



Center for Reproductive
Health Research
& Policy

**Cost-Benefit Analysis of the California Family PACT
Program for Calendar Year 2002**

**Submitted to the
State of California
Department of Health Services
Office of Family Planning**

January 2005

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

This report was prepared by staff of the Center for Reproductive Health Research and Policy in the Institute for Health Policy Studies (IHPS) and Department of Obstetrics, Gynecology, & Reproductive Sciences at the University of California, San Francisco.

Claