; Klaus et al., 1987; St. Lawrence et al., 1995).
- Eighteen found no significant impact (Coyle et al., 1999; Eisen, Zellman, & McAlister, 1990; Gottsegen & Philliber, 2000; Jemmott, Jemmott, & Fong, 1992; Jemmott, Jemmott, & Fong, 1998; Kirby, 1985; Kirby et al., 1997; Levy et al., 1995; Lieberman et al., 2000; Little & Rankin, 2001; Main et al., 1994; Nicholson & Postrado, 1991; Thomas et al., 1992; Walter & Vaughn, 1993; Warren & King, 1994).
- Only one study out of 28 found that a sex or HIV education program hastened the initiation of sex (Moberg & Piper, 1998).

Overall, this is very strong evidence that these programs do not hasten sex and that some of them actually delay sex.

Nineteen studies examined the impact of sexuality and HIV education programs on the *frequency* of intercourse:

- Five studies found that they reduced the frequency of sex (Coyle et al., 2001; Howard & McCabe, 1990; Jemmott, Jemmott, & Fong, 1992; Jemmott, Jemmott, & Fong, 1998; St. Lawrence et al., 1995).
- Thirteen found no significant impact (Blake, Ledsky, Lohrmann, et al., 2000; Coyle et al., 1999; Jemmott, Jemmott & Fong, 1998; Kirby, 1985; Kirby et al.,

1991; Kirby, Korpi, Adivi et al., 1997; Levy et al., 1995; Little & Rankin, 2001; Main et al., 1994; Moberg & Piper, 1990; Rotheram-Borus et al., 1991).

- Only one of nineteen studies found a significant increase in frequency (Moberg & Piper, 1998).

Again, this is strong evidence that these programs do not increase the frequency of sex and that some of them reduce the frequency.

Finally, of the ten studies that examined impact on *number of sexual partners*, three found a significant decrease in partners (Jemmott, Jemmott, & Fong, 1992; Main et al., 1994; St. Lawrence et al., 1995), seven found no impact (Coyle et al., 1999; Gillmore et al., 1997; Kirby et al., 1991; Kirby, Korpi, Adivi, et al., 1997; Levy et al., 1995; Little & Rankin, 2001; Magura, Kang, & Shapiro, 1994), and none found a significant increase. Once more, this is strong evidence that these programs do not increase the number of sexual partners.

In sum, these data strongly indicate that sex and HIV education programs do not significantly increase any measure of sexual activity, as some people have feared. These results are also consistent with reviews of programs evaluated in other countries that have also found that sex and HIV education programs do not increase any measure of sexual activity (Grunseit et al., 1997).

These studies also demonstrate that some programs increased condom use or contraceptive use more generally. Of the eighteen programs for which impact on condom use was evaluated, ten programs (or more than half) significantly increased some measure of condom use (Coyle et al., 1999; Hubbard, Giese, & Rainey, 1998; Jemmott, Jemmott, & Fong, 1992; Jemmott, Jemmott, & Fong, 1998; Magura, Kang, & Shapiro, 1994; Main et al., 1994; Rotheram-Borus et al., 1991; St. Lawrence et al., 1995; Walter & Vaughn, 1993). Similarly, four of eleven programs that measured contraceptive use more generally significantly increased its use (Aarons et al., 2000; Coyle et al., 1999; Gottsegen & Philliber, 2000; Kirby, Barth, Leland, & Fetro, 1991). None of the programs reduced either condom or contraceptive use. Taken together, these results are quite positive.

A disproportionate number of the programs that significantly increased either condom or contraceptive use more generally were HIV education programs that increased condom use. Eight out of eleven HIV education programs found significant effects on condom use, while two out of seven sex education programs found significant effects on condom use and four out of eleven found significant effects on contraceptive use more generally. It cannot yet be determined whether HIV education programs are inherently more effective than more general sex education programs that cover pregnancy, STDs, HIV, and other topics, or whether HIV education programs have simply been better funded, provided better training, had studies with larger sample sizes, or had some other advantage that might improve effectiveness. The special effectiveness of HIV education programs may also reflect the fact that AIDS is undoubtedly a more salient threat than pregnancy for high-risk males in some communities.

The data also suggest that these sex and HIV education programs may be more effective with higher risk youth than with lower risk youth. This may be partly due to the behavioral characteristics of high-risk youth — that is, when youth engage in a large amount of unprotected sex, there is greater room for improvement than if they engage in little unprotected sex to begin with. In addition, these findings may be due, in part, to methodological and statistical factors. A program that reduces the proportion of

lower risk youth who initiate sex from 6 percent to 4 percent is more difficult to measure than a program that reduces the proportion of higher risk youth who initiate sex from 12 percent to 8 percent, even though the proportional reductions are the same.

The strength of the evidence for the effectiveness of some sex and HIV education programs has improved considerably during recent years. In 1997, *No Easy Answers* raised serious concerns about the methodological rigor of some of the studies evaluating these programs. It noted that (1) many studies did not include random assignment, large sample sizes, long-term follow-up, measurement of behavior, and proper statistical analyses, and (2) the few studies that did include all these methodological strengths failed to find positive and significant effects on behavior (Kirby, Korpi, Barth, et al., 1997; Kirby, Korpi, Adivi, et al., 1997; Thomas et al., 1992). However, there are now three studies with random assignment, large sample sizes, long-term follow-up, measurement of behavior, and proper statistical analyses that have shown statistically significant and programmatically important reductions in adolescent sexual risk-taking (Coyle et al., 1999; Jemmott, Jemmott, & Fong, 1998; St. Lawrence, 1995). These three studies clearly indicate that certain school-based and community-based sex and HIV education programs can delay sex, decrease the frequency of sex, increase condom or contraceptive use, or decrease unprotected sex. In previous years, few studies measured or found long-term effects. However, that too has changed. Several recent studies have found lasting effects for one year, some have found effects for about 18 months, and one study found effects that lasted more than 31 months after the intervention (Coyle et al., 2001).

In years past, there were also few replications of studies. When they did occur, the second study usually failed to find the positive behavioral effects that the first study found. For example, the initial positive results for *Postponing Sexual Involvement* in Atlanta, Georgia, were not replicated in California (Howard & McCabe, 1990; Kirby, Korpi, Barth, et al., 1997). However, there is now evidence of one successful replication. Two separate research teams in California and Arkansas trained people to implement *Reducing the Risk*, implemented it in multiple schools in each study, and evaluated the impact of the curriculum on adolescent sexual behavior. Both found that it delayed the onset of sexual intercourse and increased use of condoms or contraception more generally among some groups of youth (Hubbard, Giese, & Rainey, 1998; Kirby et al., 1991). Such confirmation of positive behavioral findings is most encouraging, providing greater evidence that *Reducing the Risk* can delay the onset of intercourse in different communities throughout the country.

Only one study has 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 in total medical and social costs were saved (Wang et al., 2000). The savings were produced by preventing pregnancy and STDs, including HIV.

Common Characteristics of Effective Curricula

Those curricula with evidence that they reduce sexual risk-taking share ten particular characteristics, noted below. Some of these characteristics have also been identified in other reviews of impact studies (Frost & Forrest, 1995; Miller & Paikoff, 1992; Moore et al., 1995). These characteristics reflect different aspects of effective teaching and are similar to the characteristics of educational programs found to reduce substance abuse (Dusenbury & Falco, 1995).

The ten characteristics appear to be necessary characteristics — that is, when

evaluated programs lacked one or more of these characteristics, they were typically found to be ineffective at changing behavior. However, there is little evidence specifying which of these factors or combinations of factors contributes most to the overall success of the programs.

These ten characteristics of effective programs are:

1. Effective programs focused on reducing one or more sexual behaviors that lead to unintended pregnancy or HIV/STD infection. These programs focused narrowly on a small number of specific behavioral goals, such as delaying the initiation of intercourse or using condoms or other forms of contraception; relatively little time was spent addressing other sexuality issues, such as gender roles, dating, or parenthood. Nearly every activity was directed toward the behavioral goals.

Few studies evaluated the impact of a focused and potentially effective curriculum unit that was embedded in a larger more comprehensive sexuality education program. Such units may or may not effectively change behavior, but only additional research will answer this question.

2. Effective programs were based on theoretical approaches that have been demonstrated to be effective in influencing other health-related risky behaviors — such as social cognitive theory (Bandura, 1986), social influence theory (McGuire, 1972), social inoculation theory (Homans, 1965), cognitive behavioral theory (Bandura, 1986; Schinke et al., 1981), theory of reasoned action (Fishbein & Ajzen, 1975) and theory of planned behavior (Ajzen, 1985). These theories together address many of the individual sexuality-related antecedents identified in Chapter 2. They recognize the fact that the beliefs and values of youth are influenced directly through education by parents, schools, and others, and indirectly through observing the behavior of others and the consequences that befall them. In addition, social influence theories address societal pressures on youth and the importance of helping young people understand those pressures and resist the negative ones. Thus, these programs strive to go far beyond the cognitive level; they focus on recognizing social influences, changing individual values, changing group norms and perceptions of those norms, and building social skills.

These theories help to specify which particular antecedents the interventions are trying to change (e.g., the beliefs, attitudes, norms, confidence, and skills related to sexual behavior), so that changes in these antecedents would lead to voluntary change in sexual or contraceptive behavior. Thus, each activity was designed to change one or more antecedents specified by the particular theoretical model for the curriculum, and each important antecedent in the theoretical model was addressed by one or more activities. While all of the effective curricula focused on antecedents specified by their adopted theories, some program developers actually surveyed students and empirically determined which possible antecedents best predicted desired behavior. Activities in their programs then focused on those particular antecedents.

By focusing on specific behavior (characteristic #1), by identifying particular antecedents causally related to that behavior, and by designing activities to change each of those important antecedents, the developers of these programs were, in fact, designing "logic models" and basing their interventions on those models (Kirby, 2000). Logic models are discussed in Chapter 6.

3. Effective programs gave a clear message about sexual activity and condom or contraceptive use and continually reinforced that message. This particular charac-

teristic appeared to be one of the most important criteria that distinguished effective from ineffective curricula. The effective programs did not simply lay out the pros and cons of different sexual choices and implicitly let the students decide which was right for them; rather, most of the curriculum activities were directed toward convincing the students that abstaining from sex, using condoms consistently, or using other forms of contraception consistently was the right choice, and that unprotected sex was clearly an undesirable choice. To the extent possible, they tried to use group activities to change group norms about what was the expected behavior.

4. Effective programs provided basic, accurate information about the risks of teen sexual activity and about methods of avoiding intercourse or using protection against pregnancy and STDs. Effective programs provided basic information that students needed to assess risks and avoid unprotected sex. Typically, this information was not detailed or comprehensive. For example, the curricula did not provide detailed information about all methods of contraception or different types of STDs. Instead, they provided a foundation: they emphasized the basic facts needed to persuade youth to avoid unprotected sex, and they provided information that would lead to changes in beliefs, attitudes, and perceptions of peer norms. Some curricula also provided more detailed information about how to use condoms correctly.

5. Effective programs included activities that address social pressures that influence sexual behavior. These activities took a variety of forms. For example, several curricula discussed situations that might lead to sex. Most of the curricula discussed "lines" that are typically used to get someone to have sex, and some discussed how to overcome social barriers to using condoms (e.g., embarrassment about buying condoms). Some of them also addressed peer norms about having sex or using condoms. For example, some curricula provided data showing that many youth *do not* have sex or *do* use condoms, or they had students engage in activities in which they concluded that students should abstain from sex or use condoms and then expressed those beliefs to other students. At least one curriculum addressed media influences (e.g., how sex is used to sell products and how television often depicts characters having unprotected intercourse but rarely experiencing negative consequences).

6. Effective programs provided modeling of and practice with communication, negotiation, and refusal skills. Typically, the programs provided information about skills, demonstrated the effective use of those skills, and then provided some type of skill rehearsal and practice (e.g., verbal role-playing and written practice). Some curricula taught different ways to say "no" to sex or unprotected sex, how to insist on the use of condoms or other methods of contraception, how to use body language that reinforced the verbal message, how to repeatedly refuse sex or insist on condom use, how to suggest alternative activities, and how to help build the relationship while refusing unprotected sex or refusing to have sex at all. Some curricula started with easier scenarios in role playing and then moved to more challenging ones. Some started with fully scripted role plays and moved to more improvisational ones, in which the youth resisting unprotected sex had to use their own words. Although all effective curricula gave some attention to skills, there were significant variations in the quality of activities designed to teach skills and also in the time devoted to practicing the skills.

7. Effective programs employed a variety of teaching methods designed to involve the participants and have them personalize the information. Instructors

reached students by engaging them in the learning process, not through didactic instruction. Students were involved in numerous experiential classroom and homework activities, such as small group discussions, games or simulations, brainstorming, role-playing, written exercises, verbal feedback and coaching, interviewing parents, locating contraception in local drugstores, and visiting or telephoning family planning clinics. In addition to these experiential activities, a few effective curricula used peer educators or videos with characters (either real or acted) who resembled the students and with whom the students could identify. All of these activities kept the students more involved in the program, got them to think about the issues, and helped them personalize the information in their own lives.

8. Effective programs incorporated behavioral goals, teaching methods, and materials that were appropriate to the age, sexual experience, and culture of the students. For example, programs for younger youth in junior high school, few of whom had engaged in intercourse, focused on delaying the onset of intercourse. Programs designed for high school students, some of whom had engaged in intercourse and some of whom had not, emphasized that students should avoid unprotected intercourse; that abstinence was the best method of avoiding unprotected sex; and that condoms or contraception should always be used if they did have sex. And programs for higher-risk youth, most of whom were already sexually active, emphasized the importance of always using condoms and avoiding high-risk situations. Some of the curricula, such as *Becoming a Responsible Teen* and *Making a Difference,* were designed for specific racial or ethnic groups and emphasized statistics, values, and approaches that were tailored to those groups.

9. Effective programs lasted a sufficient length of time to complete important activities adequately. In general, it requires considerable time and multiple activities to change the most important antecedents of sexual risk-taking and to thereby have a real influence on behavior. Thus, short programs that lasted only a couple of hours did not appear to be effective, while longer programs that had many activities had a greater effect. More specifically, effective programs tended to fall into two categories: (1) those that lasted 14 or more hours and (2) those that lasted a smaller number of hours but recruited youth who voluntarily participated and then worked with these youth in small group settings with a leader for each group. (When youth volunteer to participate, they may be more open to instruction than if they are required to sit in a school class. And when they work in small groups, instructors may be able to involve the youth more completely, to tailor the material to each group, and to cover more material and more concerns more quickly.)

10. Effective programs selected teachers or peer leaders who believed in the program they were implementing and then provided them with training. Given the challenges of implementing programs that focused on a sensitive topic and incorporated a variety of interactive activities, the effective programs carefully selected teachers and provided them with training. The training ranged from approximately six hours to three days. In general, the training was designed to give teachers and peer leaders information on the program as well as practice using the teaching strategies included in the curricula (e.g., conducting role-playing exercises and leading group discussions). Some of the teachers in these effective programs also received coaching and/or follow-up training to improve the quality of their teaching.

Conclusions about Abstinence-Only, Sex Education, and HIV Education Programs

Taken as a whole, the studies reviewed above suggest the following conclusions about abstinence-only, sex education, and HIV education programs:

- Given the great diversity of abstinence-only programs, the few studies that have been completed, and the methodological limitations of those studies, few conclusions can be reached about abstinence-only programs. Clearly, some programs are not effective at significantly delaying the onset of intercourse, but others might turn out to be effective. Currently, there are no specific abstinence-only programs with strong evidence for their success, but this may change when research in progress is completed.
- Sexuality and HIV education programs that include discussion of condoms and contraception do not increase sexual intercourse; they do not hasten the onset of intercourse, do not increase the frequency of intercourse, and do not increase the number of sexual partners. To the contrary, some of the programs actually delay sex, reduce the frequency of sex, or reduce the number of sexual partners. And, notably, at least two independent studies found that one particular sex education curriculum delays the onset of sexual intercourse.
- Studies of some, but not all, of these same sex and HIV education programs provided strong evidence that they substantially increased condom or contraceptive use. Thus, some sexuality or HIV education programs reduced unprotected sex *both* by reducing sexual intercourse and by increasing the use of protection against STDs and pregnancy.
- Some sex and HIV education programs had a positive impact on behavior for a substantial period of time — that is, for as long as 31 months. Given both the magnitude and duration of their impact, they may actually reduce teen pregnancy and STDs.
- The programs that effectively changed risk-taking behavior focused on sexual and contraceptive behavior, gave a clear message about what behavior was desired or appropriate, and, more generally, shared all ten program characteristics identified above. Notably, short programs, regardless of whether they were abstinence-only programs or sex and HIV education programs, did not have a measurable impact on behavior.
- These educational programs are not a complete solution to reducing unprotected sexual intercourse — some program participants continued to engage in unprotected intercourse even after completing the most effective programs; only a few studies measured and demonstrated long-term effects; few studies even measured impact on pregnancy rates and those that did found none; and none of the studies measured impact on STD rates. Nevertheless, some of these programs did show important long-term behavioral effects (e.g., reduction of unprotected sex), which suggests that they make effective components of larger, more comprehensive initiatives to prevent pregnancy.

Sex and HIV/AIDS Education Programs for Parents and Their Families

Most parents and their children have remarkably few conversations about sexual topics, often because both parents and their teens feel so uncomfortable doing so. To help alleviate this problem, many brief educational programs have been designed to increase parent/child communication. These include programs for parents only, programs

for parents and their children 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 such programs and that getting them to enroll in these programs is very challenging. With remarkable consistency, however, many studies also indicate that, when parents do participate, they do increase their communication with their children about sexuality in the short term, as well as their comfort with that communication (Kirby, 2001). However, those positive effects on communication seem to dissipate with time.

Because there does not exist a simple relationship between parent/child communication and adolescent sexual and contraceptive behavior, it is not sufficient to simply examine the impact of programs on communication; studies must also examine their effects on sexual behavior. Only two studies have done so (see Table 4.4). The first of these, implemented by Girls Inc. (formerly Girls Clubs), included five, two-hour sessions for mothers and their daughters (Nicholson & Postrado, 1991). Although the program group appeared less likely to initiate intercourse, the result was not statistically significant, and the program and comparison groups were probably not equivalent before the program. The second program included a well-designed video and written materials to be used at home (Miller et al., 1993). It increased parent/child communication but failed to delay the onset of intercourse significantly, in part because very few youth in either the intervention or control group initiated sex in the conservative community where it was implemented. Thus, despite the widespread belief that parent/child communication about sexuality will delay sex and reduce adolescent sexual risk-taking, there is little evidence available indicating that *programs* designed to increase parent/child communication actually reduce teen sexual risk-taking.

Clinic or School-Based Programs Designed to Provide Reproductive Health Care or to Improve Access to Condoms or Other Contraceptives

In this section, studies of five groups of interventions are summarized: family planning services, protocols for clinic appointments and supportive activities, other clinic characteristics and programs, school-based and school-linked clinics, and school condom-availability 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. According to a 1992 national survey of family planning clinics, many have special facilities for teenagers, three-fourths encourage their counselors to spend extra time with clients under age 18, four-fifths have outreach programs for teenagers, many have programs for teenage parents as well as for the parents of these teenagers, and many have sex education training programs for adults and teens (Henshaw & Torres, 1994).

Adolescents do not immediately begin using organized family planning services when they first have sex. As noted above, 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 teen girls wait a year or more after initiating intercourse before visiting a doctor or clinic for contraception (Alan Guttmacher Institute, 1994). However, many sexually active female teenagers do receive family

planning services. According to the 1995 National Survey of Family Growth, an estimated 2.6 million 15- to 19-year-old females (or nearly one-third of all females in that age group) made one or more visits to a clinic, private medical source, or counselor for family planning in a single year — of those, almost two-thirds visited a clinic (Abma et al., 1997). Many of these young women received oral contraceptives and other contraceptives that are more effective at preventing pregnancy than condoms or other non-prescription methods that can be purchased without the requirement of a clinic visit or prescription. Accordingly, these family planning services presumably prevented many adolescent pregnancies that would have occurred if these services did not exist or were significantly curtailed.

The estimated number of adolescent pregnancies averted by family planning services depends greatly on what assumptions one makes about what the prevalence of teen sexual and contraceptive activity would be if prescription contraceptives were unavailable. That is, it is not known how teenagers would change their behavior if highly effective contraceptive methods were not available; some might refrain from sex altogether, some might have sex and use less effective methods, and some might have sex and not use any method at all. If one assumes that youth would use over-the-counter methods of contraception if prescription methods were not available, then the estimated number of additional teen pregnancies per year that would result ranges from 40,000 to 160,000 nationally, depending upon changes in sexual activity (Kahn, Brindis, & Glei, 1999).

Unfortunately, there is remarkably little research about the impact of family planning services generally. While there have been several studies of the effects of family planning clinics on pregnancy or birth rates (Anderson & Cope, 1987; Brewster et al., 1993; Forrest, Hermalin, & Henshaw, 1981; Lundberg & Plotnick, 1990; Olsen & Weed, 1986; Singh, 1986; Weed & Olsen, 1986), the strength of their conclusions is greatly weakened by conflicting results among studies and by several severe methodological limitations. Thus, the actual impact on adolescent pregnancy rates of either family planning services generally or subsidized family planning clinics specifically has not been accurately estimated.

However, there are other important, though narrower, questions that have been addressed by studies employing 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?

Protocols for Clinic Appointments and Supportive Activities

Six studies have examined what happens during a clinic visit — the counseling and instruction that takes place between a medical provider and a teen patient and the other materials and activities that can support and reinforce that counseling. Four found positive effects on condom or contraceptive behavior (see Table 4.5). All six interventions were part of longer medical appointments.

During the most modest of the six interventions, African-American teen males attending an STD clinic received either a 14-minute video, or a one-on-one session with a health educator, *or* standard care (DeLameter, Wagstaff, & Havens, 2000). All males received the results of their STD tests and appropriate treatment. The experimental design was a rather strong one, but the study failed to find any significant differences among the behavioral effects of these three treatment models. Notably, condom use, as

well as frequency of sex and number of sexual partners, increased among all three groups over time.

The second study evaluated a very modest intervention for female patients with chlamydia (Orr et al., 1996). 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 engaged the patient in a brief role-play involving a woman getting her partner to use a condom. An experimental design was used to measure the impact at six months and found that those youth who received the special instruction were substantially more likely to use condoms than those youth who received the standard intervention.

The third study evaluated a program for males that included two parts: (1) a slide-tape program that focused on anatomy, STDs, contraception, couple communication, and access to health services 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 use of contraception, especially by the males' partners and by program participants who were not sexually experienced at baseline (Danielson et al., 1990).

The fourth program focused on HIV/STD prevention and served equal percentages of males and females (Boekeloo et al., 1999). It included a 15-minute audio-taped 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 parent brochures. On a one-to-one basis, the patient's physician then reviewed the risk assessment with the patient and discussed concerns and methods of avoiding unprotected sex. An experimental design indicated that the program increased use of condoms during the three months after the intervention. It *might* also have increased the chances of having sex but not the frequency of sex during the following three months, but the results were mixed depending upon the type of analysis. However, both results ceased being significant by nine months after the intervention.

In the fifth study, a family planning clinic substantially improved its clinic protocol for adolescents by placing greater focus upon non-medical problems, providing more information and more counseling, delaying the medical examination until the second visit, and giving more attention to partner and parent involvement (Winter & Breckenmaker, 1991). It also designated one staff person as a teen counselor. The study did not have a strong evaluation design, but its results indicate that it did increase contraceptive use.

Finally, the last study examined two different interventions, both of which were very modest (Hercog-Baron et al., 1986). During a clinic visit, patients either (1) were invited to bring their parents to six subsequent visits or (2) 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 youth in the second group (84 percent) did receive the phone calls. Results indicated that the program failed to have a significant impact on use of contraception or pregnancy.

The fact that four of these six studies found positive effects on behavior with such brief, modest interventions is quite encouraging. It should be noted that all four of the

effective interventions focused on sexual and contraceptive behavior, gave clear messages about appropriate sexual and contraceptive 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 further developed and rigorously evaluated. These results should also encourage medical providers to review their instructional protocols with youth and to spend more time talking with individual adolescent patients about their sexual and contraceptive activity.

Other Clinic Characteristics and Programs

Another study evaluated the effect of a city-wide effort to improve family planning services for young people (Hughes, Furstenberg, & Teitler, 1995) (see Table 4.6). 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 teenage walk-in hours, decreased the average waiting time for appointments, and increased the hours reserved for teenagers only. The program also 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 others in this review in that it measured the impact of this city-wide effort on all the youth in the targeted geographical areas, not just on those youth who actually used the clinic. This is a far more demanding challenge, but it was an appropriate one given the initiative's goal to expand services and its community-wide efforts, including the media campaign. A comparison of changes over time between the catchment area and a comparison area revealed no significant changes in contraceptive use or pregnancy or childbearing rates.

School-Based Health Centers and School-Linked Reproductive Health Clinics

School-based health centers are clinics located on school grounds that offer services to students in their schools. The purpose of these clinics is to provide primary health care services that are affordable and accessible to students who otherwise might not have ongoing access to such services. Consequently, all of these clinics provide basic primary health care services. In 1999, there were at least 1,135 school-based health centers, and 70 percent of these served students in grades 7-12 (Making the Grade, 2000).

While 90 percent of clinics in secondary schools provide at least one reproductive health service (such as gynecologic exams, birth control counseling, pregnancy testing, and STD diagnosis and treatment), only 29 percent of all clinics write prescriptions for birth control pills that can be filled elsewhere, and only 18 percent actually dispense birth control pills (Fothergill & Feijoo, 2000). About 28 percent dispense condoms.

When school-based clinics are well-staffed and well-run and dispense contraceptives, they potentially have many qualities that might be seen as those of ideal adolescent reproductive health programs — that is, their location is convenient to the students, they reach both females and males, they provide comprehensive health services, they are confidential, their staff are selected and trained to work with adolescents, they can easily conduct follow-up, their services are free, and they can integrate education, counseling, and medical services. On the other hand, school-based clinics typically do not reach out-of-school teenagers (e.g., those who have graduated from or dropped out of high school), nor do they reach older males, the ones who most often father children born to adolescent girls.

When school-based clinics make contraception available, many sexually-experienced students obtain it from the clinics. For example, in a study of four clinics that provided prescriptions or actually dispensed contraceptives, the proportion of sexually-experienced females who obtained contraceptives through the clinic varied from 23 percent to 40 percent (Kirby, Waszak, & Ziegler, 1991).

Six studies have examined the effects on behavior of school-based health centers (see Table 4.7) (Edwards et al., 1980; Kirby, 1991; Kirby, Waszak, & Ziegler, 1991; Kirby et al., 1993; Kisker, Brown, & Hill, 1994; Newcomer, Duggan, & Toczek, 1996). (An additional study discussed below examined the impact of a *school-linked* reproductive health clinic.) Five of the six studies examined school-based clinics in three or more schools. Although the quasi-experimental designs used in the studies varied considerably, they were not strong in general. For example, some of them did not include both intervention and comparison groups and also pretest and posttest data in the same design. Consequently, inferences should be drawn cautiously from these studies. In addition, these studies measured population effects — that is, they typically measured the effects on the entire school population and not just on those students who actually used the clinics for family planning services. Measuring impact on all students is the appropriate criterion for judging the effectiveness of such an intervention, but it is a more demanding one.

Three of these studies measured the effect of school-based clinics on sexual behavior, and they found consistent evidence that the clinics did not increase sexual activity (Kirby, 1991; Kirby, Waszak, & Ziegler, 1991; Kisker, Brown, & Hill, 1994). The three studies evaluated the effects of one, six, and 19 clinics respectively. (However, one of the six sites in the Kirby, Waszak, and Ziegler study did not meet the criteria for inclusion in this review and is not summarized.) The first two studies (Kirby, 1991; Kirby, Waszak, & Ziegler, 1991) found that the presence of the clinic did not affect the onset of sexual intercourse either positively or negatively. Kisker, Brown, and Hill (1994) found some data indicating that the clinic and its educational programs may have delayed the onset of intercourse. The first two studies also found that clinic presence was not associated with greater frequency of intercourse. In combination, these studies indicate that prescribing or dispensing contraceptives on high school campuses does not hasten the onset of intercourse nor increase its frequency, as some people have feared.

These same three studies measured clinic impact on contraceptive use, but their results were mixed. Kisker, Brown, and Hill (1994) produced the most negative results — clinic presence was associated with lower rates of contraceptive use. It is not clear what produced this counter-intuitive result. The first Kirby study (1991) examined the impact of a clinic that did not focus on reproductive health and that prescribed but did not dispense contraception. That clinic did not increase contraceptive use in that school. The results of the Kirby, Waszak, and Ziegler study (1991) varied with the site. At one site that was run by Planned Parenthood, focused on high-risk youths, emphasized pregnancy prevention, and dispensed oral contraceptives, there was a significantly greater use of oral contraceptives among female students than among female students in the comparison school many miles away; however, there was no significant difference in condom use. At two other sites that dispensed both condoms and oral contraceptives but did not have a strong educational component, no significant differences were found between the clinic and comparison schools in use of condoms by male students or use of oral contraceptives by female students. At these latter two schools, there

clearly were substitution effects — 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 there.

Three studies of school-based clinics examined their impact on pregnancy rates, and all failed to find an impact. Kirby (1991) found that opening a clinic did not significantly reduce the pregnancy rate in the one site in that study. Similarly, Kirby, Waszak, and Ziegler (1991) found that clinic presence was not significantly related to pregnancy rates in any of the five school-based clinic sites, after background characteristics of the students were statistically controlled. Finally, Kisker, Brown, and Hill (1994) also found that clinic presence was not related to overall pregnancy rates in the multiple sites they examined.

Three studies examined clinic impact on birth rates, and they found mixed results. Edwards and colleagues (1980) gave a great impetus to school-based clinics with a report that birth rates declined in three different schools in St. Paul after clinics providing reproductive health care (including prescriptions for contraception) were opened. However, these conclusions were based on only one baseline year for each school and on the clinic staff's knowledge of births among students. Subsequently, Kirby and colleagues (1993) studied five St. Paul school-based clinics (including the three studied by Edwards and colleagues), overcoming the previous study's limitations by generating birth rates from school and public records in St. Paul for two to five baseline years and for multiple post-clinic years. That study found large year-to-year variations in school-wide birth rates but no evidence indicating that the clinics significantly reduced birth rates. Similarly, Newcomer, Duggan, and Toczek (1999) used public records to generate birth rates for ten years for four schools with clinics and 19 schools without clinics in a mid-Atlantic city. They also found no evidence that opening clinics in the four high schools reduced birth rates.

In contrast to these school-*based* health centers that were located on the school grounds and that provided primary health care services, the *Self Center* in Baltimore was located across the street from a high school and four blocks away from a junior high school and provided *only* reproductive health services (Zabin et al., 1986). More 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 afterschool group discussions, while in the clinic the staff provided individual counseling, group counseling, and contraceptive services. According to survey data collected from the two program schools and two matched comparison schools, there was a delay in the intervention schools in the onset of sexual intercourse among those youth who had not yet initiated sex and an increase in the use of contraception among those who had ever had sex. In addition, there was an apparent decrease in pregnancy rates in the program schools two years after the *Self Center* opened.

These studies of comprehensive school-based health centers and a school-linked reproductive health clinic provide inconsistent results. While all the studies provided evidence that the clinics did not increase sexual activity, their evidence regarding contraceptive use and pregnancy rates was mixed. There are at least two possible explanations for this. The first is methodological: few of these studies had strong quasi-experimental designs, and all had important limitations that could have affected results either one way or the other. A second explanation is programmatic: it is notable that only two of the clinics appeared to increase contraceptive

use — one was a school-based clinic that was run by Planned Parenthood, focused considerably on reproductive health, and gave a clear message about contraceptives; the second was a school-linked clinic that focused solely on reproductive health and also had charismatic staff who gave a clear message about abstinence and contraceptives. It is possible that, in increasing school-wide rates of contraceptive use, location of the clinics is not as important as a clear focus on reproductive health. Further research is needed to determine which of these (or other) explanations best explains the apparent differential success of the 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 (Kirby & Brown, 1996). These schools are in addition to about 250 schools that make condoms available to students through school-based clinics.

When available in school, the number of condoms obtained per student from schools varies greatly from program to program (Kirby & Brown, 1996). 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 and private locations and without any restrictions, students obtained many more condoms than when there were restrictions (e.g.,when students could only obtain a small number of condoms from school personnel at specified times after brief counseling). Finally, students obtained many more condoms in schools that had clinics.

Thus far, only four studies meeting the criteria for this review have presented results on the behavioral effects of condom-availability programs in schools (Table 4.8). The study with the strongest evaluation design assessed the effects of making condoms available through vending machines in five Seattle schools without school-based clinics and through vending machines and baskets in five additional Seattle schools with pre-existing school-based clinics (Kirby, Brener, Brown, et al., 1999). School-wide data were collected both before condoms were made available and then again two years later. In neither group of schools was there an increase in sexual activity. In the schools with only vending machines and no clinics, there were no significant changes in condom use (or in use of oral contraceptives). By contrast, in the schools with clinics and baskets of condoms, there was, surprisingly, 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 intervention, but, because it existed before the baseline data collection, the effect of the educational component was not measured by this study.

A second study measured the impact of making condoms available in baskets in nine Philadelphia schools (Furstenberg et al., 1997). Students in those schools could receive reproductive health information, condoms, and general health referrals. Both before and after the centers were opened, young people were randomly selected for personal interviews from census tracts surrounding these 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 authors noted that

there were consistent non-significant 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 detect programmatically meaningful results.

The third study evaluated a comprehensive AIDS prevention program in the New York City high schools. It included instruction about AIDS, school-wide activities, and condom availability. Analyses compared students in New York schools after the program was put in place with a matched sample from Chicago schools; that is, 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).

Finally, the fourth study measured the impact of making condoms available in nine randomly selected Massachusetts schools. Analyses compared students in these schools with students in 50 randomly selected Massachusetts schools not making condoms available. Schools that made condoms available apparently were also more likely to provide their students with instruction about avoiding HIV. No baseline data were collected that measured student sexual and condom behavior before the condoms were made available in the schools. Thus, there may have been a variety of known and unknown differences between the two groups of schools before condoms were made available. Nevertheless, results indicated that students in schools with condom availability 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 use a condom the last time they had sex, and were less likely to use a method of contraception other than condoms the last time they had sex (Blake, Ledsky, Goodenow, et al., 2000)

What conclusions can one reach from these four studies about the impact of condom availability on condom use? There are three logical possibilities. First, the differences in results could be caused by differences in the research methods. If this is true, then this group of studies provides weak overall evidence that school condom availability increases condom use because the strongest study found a negative effect, the second study found a non-significant trend in the desired direction, and the third and fourth studies found a significant positive effect on condom use. Second, the differences in results could be caused by differences in the communities and in student needs. If youth 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. By contrast, if communities do not provide condoms in convenient and confidential or private locations, then making them available in schools may increase student access to condoms and subsequently increase use of condoms. (This would suggest 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 for youth and whether making them available in schools would meet a real need.) Third, the differences in study results could be due, in part, to the addition of other programmatic components (e.g., educational components and the availability of small group discussions or one-on-one counseling) in three of the studies. This is consistent with the data above showing that some sex and HIV education programs and

some brief interventions providing individual counseling increase condom use.

Conclusions about the Effects of Programs Designed to Provide Reproductive Health Care or to Improve Access to Condoms or Other Contraceptives

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 these contraceptives presumably prevent many adolescent pregnancies each year. However, because the long-term impact of family planning services on sexual behavior is not known, the net effect of family planning services on pregnancy is difficult to estimate.
- Brief clinic protocols and programs that provided youth with more information about abstinence, condoms, and/or other forms of contraception; engaged youth in one-on-one discussions about their own behavior; gave a clear message; and provided condoms or contraceptives typically did not increase sexual activity but did consistently increase the use of condoms and contraception.
- According to many studies, providing contraceptives in school-based health centers and providing condoms in school condom-availability programs consistently did not hasten the onset of sexual intercourse nor 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 condoms and comfortable, easy access to condoms — substantial proportions of sexually experienced students did obtain contraceptives and condoms.
- However, 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 markedly increase 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 the school-wide pregnancy or birth rates in these sites.
- By contrast, when school-based or school-linked clinics not only provided contraceptives but also focused more intensely on contraception and gave a clear message about abstinence and oral contraceptives, results suggested that the programs did increase use of contraception.
- Studies of school condom-availability programs provide conflicting results that may reflect methodological limitations, differences in the overall availability of condoms in the communities, or differences in the programs themselves.
- In sum, multiple studies of community clinics, school-based health clinics, and school-linked clinics that were devoted primarily (or solely) to reproductive health and that combined educational material (however modest), the opportunity for one-on-one counseling or discussions, a clear message about abstinence and condom or contraceptive use, and actual condoms or contraceptives did rather consistently find significant increases in condom or contraceptive use either among individual participants or among students school-wide. Despite the

methodological limitations of these studies and the variation among these programs, the number of studies and the consistency of their findings suggest that this may be an effective combination of components and that even brief interactions can have an beneficial impact.

Community-Wide Pregnancy or HIV Prevention Initiatives with Multiple Components

During the last two decades, there has been a growing recognition that it might take more than just single programs focusing on discrete populations of teens to change teen pregnancy rates markedly. Thus, many communities have developed community-wide collaboratives or initiatives with the goal of reducing teen pregnancy.

Seven different studies have examined the impact of community-wide programs (see Table 4.9). All of them measured impact on community-wide measures of sexual or contraceptive behavior or pregnancy or birth rates; they did not measure the impact on those 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. These studies are discussed roughly in order of the intensity of the programs' interventions, beginning with the least intensive.

The first study measured the effects of a comprehensive community-wide HIV education program for adolescents — a multifaceted intervention in New England designed to increase the use of condoms and reduce HIV transmission (Sellers, McGraw, & McKinlay, 1994). Trained peer leaders ran workshops in schools, community organizations, and health centers; organized group discussions in the homes of youth; gave 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 these peer-led activities, there were radio and television public service announcements and posters in local businesses and other public locations. In comparison with youth in another city, males in the intervention community were less likely to initiate intercourse, and females in the intervention group were less likely to have multiple partners. However, the program did not appear to significantly affect other measures of sexual activity or condom use.

A second initiative, the *RESPECT* initiative in Philadelphia discussed above (see p. 99), improved clinic services and conducted community-wide activities (Hughes, Furstenberg, & Teitler, 1995). 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. It was the subject of many radio programs and several newspaper articles. As noted above, the analyses revealed no significant changes in contraceptive use or pregnancy or childbearing rates.

A third study examined the impact of a large, comprehensive social marketing campaign called *Project Action* (Polen & Freeborn, 1995). Three public service announcements were aired multiple times on television, condom vending machines were installed in locations recommended by youth, and teenagers were trained to facilitate small-group workshops that focused on decision-making and assertiveness skills. Results indicated that the campaign did not increase the proportion of higher-risk youth 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.

The fourth study (Alstead et al., 1999) examined the impact of a social marketing campaign that was very similar to the one described in the third study. A mass media campaign targeted sexually active teens with pamphlets, posters, t-shirts, radio spots, bus signs, and billboards with a message to use condoms. The campaign also arranged with multiple agencies, organizations, and businesses to put 22 bins of condoms and 25 condom vending machines in restrooms and other locations recommended by youth. Results indicated that it did not increase sexual activity nor did it increase condom use.

The fifth initiative was the multi-year *Plain Talk* program (Grossman & Pepper, 1999). It was implemented in five communities, three of which participated in the impact evaluation. The initiative focused on sexually active youth and strove to increase adult-youth communication about sex and contraception and to increase access to contraceptive services. To do this, it launched a variety of community activities to create a consensus among adults about the need to protect sexually active youth by encouraging contraceptive use, and it provided parents and other community adults with the knowledge and skills to communicate more effectively with teens about sexual behavior and contraception. In one of the three communities, a clinic serving adults and teens was opened; in the second community, an adolescent clinic opened; and in the third, a clinic increased its hours for adolescents. Reproductive health information was also given to youth at several community events. Survey results revealed no significant changes in use of contraception at first or last sex. They also suggested no significant overall effects on reported pregnancy.[4]

The sixth community initiative — the most intensive — was designed to reduce teen pregnancy in a small, rural South Carolina community. The program 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 messages of avoiding unintended pregnancy (Koo et al., 1994; Vincent, Clearie, & Schluchter, 1987). After the program was put in place, the pregnancy rate for 14- to 17-year-olds declined significantly for several years. After parts of the program ended — for example, some of the community efforts declined in intensity, the school nurse resigned and her links to family planning clinics and her distribution of condoms ended, some teachers left the school, and more generally program momentum declined — the pregnancy rate returned to pre-program levels. From the existing data, it is not clear which of the program components or other unknown factors produced the changes over time in pregnancy rates.

The final community initiative did not appear to be as intensive as the South Carolina initiative, but it was a partial replication of that initiative in three communities in Kansas (Paine-Andrews et al., 1999). The initiative got the community to become more involved in preventing teen pregnancy, enhanced sexuality education for teachers and parents, improved age-appropriate K-12 sex education, increased access to health services, increased collaboration with school administrators, implemented mass media

4 The results between the baseline survey and the four-year post survey did indicate a significant decrease in pregnancy rates among girls, but there was a non-significant *increase* reported by boys, and neither finding controlled for the decrease in nationwide teen pregnancy rates during this time period.

events, increased alternative activities for youth, 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 there were a few favorable trends, there were no consistent and significant changes in sexual behavior, condom use, pregnancy rates, or birth rates.

Conclusions about Multi-Component Community-Wide Initiatives

Although these community initiatives and their impact differed considerably, their results suggest several conclusions, some of them more tentative than others:

- These results confirm that community initiatives focusing on pregnancy or condom use do not hasten or increase sexual activity, even when they focus primarily on condom or contraceptive use.
- With regard to contraceptive use or pregnancy or birth rates in general, these studies are not particularly encouraging. The failure of most of these initiatives to significantly improve adolescent sexual or contraceptive behavior or to decrease pregnancy and birth rates may reflect the fact that it is very challenging to improve *community-wide* adolescent sexual or contraceptive behavior.
- The most effective program was clearly the most intensive. However, when others attempted to replicate it, they did not achieve consistent positive effects.
- The effects of both *Project Action* and the South Carolina program also suggest that programs must be maintained if they are to continue to have an effect. In both cases, after the programs ended, use of condoms or pregnancy rates returned to pre-program levels. This finding is consistent with studies of marketing efforts more generally.

Programs that Focus Primarily on Non-Sexual Antecedents

Research clearly suggests that improving young women's education, employment, and other life options reduces their pregnancy and birth rates. In many countries throughout the world, as young women's educational levels and employment opportunities increased, their fertility rates declined. In this country, between the mid-1950s and the mid-1970s, increasingly large percentages of young women pursued higher education and more challenging professional careers and postponed marriage and childbearing. During these years, the teen birth rate declined markedly (Alan Guttmacher Institute, 1994). And as noted in Chapter 2, there remains an important relationship between educational and career plans and adolescent pregnancy among today's adolescents. Observing these trends, some professionals working with youth believe that one of the most promising approaches to reducing teen pregnancy is to improve educational and career opportunities through youth development programs. Whereas the programs summarized in the first four groups above focused primarily on changing the sexual antecedents of adolescent sexual behavior (e.g., the knowledge, attitudes, norms, and skills involving sexual and contraceptive behavior), the youth development programs included in this review focused primarily on the non-sexual antecedents of adolescent sexual behavior (e.g., involvement with other adults, attachment to school, educational goals, and community employment opportunity). In other words, they were designed to improve the participants' education, life skills, and employment options. The first of these groups of youth development programs was designed for very young children. The second was designed for adolescents.

Early Childhood Programs

Only one study meeting the criteria for this review evaluated an early childhood program in relation to teen pregnancy and childbearing, the *Abecedarian Project* (Campbell, 1999) (Table 4.10). Infants in low-income families were randomly assigned either to participate in a full-time, year-around day care program that focused on improving the children's intellectual and cognitive development or to receive whatever day care the families and communities could provide. Then, in elementary school, all the study participants were again randomly assigned to receive either the normal school environment or a three-year program to involve parents and improve parent-school communication about the child. All youth were tracked until age 21. Although the sample size was small (n=104), the children who received the preschool program delayed childbearing by more than a year in comparison with the control group. Notably, they also performed higher on a number of intellectual and academic measures and received more years of education than the control group. The children who participated in the elementary school program (as opposed to the preschool day care program) also performed significantly better on all of these outcomes, but the results were not quite as strong.

These results are encouraging; the *Abecedarian* program's impact on educational attainment may partially explain why the program participants delayed childbearing. The results of this study also suggest that other studies of early childhood programs should measure long-term impact on teen pregnancy and childbearing. However, the small sample size of the *Abecedarian* study and the fact that it is the only study meeting the criteria of this review prevent any more definitive conclusions.[5]

Youth Development Programs for Adolescents

Service Learning Programs

By definition, service learning programs include (1) 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 (2) structured time for preparation and reflection before, during, and after service (e.g., group discussions, journal writing, or papers). Often the service is voluntary, but sometimes it is prearranged as part of a class. And often, but not always, the service is linked to academic instruction in the classroom.

Service learning programs may have stronger evidence that they reduce actual teen pregnancy rates while youth are in the programs than any other type of intervention. Four different studies, three of which evaluated programs in multiple locations, have consistently indicated that service learning reduces either sexual activity or teen pregnancy (Allen, Philliber, Herrling, & Kupermanic, 1997; Melchior, 1998; O'Donnell et al., 1999; O'Donnell et al., 2000; Philliber & Allen, 1992) (Table 4.11).

The first study of a service learning program evaluated multiple sites using the *Teen Outreach Program* (TOP) (Philliber & Allen, 1992). It found that youth were less likely to report becoming pregnant during the school year in which they participated in TOP. Because the comparison group consisted of youth identified by participants as similar to themselves, there was the potential for self-selection effects. Consequently, a second

5 It should be noted that the results of the *Abecedarian* study are consistent with the pregnancy results for females of the *High/Scope Perry Preschool Study*, which measured the long-term impact of a high quality, active-learning preschool program. However, the *High/Scope* study is not summarized in this review because of its small sample size for pregnancy results (n=49) (Schweinhart, Barnes, & Weikart, 1993).

study was completed, this time with an experimental design, including random assignment of youth to participate in TOP or not to participate (Allen, Philliber, Herrling, & Kupermanic, 1997). Again, this study evaluated the impact of TOP in multiple sites around the country. On the average, these TOP participants spent about 46 hours doing service. TOP participants again reported lower pregnancy rates during the school year in which they participated in TOP than did the control group. It should also be noted that TOP participants also had lower rates of school failure than the control group.

A third study measured the impact of exemplary *Learn and Serve* programs throughout the country (Melchior, 1998). Students in these programs spent an average of 77 hours providing service. This 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. Its results tended to confirm the TOP results in that participants in the *Learn and Serve* programs reported lower pregnancy rates during the school year in which they participated. However, the result was not quite significant ($p=.10$). Notably, this study also evaluated the longer term impact of participation in *Learn and Serve* and found that the impact on pregnancy (and also on most other outcomes) did not last through the school year following the year of participation. This suggests that participation in service learning programs may reduce teen pregnancy rates only during the semesters in which youth 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 (O'Donnell et al., 1999; O'Donnell et al., 2000). Results indicated that the health education curriculum alone did not significantly decrease recent sexual activity, but the addition of service learning did significantly reduce sexual activity. In the short term, it delayed the onset of sex while, in the long term (more than three years later), it both delayed the onset of sex and reduced the percentage of students who had sex the previous month. These studies suggest that service learning may reduce teen pregnancy rates in part by reducing sexual activity.

It is not known for sure why service learning has positive effects on pregnancy, but several explanations have been suggested: participants developed on-going relationships with caring program facilitators; some may have developed greater autonomy and felt more competent in their relationships with peers and adults; some may have been heartened by the realization that they could make a difference in the lives of others — all of which might have increased motivation to avoid pregnancy. The volunteer experiences also encouraged youths to think more about their futures. It may also be that both supervision and alternative activities simply reduced the opportunity for participants to engage in problem behaviors, including unprotected sex. After all, these programs were time intensive — the average number of hours that youth spent in TOP and *Learn and Serve* programs during the academic year were 46 hours and 77 hours respectively. The study of TOP found that the kinds of volunteer service varied considerably from site to site, but TOP appeared to be most effective when young people had some control over where they volunteered (Allen, Philliber, Herrling, & Kupermanic, 1997). The effectiveness of TOP was ***not*** dependent upon the fidelity of the implementation of the TOP curriculum (Allen, Philliber, & Hoggson, 1990), which suggests that the 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. Four different studies evaluated such programs, all in multiple sites (Table 4.12).

The first study evaluated the impact of the *Summer Training and Education Program* (STEP) (Grossman & Sipe, 1992; Walker & Vilella-Velez, 1992). Youth in the treatment group received 90 hours of academic remediation and half-time summer employment. They also received other support services, including 36 sessions of life skills education and 5-15 hours of other support during the school years. By contrast, the control group received full-time summer employment. In other words, in comparison with the control group, the intervention group received less summer employment but did receive the academic remediation, life skills education, and personal support. A very strong experimental design revealed that the program did not have a consistent and significant impact on either sexual activity or use of contraception.

The remaining three programs, the *Conservation and Youth Service Corps*, the *Job Corps*, and *JOBSTART*, were all implemented in the late 1980s or 1990s and were targeted toward somewhat older youth. In the *Job Corps* and *JOBSTART* programs, about 73 percent of the participants were 16- to 19-years-old; the other 27 percent were older. These programs combined remedial, academic, and vocational education (Cave et al., 1993; Jastrab et al., 1997; Schochet, Burghardt, & Glazerman, 2000). To varying degrees, these programs also provided other support services, including life skills education, health education, health care, child care, and job placement assistance. While all three programs focused on disadvantaged youth, only *JOBSTART* was restricted to school dropouts. The *Job Corps* was mostly residential; *JOBSTART* and the *Conservation and Youth Service Corps* were for the most part not residential. All three studies incorporated strong experimental designs with random assignment of individual youth, large sample sizes, long-term measurement (15-48 months), and measurement of either pregnancy or childbearing (but not sexual behavior). Results from these three studies demonstrate that the programs did not affect overall pregnancy or birth rates. There was no significant impact of the *Conservation and Youth Service Corps* on unmarried pregnancy rates measured 15 months later; no impact of *Job Corps* on birth rates measured 30 months later; and no impact of *JOBSTART* on pregnancy or birth rates measured 48 months later among women not residing with any of their own children at baseline. There were, however, two small exceptions to these findings that showed no effects. Among African-American women in the *Conservation and Youth Service Corps* study, participants were significantly less likely to experience an unmarried pregnancy than the control group, and, in the *JOBSTART* study, among teen mothers residing with their children, participants were *more* likely to experience a pregnancy or birth than non-participants. Overall, these studies provide rather strong evidence that these programs did not have significant positive overall effects on pregnancy or childbearing.

Other Youth Development Programs

Two other studies have examined the impact of youth development programs for adolescents. The programs differed considerably from each other (see Table 4.13). The first study evaluated the impact of a very comprehensive program called the *Quantum Opportunities Program* (Hahn, 1994), which was implemented among high school students from families receiving public assis-

tance. The 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). Thus, 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 and matching funds for approved activities after the school day. Although the evaluation had a strong research design, its sample size was small (n=156 for analyses of birth rates), and there are many questions about the quality of the actual program implementation. Results suggested that the program participants had a lower birth rate than the control group, but this result was not quite significant (p=.10).

The second study evaluated the impact of the *Seattle Social Development Program* (Hawkins et al., 1999), 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 in schools, the program provided five days of in-service training for teachers of grades 1-6 each year. Many teachers participated in this. To improve parenting skills, the program offered parenting classes for parents of children in grades 1-3 and 5-6; relatively few parents attended. The program also implemented a curriculum unit in schools to increase students' social skills (e.g., decision-making and refusal skills). When these grade school students were followed to age 18, those receiving the intervention were less likely to report a pregnancy than the comparison group. They were also more attached to school, got higher grades, and engaged in fewer delinquent acts.

Conclusions about the Effects of Youth Development Programs

All these studies of different types of youth development programs, for either small children or adolescents, support several conclusions:

- Service learning, which combines community service with reflection on those experiences, appears to reduce teen pregnancy during the academic year in which youth 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 strong preschool childcare 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.
- At this point, it is simply not clear why some youth development programs (i.e., service learning) reduce teen pregnancy and others with some similar characteristics (i.e., vocational education programs) do not. This is an important area for further research.

Programs that Focus on Both Sexual and Non-Sexual Antecedents

Multi-Component Programs with Both Sexuality and Youth Development Components

A number of studies have examined programs that focused on *both sexual* and non-sexual antecedents of teen pregnancy — that is, they had components addressing both sexuality and youth development more broadly. The first two studies evaluated several different types of programs, all of which were relatively modest in intensity and duration, and the third study evaluated a very intensive, long-term program.

The first study evaluated the impact of three programs in Washington state (McBride & Gienapp, 2000) (Table 4.14). 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. These three programs implemented a "client-centered" approach that was based on the service providers' understanding of why the teens they were working with were involved in sexual risk-taking. The service providers generally believed that their teen clients lacked one or more of the following: (1) information about sex, (2) a variety of coping skills, (3) emotional support, (4) positive guidance, and (5) adults they could trust and talk to about sensitive issues. The programs tried to address these problems and others by providing small group and individualized education and skill-building sessions, as well as several other individualized services, such as counseling, mentoring, referrals, and advocacy, that were tailored for each teen. Results indicated that the program did not delay sex nor increase contraceptive use, but did decrease the frequency of sex.

The second study evaluated different programs in 44 different sites in California (East & Kiernan, 2000). Their unusual and common quality was that they all targeted girls at high risk of becoming pregnant because their sisters had become pregnant as teenagers. The primary goals of these 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, programs were designed to help youth remain in school or return to school, increase self-esteem, improve knowledge and skills to make healthy decisions, improve access to health and reproductive health services, and increase communication with parents and adults. The sites 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. Youth 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 in these programs was less than 19, although they varied from less than one hour to more than 95 hours. While the evaluation was limited by lack of random assignment and possible selection effects, the results indicated that the interventions both delayed sex and decreased reported pregnancy rates nine months later, but they did not significantly increase contraceptive use.

The third program that addressed both sexual and non-sexual antecedents was the *Children's Aid Society-Carrera Program* (CAS-Carrera Program) (Philliber et al., 2000). It was a long-term and intensive program that recruited youth when they were about 13- to 15-years-old and encouraged them to participate throughout high school. During those school years, it operated 5 days a week. Some programs had regularly sched-

uled special events, education programs, and entrepreneurial activities. During the summer months, 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; many spent more time in the program. The *CAS-Carrera Program* used a holistic approach, providing multiple services: (1) family life and sex education, (2) an education component that included individual academic assessment, tutoring, help with homework, preparation for standardized exams, and assistance with college entrance, (3) a work-related intervention that included a job club, stipends, individual bank accounts, employment, and career awareness, (4) self-expression through the arts, and (5) individual sports. In addition, the program provided mental health care and comprehensive medical care, including reproductive health and contraception when needed. In all these areas, staff tried to create close caring relationships with the participants. Although the program focused on youth, it also provided services for the participants' parents and other adults in the community.

The evaluation study of the *CAS-Carrera Program* was a very rigorous one. It included multiple sites, random assignment, a large sample size, long-term measurement, measurement of behavior, and proper statistical analyses. The study found that, after three years and among girls, the program significantly delayed the onset of sexual intercourse, increased the use of condoms as a secondary method with another highly effective methods of contraception, reduced pregnancy rates, and reduced birth rates. Among males, the program did not have significant positive behavioral effects, but the study did have one unexpected finding — males 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 control group. This was found among males who had initiated sexual activity prior to the onset of the program. Notably, these findings are reported for all the members of the treatment and control groups, even though some members of the treatment group (especially the boys) did not participate extensively in the program, and some members of the control group received a few services from the same organization or other organizations in the community.

This study of the *CAS-Carrera Program* is the first and only evaluation to date using random assignment, multiple sites, and a large sample size that found a positive impact on sexual and contraceptive behavior and pregnancy and birth rates among girls for as long as three years. In fact, the pregnancy rate among girls in the intervention group was *less than half* the rate among the control group (10 percent v. 22 percent). These are strong, very important results. It should also be recognized that this is a complex program to implement, requiring significant financial and staff resources, and sites that do not implement all the components or that do not fully engage young people over time cannot expect to achieve these positive results.

Why was the *CAS-Carrera Program* successful where other programs with some similar components (*JOBSTART, Job Corps*, and the *Conservation and Youth Service Corps*) were not? There are several possible explanations: (1) the vocational education programs targeted somewhat older youth and tracked them into their early twenties when childbearing is more normative and less costly; (2) the *CAS-Carrera Program* included a strong sexuality education component in combination with improved access to reproductive health and other health services, as well as the intensive youth development components; and (3) staff in the *CAS-Carrera Program* may have developed

closer relationships with the young people they served.

Conclusions about the Effects of Programs that Address Both Sexual and Non-sexual Antecedents

Although there are only three studies in this group, they support the following conclusions:

- Modest interventions that address both sexual and non-sexual antecedents may reduce adolescent sexual risk-taking and pregnancy. The ability of some programs to have success in reducing both sexual risk-taking and even pregnancy suggests that further research is needed to better define the qualities of effective programs.
- Intensive long-term programs, like the *CAS-Carrera Program*, that have multiple components addressing both the reproductive health needs and the other emotional and social needs of youth can have a substantial long-term impact upon pregnancy among girls.

Chapter Notes

List of Criteria for Selection of Studies

- ☐ The study was completed during or after 1980.
- ☐ The study was conducted in the United States or Canada.
- ☐ The study primarily targeted adolescents of high school age or younger (roughly 18 or younger) who were not yet parents.
- ☐ The intervention was implemented with reasonable integrity or fidelity.
- ☐ The sample size was at least 100 in the combined treatment and control group. This minimum number applies to the actual statistical analysis measuring impact on behavior.
- ☐ The same method of parental consent was used with both the intervention and comparison/baseline groups.
- ☐ The study used an appropriate and valid experimental or quasi-experimental design. For example, if the intervention targeted either individual youth or classrooms of youth, then at a minimum the study must have used a quasi-experimental design with both intervention and comparison groups and baseline and follow-up data. If the intervention targeted entire schools or entire communities, then at a minimum the study must have used a quasi-experimental design with school-wide or community-wide time-series data (at least two points in time), or alternatively a quasi-experimental design with numerous intervention schools or communities and well-matched comparison schools or communities with statistical adjustments for baseline differences, or another appropriate and equally valid quasi-experimental design.
- ☐ Whether each study participant was in the intervention or comparison group must be known independently by the researchers; it cannot be based solely on the recall of the respondents one or two years after participation.
- ☐ The study must have measured impact on actual sexual behavior, i.e., measures of sexual intercourse such as the timing of initiation of intercourse, condom or contraceptive use, pregnancy, or childbearing.
- ☐ When the study measured impact on the initiation of sex, then it must have followed youth for at least six months after the intervention in order to allow sufficient time for fewer youth in the intervention group than in the comparison group to initiate sex. When the study measured impact on the frequency of sex or use of condoms or contraception, then the study must have measured impact for at least 2 months after the intervention or 4 months after baseline, whichever was shorter.
- ☐ The study employed proper statistical analyses.

Table 4.1: Studies of Abstinence Programs

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Postponing Sexual Involvement/ENABL Kirby, Korpi, Barth, Cagampang 1995	Dispersed throughout California Varied SES N=7,753	12-13 years 7th and 8th graders M=42% F=58% Wh=38% His=31% Bl=9%	**Setting:** Classrooms in most designs; community organizations in one design. **Sessions:** 5 1-hour sessions **Content:** Designed both to help youth understand social and peer pressures to have sex and to develop and apply resistance skills; emphasis upon postponing sexual involvement; based on social influence theory. **Methods:** Taught by adults or teens.	Experimental. Random assignment of entire schools, classrooms, or individual youths. In part of the study, students were randomly assigned to adult-taught PSI, peer-taught PSI, or a control group. Matched questionnaire data were collected at baseline, 3 and 17 months post-intervention. Intervention post-test: N=3,697 Comparison post-test: N=4,056	t-tests between intervention and comparison groups using change scores.	Initiation of intercourse: 0 Frequency of sex in previous 3 months: 0 Frequency of sex in previous 12 months: 0 Number of sexual partners: 0 Use of condoms: 0 Use of birth control pills: 0 Pregnancy: Teen led: – Adult led: 0	The evaluation was very rigorous; it had random assignment, large sample sizes, long-term follow-up, and appropriate statistical analyses. It also examined the impact of PSI implemented in either community settings, individual classrooms, or entire schools.
Sex Respect, Teen-Aid, Values and Choices Weed, Olsen, DeGaston, Prigmore 1992	Utah Mixed SES N=1,963	Mean=15.5 years Middle and senior high school M=49% F=51% Wh=90% His=3% Oth=7%	**Setting:** School classrooms **Sessions:** Not reported; appear to be two to three weeks. **Content:** All three curricula focused upon abstinence (Values and Choices was edited to conform to abstinence-only and Utah guidelines). Sex Respect taught skills to avoid sex in difficult situations. It focused on self-control, self-respect, and respect for others. Teen-Aid provides information and teaches decision-making; it emphasizes that abstinence is the best choice. It provides a broader understanding of sexuality and covers dating standards. It also covers other health issues, e.g., abstinence from drugs, alcohol, and tobacco. Values and Choices provides information and promotes decision-making. It gives less emphasis to abstinence as the only correct choice.	Quasi-experimental. Three high schools and 5 junior high schools implemented the programs; 2 matched high schools and 3 matched junior high schools served as comparison groups. Matched questionnaire data were collected at baseline, 3 to 4 weeks later (at the end of each program), and one year later. Intervention group: N=1,207 Comparison group: N=756	Repeated measures analysis of covariance, controlling for variables that were related to intervention group and outcome measure. Loglinear models used for transition to sex.	Initiation of sex: **High school:** Overall: 0 Most permissive values group: + Middle permissive values group: 0 Least permissive values group: 0 High future orientation group: 0 Low future orientation group: + **Junior high school:** Overall: 0 Most permissive values group: 0 Middle permissive values group: 0 Least permissive values group: 0	The strength of this design was weakened by the lack of random assignment, failure to show baseline comparability between intervention and comparison groups, and small sample sizes for some sub-group analyses. Behavior data were based upon first cohort data only. Among youth with the most permissive values, the differences in initiation rates among the three groups were not significant. This may have been due to insufficient sample size.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.1: Studies of Abstinence Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Stay SMART St. Pierre, Mark, Kaltreider, Aikin 1995	Mostly in urban areas throughout the U.S. Low SES N=273	Mean=13.6 years Not reported M=75% F=25% Wh=45% Bl=42% His=14%	**Setting:** Boys and Girls Clubs of America **Sessions:** 12 **Content:** Multi-focus: Designed to delay sex and prevent alcohol, cigarette, and marijuana use. Based on personal and social competence model of prevention (broader version of social influence theory). Included 9 sessions on life skills training (general coping skills and skills to resist negative peer influences) and 3 on postponing sexual involvement (discussed sex in media, lines to have sex, and consequences of sex and did role playing). **Methods:** A 5-session 1-year booster and a 4.5-hour 2-year booster were designed to reinforce the skills and knowledge and to help older youth be positive role models. Taught by staff members. Youth volunteered to participate.	Quasi-experimental. Fourteen clubs were assigned to 3 groups: comparison group, which received nothing; the first intervention group, which received Stay SMART without the booster; and the second intervention group, which received Stay SMART and the boosters. If youths did not participate in most of the sessions, they were dropped from the intervention groups. Matched questionnaire data were collected at baseline, 3 months later, 15 months later, and 27 months later. 3-month post-test: Stay SMART: N=83 Stay SMART + booster: N=81 Comparison: N=109	Repeated measures ANCOVA used to control for the pre-test measure of the outcome variable, gender, age, and ethnicity. There were few significant differences at baseline; none on behavior outcomes. Separate analyses for virgins and non-virgins as measured at pre-test.	**Virgins:** At 3 months: Recency of last intercourse: 0 Frequency of intercourse: 0 Combined measure: 0 At 15 months: Recency of last intercourse: 0 Frequency of intercourse: 0 Combined measure: 0 At 27 months: Recency of last intercourse: 0 Frequency of intercourse: 0, + Combined measure: 0 **Non-virgins:** At 3 months: Combined measure: 0 At 15 months: Combined measure: 0 At 27 months: Combined measure: 0	For non-virgins, results were inconsistent. Stay SMART without the booster appeared to reduce frequency of intercourse at 27 months. With the booster, it did not appear to reduce frequency. These inconsistent results, coupled with lack of random assignment, small sample sizes, very high attrition rates, and failure to adjust for clustering effect at the club level render these results inconclusive.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.2: Studies of Sex Education Programs

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Draw the Line/ Respect the Line Coyle, Kirby, Marin, Gomez, Gregorich 2000	Urban area in northern California Mixed SES N=2,829	Mean=11.5 years 6th grade M=50% F=50% His=59% Wh=17% Asn=16% Bl=5% Oth=3	**Setting:** Middle schools **Sessions:** 20 sessions: 5 in the 6th grade, 8 in the 7th grade, and 7 in the 8th grade. **Content:** Topics included consequences of unplanned sex (pregnancy, STDs, and HIV), personal sexual limit setting, and refusal skills. Based on social learning theory and social inoculation theory. Activities were highly interactive.	Experimental. Nineteen middle schools randomly assigned to intervention and control conditions. Control schools received usual STD, HIV, and pregnancy prevention education. Matched questionnaire data were collected in the spring of the 6th grade before the intervention and in the spring of the 7th and 8th grades.	Repeated measures logistic models for males and females separately, controlling for the one variable that was different between the two groups and related to initiation of sex.	**Initiation of intercourse:** At end of 7th grade: Boys: + Girls: 0 At end of 8th grade: Boys: + Girls: 0 **Had sex in last 12 months:** At end of 7th grade: Boys: + Girls: 0 At end of 8th grade: Boys: + Girls: 0	In general, this was a very rigorous study with random assignment of schools, large sample sizes, long-term measurement of behavior, and proper statistical analysis. However, the significance of the impact upon sex in the last 12 months depended upon the type of statistical analysis used.
Health for Life Project Moberg, Piper 1998	Wisconsin Mixed and middle SES N=1,981	6th grade M=48% F=52% W=96% Oth=4%	**Setting:** Middle schools **Sessions:** 58 total; 16 on sexuality **Content:** Comprehensive health curriculum designed to positively affect alcohol use, tobacco use, marijuana use, nutrition, and sexual behavior. Based on social influences model and principles of adolescent development. Skill-based. Peer, parent, and community components. Topics: understanding social situations, refusal skills, parental values, media, communication with parents and the opposite sex, responsibility for health behaviors, risks of sexual activity, sexuality facts, and birth control information.	Experimental. Twenty-one middle schools randomly assigned to intervention and control conditions, stratifying for substance use. Schools assigned to intervention condition could choose between an age-appropriate version taught in grades 6-8, or intensive version taught in grade 7. Control schools received other prevention-oriented curricula. Matched questionnaire data were collected in the fall of the 6th, 7th, 8th, 9th, and 10th grades.	Logistic regression was used to control for baseline measures of substance use, non-intercourse involvement with opposite sex and to mimic an ANCOVA design. Adjustments for clustering.	**Initiation of intercourse:** At grade 8: 0 At grade 9: – At grade 10: – **Sex last month:** At grade 8: – At grade 9: 0 At grade 10: – **Consistent condom use:** At grade 8: 0 At grade 9: 0 At grade 10: 0	In general, this was a very rigorous study with random assignment of schools, large sample sizes, long-term measurement of behavior, and proper statistical analysis. However, it was not possible to measure whether students had ever had sex at baseline.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.2: Studies of Sex Education Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
McMaster Teen Program Thomas, Mitchell, Devlin, Goldsmith, Singer, Watters 1992 Mitchel-DiCenso, Thomas, Devlin, Goldsmith, Willan, Singer, Marks, Watters, Hewson 1997	Ontario, Canada Not reported N=2,570	Mean=12.7 years 7th and 8th graders M=48% F=52% Not reported English as primary language=75%	**Setting:** Health classes in junior high schools. Students were divided into small groups of 6-8 students each. **Sessions:** 10 **Content:** Adolescent development, peer pressure, gender roles, responsibility in relationships, stages of intimacy, adolescent pregnancy and childbearing, and decision-making. **Methods:** Tutors used group discussion, question-and-answer periods, films, and role-plays.	Experimental. Twenty-one schools randomly assigned to treatment and control conditions. Ten control schools received the conventional sex education curriculum. Matched questionnaire data were collected at baseline, 3-month post-intervention, and 4 follow-up periods at 1-year intervals. Intervention post-test: N=1,593 Comparison post-test: N= 977	Logistic regression was used to control for school, school size, gender, and any other variables related to the outcome variables. Treatment group was added last to test its effect. Both overall and separate analyses by gender.	**Initiation of intercourse:** At 3 months: 0 At 1 year: 0 At 4 years: 0 **Contraceptive use:** Consistent use At 3 months: 0 At 1 year: 0 Males: + Female: 0 At 4 years: 0 **Pregnancy rates:** At 3 months: 0 At 1 year: 0 At 4 years: 0	The content of the treatment intervention did not appear much stronger than that of the control intervention. The evaluation was rigorous; it had random assignment of schools, large sample sizes, short- and long-term follow-up, low dropout rates, and appropriate statistical analyses. However, despite the random assignment of schools, males in the intervention group at baseline were more likely to have initiated intercourse than males in the control group at baseline.
Postponing Sexual Involvement (PSI) and Human Sexuality Howard, McCabe 1990	Atlanta, GA Low SES N=536	13-14 years 8th graders M=34% F=66% BI=99%	**Setting:** Regular classrooms **Sessions:** 10 PSI=5 hr. Human Sexuality=5 hr. **Content:** PSI: Designed both to help youth understand social and peer pressures to have sex and to develop and apply resistance skills; emphasis upon postponing sexual involvement; based on social influence theory. Human Sexuality: 5 basic sessions on human sexuality, decision-making, and contraceptives. **Methods:** Taught by peer leaders (11th and 12th graders).	Quasi-experimental. Intervention: one school district received PSI and Human Sexuality. Comparison: 3 smaller school districts received existing programs. Telephone interviews were conducted in the 8th, 9th, and 12th grades. Sample = children of parents who were patients at a public hospital. Matched questionnaire data were collected at baseline and post-intervention. Intervention post-test: N=395 Comparison post-test: N=141	t-tests between intervention and comparison groups at pre- and post-test. Initial equivalence of intervention / comparison established with t-tests.	**Initiation of intercourse:** End 8th grade: + End 9th grade: + End 12th grade: 0 **Frequency of intercourse:** Inexperienced at pre-test but initiating by follow-up: End 9th grade: + End 12th grade: 0 Experienced at pre-test: 0 **Contraceptive use:** Inexperienced at pre-test but initiating by follow-up: End 9th grade: + End 12th grade: 0 Experienced at pre-test: End 9th grade: 0 End 12th grade: 0	A limitation of the study was the fact that intervention and comparison groups lived in different geographic areas. Some background characteristics were controlled through sampling procedures to reduce the impact of this difference. Other events or activities that might have affected either the intervention group or comparison group differently were not controlled.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.2: Studies of Sex Education Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Postponing Sexual Involvement (PSI) and Human Sexuality (Adapted) Little, Rankin 2001	Cortland, NY Not reported N=271	Mean=14.0 years 8th graders Not reported Wh=88% Oth=12%	**Setting:** Regular classrooms **Sessions:** 4 **Content:** PSI: Designed both to help youth understand social and peer pressures to have sex and to develop and apply resistance skills; emphasis upon postponing sexual involvement; based on social influence theory. Included media analysis and substance abuse information. **Methods:** Taught by peer leaders (10th graders).	Quasi-experimental. Intervention: 1 school received PSI. Comparison: 3 smaller schools received existing programs, but not PSI or other peer programs. Unmatched quesionnaire data were collected at baseline, 2 months, and 6 months. Intervention 6-month: N=166 Comparison 6-month: N=105	t-tests between intervention and comparison groups at pre- and post-tests. Initial equivalence of intervention/ comparison established with t-tests.	Ever had consenting sex: 0 Frequency of intercourse in the last month: 0 Frequency of intercourse in the last 12 months: 0 Number of sexual partners: 0	This was not a strong evaluation design. Pre- and post-questionnaires were not matched and there was greater attrition among the intervention group. Modest sample sizes might have obscured program impact, but no behavioral results were close to significance.
Postponing Sexual Involvement (PSI), Human Sexuality, and Health Screening Aarons, Jenkins, Raine, El-Khorazaty, Woodward, Williams, Clar, Wingrove 2000	Washington, DC Low SES N=2,099	Mean=12.8 years 7th graders M=48% F=52% Bl=83% His=13% Oth=2%	**Setting:** Schools. **Content:** Human sexuality: 3 sessions on reproductive health taught by health professionals. PSI: 5 sessions taught by 10th and 11th graders. Designed both to help youth understand social and peer pressures to have sex and to develop and apply resistance skills; emphasis upon postponing sexual involvement; based on social influence theory. Included media analysis and substance abuse information. Health screening and individual assessment: Students completed a health risk assessment. Individual interviews were conducted with youth with problems or risk behaviors. Small group sessions: 8 sessions on different health topics. Other school-wide activities.	Experimental. Six schools were paired and the then randomly assigned to intervention and control conditions. Unmatched questionnaire data were collected during the middle of the 7th grade (baseline), the end of the 7th grade, the beginning of the 8th grade, and the end of the 8th grade. Baseline 7th grade survey: N=522 Final 8th grade followup: N=422	Logistic regression controlling for differences between the 2 groups of schools, and conducted separately for each gender.	**Initiation of sex:** Girls: End of 7th: + Beginning of 8th: 0 End of 8th: + Boys: End of 7th: 0 Beginning of 8th: 0 End of 8th: 0 **Contraceptive use at last sex:** Girls: End of 7th: + Beginning of 8th: + End of 8th: + Boys: End of 7th: 0 Beginning of 8th: 0 End of 8th: 0	Although 6 schools were randomized, the strength of this design was substantially weakened by the failure to collect matched pre-post questionnaire data, the closing and relocation of one school, changes in ethnic composition of schools, the failure to adjust for clustering in schools, and apparently the failure to control for baseline differences in the outcome behavior.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.2: Studies of Sex Education Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Project IMPACT Liebermann, Gray, Wier, Fiorentino, Maloney 2000	New York, NY Low SES N=312	Mean=12.9 years 7th and 8th graders M=33% F=67% Bl=66% His=22% Oth=11%	**Setting:** 3 middle schools. **Sessions:** 12 to 14 class sessions over one semester. **Content:** Topics include anatomy, pressure to have sex, coping with peer pressure and media pressure, risks of sexual involvement, STDs, and HIV/AIDS. Abstinence is emphasized, but contraception is discussed. Students volunteer and participate in small groups of 8 to 12 members.	Quasi-experimental. Intervention and comparison students were recruited from different areas of the same schools Matched questionnaire data were collected at baseline, 3 to 4 months later, and 14 to 18 months later. Intervention 14-18 month: N=124 Comparison 14-18 month: N=186	t-tests to measure difference in change scores and chi-square tests for dichotomous variables.	Initiation of sex: 0 Condom use at last sex: 0 Pregnancy: 0	Differences between intervention groups at baseline might not have been well-controlled. There was low retention (59%). Modest sample sizes might have obscured program impact, but only one behavioral result was close to significance.
Project Model Health Moberg, Piper 1990	Near Madison, WI Middle SES N=197	Not reported 8th graders M=45% F=55% Wh=100%	**Setting:** Teacher/advisor periods in middle schools. **Sessions:** 64 half-hour classes. **Content:** Comprehensive health curriculum including nutrition, marijuana use, tobacco use, drinking and driving, and sexuality. Based upon social learning theory and social influence theory. Included discussions of the media, information on peer behaviors and norms, emphasis upon short-term effects, public commitments to change behavior, and school and community advocacy for healthy behaviors. **Methods:** Trained and used college instructors, 2 per class. Used role-playing practice.	Quasi-experimental. Eighth graders in 2 schools were assigned to intervention and comparison groups. Comparison group received standard health curriculum. Matched questionnaire data were collected just before the intervention, the following spring, and the spring of the year later. Also, during the follow-up period, data were collected from the preceding cohort of 8th graders in the intervention school. Intervention post-test: N=115 Comparison post-test: N=82	Two-way (treatment group by testing occasion) repeated measures analysis of variance and covariance multiple regression controlling for ever had sex at pre-test.	Had sex last month: 0	This was a weak design: individual students were not randomly assigned to conditions; the schools were somewhat distant from one another; the sample sizes were small; there were large pre-test differences in ever had sex at pre-test (5.4% vs. 13.6%); there was considerable attrition; and the results varied with the type of statistical analysis employed. Some analyses indicated that the program delayed the onset of intercourse.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.2: Studies of Sex Education Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Project SNAPP Kirby, Korpi, Adivi, Weissman 1997	Los Angeles, CA Low SES N=1,657	Mean=12.3 years 7th graders M=46% F=54% His=64% Asn=13% Bl=9% Wh=5%	**Setting:** Health or sex education classes in schools **Sessions:** 8 **Content:** Based upon social learning theory; covered basic facts, risks, and consequences of sex, pressures to have sex, decision-making, assertiveness skills, condoms and contraception, and community resources. **Methods:** Interactive activities: games, role plays, large- and small-group activities, guided discussion. Taught by well-trained peer educators, including HIV+ males and teen mothers.	Experimental. 102 classrooms of students were randomly assigned to treatment group, which received regular instruction plus SNAPP, and control group, which received regular instruction. Matched questionnaire data were collected at baseline, 5 months, and 17 months. Intervention post-test: N=772 Control post-test: N=757	t-tests between interventon and comparison groups using change scores. Both overall and separate analyses by gender.	Initiation of sex: 0 Frequency of sex: 0 Number of sexual partners: 0 Use of condoms at last sex: 0 Use of birth control pills at last sex: 0 Pregnancy rates: 0 STD rates: 0	There were few changes in the mediating variables that might affect behavior. This was a rigorous design with random assignment, large sample sizes, long-term measurement, and measurement of behavior.
Reducing the Risk Hubbard, Geise, Rainey 1998	Urban and rural areas in Arkansas Varied SES N=212	Not reported 9th=8% 10th=49% 11th=31% 12th=12% M=48% F=52% Wh=85% Bl=14% Othr=1%	**Setting:** Health education classes. **Sessions:** 16 **Content:** Cognitive behavioral theory, social inoculation theory; strong emphasis on avoiding unprotected sex either by avoiding sex or using protection. **Methods:** Experiential; many role-plays to build skills and self-efficacy.	Quasi-experimental. Five intervention school districts were matched with 5 comparison districts. Comparison group received existing sex education activities from state-approved texts or abstinence-only curricula. Matched questionnaire data were collected at baseline and 18-months later from one class selected from each school. Intervention post-test: N=106 Comparison post-test: N=106	One-way z-tests between intervention and comparison groups at 18 months. Initial equivalence of intervention and comparison groups determined.	Initiation of sex: + Condom Use: Sexually inexperienced at pre-test: +	There were no significant differences between groups at baseline, but there was no random assignment. Attrition was very high (58%), in part because of graduation from high school. Sub-group sample sizes were small.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.2: Studies of Sex Education Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Reducing the Risk Kirby, Barth, Leland, Fetro 1991	Urban and rural areas throughout California Varied SES N=758	Not reported 9th=27% 10th=56% 11th=9% 12th=6% M=47% F=53% Wh=62% His=20% Asn=9% AmInd=2% Bl=2% Othr=5%	**Setting:** Health education classes. **Sessions:** 15 **Content:** Cognitive behavioral theory, social inoculation theory; strong emphasis on avoiding unprotected sex either by avoiding sex or using protection. **Methods:** Experiential; many role-plays to build skills and self-efficacy.	Quasi-experimental. Partial random assignment of classrooms to intervention or comparison groups. Comparison group received existing sex education programs of equal length. Matched questionnaire data were collected at baseline, 6-months, and 18-months post-intervention. Intervention post-test: N=429 Comparison post-test: N=329	Chi-square or t-tests between intervention and comparison groups at 6 and 18 months. Initial equivalence of intervention/ comparison established with t- or chi-square tests.	**Initiation of intercourse:** At 6 months: 0 At 18 months: + **Frequency of intercourse: 0** **Contraceptive use at first sex:** At 6 months: 0 At 18 months: 0 **Contraceptive use at last sex:** At 6 months: 0 At 18 months: 0 **Frequency of contraceptive use at 18 months:** Overall: 0 Females: + Males: 0 Lower-risk youth: + Higher-risk youth: 0 **Unprotected intercourse at 18 months:** Overall: 0 Sexually inexperienced at pre-test: + Sexually experienced at pre-test: 0 **Teen pregnancy rates: 0**	Sample sizes for some subgroups were too small for reasonable power.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.2: Studies of Sex Education Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Safer Choices Coyle, Basen-Engquist, Kirby, Parcel, Banspach, Collins, Baumler, Carvajal, Harrist Forthcoming (June 2001)	Urban and suburban areas in San Jose, CA and Houston, TX Varied SES Cohort N=3,058	9th graders M=48% F=52% Wh=30% His=27% Bl=17% As=18% Oth=7%	**Setting:** High schools. **Sessions:** 10 in 9th grade and 10 in 10th grade. **Content:** Five major components: school health protection council, curriculum, peer resources and school environment, parent education, and school-community linkages. Based on social cognitive theory, social influence theory, and models of school change. Emphasized abstinence as the safest choice; condoms as safer than unprotected sex. Curriculum topics focused on knowledge, norms and skills to avoid sex or use condoms. Skill-based and interactive.	Experimental. Twenty schools were randomly assigned to treatment and control conditions. Control schools received existing sex/HIV education programs that were mostly knowledge-based. Matched questionnaire data were collected fall of 9th grade (baseline) and spring of 9th, 10th, and 11th grades.	Linear, logistic, and negative binomical regression models in a repeated measures ANCOVA framework to adjust for baseline variables. Impact was measured over the 31-month period. All were multilevel to adjust for clustering.	Initiation of intercourse: 0 Frequency of sex: 0 Number of sex partners: 0 Use of condoms at last sex: + Use of contraception at last sex: + Frequency of sex without condoms: + Number of sexual partners without condoms: +	This was a very strong design with random assignment, large sample sizes, long-term measurement of behavior, and proper statistical analysis in two different locations.
Skills for Healthy Relationships Warren, King 1994	Canada Not reported N=2,323	14-15 years 9th graders Not reported Not reported	**Setting:** 9th grade classes. **Sessions:** 20 1-hour classes. **Content:** Based, in part, upon theory of reasoned action. Focused upon improving knowledge, attitudes, motivation, and skills. Designed to maintain abstinence, produce a return to abstinence, and increase protective measures (e.g., condom use). Skills included interpersonal skills (assertiveness) and condom skills (purchasing and putting on a condom). **Methods:** Taught by teachers with use of peer-led, small group discussions.	Quasi-experimental. In each of 4 provinces, 2 school boards were matched and assigned to intervention and comparison groups. Fifty-eight schools were assigned to receive the intervention program or the normal HIV/AIDS/STD education program. Matched questionnaire data in 123 classes were collected before and after the 9th grade curriculum, the beginning of the 10th grade, and the beginning of the 11th grade. Intervention post-test: N=1,358 Comparison post-test: N=965	t-tests between intervention and comparison groups at each of four time intervals. t-tests between pre-test data and post-test data for each group. Regression analyses.	Initiation of intercourse: 0 Always used a condom during last two months: 0 Use of a condom during last act of intercourse: 0	The strength of this design was increased by the large number of classrooms and students participating, the long-term follow-up, the similarity of intervention and comparison groups students at pre-test, and the analysis of change scores over time.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.2: Studies of Sex Education Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Taking Care of Business Nicholson, Postrado 1991	Dallas, Texas; Memphis, Tennessee; Omaha, Nebraska; Wilmington, Delaware Low SES Baseline: N=343	14-20 years Not reported F=100% Bl=85% Wh=9%	**Setting:** Girls Clubs. **Sessions:** 9 2-hour classes. **Content:** Focused upon the futures of women, career planning, goal setting, decision-making, assertiveness, postponing sex, and contraception. **Methods:** Interactive exercises, role-playing.	Quasi-experimental. Girls and parents who volunteered to participate in programs within the 4 Girls Clubs constituted the program group, while those who chose not to participate constituted the comparison group. Questionnaire data were collected at baseline and annually for 2 years.	Multiple-logistic analysis, controlling for background and baseline characteristics. There were significant differences at baseline between the treatment and comparison groups.	Initiate intercourse: 0 Engage in intercourse without birth control: 0 Pregnancy: 0	The strength of this design was reduced by the lack of random assignment, relatively small sample sizes, and results that varied with how girls who participated in only a few sessions were treated. There were positive findings for these girls who completed most sessions.
Teen Talk Eisen, Zellman, McAlister 1990	Texas and California Not reported N=888	13-14=32% 15-17=65% 18-19=3% Not reported M=46% F=54% His=51% Bl=22% Wh=17% Othr=10%	**Setting:** 6 family planning service agencies; 2 programs in one school district. **Sessions:** 8 12-hour classes. **Content:** Theory-based (health belief model, social learning theory). Factual material, values, feelings, decision-making, skill-building. **Methods:** Lectures and discussion, role-playing, films.	Experimental. Random assignment of classes. Comparison classes received varied programs of equal duration to Intervention. Matched questionnaire data were collected at baseline, immediate post-intervention, and 1-year follow-up. Intervention post-test: N=462 Comparison post-test: N=426	Logistic regression controlling for background characteristics. Separate analyses for gender/ sexually (in)experienced. Males: N=197 Females: N=290 Inexperienced at pre-test but initiating by follow-up: Males: N=79 Females: N=67 Experienced at pre-test: Males: N=115 Females: N=92	**Initiation of intercourse:** Overall: 0 Males: + Females: 0 **Contraceptive use:** Inexperienced at pre-test but initiating by follow-up: Males: First intercourse: 0 Last intercourse: 0 Consistent use: 0 Females: First intercourse: – Last intercourse: 0 Consistent use: – Experienced at pre-test: Males: Last intercourse: 0 Consistent use: + Females: Last intercourse: 0 Consistent use: 0	The combination of varied sex education programs among the comparison groups, small sample sizes for many analyses, and inconsistent results make it difficult to draw conclusions from these results.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.2: Studies of Sex Education Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Untitled Blake, Ledsky, Lohermann, Bechhofer, Nichols, Windsor, Banspach, Jones Unpublished (2000)	Michigan communities Not reported N=30 teachers and 3,516 students	14=19% 15=51% 16=29% 9th=63% 10th=37% M=56% F=44% Wh=52% Bl=36% His=3% Oth=9%	**Setting:** School classrooms **Sessions:** 17 **Content:** Based on key characteristics of effective programs and social learning theory. Interactive and skills-based. Emphasized abstinence, but briefly covered condoms.	Experimental. Thirty teachers were matched and then randomly assigned to implement either the intervention curriculum or a comparison curriculum to 69 classrooms. Unmatched questionnaire data were collected at baseline, immediate post-test, and six-month follow-up. Intervention follow-up: N=564 Comparison follow-up: N=785	Logistic regression and ANCOVA controlling for baseline differences and gender.	Initiation of sex: 0 Had sex in past 3 months: 0	The strength of this design was reduced by the failure to collect matched questionnaire data. The statistical power to detect changes in initiation of sex was reduced by using the teacher as the unit of analysis and short-term follow-up. Six-month follow-up was not high (64%).
Untitled (Three sexuality education programs) Kirby 1985	Dispersed throughout the U.S. Varied SES N's for individual programs ranged from 301 to 556.	Not reported 9-12 graders Varied gender proportions All major ethnic groups represented	**Setting:** Health or sex education classes. **Sessions:** 6 hours to 1 full semester. **Content:** Varied with the program; some were mostly knowledge-based; a few used role playing to teach communication skills.	Quasi-experimental. Matched questionnaire data were collected at baseline and post-intervention in 2 sites. In the third site, follow-up data were collected at 3 months.	t-tests between intervention and comparison groups using change scores.	Initiation of intercourse 3 programs: 0 Frequency of sex in the previous month 3 programs: 0 Use of contraceptives: 3 programs: 0 Pregnancy: 1 program: 0	This was a study of 15 different sexuality education programs in the U.S. Three of the studies met the criteria for this review. Those three are summarized in this table. These were not a strong set of studies. Students were not randomly assigned; sample sizes for individual programs were often too small for reasonable power; and longer term effects were not measured for 2 of the 3 programs.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.2: Studies of Sex Education Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Untitled (Natural family planning) Klaus, Bryan, Bryant, Fagan, Harrigan, Kearns 1987	Seven areas in the U.S. Low-middle SES N=304	15- to 17-year-olds Not reported F=100% Unk=34% Wh=38% Bl=20% His=8% Oth=1%	**Setting:** Schools. **Sessions:** Every 2 weeks for first 3 months, once a month for 3 months, every 3 months for 6 months. **Content:** Focused on proper use of the Billings method of natural family planning. Also other contraceptive methods, relationships, vocational future, ethical and religious positions. Individual review of each girl's chart.	Quasi-experimental. Girls agreeing to use the Billings method were compared with girls from the general population and from two family planning clinics. Matched questionnaire data were collected at baseline and 12 months. Intervention post-test=242 Comparison post-test=62	Not reported.	Initiation of intercourse: +	This was a very weak evaluation design with very strong self-selection effects into the program.
Wise Guys Gottsegen, Philliber Unpublished (2000)	Greensboro, NC High-risk youth N=335	12 or 13=74% 7th=76% M=100% Wh=63% Oth=37%	**Setting:** Schools. **Sessions:** 8 class sessions, 1 per week. **Content:** Provides information about reproduction, contraception and STDs; seeks to develop healthy values about sexuality, responsibility, respect for women, resistance skills, and communication skills. **Methods:** A variety of active learning methods, including role playing.	Quasi-experimental. Principals identified males at risk of early sexual involvement in both the intervention and comparison schools. Unmatched questionnaire data collected at baseline, 8 weeks later, and 6 months later. Baseline intervention: N=94 Baseline comparison: N=55	Not reported.	Initiation of sex: 0 Contraceptive use at last sex: + Frequency of contraceptive use: +	This study had a very weak design. The two groups did not appear very similar at baseline, baseline and follow-up questionnaire data were not matched, sample sizes were small, and the statistical analysis was weak (only significant results were presented in the tables and results did not appear to control for differences between the two groups).

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.3: Studies of HIV/AIDS Education Programs

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date(s)	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
AIDS Prevention for Adolescents in School Walter, Vaughan 1993	New York, NY Low SES N=867	Not reported 9th and 11th graders M=42% F=58% Bl=37% His=35% Wh=13% Asn=11% Othr=4%	**Setting:** General education classes. **Sessions:** 6 **Content:** Health belief model, social cognitive theory, model of social influence; focus upon correcting facts about AIDS, teaching cognitive skills to appraise risk of transmission, increasing knowledge of AIDS-prevention resources, changing perceptions of frequency of peer risk-taking behaviors, clarifying personal values, understanding external influences, and teaching skills to delay intercourse and/or consistently use condoms.	Quasi-experimental. Four high schools were divided into two matched pairs. Within each pair, one school provided 9th grade program classes and 11th grade comparison classes, while the other school provided 9th grade comparison classes and 11th grade program classes. Comparison classes received no AIDS prevention program. Matched questionnaire data were collected at baseline and 3-month post-intervention. Intervention post-test: N=477 Comparison post-test: N=390	t-tests between intervention and comparison groups using change scores. Multiple regression was used to control for background characteristics and baseline scores.	Abstinence: 0 Intercourse with high-risk partner: + Monogamous relationships: + Consistent condom use: +	The 3-month post-test did not allow measurement of long-term effects. Changes in behavior were modest.
Becoming A Responsible Teen St. Lawrence, Brasfield Jefferson, Alleyne, O'Bannon, Shirley 1995	Jackson, MS Low SES N=225	Mean=15.3 years Mean grade=9.7 M=28% F=72% Bl=100%	**Setting:** Conference room in a health center. **Sessions:** 8 90- to 120-minute weekly meetings. **Content:** Based upon social learning theory. Designed to affect cognitive and emotional meanings attached to risky behavior, model behavioral competencies, and provide practice, feedback, and reinforce new skills. Covered AIDS information, sexual decisions and pressures, use of condoms, "lines," effective social skills, and situations that would be difficult to handle. **Methods:** Small group discussions with 5-15 youths were led by male and female co-facilitators. Considerable role-playing and practice. Sessions with HIV+ youth.	Experimental. Individual youth were randomly assigned to receive the study intervention or an alternative 2-hour educational intervention. Matched questionnaire data were collected at baseline, 2 months later, 6 months later, and 12 months later.	Repeated measures MANOVA used to measure impact of group and gender. No significant differences at pre-test.	Initiation of intercourse: + Sexual intercourse during previous two months: + Number of sex partners: + Frequency of unprotected vaginal intercourse: Males: + Females: 0 Frequency of condom-protected vaginal intercourse: + Frequency of unprotected oral sex: + Frequency of unprotected anal sex: + Frequency of condom-protected anal sex: 0 Percent of acts of intercourse protected by condoms: +	This was a very strong evaluation design with random assignment, long-term follow-up, multiple outcome measures, and sophisticated statistical analysis. On some outcomes, reported risks fluctuated considerably from one time period to another.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.3: Studies of HIV/AIDS Education Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Be Proud, Be Responsible Jemmott III, Jemmott, Fong 1992	Philadelphia, PA Low SES N=150	Mean=14.6 years Not reported M=100% BI=100%	**Setting:** At a school on a Saturday. **Sessions:** 5 continuous hours. **Content:** Based upon theory of reasoned action. Included information about risks, videotapes, games, exercises, role-playing, and other active learning activities. All were culturally and developmentally appropriate. **Methods:** Implemented by 27 black facilitators with backgrounds in human sexuality. Taught in small groups with a mean of about 6 youths.	Experimental. Youths were randomly assigned to the treatment group and a control group, which received a career, opportunities intervention. Matched questionnaire data were collected at baseline, at the end of the interventions, and 3 months later.	Analysis of covariance was used to control for the gender of the facilitator and the respective pre-intervention measure of the outcome being measured.	Had sex: 0 Number of days had sex: + Number of partners: + Rated frequency of condom use: + Number of days of sex without condoms: + Had heterosexual anal sex: + Number of days had heterosexual anal sex: 0 Number of female anal sex partners: 0	In general, this was a strong evaluation design. However, the sample size was relatively small, and the 3-month post-test did not allow measurement of long-term effects.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.3: Studies of HIV/AIDS Education Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Be Proud! Be Responsible! A Sexual Abstinence Curriculum **Be Proud! Be Responsible! A Safer Sex Curriculum** ("Be Proud! Be Responsible!" now known as "Making a Difference") Jemmott, Jemmott, Fong 1998	Philadelphia, PA Low income Total N=659	Mean=11.8 years 6-7th graders M=47% F=53% Bl=100%	**Setting:** Recruited from schools for a Saturday program on school campuses. **Sessions:** 8 1-hour modules delivered over two Saturdays. **Content:** 2 curricula, 1 abstinence-based, 1 safer sex-based. Based on cognitive-behavior theories and elicitation research. Small group discussions, videos, games, brainstorming, experiential exercises, and skill-building exercises. The safer sex curriculum also addressed hedonistic beliefs about condom use. Trained adult or peer facilitators.	Experimental. Random assignment to 2 treatment groups and 1 control group that received different intervention. Matched questionnaire data were collected at baseline, 3 months, 6 months, and 12 months.	Chi-squared tests or f-tests.	**Abstinence-based:** Initiation of intercourse: At 3 months: + Frequency of sex: At 3 months: 0 At 6 months: 0 At 12 months: 0 Condom use: At 3 months: 0 At 6 months: 0 At 12 months: + Frequency of unprotected sex: At 3 months: 0 At 6 months: 0 At 12 months: 0 **Safer sex-based:** Initiation of intercourse: At 3 months: 0 Frequency of sex: At 3 months: 0 At 6 months: + At 12 months: + Condom use: At 3 months: + At 6 months: + At 12 months: + Frequency of unprotected sex: At 3 months: + At 6 months: + At 12 months: 0	This was a very strong study. Both the design was strong and the results were positive. Effects in mediating variables supported behavioral effects. Non-significant behavioral effects were typically in the desired direction. The safer sex curriculum had significant effects upon frequency of unprotected sex among youths sexually experienced at baseline, but not all youth. Results did not differ by matching participants and staff on gender, nor by adult versus peer facilitators.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.3: Studies of HIV/AIDS Education Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Get Real About AIDS Main, Iverson, McGloin, Banspach, Collins, Rugg, Kolbe 1994	Colorado Not reported N=979	Mean=15 years 9th=60% 10th=13% 11th=22% 12th=5% M=51% F=49% Wh=65% His=21% Bl=6% Asn=3% Othr=5%	**Setting:** Classrooms. **Sessions:** 15. **Content:** Based upon social cognitive theory and theory of reasoned action. Emphasized skills. Topics covered: functional knowledge about HIV-risk avoidance, impact of norms, condom use, and skills to identify, manage, avoid, and leave risky situations. Teachers received 40 hours of training. Posters were distributed throughout the school and students were given HIV information cards. **Methods:** 25 teachers taught curriculum.	Quasi-experimental. Seventeen schools were assigned to the intervention group and the comparison group, which received the school's usual HIV education program. Four of the 6 comparison schools offered no program. Matched questionnaire data were collected at baseline, 2 months after the intervention, and 6 months after the intervention. Intervention post-test: N=560 Comparison post-test: N=419	Random-effects logistic and linear regression models were used to analyze student-level data, controlling for clustering of students within schools. Analyses controlled for student pre-test response (outcome variable measured at baseline), grade, ethnicity, and gender.	Ever had sex: 0 Ever purchased condoms: + Number of sexual encounters during last 2 months: 0 Number of sexual partners during last 2 months: + Condom use during last 2 months: +	The students were followed for a relatively short period of time. Given the quasi-experimental design, sophisticated and proper analytic methods were used that corrected for the clustering effect of students. There were difficulties in matching pre-test and post-test scores for students. All the results were just barely significant at the .05 level.
Healthy Oakland Teens Ekstrand, Siegel, Nido, Faigeles, Cummings, Battle, Krasnovsky, Chiment, Coates 1996	Oakland, CA Low SES N=250	12-16 years Mean=13.1 years 7th graders M=48% F=52% Bl=78% His=11% Wh=7% Othr=5%	**Setting:** Social science classes at a middle school. **Sessions:** 5 adult-led / 8 peer-led. **Content:** 5 adult-led sessions included basic information on anatomy, substance abuse, HIV/STDs, and preventive behaviors. Eight peer-led sessions were more interactive and included perception of risk, values clarification, costs and benefits of preventive behaviors, influence of alcohol and drugs, peer norms, refusal skills, and condom use.	Quasi-experimental. A cohort of students in the intervention school were compared with cohorts of students in similar nearby schools. Baseline questionnaire data were collected in the 7th grade and 8-11 months later in the 8th grade. Intervention post-test: N=107 Control post-test: N=143	The 2 groups were compared with logistic regression controlling for baseline differences.	Initiation of sex: +	The validity of these results was reduced by the lack of random assignment, some differences between the intervention and comparison groups, relatively small sample size for analyses of initiation of sex (N=190), and failure to adjust for clustering effects. In addition, parent consent requirements changed, but the study was restricted to those respondents who completed surveys when passive parental consent was still in effect.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.3: Studies of HIV/AIDS Education Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Untitled Gillmore, Morrison, Richey, Balassone, Gutierrrez, Farris 1997	Seattle, WA Not reported N=314	14-19 years Mean=9th grade M=54% F=46% Bl=52% Wh=48%	**Setting:** Juvenile detention, public health STD clinics, and other clinics. **Content:** Group 1 received a comic book with basic information and examples of communication skills. Group 2 received the comic book and a videotape with teen actors modeling skills for negotiating condom use. Group 3 participated in 2 4-hour skill-training sessions with role playing, small group exercises, games, and both the comic book and the videotape.	Experimental. Youth were randomly assigned to 3 groups. Matched questionnaire data were collected at baseline, 3 months later, and 6 months later.	Repeated measures analysis of covariance was used to control for baseline differences.	Number of sexual partners: 0 Condom use: 0 Refusing sex without condom: 0	In addition to the lack of behavioral impact, there were few significant changes in mediating variables. In general this was a strong research design, but the validity of the results were limited by the small sample sizes for some analyses.
Untitled Magura, Kang, Shapiro 1994	New York, NY Not reported N=157	Mean=17.8 years Not reported M=100% Bl=65% His=33% Wh=2%	**Setting:** Department of Correction's adolescent reception and detention center. **Sessions:** 4 1-hour sessions. **Content:** Based upon techniques of problem-solving therapy. Included small-group discussions focusing upon health issues, especially AIDS and drug abuse. Also included decision-making about drugs, sex, and HIV and role-playing. Participants volunteered for program.	Quasi-experimental. Intervention group received the program; the comparison group members were wait-listed but were released before receiving the program. Matched interview data were collected at baseline and 10 months later (5 months after release from jail). Intervention post-test: N=58 Comparison post-test: N=99	Multiple regression or multiple logistic regression were used to measure impact of the intervention and to control for the baseline measure of the outcome variable. No significant difference on background characteristics, including behaviors at pre-test. One-tailed tests of significance used.	Multiple sexual partners: 0 High-risk sexual partners: 0 Anal sex: 0 Condom use during vaginal sex: + Condom use during oral/anal sex: + Condom use in general: +	The lack of random assignment and relatively small sample size reduced the strength of the study design. However, the veracity of the findings on condom use are increased by the similarity of the intervention and comparison groups, the controlling for pre-test measures, and the combination of consistent findings on condom use and lack of findings for other risk-taking behaviors (e.g., drug use).

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.3: Studies of HIV/AIDS Education Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Untitled Rotheram-Borus, Koopman, Haigners, Davies 1991	New York, NY Low SES (runaway youths) N=145	11-18 years Mean=15.5 years Not reported M=36% F=64% Bl=63% His=22% Wh=8% Othr=7%	**Setting:** Shelter for runaway youth **Sessions:** Designed as 20, but was 3 to 30. Mean = 13 sessions. **Content:** Included general knowledge about HIV/AIDS, training in coping skills (including unrealistic expectation in high-risk situations), access to health care and other resources, and methods of surmounting individual barriers (covered in private counseling). Activities were interactive (e.g., developed raps and soap opera dramatizations and practiced behavioral coping responses). **Methods:** Taught in small groups (N=10) 4 days per week by male and female team of trained leaders.	Quasi-experimental. One shelter for runaway youth offered the program, while a second similar shelter in the same city serving similar youth did not. Matched interview data collected at baseline, 3 months later, and 6 months later. Intervention post-test: N=78 Comparison post-test: N=67	Outcomes were regressed onto the number of sessions that runaways participated in and demographic variables. There were no significant differences between the 2 groups at baseline.	At 3 months: Abstained from sex: 0 Consistent condom use: + Avoidance of high-risk situations: + At 6 months: Abstinence: 0 Consistent condom use: + Avoidance of high-risk situations: +	Several things reduced the validity of this design: the lack of random assignment; the use of only two groups; the relatively small sample size; and the failure to adequately control for other differences between those youth who remained in the shelter for longer periods of time and those who remained for shorter periods. On the other hand, there were no significant differences in demographic characteristics or sexual risk behaviors at baseline between the two groups, and the magnitude of the effects appeared large.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.3: Studies of HIV/AIDS Education Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Untitled Slonim-Nevo, Auslander, Ozawa, Jung 1996	St. Louis, MO Not reported N=218	Mean=14.7 years Not reported M=56% F=44% Wh=54% Bl=46%	**Setting:** Residential centers for youth who had been delinquent, abused, or neglected or had mental health problems. **Sessions:** 9 1.5-2 hour sessions delivered over a 3-week period. **Content:** Based on cognitive-behavioral theory. Substantive HIV content the same for both. The skills-based group was taught skills using modeling, demonstrations, role plays, and practice, while the discussion group was taught using problem solving and discussions. **Methods:** Taught in small groups (8-10) of same age and gender. Two facilitators per group.	Experimental. 15 residential centers were randomly assigned to skills training group, discussion-only group, or control group. Matched questionnaire data were collected at baseline, post-test, and 9-12 months.	Analysis of co-variance with baseline scores of outcome variables as covariates. General linear models for continuous outcome variables and logistic models for dichotomous.	Sex with an unknown partner: 0 Vaginal sex without condom: 0 Anal sex without condom: 0	This was a strong evaluation design with random assignment, long-term follow-up, multiple outcome measures, and sophisticated statistical analysis. The sample size was modest, but results were not consistently in the desired direction nor close to significance.
Youth AIDS Prevention Project (YAPP) Levy, Perhats, Weeks, Handler, Zhu, Flay 1995 Weeks, Levy, Gordon, Handler, Perhats, Flay 1997	Chicago, IL Low SES N=1,669	Not reported 7th graders M=49% F=51% Bl=59% Wh=24% His=13% Othr=4%	**Setting:** School classrooms. **Sessions:** 10 in 7th grade, 5 in 8th grade booster. **Content:** Based on social learning theory; topics included HIV/AIDS/STD prevention, pregnancy prevention, decision-making, and resistance/negotiation skills. Activities included lectures, class discussions, small group exercises, role plays, educational competitions, and an anonymous question box. **Methods:** Instruction was implemented by professional health educators.	Experimental. Fifteen school districts were randomly assigned to the first treatment group, which included classroom instruction plus parent activities, a second treatment group, which received classroom instruction, and the control group, which received the standard AIDS curriculum. Matched questionnaire data were collected before the intervention in the 7th grade, after the intervention booster in the 8th grade, and in the 9th grade. Intervention post-test: N=1,001 Control post-test: N=668	Significance tests showed no differences between groups at pre-test. Three-way ANOVAs controlling for race and gender, and logistic regression controlling for race and gender. Also random-effects regression to handle some missing data.	Initiation of intercourse: 0 Frequency of sexual activity: 0 Number of sexual partners: 0 Ever used condoms: 0 Condom use last sex: 0	Large groups of students were randomly assigned (school districts), but analyses were conducted at the individual level. Attrition rates were high (56%) by 9th grade. Post-test may have occurred shortly after the 8th grade intervention, not allowing for a decline in the impact or for a possible delay in initiation of intercourse to be measured.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.4: Studies of Sex and HIV/AIDS Education Programs for Parents and Their Families

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Facts and Feelings Miller, Norton, Jenson, Lee, Christopherson, King 1993	Northern Utah Upper-middle SES N=503	12-14 years 7th and 8th graders Not reported Wh=95% Mormon=86%	**Setting:** Home-based video. **Sessions:** 6 units, each including a 15- to 20-minute video and written materials. **Content:** The video provided information, modeled parent/child communication, and emphasized sexual values consistent with abstinence. The written materials suggested questions and topics for discussion. Together they covered changes in puberty, facts about reproduction, parent/teen communication, values and sexual behavior, sexuality in the media, decision-making skills, and communication skills. Phone calls were made bi-weekly to encourage use of the materials.	Experimental. Families were randomly assigned to 3 groups: the first intervention group, which received the videos and mailed newsletters; the second intervention group, which received the videos only; and the control group, which received nothing. Matched questionnaire data were collected from teens and parents at baseline, after 3 months, and after 1 year. Intervention group 1 post-test: N=120 Intervention group 2 post-test: N=122 Control group post-test: N=261	Repeated measures analysis of variance.	Initiation of intercourse: 0	This was a strong design. However, only 3-5% of the youths in any group initiated intercourse during the elapsed year. Thus, it was difficult to produce an impact on this outcome. However, there was not a significant impact upon youths' intent to have intercourse during the following year or until marriage.
Growing Together Nicholson, Postrado 1991	Dallas, TX; Memphis, TN; Omaha, NE; Wilmington, DE Low SES Baseline: N=201	Mean=12.4 years Not reported F=100% Bl=74% Wh=15% Othr=11%	**Setting:** Girls Clubs. **Sessions:** 5 2-hour classes. **Content:** Designed to help parents communicate with their daughters. Included facts about adolescent sexuality, values about dating and relationships. **Methods:** Interactive exercises; practice communicating with their own daughters and others.	Quasi-experimental. Girls and parents who volunteered to participate in programs within the four Girls Clubs constituted the program group, while those who chose not to participate constituted the comparison group. Questionnaire data were collected at baseline and 1 and 2 years later.	Multiple-logistic analysis, controlling for background and baseline characteristics. There were few differences between groups at baseline.	Initiate intercourse: 0	The strength of this design was reduced by the lack of random assignment and relatively small sample sizes. The comparison group was about 2.5 times more likely to initiate intercourse. This was almost significant (p=.054), but not quite.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.5: Studies of Protocols for Clinic Appointments and Supportive Activities

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
ASSESS Boekeloo, Schamus, Simmens, Cheng, O'Connor, D'Angelo 1999	Washington, D.C. Low SES N=197	12-13=54% 14-15=47% Not reported M=50% F=50% Bl=64% W=19% His=4% Oth=13%	**Setting:** Managed care clinic sites. **Sessions:** 1 **Content:** Major message: unprotected sex was unsafe, condoms were safer, abstinence was safest. Focus upon STDs and HIV. Materials provided to each youth included: a 15-minute audiotaped risk assessment and education program, a discussion ice-breaker, two brochures on skills and self-efficacy to avoid unprotected sex, a brochure on community resources, and parent brochures. Physicians reviewed the risk assessment with each youth and discussed concerns and methods of avoiding unprotected sex.	Experimental. Youth were randomly assigned to treatment and control groups. Control group received usual health examination. Matched interview surveys were conducted at end of clinic appointment, 3 months later, and 9 months later. Intervention follow-up: N=94 Control follow-up: N=103	Chi-squared and Fisher's exact test. Adjustments for clustering within providers. Multiple logistic or linear regression models.	**At 3 months:** Vaginal intercourse in last 3 months: – Vaginal, anal, or oral sex in last 3 months: 0 Frequency of sex: 0 Number of partners: 0 Use of condoms at last sex: + Unprotected sex: + STD diagnoses: 0 **At 9 months:** Intercourse in last 3 months: 0 Vaginal, anal, or oral sex in last 3 months: 0 Frequency of sex: 0 Number of partners: 0 Use of condoms at last sex: 0 Unprotected sex: 0 STD diagnoses: 0	This was a strong research design, although sample sizes were not large. Bivariate analyses revealed no significant impact upon sex in last three months. Multivariate analyses found it to be just barely significant.
Untitled Danielson, Marcy, Plunkett, Wiest, Greenlick 1990	Portland, OR, and Vancouver, WA Middle SES N=971	15-18 years 9th=18% 10th=34% 11th=24% 12th=24% M=100% Wh=91% Bl=5% Asn=4%	**Setting:** Health maintenance organization. **Sessions:** Part of a one-hour medical appointment. **Content:** Included two parts: (1) a slide-tape program that focused upon anatomy, STDs, contraception, couple communication, and access to health services, and (2) a visit with a health care practitioner who focused upon contraception, reproductive goals, health risks, and the patient's interests. Emphasized abstinence and use of contraception.	Experimental. Youth were randomly assigned to treatment and control groups. Matched questionnaire data were collected at baseline and about one year later.	Logistic regression was used to control for a variety of potentially confounding variables.	Frequency of sexual activity: 0 Contraceptive methods used in previous year: 0 Frequency of contraceptive use: 0 Primary method used in previous year: + Method used at last intercourse: +	This was a strong experimental design. The results mostly indicated greater pill use and occurred mostly among those who initiated sex after baseline.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.5: Studies of Protocols for Clinic Appointments and Supportive Activities *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Untitled DeLameter, Wagstaff, Havens 2000	Milwaukee, WI Not reported N=562	15-19 years Mean=18.3 years Not reported M=100% BI=100%	**Setting:** Urban STD clinic. **Sessions:** Video: 1 14-minute video. Educator/patient session: 1 session lasting about 14 minutes. **Content:** Video: focused on STD/AIDS. Designed to affect perceived risk, motivational factors, response efficacy, and self-efficacy. It was culturally appropriate, presented by people with whom the viewers could identify, evoked social responsibility, and emphasized that African-American youth are at risk. It included personal stories, involved reference group norms for condom use, demonstrated how to put on and take off a condom, and presented information in an unauthoritative manner. Health educator: face-to-face session allowed tailoring of message, personalization of risk, and answers to questions. Included practice putting condom on plastic penis.	Experimental. Youth were randomly assigned to a video intervention, health educator intervention, or control group. Control classes received standard treatment and education program. All groups received results of STD tests. Matched questionniare data were collected at baseline, immediate post, 30 days later, and 6 months later.	Analysis of covariance with post-test – pre-test difference as the dependent variable. Used Bonferroni-adjusted t-tests.	Number of partners: 0 Frequency of sex: Steady partner: 0 Casual partner: 0 Condom use: Steady partner: 0 Casual partner: 0	Although this was a rigorous design, the interventions were extremely modest interventions, especially in comparison with being tested for an STD, learning the results, and receiving the standard education and care. The standard care intervention was not described. Over time among all three groups, there were reported increases in frequency of sex, number of partners, and use of condoms.
Untitled Orr, Langefeld, Katz, Caine 1996	Indianapolis, IN Low SES N=112	14-19 years Mean=17.9 years F=100% BI=55% Oth=45% All had tested positive for chlamydia	**Setting:** Family planning and STD clinics. **Sessions:** 1 10-20 minute session. **Methods:** One-on-one session. Content based upon the health belief model. Included (1) discussion of chlamydia (with use of a pamphlet), (2) modeling and practice of how to put a condom on (over a banana), and (3) brief role play involving a woman getting her partner to use a condom.	Experimental. Two family planning clinic sites were randomly assigned to treatment and control conditions. Individuals at the STD clinic were randomly assigned. Matched questionnaire data collected at baseline and 6-month follow-up. Control group got similar length traditional discussion with nurse about condom use and partner treatment. Intervention post-test: N=50 Comparison post-test: N=55	Change scores were compared with Wilcoxon signed rank and paried t-tests. Also contingency table analysis controlling for baseline (Cochran-Mantel-Haenszel test).	Condom use: +	The two groups were poorly matched at baseline on ethnicity: the intervention site was mostly black and the control site mostly white. However, all had chlamydia, and the groups were well-matched on behaviors. There was also high attrition (46%). Analyses did not control for clustering at the two family planning clinics.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.5: Studies of Protocols for Clinic Appointments and Supportive Activities *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Untitled Winter, Breckenmaker 1991	Pennsylvania Not reported N=672	15=16% 16=34% 17=>40% Not reported F=100% Wh=98% Bl=1% His=1%	**Setting:** Family planning clinic. **Sessions:** 2 sessions, then more frequent visits. **Content:** Greater focus upon the non-medical needs of adolescents: more information, more concrete instruction, more counseling, more comfort during exam, more involvement of male partners, more recognition of peer pressure, and more parental involvement. **Methods:** One-on-one sessions.	Quasi-experimental. Six clinics assigned to receive the improved patient protocols or the standard protocols. Some baseline data collected. Patient records for the subsequent 9-20 months examined. Intervention post-test: N=228 Comparison post-test: N=444	Analysis of variance. Small pre-test differences in satisfaction.	**Among all patients:** Use of contraception at 6 months: + Use of contraception at 12 months: 0 **Among patients experiencing problems:** Use of contraception at 6 months: + Use of contraception at 12 months: +	The validity of the design was reduced by the inability to compare contraceptive use at baseline, the failure to demonstrate equivalence between the two groups in other ways, and failure to control for clustering effect. Other data supported the positive impact of the expanded program.
Untitled Herceg-Baron, Furstenberg, Shea, Harris 1986	Philadelphia, PA Not reported N=358	<16=31% 16=33% 17=36% Not reported F=100% Bl=53% Wh=47%	**Setting:** Hospital clinics, neighborhood health clinics, and family planning clinics. **Sessions:** First intervention: Family support. Patients were asked to attend 6 weekly counseling sessions with a family member. Second intervention: Periodic support. Patients received 2-6 telephone calls from clinic staff during the 4-6 weeks following the initial clinic visit.	Experimental. Patients were randomly assigned to the 2 intervention and 2 control groups (which participated in 3 and 1 interviews respectively). Interviews conducted at baseline, 6 months later, and 15 months later. First intervention: N=93 Second intervention: N=61 Control groups: N=198	Significance among intervention and control groups measured at post-test periods. No significant differences at pre-test.	Clinic attendance: 0 Use of contraception: 0 Pregnancy: 0	This was a strong experimental design. The proportion of patients in the family support group that actually brought a family member was very low (30%). Participants received only 2.3 sessions each.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.6: A Study of a Community-Wide Effort to Improve Clinic Services

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
RESPECT (Responsible Education on Sexuality and Pregnancy for Every Community's Teens) Hughes, Furstenberg, Teitler 1995 Note: This study also appears in Table 4.9	Philadelphia, PA Cross-section of city N=1,961	14-18 years Not reported Not reported Not reported	**Setting:** 9 family planning clinics and their communities. **Sessions:** Not reported. **Content:** Clinics initiated or expanded after-school or evening hours, began teenage walk-in hours, decreased the average waiting time for appointments, and increased the hours reserved for teenagers only. They also trained the staff to work with teens. In addition, the initiative conducted school and community activities, as well as a media campaign.	Quasi-experimental. Random samples of teens from the entire catchment areas of the clinic were compared with random samples of teens from the entire city excluding the catchment areas. Telephone interviews with teens before the program was initiated and about 2.5 years later. Wave 1 Pre-test: N=907 Wave 1 Post-test: N=117 Wave 2 Pre-test: N=680 Wave 2 Post-test: N=257	Logistic regression was used to control for age, race, and gender, and to measure change over time in the catchment area versus that in the remainder of the city.	Initiation of intercourse: 0 Frequency of sex: 0 Use of contraception: 0 Pregnancy rates: 0 Birth rates: 0	This study measured the impact upon the entire targeted population, not just upon those actually receiving services; this is a much more demanding outcome criterion. Some program components (e.g., the media component) may have reached the comparison group as well.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.7: Studies of School-Based and School-Linked Health Centers

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
St. Paul school-based clinics (see Kirby et al. below) Edwards, Steinman, Arnold, Hakanson 1980	St. Paul, MN Low-middle SES N=approx. 1,000	Not reported 9-12 graders F=100% Not reported	**Setting:** One junior/senior high school and two high schools. **Content:** School-based clinics provided comprehensive health services; reproductive health care provided in the clinic; contraceptives picked up at special hospital clinic; day care for infants provided.	Quasi-experimental. Pregnancy and birth rates for the first year each clinic was open were compared with subsequent years; pregnancy and birth rates were estimated by clinic staff from their personal knowledge of student pregnancies and births.	No tests of significance were conducted.	Birth rates: +	The validity of these results was limited by the small number of baseline years, incomplete knowledge of pregnancies and births, lack of comparison schools, and lack of tests of significance.
St. Paul school-based clinics (see Edwards et al. above) Kirby, Resnick, Downes, Kocher, Gunderson, Pothoff, Zelterman, Blum 1993	St. Paul, MN Not reported N=1,838 to 2,988 depending upon year	Not reported 9-12 graders F=100% Not reported	**Setting:** High schools. **Content:** Provided comprehensive health services; reproductive health care provided in the clinic; contraceptives picked up at special hospital clinic; day care for infants provided.	Quasi-experimental. In four schools, birth rates for 5 years before and 6 years after clinics opened were compared; in one school, birth rates 2 years before and 3 years after the clinic opened were compared; birth rates were estimated by matching school enrollment records and county birth certificates.	Several methods were used to compare pre-clinic and post-clinic birth rates. Tests of significance were conducted.	Birth rates: 0	There were no comparison schools in the study. There were large year-to-year fluctuations in birth rates that may have obscured a small clinic impact. St. Paul students had access to relatively good health care and had relatively low birth weights before the clinics opened. Only school-wide effects were measured, even though not all students used the clinics for contraception.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.7: Studies of School-Based and School-Linked Health Centers *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Self Center Zabin, Hirsch, Smith, Streett, Hardy 1986	Baltimore, MD Low SES N=6,596	Not reported 7-12 graders M=45% F=55% Bl=99%	**Setting:** Classrooms and storefront clinic. **Content:** Clinic staff made presentations to each home room at least once per year, provided individual consultation in the school health suite during the school day, and provided a full range of reproductive health services (group discussions, individual counseling, contraceptive services, pregnancy testing, referral) at the clinic located across the street from the high school and a few blocks from the junior high school. Most students contacts were through the small-group discussions. **Methods:** 2 self care teams (social worker and nurse) delivered bulk of services. Peer leaders acted as spokespeople for program.	Quasi-experimental. One junior and 1 senior high school were selected for the program group; another junior and senior high school were selected for the comparison group. Questionnaire data were collected from students school-wide in the fall before the program was implemented and the three following springs. Pregnancy rates were analyzed for only 28 months.	Life table analysis used to adjust for age-related differences in some tables. Multiple tests of significance were used to compare intervention and comparison groups.	**Initiation of intercourse:** Females: + Males: Not provided **Contraceptive use:** All students: Time from first intercourse to clinic attendance: + Females: Use at last intercourse: + **Pregnancy rates:** High school females: +	The validity of the results were limited by several factors: some higher risk students dropped out between the first fall survey and three subsequent spring school surveys; the program schools (one of which was, in part, a magnet school) may have differed in unknown ways from the comparison schools; an additional middle school opened nearby; some sample sizes were small; and the study failed to control for clustering effects of students in schools.
Untitled Kirby 1991	Norfolk, VA Low SES N=6,260	13=2% 14=15% 15=23% 16=26% 17=23% 18=9% 19=2% 9th=30% 10th=24% 11th=23% 12th=24% M=47% F=53% Bl=58% Wh=34% Asn=5% His=1% Oth=2%	**Setting:** High school. **Content:** The clinic provided comprehensive primary healthcare, including prescriptions for contraception. It did not dispense contraception.	Quasi-experimental. The intervention school was matched with a nearby comparison school. Questionnaire data were collected from either the entire school or samples of students just before the clinic opened, 2 years later, and 3 years later.	Changes over time were determined by chi-squared tests and t-tests.	Ever had sex: 0 Age of 1st sex: 0 Frequency of sex: Males: 0 Females: 0 Use of contraception: 0 Pregnancy rate: Males: 0 Females: 0 Birth rate: Males: 0 Females: 0	The comparison school was a good match for the clinic school. However, the selected sample at the comparison school was not a very representative sample of the entire school during the 2-year data collection. The survey data included data from the 9th graders who had little exposure to the clinic. Only school-wide effects were measured, even though not all students used the clinics for contraceptives. Also, the statistical analyses were simplistic.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.7: Studies of School-Based and School-Linked Health Centers *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Untitled Kirby, Waszak, Ziegler 1991	Gary, IN; Muskegon, MI; Jackson, MS; Quincy, FL; Dallas, TX Low SES Site: N 1=1,295 2=1,360 3=824 4=1,185 5=1,274	Not reported 9-12 graders M=45% F=55% BI=100%	**Setting:** High schools. **Content:** All clinics provided comprehensive health services. In addition, 1 referred for contraception, 1 prescribed contraception, and 3 dispensed contraception.	Quasi-experimental. Schools were matched to the extent feasible. In 4 sites, school-wide post-clinic data from schools with clinics were compared with data from similar comparison schools; in 1 site, school-wide data were collected before and 2 years after the clinics opened. Data were collected through school-wide surveys.	Separate analyses were conducted for each gender and race; regression was used to control for 6 other student background characteristics.	**Initiation of intercourse:** Males: 4 sites: 0; 1 site: + Females: 4 sites: 0; 1 site: + **Frequency of sexual activity:** Males: 5 sites: 0 Females: 5 sites: 0 **Use of contraceptives:** Condoms: All students: 4 sites: 0; 1 sites: + Pill: Females: 4 sites: 0; 1 site: + **Pregnancy:** 5 sites: 0	This post-test-only design was weak: school and community differences may have affected the clinic school/comparison school analyses in unknown ways. The pre- and post-test design in Quincy was probably the strongest design. Only school-wide effects were measured, even though not all students used the clinics for contraceptives. The clustering effect of students in schools was not controlled statistically.
Untitled Kisker, Brown, Hill 1994	Clinics in schools in urban areas throughout the country. Low SES N=3,909	17=35% 18=46% 19=19% Not reported Not reported His=44% Bl=32% Wh=15% Asn=7% Othr=2%	**Setting:** School health centers. **Sessions:** By their senior year, students attended the clinics an average of 1.9 times per year. **Content:** Clinic provided a wide range of primary health care services. Some clinics only referred students for contraception; others provided contraception.	Quasi-experimental. Cohort data from students in schools with clinics were compared with cohort data collected from a national sample of students in urban schools. Intervention: N=3,050 Comparison: N=859	Numerous multi-variate statistical analyses were conducted to measure the impact.	Initiation of intercourse: + Had intercourse in last month: 0 Used a condom at last intercourse: 0 Used an effective method of birth control at last intercourse: – Used a method consistently during last month: 0 Pregnancy: 0	The basic design was weak. Baseline data were not collected from the students in the clinic schools before the students could have received services; the comparison group was not always equivalent; and the design did not control for the clustering of students in schools. The evaluation measured the impact upon all students in the schools, not just upon those using the clinic for reproductive health services.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.7: Studies of School-Based and School-Linked Health Centers *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Untitled Newcomer, Duggan, Toczek 1999	Mid-Atlantic city Low SES N=more than 200,000	Not reported 9-12 graders F=100% Bl=80% Wh=18% Othr=2%	**Setting:** High schools. **Content:** School-based clinics. Provided comprehensive health services, contraceptive counseling, and prescriptions for contraception. After several years, contraception was dispensed, not just prescribed.	Quasi-experimental. Birth rates for 4 clinic schools and 19 non-clinic schools were calculated by matching school enrollment data and birth certificates. Birth rates were calculated for 1 year before the clinics opened and 9 years after they opened. Only births that were conceived while the student was in school or within 6 months of being enrolled in school were counted.	Birth rates were adjusted for student age and ethnicity.	Birth rates: 0	This quasi-experimental design was strengthened by the relatively large number of clinic and comparison schools, the matching of these schools, the time series data, the generation of birth rates from public records, and the statistical control of age and ethnicity. However, its strength was weakened by the single baseline year of data. After adjustment for age and ethnicity, girls in the clinic schools who used the clinic were less likely to give birth than those who did not use the clinic.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.8: Studies of School Condom-Availability Programs

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Massachusetts Blake, Ledsky, Goodenow, Sawyer, Lohrmann, Windsor Unpublished (2000)	Massachusetts Mixed SES N=4,166	Mean=16.1 years 9th=28% 10th=26% 11th=24% 12th=22% M=51% F=49% Wh=75% Bl=6% His=8% Asn=4% Oth=6%	**Setting:** High schools. **Content:** Schools made condoms available to students.	Quasi-experimental. Post-program questionnaire data were collected from 59 randomly selected Massachusetts high schools; 9 made condoms available, 50 did not.	Analysis of covariance and logistic regression, controlling for community and student characteristics. Data were weighted by several factors.	Ever had sex: + Age at first sex: 0 Had sex in last 3 months: + Number of sexual partners in last 3 months: 0 Number of sexual partners in lifetime: + Condom use at last sex: + Contraceptive use other than condom at last sex: – Pregnancy: 0	Although this study measured the impact of condom availability in multiple schools, the strength of its design was substantially weakened by the fact that baseline data were not collected and the fact that schools that made condoms availabile differed in known and unknown ways from schools that did not make condoms available (e.g., they were more likely to provide their students with instruction about condom use).
New York Guttmacher, Lieberman, Ward, Freudenberg, Radosh, DesJarlais 1997	New York, NY Mixed SES N=12,857	14=18% 15=23% 16=25% 17=23% 18=10% Not reported M=46% F=54% Bl=47% His=28% Wh=17% As=7% Oth=1%	**Setting:** High schools. **Content:** Components included: an AIDS team in each school, 6 HIV/AIDS lessons in each grade, a resource room where informational materials and condoms were available, staff serving as condom resource volunteers in the resource room, and an HIV/AIDS information session for parents.	Quasi-experimental. Post-program questionnaire data were collected from 12 randomly selected New York schools and 10 matched Chicago schools. Intervention (New York): N=7,119 Comparison (Chicago): N=5,738	Data were weighted to match the overall New York City high school system. Multi-variate logistic models compared the 2 sites, controlling for numerous variables related to sexual behavior and condom use.	Ever engaged in oral, vaginal, or anal sex: 0 Condom use at last sex: +	This was a very weak design because baseline data were not collected and pre-existing differences between intervention and comparision schools could only be controlled statistically.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.8: Studies of School Condom-Availability Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Health Resource Centers Furstenberg, Geitz, Teitler, Weiss 1997	Philadelphia, PA Mixed SES N=1,435	Mean=16 years 9th-12th grade M=38% F=62% Bl=66% Wh=23% Oth=11%	**Setting:** Public high schools. **Content:** Health resource centers were opened. They provided counseling on the importance of abstinence, reproductive health information, condoms, and general health referrals to nearby health facilities.	Quasi-experimental. Multiple designs were used. Interview data were collected from a random sample of youth in the communities before the intervention, a different group of census tracts after the intervention, and some of the pre-intervention respondents were re-interviewed. Intervention: N=519 Comparison: N=916	Data weighted to match school characteristics. Logistic regression to control for background variables.	Ever had sex: 0 Had sex in past 4 weeks: 0 Used condom at last sex: 0 Had sex without condom in last 4 weeks: 0	Intervention schools differed some from comparison schools. About 32 percent of the students had used the health resource center. Several trends were in the desired direction, but not significant.
Seattle Kirby, Brener, Brown, Peterfreund, Hillard, Harrist 1999	Seattle, WA Mixed SES N=40,572	14=9% 15=24% 16=26% 17=225% 18=16% 9th-12th grade M=49% F=51% Wh=40% Bl=19% His=5% As=32% Oth=5%	**Setting:** Public high schools. **Content:** In 5 high schools without health centers, condoms were made available in vending machines. In 5 high schools with health centers, condoms were made available, unrestricted, in baskets in the health centers. Near each basket was free information on abstinence, condom use, and HIV prevention.	Quasi-experimental. Questionnaire data were collected school-wide in 10 Seattle schools and independently in random samples of schools throughout the country before the program was implemented and 2 years later. The 2 national samples included different samples of schools. Intervention: N=15,072 Comparison: N=27,200	Data were weighted to match Seattle schools. Two-way analysis of variance, which adjusted for clustering.	Ever had sex: 0 Sex in past 3 months: + Had ≥ 4 lifetime partners: 0 Had ≥ 4 partners in last 3 months: + Mean age of first sex: 0 At last sex: Condom use: – Pill: +	Students obtained a mean 4.6 condoms per year. The baseline Seattle and comparison samples were well-matched. The Seattle schools with clinics might have changed their procedures regarding pill use.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.9: Studies of Community-Wide Pregnancy or HIV Prevention Initiatives with Multiple Components

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Condom Campaign Alstead, Campsmith, Halley, Hartfield, Goldbaum, Wood 1999	3 King County (Seattle) communities Not reported N=1,425	15=34% 16=35% 17=31% Not reported M=49% F=51% Wh=40% Bl=26% Asn=18% Oth=16%	**Setting:** 3 communities **Content:** 3 primary strategies: (1) mobilization of multiple levels of the community to support the campaign; (2) a mass media campaign targeting sexually active teens using pamphlets, posters, t-shirts, radio spots, bus signs, and billboards; and (3) recruitment of multiple agencies, organizations, and businesses to distribute condoms from 22 bins or 25 vending machines in restrooms and other locations.	Quasi-experimental. Cross-sectional interview survey data collected before the campaign, 2 months later (after the first wave of the media campaign), and 7 months later (after the second wave). Samples selected from convenience sites where youth congregated. Baseline: N=341 2-month: N=478 7-month: N=606	Chi-square or Fisher's exact test were used to compare pre- and post-test proportions.	Ever had sex: 0 Sex in last 90 days: 0 Use of condoms: 0	This was a challenging design, because it attempted to measure the impact of the campaign upon all sexually active youth in the communities, not just upon those who observed the campaign. The validity of the study was reduced by the lack of random assignment and no comparison group. There were also no significant differences in condom use (or in intent to use condoms) between those who reported exposure to the campaign and those who did not.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.9: Studies of Community-Wide Pregnancy or HIV Prevention Initiatives with Multiple Components *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Plain Talk Grossman, Pepper 1999	Atlanta, GA; New Orleans, LA; San Diego, CA Low SES N=1,268	12-13=32% 14-16=41% 17-18=27% Not reported M=50% F=50% Bl=58% His=40% Oth=2%	**Setting:** 3 communities **Content:** Designed to: (1) create a consensus among adults about the need to protect sexually active youth by encouraging contraceptive use; (2) provide parents and other community adults with the knowledge and skills to communicate more effectively with teen about sexual behavior and contraception; and (3) improve access to reproductive health care, including contraception. A clinic was opened in one community; an adolescent clinic opened in the evening in a second, and a clinic increased its hours in the third. Community events were implemented and reproductive health information provided.	Quasi-experimental. Cross-sectional survey data were collected before the intervention and again 3 years later (1 site) or 4 years later (2 sites).	Logistic regression.	Use of birth control at first sex: All: 0 Girls: 0 Boys: 0 Use of birth control at last sex: All: 0 Girls: 0 Boys: 0 Pregnancy: All: 0 Girls: + Boys: 0	This was a challenging design, because it attempted to measure the impact of the campaign upon all sexually active youth in the communities, not just upon those who observed the campaign. The strength of the evidence was reduced by the long period of time between pre and post surveys and inability to control well for the many other changes that took place both nationally and locally during that time (e.g., changes in local school health education programs, statewide pregnancy prevention initiatives, welfare reform, national teen sexual behavior, and national teen pregnancy rates). Pre and post surveys were also conducted at different times of the year. The analysis of the pregnancy rates did not adjust for decreases in national pregnancy rates.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.9: Studies of Community-Wide Pregnancy or HIV Prevention Initiatives with Multiple Components *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Poder Latino Sellers, McGraw, McKinlay 1994	Boston, MA, and Hartford, CT Low SES N=536	Mean=16.9 years Not reported Not reported His=100% Puerto Rican= 94%	**Setting:** School and community. **Sessions:** 18-month program. **Content:** Workshops run by peer educators in schools, community organizations, and health centers; group discussions in homes; presentations at large community events; door-to-door and street corner canvassing; provision of condoms; radio and TV PSAs; posters; quarterly newsletters.	Quasi-experimental. Areal probability samples selected in the inner-city areas of Boston (with the intervention) and Hartford (without the intervention). Interviews conducted before and after the intervention (18 months later).	Multivariate regression and logistic regression were used to control for differences between the two samples. There were pre-test differences between the two groups in whether they had ever had an STD or knew someone with AIDS. Males and females were analyzed separately.	Initiation of intercourse: Males: + Females: 0 Having multiple partners during the previous 6 months: Males: 0 Females: + Frequency of sex in previous 6 months: Males: 0 Females: 0 Use of condom during last intercourse: Males: 0 Females: 0 Proportion of time a condom used: Males: 0 Females: 0	This was not a strong design, because basically two different cities were being compared and other factors could have contributed to these outcomes (or lack of outcomes). However, many baseline differences were controlled statistically, and change over time was measured. Samples sizes for subsets of youth (sexually inexperienced at pre-test) were small (e.g., 89 inexperienced males). The percentage of youth who had participated in AIDS workshops and programs was similar in both cities, but more youth had received free condoms in Boston.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.9: Studies of Community-Wide Pregnancy or HIV Prevention Initiatives with Multiple Components *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Project ACTION Polen, Freeborn 1995	Portland, OR Not reported N=2,212	12-21 years Median=15-16 years Not reported M=58% F=42% Wh=42% Bl=35% His=5% AmInd=4% Asn=2% Othr=12%	**Setting:** Community. **Content:** The intervention included: (1) a community mobilization to increase community acceptance of efforts to increase teen condom use; (2) a media campaign involving 3 PSAs airing on TV; (3) the installation of 240 condom vending machines in locations recommended by youth; and (4) a teen skills-building workshop program.	Quasi-experimental. Cross-sections of teen clients of local agencies serving youth at higher risk of STDs were interviewed before the intervention began and continuously thereafter for about 2 years. Baseline: N=508 Post intervention: N=1,704	Used regression and logistic regression to assess change over time, controlling for gender, age, race, and number of sexual partners.	Initiation of intercourse: 0 Acquired a condom in the last month: 0 Used a condom at last intercourse with main partner: 0 Used a condom at last intercourse with other or casual partner: +	This was a challenging design, because it attempted to measure the impact of the campaign upon all youth in youth-serving agencies, not just upon those who observed the campaign. The validity of the study was reduced by the lack of random assignment, some differences among the different cross-sectional samples of youth, and the relatively small sample sizes for youth who had sex with casual partners. It was not possible to link the short-term increase in condom use with the campaign. Teens familiar with the PSA or logo were not more likely to use a condom than those teens not familiar. Attitudes toward condoms and self-efficacy regarding condom use improved.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.9: Studies of Community-Wide Pregnancy or HIV Prevention Initiatives with Multiple Components *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
RESPECT (Responsible Education on Sexuality and Pregnancy for Every Community's Teens) Hughes, Furstenberg, Teitler 1995 Note: This study also appears in Table 4.6	Philadelphia, PA Cross-section of city N=1,961	14-18 years Not reported Not reported Not reported	**Setting:** 9 family planning clinics and their communities. **Sessions:** Not reported. **Content:** Clinics initiated or expanded after-school or evening hours, began teenage walk-in hours, decreased the average waiting time for appointments, and increased the hours reserved for teenagers only. They also trained the staff to work with teens. In addition, the initiative conducted school and community activities, as well as a media campaign.	Quasi-experimental. Random samples of teens from the entire catchment areas of the clinic were compared with random samples of teens from the entire city excluding the catchment areas. Telephone interviews with teens before the program was initiated and about 2.5 years later. Wave 1 pre-test: N=907 Wave 1 post-test: N=117 Wave 2 pre-test: N=680 Wave 2 post-test: N=257	Logistic regression was used to control for age, race, and gender, and to measure change over time in the catchment area versus that in the remainder of the city.	Initiation of intercourse: 0 Frequency of sex: 0 Use of contraception: 0 Pregnancy rates: 0 Birth rates: 0	This study measured the impact upon the entire targeted population, not just upon those actually receiving services; this is a much more demanding outcome criterion. Some program components (e.g., the media component) may have reached the comparison group as well.
School/Community Program for Sexual Risk Reduction Among Teens Vincent, Clearie, Schluchter 1987 Koo, Dunteman, George, Green, Vincent 1994	Rural county in South Carolina Low SES N=3,800 to 4,430, depending upon year	14-17 years Not reported F=100% Bl=58% Wh=42%	**Setting:** K-12 classrooms. **Sessions:** Integrated into other instruction. **Content:** About two-thirds of the school staff were given sex education training. Classroom instruction was designed to increase knowledge, decision-making skills, communication skills, and self-esteem, and to align values with those of the community. The focus was not always on sexuality but upon problem-solving, risk assessment, and assuming personal responsibility. Peer education was included. School nurse provided consultation, condoms, and transportation to a family planning clinic. Community groups and churches implemented classes and special events. Articles appeared in papers, and announcements were on the radio.	Quasi-experimental. Annual pregnancy rates for 14- to 17-year-old females were estimated for the years 1977-1988 for: (1) the western part of the county surrounding the program community; (2) the eastern part of the county serving as a comparison group; and (3) 3 similar counties serving as comparison groups. Intervention: N=range from 319 to 333 Comparison: N=range from 391 to 1,630	Z statistic for proportional differences in pregnancy rates was used to compare intervention and comparison groups.	Pregnancy rates: +	This was a challenging design, because it attempted to measure the impact of the program upon all youth in the community, not just upon those who received interventions. After the program was implemented, pregnancy rates declined; after parts of the program ended, pregnancy rates returned to their previous level. The small number of years and the small number of 14- to 17-year-old females limit the internal validity of these findings. The very small population and the geographical isolation of the county limit its external validity. It is not clear what parts of the program were most important.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.9: Studies of Community-Wide Pregnancy or HIV Prevention Initiatives with Multiple Components *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
School/Community Sexual Risk Reduction Replication Initiative Paine-Andrews, Harris, Fisher, Lewis, Williams, Fawcett, Vincent 1999	3 Kansas communities: Geary, Franklin, Wichita Mixed SES	Not reported Not reported Not reported Geary: Wh=66% Bl=23% His=6% As=4% Franklin: Wh=97% His=2% Bl=1% Wichita: Not reported	**Setting:** Communities and schools, clinics and organizations within them. **Content:** Community-wide initiatives included: enhanced sexuality education for teachers and parents, age-appropriate sex education (K-12), increased access to health services, collaboration with school administrators, use of mass media, greater involvement of community in teen pregnancy prevention, peer support and education, alternative activities for youth, and involvement of the faith communities.	Quasi-experimental. The intervention zip codes were matched with other zip codes to form comparison groups. In Geary and Franklin, questionnaire data were collected in schools in the intervention areas before and after the intervention. In all these communities, birth rate data were collected for up to 5 years before the intervention and 3 years during, in both the intervention and comparison zip codes. Geary: Pre-test N=1,004 Post-test N=952 Franklin: Pre-test N=710 Post-test N=817	Chi-square tests for behavioral data; an adjusted z-statistic for pregnancy and birth rate data.	Ever had sex: Geary: + Franklin: – Age at first sex: Geary: 0 Franklin: 0 Condom use: Geary: 0 Franklin: + Pregnancy: Geary: 0 Franklin: 0 Births: Wichita: 0	This was a challenging design, because it attempted to measure the impact of the program upon all youth in the community, not just upon those who received interventions. It employed a theory of change evaluation strategy. Process data indicated numerous school and community changes. Conclusions are limited by various design limitations and results that differed across the sites. Changes in pregnancy and birth rates were not consistently favorable, and never statistically significant, but tended to favor the intervention zip codes.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4-10: Study of an Early Childhood Program

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Abecedarian Project Campbell 1999	Not reported Low SES N=104	Infancy through 21 years Not relevant M=51% F=49% Bl=98% Oth=2%	**Setting:** Pre-schools and elementary schools. **Duration:** Both: 8 years Preschool: 5 years Elementary: 3 years **Content:** Preschool: Full-day child care all year from infancy to kindergarten. Elementary: A home-school resource teacher strove to increase parent involvement in child's learning and to convey issues of concern between parents and school; curriculum packets given for parents and their children.	Experimental. Children were randomly assigned to 4 groups: preschool plus elementary treatment, preschool treatment only, elementary treatment only, and control. Children were followed to age 21. Questionnaire and survey data collected near 21st birthday.	General linear model for continuous outcome variables. Chi-square analyses.	Birth rates: +	The preschool treatment group delayed childbearing by more than a year. Both treatment groups also performed higher on intellecutal and academic measures and educational level attained. Both the preschool and elementary interventions were statistically significant, but, in general, the preschool treatment appeared to have the stronger impact.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.11: Studies of Service Learning Programs

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Learn and Serve America Melchior 1998	Seventeen communities in U.S.	Not reported 7th-8th=30% 9th-12th=70% M=40% F=60% Wh=58% His=19% Bl=17% Oth=6%	**Setting:** Middle and high schools. **Content:** Service learning projects included: (1) "meaningful" service in the community (e.g., tutoring, working as a teacher's aide, working in a nursing home, or homeless shelter) for a mean of 77 hours; and (2) structured time for reflection (discussions, journal writing, papers, and group presentations). Both parts are linked to the academic curriculum. Only well-designed and high quality programs were selected.	Quasi-experimenal. Comparison groups were other similar classes in the same school or classes in other schools. Questionnaire data were collected at baseline, after program participation (end of school year), and one year after participation (end of following school year). Intervention group: N=608 Comparison group: N=444	ANCOVA, controlling for baseline differences, and ANCOVA using change scores.	Pregnancy: 0	This strength of this design was weakened by possible self-selection effects. There was an impact upon pregnancy at the p=.10 level at post-test, but not the one-year follow-up test. At post-test, the program also had a small positive impact upon educational attitudes and some measures of school performance, but these did not last through the following year.
Reach for Health and Community Youth Service Learning O'Donnell, Stueve, Doval, Duran, Haber, Atnafou, Johnson, Grant, Murray, Juhn, Tang, Piessens 1999 (See next entry)	New York Low SES N=1,061	Mean age=12.7 years 7th=52% 8th=48% M=47% F=53% Bl=79%	**Setting:** Middle schools. **Sessions:** 40/year for Reach for Health, plus 3 hours/week for community service. **Content:** Community Youth Service (CYS) included service in nursing homes, neighborhood clinics, child day care centers, and a senior citizen center. Each student was assigned to 2 locations. Students debriefed experiences. Reach for Health (RFH) focused on substance use, violence, and sexual behavior.	Part experimental; part quasi-experimental. Thirty-five classrooms of students were randomly assigned to receive Reach for Health plus community service or only Reach for Health. Another school was matched as a comparison school. Matched questionnaire data collected in fall (baseline) and spring (follow-up). RFH & CYS: N=255 RFH: N=222 Comparison: N=584	MIXOR used to control for baseline scores. Adjusted for clustering.	CYS & RFH vs. Control Had sex in last 3 months: + RFH vs. Control Had sex in last 3 months: 0	The strength of the design was reduced by lack of random assignment to the control group, small sample sizes, modest long-term follow-up, and an absence of tests of significance for some outcomes. The greatest effect was upon 8th graders (as opposed to 7th graders). Trend data indicated that the greatest impact was also upon youth in special education classes.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.11: Studies of Service Learning Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Reach for Health and Community Youth Service Learning O'Donnell, Stueve, O'Donnell, Duran, Doval, Wilson, Haber, Perry, Pleck Unpublished (2000) (See previous entry)	New York Low SES N=195	Not reported 7th=100% M=41% F=59% Bl=71% His=26% Oth=3%	**Setting:** Middle schools. **Sessions:** 3 hours/week for 30 weeks community service or 90 hours altogether. **Content:** Community Youth Service (CYS) included service in senior citizen homes, nursing homes, health centers, and child day care centers. Each student was assigned to 2 locations. Students debriefed experiences. Reach for Health (RFH) focused on substance use, violence, and sexual behavior.	Experimental. Eighteen classrooms of students were randomly assigned to receive Reach for Health plus community service or only Reach for Health. Matched questionnaire data were collected in fall of the 7th grade (baseline) and spring of the 10th grade (follow-up).	Logistic regression, adjusted for the clustering of students in classrooms.	Initiation of sex: + Had sex in last month: +	A few students transferred into or out of the program because of expanded resources or scheduling conflicts.
Teen Outreach Program (TOP) Philliber, Allen (#1) 1992 Allen, Philliber, Herrlin, Kuperminc (#2) 1997	**Study #1:** 150 sites nationwide Mixed SES **Study #2:** 25 sites nationwide Mixed SES	**Study #1:** 11-19 years Middle and high schools Not reported Not reported **Study #2:** Mean age: 15.8 years 9th=36% 10th=33% 11th=20% 12=11% M=15% F=85% Bl=67% Wh=19% His=11% Oth=3%	**Setting:** Schools and communities in many sites throughout the country. **Sessions:** Weekly. **Content:** 2 major components: (1) small group classroom discussions of values, decision-making, communication skills, parenting, life options, and volunteer experiences; and (2) volunteer service in school or community, e.g., served as aides in hospitals and nursing homes, participated in walkathons, peer tutoring, and other activities. A minimum of 20 hours of service, but mean was 46 hours.	**Study #1:** Quasi-experimental. Comparison group selected by TOP participants, TOP or school staff, or random assignment. Matched questionnaire data were collected at intake and exit from program (beginning and end of school year). Intervention post-test: N=2,624 Comparison post-test: N=3,032 **Study #2:** Experimental. Matched questionnaire data were collected during first several weeks of school year and end of school year. Intervention post-test: N=342 Comparison post-test: N=353	Two groups were compared, controlling for baseline differences in problem behaviors and other characteristics.	**Study #1:** Pregnancy rates: + **Study #2:** Pregnancy rates: +	The second study had a strong experimental design. It confirmed the results found in the first study which had a weaker design. Neither study measured long-term results. The program also reduced course failure and school suspensions.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.12: Studies of Vocational Education and Employment Programs

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Conservation and Youth Service Corps Jastrab, Blomquist, Masker, Orr 1997	Four cities throughout the country Low SES Not reported	18-25 years Out of school M=57% F=43% Bl=50% His=25% Wh=14% As=5% Oth=6%	**Setting:** Communities. **Duration:** About 4-5 months on average. **Content:** Provides remedial, vocational and academic education, and work experience within the context of community service (about 80% community service and 20% education and other activities). Corps members work full time in small teams. Community projects last 2-12 weeks, e.g., provide assistance to nursing homes, help renovate low-income housing, or complete environmental projects.	Experimental. Individual youth were randomly assigned to the corps or to nothing. Interview data were collected at baseline; telephone interview data collected 15-months later. Sample size not reported.	Not reported.	Unmarried pregnancy: Overall: 0 Black females: + Hispanic females: 0 White females: 0	The evaluation had a strong design, but the impact upon pregnancy was not in the same direction for all ethnic groups. Intervention group had other positive outcomes, such as lower arrest rates and higher rates of paid employment.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.12: Studies of Vocational Education and Employment Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Job Corps Schochet Burghardt Glazerman 2000	119 communities in the U.S. Low income N=11,787	16-17=44% 18-19=30% 20-24=26% Not reported M=57% F=43% Bl=49% Wh=26% His=17% Oth=7%	**Setting:** Mostly residential, but a few non-residential Job Corps settings. **Content:** An intensive, comprehensive program whose major service components include academic education, vocational training, residential living, health care, health education, counseling, and job placement assistance. Mean number of months of participation was 8 months. Mean number of hours of academic and vocational instruction was greater than 1,000.	Experimental. A random sample of youth eligible to participate in Job Corps nationwide were selected for the study. They were randomly assigned to Job Corps and control groups. Control group members could participate in other programs (mean is 637 hours of programs). Interview data were collected at baseline, 12 months, and 30 months. Intervention group: N=7,311 Control group: N=4,476.	Chi-square and t-tests. Appropriate sample weights.	Birth rates: 0	This was an extremely strong experimental design: random sample of U.S. eligible participants, random assignment to group, long-term follow-up, and measurement of births. Many control group members participated in other similar types of programs. Job Corps participation led to more GED completion, higher earnings after 2 years, lower employment during Job Corps and higher employment after 2 years, lower receipt of public assistance, and lower arrest and conviction rates, but most effects were very small. There were no significant changes in college attendance and substance use. Note the sample was much older at the 30-month follow-up survey.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.12: Studies of Vocational Education and Employment Programs *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
JOBSTART Cave, Bos, Doolittle, Toussaint 1993	13 cities in U.S. Low income N=1,941	16-19=73% 20-21=27% School dropouts M=46% F=54% Bl=44% His=44% Wh=9% Oth=3%	**Setting:** Community organizations, schools, and Job Corp settings. **Content:** Included individualized instruction in basic academic skills, occupational training, support services (i.e., transportation, child care, counseling, life skills), and job placement assistance. Mean of 400 hours of activities.	Experimental. Youth who applied for the program were randomly assigned to participate or not. The control group could and did receive services from other programs. Survey data were collected at baseline, 12, 24, and 48 months. Intervention group: N=533 Control group: N=496	t-tests.	Non-custodial women: Pregnancy rates: 0 Birth rates: 0 Custodial mothers: Pregnancy rates: – Birth rates: –	This was a strong experimental design. JOBSTART led to increases in GED completion and lower earned income during JOBSTART participation. There was a significant increase in childbearing among women who were custodial mothers when they entered (about half), but no difference among those who were not custodial mothers when they entered. Note the sample was much older at the 4-year follow-up survey.
Summer Training and Education Program (STEP) Walker, Vilella-Velez 1992 Grossman, Sipe 1992	5 urban areas in the U.S. Low SES, (academically behind) N=4,800	14=57% 15=43% Not reported M=48% F=52% Bl=49% Asn=19% His=18% Wh/ Othr=14%	**Setting:** Classroom and part-time jobs. **Sessions:** 36 sessions over 2 summers. **Content:** Life skills education in such areas as sexual behavior, drug use, careers, and community involvement. In sexuality, it focused on decision-making and the importance of responsible behavior. Ninety hours of work (half-time) at minimum wage, 90 hours of academic recitation, and 5-15 hours of support during the school years.	Experimental. Random assignment to the STEP program or to a guaranteed job during the summer. Matched questionnaire data were collected annually for 5 years. Treatment: N=2,400 Control: N=2,400	Not reported.	Sexual activity: 0 Use of contraceptives: 0 Births: 0	The evaluation was very rigorous; it had random assignment, large sample sizes, and long-term follow-up. It should be recognized that the control group received full-time jobs (rather than half-time jobs) during the summer.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.13: Studies of Other Youth Development Programs

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Quantum Opportunities Program Hahn, Leavitt, Aaron 1994	San Antonio, TX; Philadelphia, PA; Milwaukee, WI; Saginaw, MI; and Oklahoma City, OK Low SES N=149	Not reported 9th graders Not reported Not reported	**Setting:** Community youth-serving agencies **Content:** Included educational activities (e.g., tutoring and computer-based instruction), community service activities, and development activities (arts, career, and college planning). Participants received small stipends and bonus payments for participation and completion of activities.	Experimental. In each of the 5 sites, 50 students were randomly assigned to treatment and control conditions. Follow-up questionnaire data were collected 6 times over 4 years.	Means for 2 groups were compared.	Birth rates: 0	Aside from the relatively small sample size, this was a strong evaluation design. While there were no significant effects upon birth rates at the p=.05 level for the first 3 years, after 4 years there was a positive effect on birth rates at the p=.09 level.
Seattle Social Development Project Hawkins, Catalano, Kosterman, Abbott, Hill 1999	Seattle, WA Low SES=57% N=598	Not reported Not reported M=50% F=50% Wh=44% Oth=56%	**Setting:** Elementary schools. **Content:** Designed to increase attachment to school and family by improving teaching strategies and parenting skills. Also designed to increase children's social skills (e.g., decision-making and refusal skills). Grades 1-6: 5 days of in-service training for teachers each year, parenting classes for parents of children in grades 1-3 and 5-6, and social competence training for children in grades 1-6.	Quasi-experimental. Eighteen schools were non-randomly assigned to treatment and control; classrooms within some schools randomly assigned to treatment and control. Interview data collected at age 18.	Analysis of variance for continuous variables; chi-square test for dichotomous measures. Logistic and linear regression also used.	Ever had sex: + Number of sex partners: + Pregnancy: +	The strength of this design was weakened by the lack of random assignment. Intervention group had other positive outcomes, such as fewer delinquent acts, less drinking, less school misbehavior, more attachment to school, and higher academic achievement.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.14: Studies of Multi-Component Programs with Both Sexuality and Youth Development Components

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
California's Adolescent Sibling Pregnancy Prevention Program East, Kiernan 2000	16 locations in California Not reported N=1,270	Mean=13.7 years Mean grade=8.2 M=40% F=60% His=68% Bl=11% Wh=11% Oth=10%	**Settings:** Multiple settings, including schools, health departments, and social service agencies. **Sessions:** An average of 18.4 hours. **Content:** All 44 sites were different. Multiple strategies were used, e.g., individual case management and group services. Programs were designed to increase self-esteem, help youth remain in school or return to school, improve knowledge and skills to make healthy decisions, improve access to health and reproductive services, and increase communication with parents and adults. They were also designed to delay sex, increase contraceptive use, and decrease risk behaviors associated with teen pregnancy (e.g., drinking and drug use). Programs included recreation.	Quasi-experimental. All study participants had to meet certain criteria. Comparison group members were often selected from the waiting list (were deemed at lower risk) and found through outreach efforts. Matched questionnaire data were collected at baseline and 9 months later. Intervention post-test: N=821 Comparison post-test: N=450	Analyses statistically controlled for differences in background characteristics and for participation in other non-ASPPP services.	Initiation of sex: + Frequency of sex: 0 Number of sexual partners: 0 Consistency of contraceptive use: 0 Pregnancy: Girls: +	The strength of this design was weakened by lack of random assignment and possible self-selection effects. However, the intervention youth appeared at higher risk on some indices. Youth who received greater numbers of hours of service were less likely to initiate sex, more likely to use contraception, and less likely to become pregnant, but possible self-selection differences were not statistically controlled.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.14: Studies of Multi-Component Programs with Both Sexuality and Youth Development Components *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Children's Aid Society Carrera Program Philliber, Kaye, Herrling, West 2000	New York, NY Low SES N=484	13=36% 14=37% 15=26% Not reported M=45% F=55% Bl=56% His=36% Bl&His=7% Oth=2%	**Setting:** Community organizations serving youth. **Sessions:** 5 days a week during the school year, and special sessions in the summer. Mean number of hours of participation for first 3 years was 16 hours per month. **Content:** This was an intensive program lasting through high school. It used a holistic approach, and staff tried to develop close relationships with youth. It included 5 components: (1) family life and sex education; (2) an education component that included individual academic assessment, tutoring, help with homework, preparation for standardized exams, and assistance with college entrance; (3) a work-related intervention that included a job club, stipends, individual bank accounts, employment, and career awareness; (4) self-expression through the arts; and (5) individual sports. In addition, the program provided mental health care and comprehensive medical care, including contraception.	Experimental. In each of the 6 sites, youth were randomly assigned to treatment and control conditions. Some control group members received a few after-school services, typically recreation. Matched questionnaire data were collected at baseline and annually for 3 years. Three-year data reported. Intervention 3-yr: N=242 Control 3-yr: N=242	Logistic regression, separate for each gender, controlling for a few baseline characteristics.	Ever had sex: All: + Girls: + Boys: 0 Condom use at last sex: All: 0 Girls: 0 Boys: 0 Use of condom plus an effective method of contraception: All: 0 Girls: + Boys: – Pregnancy: All: + Girls: + Boys: 0 Births: All: 0 Girls: + Boys: 0	This was a very rigorous study with multiple sites, random assignment, a large sample size, long-term measurement, measurement of behavior, and, among females, positive findings for sexual behavior and pregnancy (as opposed to only behaviors affecting pregnancy). Notably, the findings are reported for all the members of the treatment and control groups, even though some members of the treatment group did not participate much and some members of the control group participated in some services. Positive effects upon sexual behaviors and outcomes were limited to girls and did not extend to boys. In other areas; there were a few positive effects for both girls and boys (e.g., work experience, bank accounts, and receipt of some health services).

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

Table 4.14: Studies of Multi-Component Programs with Both Sexuality and Youth Development Components *continued*

Study Information	Sample Description		Study			Results	
Program(s) / Author(s) / Publication Date	Location / SES / Post Sample (N)	Age / Grade / Gender / Ethnicity	Program Description	Design	Analytic Methods	Change in Outcome[1]	Additional Comments
Untitled McBride, Gienapp 2000	Washington state Low SES N=690	Mean=15.4 years Not reported M=10% F=90% Wh=74% Oth=26%	**Setting:** There were 3 programs which were administered in a family planning clinic, a middle and high school, and a community-based setting. One was run by the health department and two were run by family planning clinics. **Sessions:** Mean=27 hours. **Content:** Employed a "client-centered" approach that is based upon the service providers' beliefs about why teens become involved in risky sexual behaviors, e.g., they lack: (1) information about sex; (2) adults whom they can trust; (3) coping skills; (4) emotional support; and (5) positive guidance. The approach addresses these and other problems by combining small group and individualized education and skill-building with other individualized services such as counseling, mentoring, referrals, and advocacy tailored for each teen.	Experimental. Individual youth were randomly assigned. Control group received only 2 hours of program services. Matched questionnaire data were collected at baseline and 6 to 9 months later at end of intervention. Intervention group: N=191 Control group: N=166	t-tests for baseline differences. Covariance adjustment model.	Ever had sex: 0 Sex in past month: + Contraceptive use during last month: 0 Contraceptive use during last sex: 0 Always use contraceptives: 0	The study evaluated 7 programs/sites, but only 3 measured impact upon behavior. This was a strong experimental design, but its strength was weakened by small sample sizes for some analyses.

1 Change in outcome for group receiving intervention: no significant change = 0; significant desirable change = +; significant undesirable change = –.

Note: For all studies, the significance level was set at $p < 0.05$. If authors reported significant findings at the $p < 0.10$ level, they were treated as insignificant in this table.

References

Aarons, S.J., Jenkins, R.R., Raine, T.R., El-Khorazaty, M.N., Woodward, K.M., Williams, R.L., Clark, M.C., & Wingrove, B.K. (2000). Postponing sexual intercourse among urban junior high school students — A randomized controlled evaluation. *Journal of Adolescent Health, 27*(4), 236-247.

Abma, J., Chandra, A., Mosher, W., Peterson, L., & Piccinino, L. (1997). Fertility, family planning, and women's health: New data from the 1995 National Survey of Family Growth. *Vital and Health Statistics, 23*(19).

Ajzen, I. (1985). From intention to actions: A theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), *Action control from cognition to behavior* (pp. 11-39). New York: Springer-Verlag.

Alan Guttmacher Institute. (1994). *Sex and America's teenagers.* New York: Author.

Allen, J.P., Philliber, S., & Hoggson, N. (1990). School-based prevention of teen-age pregnancy and school dropout: Process evaluation of the national replication of the Teen Outreach Program. *American Journal of Community Psychology, 18*(4), 505-524.

Allen, J.P., Philliber, S., Herrling, S., & Kuperminc, G.P. (1997). Preventing teen pregnancy and academic failure: Experimental evaluation of a developmentally-based approach. *Child Development, 64*(4), 729-742.

Alstead, M., Campsmith, M., Halley, C.S., Hartfield, K., Goldbaum, G., & Wood, R.W. (1999). Developing, implementing, and evaluating a condom promotion program targeting sexually active adolescents. *AIDS Education and Prevention, 11*(6), 497-512.

Anderson, J.E., & Cope, L.G. (1987). The impact of family planning program activity on fertility. *Family Planning Perspectives, 19*(4), 152-157.

Bandura, A. (1986). *Social foundations of thought and action.* Englewood Cliffs, NJ: Prentice Hall.

Bearman, P.S., & Brückner, H. (2001). Promising the future: Virginity pledges and the transition to first intercourse. *American Journal of Sociology, 106*(4), 859-912.

Blake, S.M., Ledsky, R., Goodenow, C., Sawyer, R., Lohrmann, D., & Windsor, R. (2000). *Condom availability programs in Massachusetts high schools: Relationship to condom use and sexual behavior.* Unpublished.

Blake, S.M., Ledsky, R., Lohrmann, D., Bechhofer, L., Nichols, P., Windsor, R., Banspach, S., & Jones, S. (2000). *Overall and differential impact of an HIV/STD prevention curriculum for adolescents.* Washington, D.C.: Academy for Educational Development. Unpublished manuscript.

Boekeloo, B.O., Schamus, L.A., Simmens, S.J., Cheng, T.L., O'Connor, K., & D'Angelo, L.J. (1999). A STD/HIV prevention trial among adolescents in managed care. *Pediatrics, 103*(1), 107-115.

Brewster, K.L., Billy, J.O.G., & Grady, W.R. (1993). Social context and adolescent behavior: The impact of community on the transition to sexual activity. *Social Forces, 71,* 713—740.

Campbell, F.A. (1999, April 16). Long-term outcomes from the Abecedarian study. In F.A. Campbell (Chair), *How high-quality early childhood programs enhance long-term development: A comparison of findings and models.* Symposium presented at the Biennial Meeting of the Society for Research in Child Development, Albuquerque, NM.

Cave, G., Bos, H., Doolittle, F., & Toussaint, C. (1993). *JOBSTART: Final report on a program for school dropouts.* New York: Manpower Demonstration Research Corporation.

Chamie, M., Eisman, S., Forrest, J.D., Orr, M.T., & Torres, A. (1982). Factors affecting adolescents' use of family planning clinics. *Family Planning Perspectives, 14*(3), 126-139.

Coyle, K.K., Basen-Enquist, K.M., Kirby, D.B., Parcel, G.S., Banspach, S.W., Collins, J.L., Baumler, E.R., Caravajal, S., & Harrist, R.B. (forthcoming). Safer Choices: Long-term impact of a multi-component school-based HIV, STD, and pregnancy prevention program. *Public Health Reports.*

Coyle, K.K., Basen-Enquist, K.M., Kirby, D.B., Parcel, G.S., Banspach, S.W., Harrist, R.B., Baumler, E.R., & Weil, M.L. (1999). Short-term impact of Safer Choices: A multi-component school-based HIV, other STD, and pregnancy prevention program. *Journal of School Health, 69*(5), 181-188.

Coyle, K.K., Kirby, D., Marin, B., Gomez, C., & Gregorich, S. (2000). *Effect of Draw the Line/Respect the Line on sexual behavior in middle schools.* Santa Cruz: ETR Associates. Unpublished manuscript.

Danielson, R., Marcy, S., Plunkett, A., Wiest, W., & Greenlick, M.R. (1990). Reproductive health counseling for young men: What does it do? *Family Planning Perspectives, 22*(3), 115- 121.

DeLamater, J., Wagstaff, D.A., & Havens, K.K. (2000). The impact of a culturally appropriate STD/AIDS education intervention on black male adolescents' sexual and condom use behavior. *Health Education & Behavior, 27*(4), 453-469.

Dusenbury, L., & Falco, M. (1995). Eleven components of effective drug abuse prevention curricula. *Journal of School Health, 65*(10), 420-425.

East, P., & Kiernan, E. (2000). *California's Adolescent Sibling Pregnancy Prevention Program: Evaluating the impact of pregnancy prevention services to the siblings of pregnant and parenting teens.* San Diego: University of California, San Diego Medical Center.

Edwards, L., Steinman, M., Arnold, K., & Hakanson, E. (1980). Adolescent pregnancy prevention services in high school clinics. *Family Planning Perspectives, 12*(1), 6-14.

Eisen, M., Zellman, G.L., & McAlister, A.L. (1990). Evaluating the impact of a theory-based sexuality and contraceptive education program. *Family Planning Perspectives, 22*(6), 261- 271.

Ekstrand, M.L., Siegel, D.S., Nido, V., Faigeles, B., Cummings, G.A., Battle, R., Krasnovsky, F., Chiment, E., & Coates, T.J. (1996, July). *Peer-led AIDS prevention delays onset of sexual activity and changes peer norms among urban junior high school students.* Paper presented at the XI International Conference on AIDS, Vancouver, Canada.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior.* Reading, MA: Addison-Wesley.

Forrest, J.D., Hermalin, A.I., & Henshaw, S.K. (1981). The impact of family planning clinic programs on adolescent pregnancy. *Family Planning Perspectives, 13*(3), 109-116.

Fothergill, K., & Feijoo, A. (2000). Family planning services at school-based health centers: Findings from a national survey. *Journal of Adolescent Health, 27*(3),166-169.

Frost, J.J., & Forrest, J.D. (1995). Understanding the impact of effective teenage pregnancy prevention programs. *Family Planning Perspectives, 27*(5), 188-195.

Furstenberg, F.F., Geitz, L.M., Teitler, J.O., & Weiss, C.C. (1997). Does condom availability make a difference? An evaluation of Philadelphia's health resource centers. *Family Planning Perspectives, 29*(3), 123-127.

Gillmore, M.R., Morrison, D.M., Richey, C.A., Balassone, M.L., Gutierrez, L., & Farris, M. (1997). Effects of a skill-based intervention to encourage condom use among high-risk, heterosexually active adolescents. *AIDS Prevention and Education, 9*(Supplement A), 44-67.

Gottsegen, E., & Philliber, W.W. (2000). *Impact of a sexual responsibility program on young males.* Unpublished manuscript.

Grossman, J., & Pepper, S. (1999). *Plain Talk and adolescent sexual behavior.* Philadelphia: Public/Private Ventures.

Grossman, J.B., & Sipe, C.L. (1992). *Summer Training and Education Program (STEP): Report on long-term impacts.* Philadelphia: Public/Private Ventures.

Grunseit, A., Kippax, S., Aggleton, P., Baldo, M., & Slutkin, G. (1997). Sexuality education and young people's sexual behavior: A review of studies. *Journal of Adolescent Research, 12*(4), 421-453.

Guttmacher, S., Lieberman, L., Ward, D., Freudenberg, N., Radosh, A., & DesJarlais, D. (1997). Condom availability in New York City public high schools: Relationships to condom

use and sexual behaviors. *American Journal of Public Health, 87*(9), 1427-1433.

Hahn, A., Leavitt, T., & Aaron, P. (1994). *Evaluation of the Quantum Opportunities Program (QOP): Did the program work?* Waltham, MA: Brandeis University, Center for Human Resources.

Hawkins, J.D., Catalano, R.F., Kosterman, R., Abbott, R., & Hill, K.G. (1999). Preventing adolescent health-risk behaviors by strengthening protection during childhood. *Archives Pediatrics & Adolescent Medicine, 153*(3), 226-234.

Hercog-Baron, R., Furstenberg, F.F., Shea, J., Jr., & Harris, K.M. (1986). Supporting teenagers' use of contraceptives: A comparison of clinic services. *Family Planning Perspectives, 18*(2), 61-66.

Henshaw, S.K., & Torres, A. (1994). Family planning agencies: Services, policies, and funding. *Family Planning Perspectives, 26,* 52-59, 82.

Homans, G.C. (1965). Group factors in worker productivity. In H. Proshansky & L. Seidenbert (Eds.), *Basic studies in social psychology.* New York: Holt, Reinhart, & Winston.

Howard, M., & McCabe, J. (1990). Helping teenagers postpone sexual involvement. *Family Planning Perspectives, 22*(1), 21-26.

Hubbard, B.M., Giese M.L., & Rainey, J. (1998). A replication of Reducing the Risk, a theory-based sexuality curriculum for adolescents. *Journal of School Health, 68*(6), 243-247.

Hughes, M.E., Furstenberg, F.F., Jr., & Teitler, J.O. (1995). The impact of an increase in family planning services on the teenage population of Philadelphia. *Family Planning Perspectives, 27*(2), 60-65, 78.

Jastrab, J., Masker, J., Blomquist, J., & Orr, L. (1997). *Youth Corps: Promising strategies for young people and their communities.* Cambridge, MA: Abt Associates, Inc.

Jemmott, J.B., III, Jemmott, L.S., & Fong, G.T. (1992). Reductions in HIV risk-associated sexual behaviors among black male adolescents: Effects of an AIDS prevention intervention. *American Journal of Public Health, 82*(3), 372-377.

Jemmott, J.B., III, Jemmott, L.S., & Fong, G.T. (1998). Abstinence and safer sex: A randomized trial of HIV sexual risk-reduction interventions for young African-American adolescents. *Journal of the American Medical Association, 279*(19), 1529-1536.

Kahn, J.G., Brindis, C.D., & Glei, D.A. (1999). Pregnancies averted among U.S. teenagers by the use of contraceptives. *Family Planning Perspectives, 31*(1), 29-34.

Kirby, D. (1984). *Sexuality education: An evaluation of programs and their effects.* Santa Cruz, CA: Network Publications.

Kirby, D. (1985). The effects of selected sexuality education programs: Toward a more realistic view. *Journal of Sex Education and Therapy, 11*(1), 28—37.

Kirby, D. (1991). *An evaluation of the Lake Taylor High School Health Center.* Scotts Valley, CA: ETR Associates.

Kirby, D. (1997). *No easy answers: Research findings on programs to reduce teen pregnancy.* Washington, DC: National Campaign to Prevent Teen Pregnancy.

Kirby, D. (2000). *Logic models: A useful tool for designing, strengthening, and evaluating programs to reduce teen pregnancy.* Santa Cruz, CA: ETR Associates.

Kirby, D., Barth, R., Leland, N., & Fetro, J. (1991). Reducing the Risk: A new curriculum to prevent sexual risk-taking. *Family Planning Perspectives, 23*(6), 253-263.

Kirby, D., Brener, N.D., Brown, N.L., Peterfreund, N., Hillard, P., & Harrist, R. (1999). The impact of condom distribution in Seattle schools on sexual behavior and condom use. *American Journal of Public Health, 89*(2), 182-187.

Kirby, D., & Brown, N. (1996). School condom availability programs in the United States. *Family Planning Perspectives, 28*(5), 196-202.

Kirby, D., Korpi, M., Adivi, C., & Weissman, J. (1997). An impact evaluation of Project SNAPP: An AIDS and pregnancy prevention middle school program. *AIDS Education and Prevention, 9*(Supplement A), 44-61.

Kirby, D., Korpi, M., Barth, R.P., & Cagampang, H.H. (1997). The impact of the Postponing Sexual Involvement curriculum among youths in California. *Family Planning Perspectives, 29*(3), 100-108.

Kirby, D., & Miller, B. (forthcoming). Intervention designed to promote parent-teen communication about sexuality. *New Directions in Child and Adolescent Development.*

Kirby, D., Resnik, M.D., Downes, B., Kocher, T., Gunderson, P., Pothoff, S., Zelterman, D., & Blum, R.W. (1993). The effects of school-based health clinics in St. Paul upon school-wide birth rates. *Family Planning Perspectives, 25*(12), 12-16.

Kirby, D., Waszak, C., & Ziegler, J. (1991). Six school-based clinics: Their reproductive health services and impact on sexual behavior. *Family Planning Perspectives, 23*(1), 6-16.

Kisker, E.E. (1984). The effectiveness of family planning clinics in serving adolescents. *Family Planning Perspectives, 16*(5), 212-218.

Kisker, E.E., Brown, R.S., & Hill, J. (1994). *Health caring: Outcomes of the Robert Wood Johnson Foundation's school-based adolescent health care program.* Princeton, NJ: Robert Wood Johnson Foundation.

Klaus, H., Bryan, L.M., Bryant, M.L., et al. (1987). Fertility awareness/natural family planning for adolescents and their families: Report of a multisite pilot project. *International Journal of Adolescent Medicine and Health, 3*(2), 101-119.

Koo, H.P., Dunteman, G.H., George, C., Green, Y., & Vincent, M. (1994). Reducing adolescent pregnancy through school and community-based education: Denmark, South Carolina, revised 1991. *Family Planning Perspectives, 26*(5), 206-217.

Levy, S.R., Perhats, C., Weeks, K., Handler, A., Zhu, C., & Flay, B.R. (1995). Impact of a school-based AIDS prevention program on risk and protective behavior for newly sexually active students. *Journal of School Health, 65*(4), 145-151.

Lieberman, L.D., Gray, H., Wier, M., Fiorentino, R., & Maloney, P. (2000). Long-term outcomes of an abstinence-based, small-group pregnancy prevention program in New York City schools. *Family Planning Perspectives, 32*(5), 237-245.

Little, C.B., & Rankin, A. (2001). An evaluation of the Postponing Sexual Involvement curriculum among upstate New York eighth graders. *Sociological Forum, 15*(4).

Lundberg, S., & Plotnick, R.D. (1990). Effects of state welfare, abortion, and family planning policies on premarital childbearing among adolescents. *Family Planning Perspectives, 22,* 246-251.

Magura, S., Kang, S., & Shapiro, J.L. (1994). Outcomes of intensive AIDS education for male adolescent drug users in jail. *Journal of Adolescent Health, 15*(6), 457-463.

Making the Grade. (2000, Summer). National census survey identifies 1,135 school-based health clinics nationwide. *Access.*

Main, D.S., Iverson, D.C., McGloin, J., Banspach, S.W., Collins, K., Rugg, D., & Kolbe, L.J. (1994). Preventing HIV infection among adolescents: Evaluation of a school-based education program. *Preventive Medicine, 23*(4), 409-417.

McBride, D., & Gienapp, A. (2000). Using randomized designs to evaluate a client-centered program to prevent adolescent pregnancy. *Family Planning Perspectives, 32*(5), 227-235.

McGuire, W. (1972). Social psychology. In P.C. Dodwell (Ed.), *New horizons in psychology.* Middlesex, England: Penguin Books.

Melchior, A. (1998). *National evaluation of Learn and Serve America school and community-based programs.* Waltham, MA: Center for Human Resources, Brandeis University.

Miller, B.C., Norton, M.C., Jenson, G.O., Lee, T.R., Christopherson, C., & King, P.K. (1993). Impact evaluation of FACTS and feelings: A home-based video. *Family Relations, 42*(4), 392-400.

Miller, B.C., & Paikoff, R.L. (1992). Comparing adolescent pregnancy prevention programs: Methods and results. In B.C. Miller, J.J. Card, R.L. Paikoff, & J.L. Peterson (Eds.), *Preventing*

adolescent pregnancy (pp. 265-284). Newbury Park, CA: Sage Publications.

Mitchel-DiCenso, A., Thomas, B.H., Devlin, M.C., Goldsmith, C.H., Willan, A., Singer, J., Marks, S., Watters, D., & Hewson, S. (1997). Evaluation of an educational program to prevent adolescent pregnancy. *Health Education & Behavior, 24*(3), 300-3412.

Moberg, D.P., & Piper, D.L. (1990). An outcome evaluation of project model health: A middle school health promotion program. *Health Education Quarterly, 17*(1), 37-51.

Moberg, D.P., & Piper, D.L. (1998). The Healthy for Life Project: Sexual risk behavior outcomes. *AIDS Education and Prevention, 10*(2), 128-148.

Moore, K.A., Blumenthal, C., Sugland, B., Hyatt, B., Snyder, N., & Morrison, D.R. (1994). *State variation in rates of adolescent pregnancy and childbearing.* Washington, DC: Child Trends.

Moore, K.A., Sugland, B., Blumenthal, C., Glei, D., & Snyder, N. (1995). *Adolescent pregnancy prevention programs: Interventions and evaluations.* Washington, DC: Child Trends.

Newcomer, S., Duggan, A., & Toczek, M. (1999). Do school-based clinics influence adolescent birth rates? In A. Mundigo (Ed.), *Reproductive health: Programme and policy changes post-Cairo.* Belgium: IUSSP.

Nicholson, H.J., & Postrado, L.T. (1991). *Girls Incorporated preventing adolescent pregnancy: A program development and research project.* New York: Girls Incorporated.

O'Donnell, L., Stueve, A., Doval, A.S., Duran, R., Haber, D., Atnafou, R., Johnson, N., Grant, U., Murray, H., Juhn, G., Tang, J., & Piessens, P. (1999). The effectiveness of the Reach for Health community youth service learning program in reducing early and unprotected sex among urban middle school students. *American Journal of Public Health, 89*(2), 176-181.

O'Donnell, L., Stueve, A., O'Donnell, C., Duran, R., Doval, A.S., Wilson, R.F., Haber, D., Perry, E., & Pleck, J.H. (2000). *Long-term reduction in sexual initation and sexual activity among urban middle school participants in the Reach for Health community youth service learning HIV prevention program.* Unpublished manuscript.

Olsen, J.A., & Weed, S.E. (1986). Effects of family-planning programs for teenagers on adolescent birth and pregnancy rates. *Family Perspective, 20*(3), 153-170.

Orr, D.P., Langefeld, C.D., Katz, B.P., & Caine, V.A. (1996). Behavioral intervention to increase condom use among high-risk female adolescents. *Journal of Pediatrics, 128*(2), 288-295.

Paine-Andrews, A., Harris, K.J., Fisher, J.L., Lewis, R., Williams, E.L., Fawcett, S.B., & Vincent, M.L. (1999). Effects of a replication of a multi-component model for preventing adolescent pregnancy in three Kansas communities. *Family Planning Perspectives, 31*(4), 182-189.

Philliber, S., & Allen, J.P. (1992). Life options and community service: Teen Outreach Program. In B.C. Miller, J.J. Card, R.L. Paikoff, & J.L. Peterson (Eds.), *Preventing adolescent pregnancy* (pp. 139-155). Newbury Park, CA: Sage Publications.

Philliber, S., Kaye, J.W., Herring, S., & West, E. (2000). *Preventing teen pregnancy: An evaluation of the Children's Aid Society Carrera program.* Accord, NY: Philliber Research Associates.

Polen, M.R., & Freeborn, D.K. (1995). *Outcome evaluation of Project ACTION.* Portland, OR: Kaiser Permanente Center for Health Research.

Rotheram-Borus, M.J., Koopman, C., Haigners, C., & Davies, M. (1991). Reducing HIV sexual risk behaviors among runaway adolescents. *Journal of the American Medical Association, 266*(9), 1237-1241.

Schinke, S.P., Blythe, B.J., Gilchrist, L.D., & Burt, G.A. (1981). Primary prevention of adolescent pregnancy. *Social Work with Groups, 4*(1-2), 121-135.

Schochet, P.Z., Burghardt, J., & Glazerman, S. (2000, February 9). *National Job Corps study: The short-term impacts of Job Corps on participants' employment and related outcomes.* Report and Evaluation Report Series 00-A. Washington, DC: U.S. Department of Labor, Employment and Training Administration.

Schweinhart, L.J., Barnes, H.V., & Weikart, D.P. (1993). *Significant benefits: The High/Scope Perry Preschool study through age 27.* Ypsilanti, MI: The High/Scope Press.

Sellers, D.E., McGraw, S.A., & McKinlay, J.B. (1994). Does the promotion and distribution of condoms increase teen sexual activity? Evidence from an HIV prevention program for Latino youth. *American Journal of Public Health, 84*(12), 1952-1958.

Singh, S. (1986). Adolescent pregnancy in the United States: An interstate analysis. *Family Planning Perspectives, 18*(5), 210—220.

Slonim-Nevo, V., Auslander, W.F., Ozawa, M.N., & Jung, K.G. (1996). The long-term impact of AIDS-preventive interventions for delinquent and abused adolescents. *Adolescence, 31*(122), 409-421.

Sonenstein, F.L., Pleck, J.H., & Ku, L.C. (1989). Sexual activity, condom use and AIDS awareness among adolescent males. *Family Planning Perspectives, 21,* 152-158.

St. Lawrence, J.S., Jefferson, K.W., Alleyne, E., Brasfield, T.L., O'Bannon, R.E., III, & Shirley, A. (1995). Cognitive-behavioral intervention to reduce African American adolescents' risk for HIV infection. *Journal of Consulting and Clinical Psychology, 63*(2), 221-237.

St. Pierre, T.L., Mark, M.M., Kaltreider, D.L., & Aikin, K.J. (1995). A 27-month evaluation of a sexual activity prevention program in Boys & Girls Clubs across the nation. *Family Relations, 44*(1), 69-77.

Thomas, B., Mitchell, A., Devlin, M., Goldsmith, C., Singer, J., & Watters, D. (1992). Small group sex education at school: The McMaster Teen Program. In B.C. Miller, J.J. Card, R.L. Paikoff, & J.L. Peterson (Eds.), *Preventing adolescent pregnancy* (pp. 28-52). Newbury Park, CA: Sage Publications.

Vincent, M., Clearie, A., & Schluchter, M. (1987). Reducing adolescent pregnancy through school and community-based education. *Journal of the American Medical Association, 257*(24), 3382—3386.

Walker, G., & Vilella-Velez, F. (1992). *Anatomy of a demonstration.* Philadelphia, PA: Public/Private Ventures.

Walter, H.J., & Vaughn, R.D. (1993). AIDS risk reduction among a multi-ethnic sample of urban high school students. *Journal of the American Medical Association, 270*(6), 725-730.

Wang, L.Y., Davis, M., Robin, L., Collins, J., Coyle, K., & Baumler, E. (2000). Economic evaluation of Safer Choices. *Archives of Pediatric Adolescent Medicine, 154*(10), 1017-1024.

Warren, W.K., & King, A.J.C. (1994). *Development and evaluation of an AIDS/STD/sexuality program for grade 9 students.* Kingston, Ontario: Social Program Evaluation Group.

Weed, S.E., & Olsen, J.A. (1986). Effects of family planning programs for teenage pregnancy replication and extension. *Family Perspectives, 20*(3), 173-195.

Weed, S.E., Olsen, J.A., DeGaston, J., & Prigmore, J. (1992, December). *Predicting and changing teen sexual activity rates: A comparison of three Title XX programs.* Washington DC: Office of Adolescent Pregnancy Programs.

Weeks, K., Levy, S.R., Gordon, A.K., Handler, A., Perhats, C., & Flay, B.R. (1997). Does parental involvement make a difference? The impact of parent interactive activities on students in a school-based AIDS prevention program. *AIDS Education and Prevention, 9*(Supplement A), 90-106.

Winter, L., & Breckenmaker, L.C. (1991). Tailoring family planning services to the special needs of adolescents. *Family Planning Perspectives, 23*(1), 24-30.

Zabin, L.S., Hirsch, M.B., Smith, E.A., Streett, R., & Hardy, J.B. (1986). Evaluation of a pregnancy prevention program for urban teenagers. *Family Planning Perspectives, 18*(3), 119-126.

Chapter 5

Looking Forward: Conclusions About the State of Research and the Effectiveness of Programs

The previous chapter discussed in detail a multitude of studies on the effects of programs to prevent teen pregnancy. This chapter offers summary observations about the state of research in this field and then about what the research tells us about the effectiveness of programs.

Conclusions About the Research

At least four factors limit the conclusions that can be drawn from the many studies reviewed in this report. First, although more than 70 studies have examined the impact of programs designed to reduce teen pregnancy or HIV/STDs, there are many different approaches to reducing sexual risk-taking that have not been evaluated sufficiently — if at all. Consequently, it is not appropriate to reach conclusions about an entire approach to pregnancy prevention on the basis of one or even a small handful of studies. This is especially true when programs are implemented in different settings because their success may vary by the setting and group targeted. That is, just because a program is effective in one setting or with one group doesn't mean it will be equally so in a different environment with a different target population.

Second, there have been very few replications of most evaluations of specific programs. When programs have been replicated and evaluated, sometimes the initial study's positive results were confirmed; sometimes they were not. This calls into question our ability to make general statements about the effectiveness of types of some specific programs based on results from non-replicated studies.

Third, many of these studies were limited by methodological problems or constraints. Too often, studies have not used experimental designs (and therefore suffered from selection biases); have had sample sizes that were too small (and therefore failed to detect programmatically important outcomes, produced anomalous results, or had very large confidence intervals, meaning that the findings were more likely to be partly the result of chance); have used exploratory analytic techniques instead of confirmatory tech-

niques (i.e., have searched for positive results, rather than stating hypotheses first and then reporting results); have failed to control for the clustering of youth in schools or agencies (and thereby have exaggerated the statistical significance of results); or have failed to report and publish negative results. Accordingly, the results that are published are undoubtedly biased in multiple unknown ways but are especially likely to be biased in favor of positive results.

Fourth, some studies have produced inconsistent results. Some programs appeared to affect behavior, while other seemingly similar programs did not. When these inconsistencies occur, it is difficult to know whether the results varied because of methodological differences, whether the programs were implemented differently, or whether the programs were effective with only specific groups of youth in selected settings.

For these four reasons, it is difficult to reach many conclusions that are strongly supported by a body of evidence. As a result, some programs in this country are based on somewhat naive assumptions about what will change adolescent sexual behavior, and resources are undoubtedly not directed toward the most effective approaches. In addition, in a field as contentious as teen pregnancy prevention, it is important to be clear about the extent to which one's 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 those programs that appear promising but that have not been well-evaluated, including abstinence-only programs, clinic protocols and outreach efforts, pre-school interventions, additional types of youth development programs, and mass media programs for youth.
- Conduct basic research on other topics that may help to develop new approaches to reducing teen pregnancy (such topics include, for example, approaches to preventing and dealing with sexual abuse, methods for discouraging romantic relationships with much older partners, methods for addressing other antecedents of early voluntary sexual activity, approaches to increasing contraceptive continuation, ways to involve males in programs, important characteristics of effective youth development programs, and approaches to improving the life options that young people perceive they have, especially those who are poor or otherwise disadvantaged).
- Identify rigorous intervention studies in other fields (e.g., substance abuse prevention, violence prevention, and youth development programs) that may have data on fertility outcomes, and encourage new studies in these fields to add measures of fertility to the outcomes they are tracking in order to expand the range of program types evaluated that may help to reduce teen pregnancy.
- Improve the quality and rigor of research by using experimental designs with random assignment, obtaining large sample sizes, tracking youth for at least a year and preferably longer, measuring actual sexual and contraceptive behavior, conducting proper statistical analyses, and reporting results regardless of whether they are positive or negative. Whenever possible, these evaluations should be completed by independent parties.
- Identify programs that yield positive behavioral results in one study and re-evaluate them in different communities and with different program and research

teams to determine their success under different conditions.

- Conduct evaluations of effective programs specifically to identify which components or characteristics of these programs are the critical to their success.
- Conduct evaluations of selected programs (e.g., service learning) to understand more fully how they successfully affect the antecedents of teen pregnancy.
- Conduct research to improve our understanding of how to replicate with *fidelity* those programs that are found to be effective in two or more studies.

Conclusions About Programs

Despite the caveats expressed above, the patterns of results among existing studies do warrant several general conclusions about the effectiveness of particular types of programs:

- *Both the studies of antecedents and the evaluations of programs indicate that there are no single, simple approaches that will dramatically reduce adolescent pregnancy across the country.* While there are a number of effective programs, there are no "magic bullets." If pregnancy prevention programs and initiatives are to reduce pregnancy markedly, they may need to combine several effective components that address both the more "proximal" sexual antecedents of adolescent sexual behavior (such as values about abstinence and attitudes about contraceptive use) as well as the more "distal" non-sexual antecedents (such as community poverty, lack of opportunity, family disorganization, peer behaviors, attachment to school, substance abuse, and risk-taking more generally). This is particularly true for more disadvantaged adolescents.
- *A number of programs now appear to reduce sexual risk-taking, pregnancy, or childbearing, and they fall into three different groups. The first group includes those programs that address the sexual antecedents of sexual risk-taking (e.g., school- or community-based sex and AIDS education programs and some health clinic programs). The second group primarily addresses non-sexual antecedents (e.g., service learning programs). And the third group addresses both groups of antecedents (e.g., the* Children's Aid Society-Carrera Program*).*
- *Abstinence and use 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 HIV education programs, school-based clinics, and condom-availability programs, do not increase sexual activity. Many studies have reached this conclusion, and the rare study finding an increase in any measure of sexual activity is about what 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 youth 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 contraceptives for sexually active youth, did not decrease contraceptive use. Thus, giving appropriate emphasis to both abstinence and condoms or other contraceptives does not have the negative effects that people sometimes fear, and it can, in fact, have many positive effects.
- *Relatively little is known about the impact of programs that stress abstinence as the only acceptable behavior for unmarried*

teens. Until now, only a limited effort has been made to evaluate these programs, and very few well-designed studies have been completed. The rare study that was well designed did not find a delay in sexual intercourse, and this is not encouraging. However, because abstinence-only programs are such a diverse group, those few evaluations make it impossible to reach any overall conclusions about all abstinence-only programs. It seems plausible that some abstinence-only programs — especially those that incorporate the ten characteristics of effective sex and HIV education programs or those that include an effective youth development program with an abstinence message — may delay sexual intercourse. On the other hand, currently there does not exist any research with reasonably strong evidence demonstrating that any *particular* abstinence-only program actually delayed the onset of sexual intercourse or reduced any other measure of sexual activity. When studies currently under way are completed, this may change.

- *Studies of some sex and HIV education programs have produced credible evidence that they reduce sexual risk-taking either by delaying the onset 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 studies found these positive effects to endure for as long as 31 months. Studies of other sex and HIV education programs have failed to find positive effects on behavior. Effective sex and HIV education programs share ten characteristics that are described in Chapter 4 on pages 91-94.

- *Family planning clinics probably prevent a large number of teen pregnancies — although there is remarkably little evidence to support this common-sense view.* Each year many sexually active adolescent females attend family planning clinics or visit private physicians where they obtain contraceptives with higher effectiveness ratings than over-the-counter contraceptives. All else being equal, these contraceptives would logically reduce the pregnancy rates among those youth who use these prescribed methods. Non-experimental studies have estimated that tens or hundreds of thousands of pregnancies are prevented, the exact estimate depending on assumptions about how teens would behave sexually if these prescription contraceptives were not available. However, few studies have examined the impact of subsidized family planning services on pregnancy or birth rates, and none met the criteria for this review.

- *Several studies have consistently indicated that when clinics provide improved educational materials, discuss the adolescent patient's sexual and condom or contraceptive behavior, give a clear message about that behavior, and incorporate other components into the clinic visit, clinics can increase condom or contraceptive use, although not always for a prolonged period of time.*

- *School-based and school-linked clinics and school condom-availability programs do not increase sexual activity, but it is not clear whether they increase condom and contraceptive use.* Substantial percentages of sexually experienced female students in schools with school-based clinics obtain contraceptives from those clinics. Similarly, students obtain large numbers of condoms from schools, when schools provide those condoms 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 on contraceptive use have produced mixed results; a few found increases in condom or contraceptive use, while most did not. Notably, school-based or school-linked clinics that focused on contraceptive use and gave a clear message about abstinence and contraceptive use may have delayed sex and increased contraceptive use, while other clinics did not.

- *The small number of studies measuring the impact of community-wide initiatives and collaboratives to reduce teen pregnancy found mixed results.* One study reported evidence of a reduction in teen pregnancy rates, while others did not. It should be fully recognized, however, that these studies were population-based, which presented their respective programs with a very challenging goal: significantly changing the behavior of *all* the youth in their targeted communities, not just the behavior of a much smaller number of youth who participated directly in their programs.

- *Effective programs that addressed sexual antecedents shared two common attributes: they focused clearly on sexual behavior and condom or contraceptive use, and they gave clear messages about abstaining from sex or using protection against STDs and pregnancy.* These qualities helped define the effective school- and community-based sex and HIV education programs, the effective school-based clinic programs, the effective health clinic programs, and even the effective community collaboratives. Of those programs designed to address sexual antecedents, those programs that did not do so directly and that did not give clear messages about abstinence and the use of protection appeared to be less effective.

- *Service learning programs have the strongest evidence that they actually reduce teen pregnancy rates.* Service learning programs have been evaluated many times and in many communities, and different studies by different investigators have found positive effects on sexual risk-taking or pregnancy. This is very encouraging. However, it is unclear whether these programs reduce teen pregnancy beyond the academic year in which the students are involved in the programs. Notably, these programs did not focus on the sexual antecedents of unprotected sex, and some were not even designed to reduce teen pregnancy. However, they were intensive in that youth participated in them for many hours and often for prolonged periods of time. In addition to their success in reducing teen pregnancy, some of these programs had other positive results, such as reducing school failure.

- *Some other youth development programs (e.g., vocational education programs) that addressed non-sexual antecedents did not reduce teen pregnancy or childbearing even though they addressed seemingly important antecedents (such as basic reading, writing, and math skills and preparation for employment), were relatively intensive, and were long-lasting.*

- *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.*

- *The only evaluated program that intensively addressed both the sexual and non-sexual antecedents of disadvantaged youth (the* CAS-Carrera Program*) substantially reduced teen pregnancy reported by girls over a long period of time.* It also had other positive effects.

These conclusions indicate that programs may be effective both when they focus clearly on sexual behavior *and* when they don't address sexuality at all. Moreover, it is apparent that if programs target *sexual* antecedents, they must do so directly and must give a clear message. For example, they may discuss realistic situations that might lead to unprotected sex and methods for avoiding those situations, for remaining abstinent, and for using protection. If programs target *non-sexual* antecedents, then they need to intervene sufficiently intensively in the lives of youth so that youth become more motivated to avoid pregnancy and childbearing or simply have less opportunity to engage in unprotected sex. And, of course, the *CAS-Carrera Program* demonstrates that addressing both sexual and non-sexual antecedents can be very effective.

All in all, these findings bring good news because they mean that quite different approaches to reducing sexual risk-taking are emerging: some programs that address sexuality directly and a few programs that address youth development more broadly can reduce sexual risk-taking or pregnancy. This increases the choices that communities have for addressing teen pregnancy with effective programs.

While this review has focused principally on whether programs reduce teen pregnancy or the behaviors that lead to teen pregnancy, it is also true that much can be learned from this research about whether programs effectively reduce STDs, including HIV. After all, every program that delayed sex or increased condom use should logically reduce STD transmission. Most of these programs focused on sexual antecedents and were curriculum-based sex or HIV education programs or clinic-based programs. However, service learning programs, which do not focus on sexual antecedents, may delay the onset of sex and clearly can decrease teen pregnancy. Thus, they might also reduce STDs, although the evidence for that is dramatically weaker than it is for reducing teen pregnancy. This is an important area for further investigation.

□ □ □

In conclusion, considerable progress has been made to reduce teen pregnancy and STDs in this country. Our understanding of the antecedents of adolescent sexual risk-taking and pregnancy continues to grow and to broaden. The number of evaluations of specific programs continues to accumulate, and the quality of these studies continues to improve markedly. More important, the number of programs with evidence for behavioral change continues to increase and the strength of that evidence is improving. In just the last four years, a number of rigorous studies with random assignment that show long-term behavioral impact have been published, as have the first replications of studies with positive results. Most important, pregnancy and childbearing rates have declined every year since 1991. Certainly, there remains much to learn, but there are now some "emerging answers" to the question, "What works?" Adults working with youth should feel proud of their contribution to this success.

On the other hand, we should not be lulled into complacency. The evidence for the success of these programs, while improving markedly, is still not as strong as it should be. 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 youth and infants involved. Currently, relatively few youth in this country participate in the kinds of programs that have evidence for success, and past experience suggests that it is very

difficult to replicate successful programs with fidelity. This desperately needs to be done. And, finally, the number of teenagers in this country is expected to grow rapidly during the coming years, placing a much greater demand on all of our programs that serve youth. Clearly, we need to expand our effective programs and services rapidly in order to meet their needs. The final chapter in this report offers three strategies for using these research findings to select and design programs to prevent teen pregnancy at the community level.

Chapter 6

Bringing It Home: Applying These Research Results in Communities

How can one use this report's findings on the antecedents of adolescent sexual risk-taking and on the effects of various programs to select or design programs to reduce sexual risk-taking and pregnancy? This is not an easy question to answer, and, indeed, several excellent and detailed guides are available to help people design and implement programs (see "Excellent Guides" sidebar on the next page). Many issues need to be considered when choosing what type of programs to put in place. Several of the most important are:

- The actual sexual and contraceptive behavior of teens in the community;
- The values of the community about adolescent abstinence, sexual behavior, and contraceptive use;
- The community's concerns about teen pregnancy only versus concerns about teen pregnancy, STDs, and HIV;
- The quality of existing abstinence and sex and HIV/STD education programs in the schools and in other organizations that work with youth in the community;
- The availability of condoms and reproductive health services in the community;
- The extent to which most health care providers address adolescent sexual behavior and how they do so;
- The availability of employment opportunities in the community, the quality of schools, the stability and closeness of families, the monitoring and supervision of youth, and the existence of community programs for youth;
- The need for and interest in youth development programs for adolescents; and
- The resources — both staff resources and monetary resources — available to implement new programs.

With such considerations in mind, there are three strategies that communities should follow to increase the chances that the programs they select or design on their own will actually reduce sexual risk-taking or pregnancy:

1. Implement with fidelity programs demonstrated to be effective with similar populations.
2. Select or design programs that incorporate the key characteristics of programs that have been effective with similar populations.
3. Use logic models to select or design new programs.

1. Implement with fidelity programs demonstrated to be effective with similar populations.

The single most promising strategy for reducing teen pregnancy is to implement programs with fidelity that have been demonstrated to be effective in other places with similar youth. If a program has strong evidence that it reduced sexual risk-taking or teen pregnancy, if your target population is similar, and if you implement the program in the same way, then the chances are rather good that you will achieve similar results. If the program was found to be effective in several sites when implemented by different, independent groups, then your chances are even greater.

Of course, the question still remains: what *are* the most effective programs to reduce teen pregnancy? Unfortunately, that question cannot be answered definitively because there are thousands of programs and most have never been evaluated. Furthermore, the programs that have been evaluated have not been directly compared with one another 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.

On the other hand, it is possible to answer a related question: Which programs have the strongest evidence indicating that they delay sex, increase condom or contraceptive use, or reduce actual pregnancy or childbearing? This review has identified eight programs with strong evidence of effectiveness within the categories of sex and HIV education, service learning, and multiple-component interventions (see "Programs with Strong Evidence" sidebar on the next page). In order to be included in this list, a program must meet either of two sets of conditions. The first set of conditions includes an evaluation with an experimental design with random assignment, a large sample size, strong statistical analyses, and statistically significant and programmatically important behavioral effects for at least one year. The second set of conditions includes two or more studies conducted by independent research teams, each with at least a

Excellent Guides to Designing and Implementing Teen Pregnancy Prevention Programs

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. (www.teenpregnancy.org)

Brindis, C., & Davis, L. (1998). ***Communities Responding to the Challenge of Adolescent Pregnancy Prevention.*** Washington, DC: Advocates for Youth. (www.advocatesforyouth.org)

Card, J.J., Brindis, C., Peterson, J.L., & Niego, S. (2001). ***Guidebook: Evaluating Teen Pregnancy Prevention Programs*** (2nd edition). Los Altos, CA: Sociometrics. (www.socio.com)

Moore, K.A., & Sugland, B.W. (2001). ***Next Steps and Best Bets: Approaches to Preventing Adolescent Childbearing*** (2nd edition). Washington, DC: Child Trends. (www.childtrends.org)

Philliber Research Associates. (Ed.). (2001). ***Creating and Evaluating Successful Teen Pregnancy Programs.*** Accord, NY: Author. (www.phillibernresearch.com)

quasi-experimental design with both intervention and comparison groups and baseline and follow-up data, acceptable sample size, acceptable statistical analyses, and statistically significant and programmatically important behavioral effects for at least one year.

Programs that focus primarily on sexual antecedents. Two studies found that *Reducing the Risk* delayed the initiation of sexual intercourse and increased condom or contraceptive use among some groups of youth (see Chapter 4, p. 91). These results lasted for 18 months. The other four sex and HIV education programs on the list all had very strong experimental designs and positive results. *Safer Choices* increased condom and contraceptive use and decreased the frequency of unprotected sex over a 31-month period. *Making a Difference: An Abstinence Approach to STD, Teen Pregnancy, and HIV/AIDS Prevention* delayed the initiation of sex at three months and increased the use of condoms. *Making a Difference: A Safer Sex Approach to STD, Teen Pregnancy, and HIV/AIDS Prevention* reduced the frequency of sex, increased the use of condoms, and decreased unprotected sex during a 12-month period, and *Becoming A Responsible Teen* 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. For all five programs, some of their behavioral effects may have lasted longer than the time periods specified above, but the studies did not measure longer term effects. Although these results are very encouraging, none of these programs provided evidence for reduction in actual teen pregnancy. Although reduced sexual risk-taking should lead to reductions in pregnancy, the impact of these programs on pregnancy was either not measured or the findings were not statistically significant.

Programs with Strong Evidence of Success

I. Programs that Focus Primarily on Sexual Antecedents

Sex education programs covering both pregnancy and STDs/HIV[1]

- *Reducing the Risk*
- *Safer Choices*

HIV education programs[1]

- *Becoming a Responsible Teen: An HIV Risk Reduction Intervention for African-American Adolescents*
- *Making a Difference: An Abstinence Approach to STD, Teen Pregnancy, and HIV/AIDS Prevention*
- *Making a Difference: A Safer Sex Approach to STD, Teen Pregnancy, and HIV/AIDS Prevention*

II. Programs that Focus Primarily on Non-Sexual Antecedents

Service learning[2]

- *Teen Outreach Program (TOP)*
- *Reach for Health Community Youth Service Learning*

III. Programs that Focus Upon Both Sexual and Non-Sexual Antecedents

Multi-component programs with intensive sexuality and youth development component

- *Children's Aid Society-Carrera Program*[3]

1 While the sex and HIV education programs identified in this table demonstrated a positive impact upon sexual behavior and condom and contraceptive use, some other sex and HIV education programs did not have positive effects. Studies indicated that the sex and HIV education programs in this table reduced sexual risk-taking, but they did not provide evidence they reduced teen pregnancy.

2 All the service learning programs that have been evaluated, including the *Learn and Serve* programs, have found results suggesting a positive impact upon either sexual behavior or pregnancy. The *Learn and Serve* study is not included on this list because it did not meet the criteria for being on this list, but it did confirm the efficacy of service learning. According to the analysis of TOP, the particular curriculum used in the small group component did not appear to be critical to the success of service learning.

3 This program has provided the strongest evidence for a three-year impact upon pregnancy.

It should also be noted that all five of these curricula and their respective studies have been independently reviewed by the Centers for Disease Control and Prevention (CDC) and selected for their "Programs that Work" initiative. Two additional programs to reduce sexual risk-taking were selected by CDC for the "Programs that Work" initiative, but those two studies did not meet the criteria specified above.

Programs that focus primarily on non-sexual antecedents. In contrast to the sex and HIV education curricula, several studies suggest that service learning programs actually reduce teen pregnancy, at least during the academic year in which students participate (see Chapter 4, p. 108). The single service learning program with the strongest evidence for a reduction in teen pregnancy is the *Teen Outreach Program*. However, the *Reach for Health* service learning program delayed the onset of sexual intercourse and reduced sexual activity for as long as three years. Given that *no* studies have measured the impact of service learning programs and found that they failed to reduce teen pregnancy, it may be the case that many intensive service learning programs are effective. As has been noted before, all the service learning programs that have been evaluated were very intensive and lasted many months with many hours of structured time for participants.

A program that focuses on both sexual and non-sexual antecedents. *The Children's Aid Society-Carrera Program* is the only program with strong evidence that (among girls) it delayed sex, increased simultaneous use of condoms and other more effective contraceptives, and decreased both teen pregnancy and teen birth rates. Furthermore, the study indicated that the program had very long-term effects — effects that lasted three years after youth joined the program.

Of the eight programs with strong evidence, *Reducing the Risk, Safer Choices,* the *Teen Outreach Program*, and the *Children's Aid Society-Carrera Program* have all been implemented in five or more communities and been found to be effective. This suggests that their success is not limited to a single type of community or to a particular program team.

A very important question remains, however: what is the magnitude of the impact of these programs? How much of an improvement in behavior do they make? This is another question that is surprisingly difficult to answer. On the one hand, each of these programs had meaningful behavioral results. For example, *Reducing the Risk* decreased the percent of sexually inexperienced youth who subsequently engaged in unprotected sex by about half, from 16 percent to 9 percent (Kirby et al., 1991). *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 (Coyle et al., forthcoming). *Making a Difference: An Abstinence Approach to STD, Teen Pregnancy, and HIV/AIDS Prevention* reduced the percent of youth who had sex during the previous 3 months from 22 percent to 13 percent, a 42 percent reduction. *Making a Difference: A Safer Sex Approach to STD, Teen Pregnancy, and HIV/AIDS Prevention* reduced the percentage of youth who reported 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 (Jemmott et al., 1998). *Becoming A Responsible Teen* reduced the percent of sexually inexperienced youth who initiated sex during a 12-month period from 31 percent to 12 percent, a 63 percent reduction (St. Lawrence et al., 1995). The *Reach for Health* service learning program reduced the percent of youth who initiated sex from 27 percent to 19 percent, a 29 percent reduction (O'Donnell et al.,

2000). Finally, the *Children's Aid Society-Carrera Program* reported a reduction in pregnancy rate among girls after three years in the program from 22 percent to 10 percent, a 55 percent reduction (Philliber et al., 2000). All of these reductions are very encouraging.

However, for several reasons, these reductions are somewhat misleading, and people replicating 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 also among the largest effects in each study. Typically, these studies did not have such large effects on other behavioral outcomes. For example, *Reducing the Risk* did not have as large or significant an impact on frequency of sex as it did upon 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 these results were statistically significant, all of these estimates had rather large confidence intervals — meaning that chance probably affected the size of some of these results. In theory, chance could either enhance or diminish the apparent effects of these programs. However, given that these were among the largest effects, it is likely that they enhanced some of them, and replications would be more likely to report smaller effects.

Although these eight programs have the *strongest* evidence for success and the estimated magnitude of their success is impressive, it is important to emphasize that these are *not* the only programs in this country with evidence that they have a positive impact on adolescent sexual behavior. Both the text and tables in Chapter 4 identify numerous other programs that provide *some* evidence that they changed behavior in desired directions, but the strength of that evidence is simply 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 put in place, should community leaders confine themselves to these eight programs with the strongest evidence of effectiveness? On the one hand, community leaders should obviously give these programs serious consideration because of both the magnitude of their positive effects and the strength of the evidence for their success. On the other hand, community leaders will probably want to consider other programs. After all, these programs are not appropriate for youth of all ages, they may not match the needs of particular groups of youth, and they may not match the values or resources of some communities. And, of course, none of these programs eliminated sexual risk-taking or pregnancy. It is probably the case that to dramatically reduce teen pregnancy, broad-scale, community-wide initiatives will require a number of programmatic components to address the wide variety of sexual and nonsexual antecedents of adolescent sexual behavior described in Chapter 2.

2. Select or design programs that incorporate the key characteristics of programs that have been effective with similar populations.

When it is not possible to implement programs that have been demonstrated to be effective, then a second promising strategy is to select or design programs that incorporate the common characteristics of effective programs, especially programs that have involved similar target populations. In doing so, the chances are increased that positive behavioral results will be obtained. Of course, whether or not the program is actually effective may depend upon (1) properly

identifying the critical characteristics of effective programs, and then (2) designing or implementing a program that actually incorporates those characteristics.

Chapter 4 identified ten common characteristics of effective sex and HIV education programs (see p. 91-94). These characteristics appear to distinguish effective programs from ineffective ones, and they are similar to identified common characteristics of effective drug prevention programs. Thus, those ten characteristics may be a helpful guide for selecting programs that have not yet been evaluated or for designing new ones.

The research on programs other than sex and HIV education programs (i.e., clinic-based programs and others noted in Chapter 4) does not allow for the identification of a similar list of key characteristics. However, given that important caveat, these other groups of effective programs do appear to share a few common characteristics. First, nearly all of the effective programs that addressed sexual antecedents focused clearly on changing particular sexual behaviors and gave a clear message about those behaviors (i.e., to remain or become abstinent or to always use protection against pregnancy and STDs). A particularly good example of this was the group of clinic-based programs with modest clinician-patient interventions giving a clear message to clinic patients (see Chapter 4, p. 97). Second, effective programs that incorporated youth development components (e.g., service learning and the *CAS-Carrera Program*) were all very intensive and involved youth for many months (if not years). However, it is not known which characteristics or components of these programs (i.e., type of staff, duration of special classes, etc.) are the most critical.

3. Use logic models to select or design new programs.

If it is not appropriate or possible to put in place an existing program that research has shown to be effective or one with the common characteristics of effective programs, then a final strategy can be adopted. Communities can employ a process used by the many developers of effective programs — they can create a logic model to design the program. Many of the people who developed effective programs explicitly used a logic model; others used the *principles* inherent in logic models.

This third strategy for reducing teen pregnancy is clearly much more challenging and more problematic than either of the first two because it involves actually developing a completely new intervention, rather than implementing an existing one. However, this strategy of using a logic model is far more flexible than trying to build on the specific characteristics of other programs and can be combined with either of the first two strategies.

Logic models are concise, causal descriptions of the mechanisms through which specific program activities can affect behavior. Thus, at a minimum, they must include a specification of (1) the behaviors to be changed, (2) the antecedents of each of those behaviors, and (3) the particular program activities designed to change each selected antecedent. They also include a specification of the expected causal links among these three basic model components. Logic models are sometimes called causal models or program models.

A full discussion of logic models would be too detailed to include in this report.[1]

1 A recent guide, *BDI Logic Models: A Useful Tool for Designing, Strengthening, and Evaluating Programs to Reduce Adolescent Pregnancy* (Kirby, 2000), describes how to develop logic models for pregnancy prevention initiatives. For a much more extensive discussion of this topic and processes for designing programs, see *Intervention Mapping: Designing Theory and Evidence-Based Health Promotion Programs* (Bartholomew et al., 2001).

However, it is worthwhile here to describe the three important, basic steps in developing one:

Step #1: Identify specific sexual behavior goals for the different groups of teens being targeted. Three logical behavioral goals for reducing teen pregnancy are to (1) delay the onset of sexual intercourse, (2) reduce the frequency of sexual intercourse (including returning to abstinence), and (3) increase the use of effective contraception among those having sex. Ideally, these behavioral goals should be determined by current measured levels of sexual risk-taking and should also reflect the values and other goals of the community. This step is also an important activity to complete even when using either of the first two strategies for selecting programs.

Step #2: For each targeted group of youth, identify (to the extent feasible) the antecedents that are most highly related to the sexual behaviors you want to change, and then select those antecedents that can be changed. The chart on page 27 of Chapter 2 summarizes some of the most important antecedents for teen sexual risk-taking and pregnancy, while Tables 2.1-2.7 identify many additional antecedents for each particular behavior. Although these lists should be informative and helpful, the antecedents in those tables are based on studies of teens in many different communities. To the extent possible, communities should identify the most important antecedents for the behavioral goals of the targeted groups in their *own* communities. If a community is somewhat heterogeneous, then the most important antecedents of each behavioral goal may vary from one targeted group to another.

Ideally, program designers would use surveys or existing records to measure possible antecedents and sexual behaviors and then observe the strength of the relationships between each possible antecedent and each selected behavior. However, when this is not possible, focus groups with targeted populations can be a less costly substitute method for verifying potentially important antecedents. When identifying these antecedents, it is particularly important to identify those that have a causal impact on sexual behavior and not merely a non-causal association. Determining causality can be difficult.

Once the most important antecedents for the target population have been identified, the program designer then needs to select those antecedents that can be changed substantially with the programmatic resources available. Thus, the program must be able to change the selected antecedents, and, in turn, the changes in the antecedents must have an impact upon behavior. For example, if one's goal is to delay the initiation of sex among teens in a particular school, there are many potentially important antecedents that are highly relevant (see Chapter 2, Table 2.1). However, in a particular community, program designers might find that there are only two particular antecedents that they believe they can change and that are highly related to the initiation of sex: (1) the belief that peers have permissive attitudes toward adolescent sex and (2) the belief that peers are having sex. These are just examples; when designing effective programs, program designers typically need to select more than two antecedents.

Step #3: Identify the particular activities or programmatic components that will affect each selected antecedent. That is, having chosen the antecedents in Step #2, then specify the particular activities or program components that will change those antecedents. Careful consideration should be given to whether or not the program activities being considered are sufficiently strong to markedly change the antecedents. Ideally, each targeted antecedent will have several activities or program components designed

to affect it. However, some activities or components can also affect more than one antecedent. Although not reviewed in this report, there is a large amount of experience, theory, and research about what types of program activities affect different antecedents (for example, there is research describing what types of activities change perceptions of peer norms and increase self-efficacy).

By way of illustration, take the antecedents related to peers selected in the example under Step #2. The program developers in this hypothetical community could conduct a survey of the students in the school to measure their beliefs about adolescent sex and their actual sexual behavior. Such surveys often reveal that most teens believe that it is a good idea to wait until they are older to have sex and that fewer teens have had sex than most students would think. The program intervention that logically comes next is for these data to be presented to the students and discussed in small groups in an attempt to counter the beliefs that (1) peers favor early sex and (2) everyone is having sex. (Of course, if most teens actually *do* favor sex and most *are* having sex, then this program intervention would not be appropriate.)

When the logic model is completed, it provides a detailed guide specifying what key program activities will be implemented, which antecedents they will affect, and which sexual behaviors will be modified by the changes in these antecedents. Consequently, it can guide the development and implementation of the program, as well as any possible evaluation of it.

□ □ □

Thus, in the coming years, communities should not naively focus on simplistic solutions that have little chance for markedly reducing teen pregnancy. Instead, they should (1) replicate much more broadly and with fidelity those programs with the greatest evidence for success, (2) replicate more broadly programs incorporating the common qualities of effective programs, and (3) design and implement programs that effectively address the important antecedents of sexual risk-taking. In addition, we should all continue to explore, develop, and rigorously evaluate promising approaches.

We live in a hopeful time. Declining teen pregnancy and birth rates, combined with a stronger body of research on the antecedents of teen sexual risk-taking and on the impact of programs, should increase our confidence to continue building on current success. The challenge will be to integrate what we learn from experience with what we learn from research and to have that pooled knowledge guide our development of more effective programs for youth. Such programs will help young people avoid pregnancy and STDs, make a successful transition to adulthood, become educated and self-sufficient, and then become ready to be parents for the next generation.

References

Bartholomew, L.K., Parcel, G.S., Kok G., & Gottlieb, N.H. (2001). *Intervention mapping: Designing theory and evidence-based health promotion programs.* Mountainview, CA: Mayfield Publishing Company—A McGraw-Hill Company.

Coyle, K.K., Basen-Enquist, K.M., Kirby, D.B., Parcel, G.S., Banspach, S.W., Collins, J.L., Baumler, E.R., Caravajal, S., & Harrist, R.B. (forthcoming). Safer Choices: Long-term impact of a multi-component school-based HIV, STD, and pregnancy prevention program. *Public Health Reports.*

Jemmott, J.B., III, Jemmott, L.S., & Fong, G.T. (1998). Abstinence and safer sex: A randomized trial of HIV sexual risk-reduction interventions for young African-American adolescents. *Journal of the American Medical Association, 279*(19), 1529-1536.

Kirby, D. (2001). *BDI logic models: A useful tool for designing, strengthening, and evaluating programs to reduce adolescent pregnancy.* Santa Cruz, CA: ETR Associates.

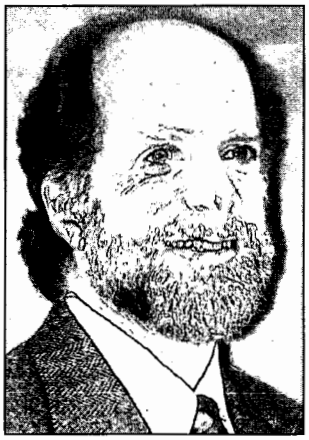
Kirby, D., Barth, R., Leland, N., & Fetro, J. (1991). Reducing the Risk: A new curriculum to prevent sexual risk-taking. *Family Planning Perspectives, 23*(6), 253-263.

O'Donnell, L., Stueve, A., O'Donnell, C., Duran, R., Doval, A.S., Wilson, R.F., Haber, D., Perry, E., & Pleck, J.H. (2000). *Long-term reduction in sexual initation and sexual activity among urban middle school participants in the Reach for Health community youth service learning HIV prevention program.* Unpublished manuscript.

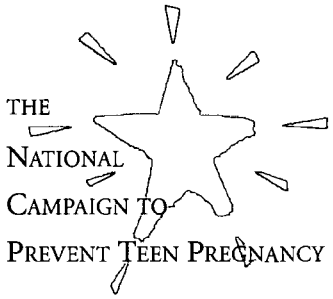
Philliber, S., Kaye, J.W., Herring, S., & West, E. (2000). *Preventing teen pregnancy: An evaluation of the Children's Aid Society Carrera program.* Accord, NY: Philliber Research Associates.

St. Lawrence, J.S., Jefferson, K.W., Alleyne, E., Brasfield, T.L., O'Bannon, R.E., III, & Shirley, A. (1995). Cognitive-behavioral intervention to reduce African American adolescents' risk for HIV infection. *Journal of Consulting and Clinical Psychology, 63*(2), 221-237.

About the Author



Douglas Kirby, Ph.D., is a Senior Research Scientist at ETR Associates in Scotts Valley, California. For more than 22 years, he has directed statewide and nationwide studies of adolescent sexual behavior, abstinence-only programs, sexuality and 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*, and *Draw the Line* curricula, all of which significantly reduced unprotected sex, either by delaying sex, increasing condom use, or increasing contraceptive use. He has painted a more comprehensive and detailed picture of the risk and protective factors associated with adolescent sexual behavior, contraceptive use, and pregnancy, and has identified important common characteristics of effective sexuality education and HIV education programs. 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 Centers for Disease Control and Prevention, the National Institutes of Health, the former Office of Technology Assessment, and various foundations. Dr. Kirby serves on the Board of the National Campaign to Prevent Teen Pregnancy and chairs the National Campaign's Task Force on Effective Programs and Research. He is the author of *No Easy Answers: Research Findings on Programs to Reduce Teen Pregnancy* (1997).



The National Campaign to Prevent Teen Pregnancy is a nonprofit, nonpartisan initiative supported almost entirely by private donations. The Campaign's mission is to improve the well-being of children, youth, and families by reducing teen pregnancy. Our goal is to reduce the rate of teen pregnancy by one-third between 1996 and 2005.

NATIONAL CAMPAIGN TO
PREVENT TEEN PREGNANCY
1776 MASSACHUSETTS AVENUE, NW
SUITE 200
WASHINGTON, DC 20036
(202) 478-8500
(202) 478-8588 FAX
CAMPAIGN@TEENPREGNANCY.ORG
WWW.TEENPREGNANCY.ORG

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

ERIC

UD034268

REPRODUCTION RELEASE

(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: Emerging Answers

Author(s): National Campaign to Prevent Teen Pregnancy

Corporate Source: NCPTP

Publication Date: May, 2001

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, *Resources in Education* (RIE), are usually made available to users in microfiche, reproduced paper copy and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following three options and sign at the bottom of the page.

The sample sticker shown below will be affixed to all Level 1 documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

Level 1

☒

Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g., electronic) and paper copy.

The sample sticker shown below will be affixed to all Level 2A documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY

sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2A

Level 2A

☐

Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only

The sample sticker shown below will be affixed to all Level 2B documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2B

Level 2B

☐

Check here for Level 2B release, permitting reproduction and dissemination in microfiche only

Documents will be processed as indicated provided reproduction quality permits.
If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.

I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Sign here, → please

Signature: Ingrid Sandin

Printed Name/Position/Title: Communications Assistant

Organization/Address: NCPTP/1776 Mass Ave NW #200 Washington, DC 20036

Telephone: 202-478-8523

FAX: 202-478-8588

E-Mail Address:

Date: July 4, 2001

(over)

III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, or, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor:
Address:
Price:

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant this reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:
Address:

V. WHERE TO SEND THIS FORM:

Send this form to the following ERIC Clearinghouse:

However, if solicited by the ERIC Facility, or if making an unsolicited contribution to ERIC, return this form (and the document being contributed) to:

ERIC Clearinghouse on Urban Education
Teachers College, Columbia University
Box 40
525 W. 120th Street
New York, NY 10027

Toll Free: (800) 601-4868
Fax (212) 678-4012
Email: eric-cue@columbia.edu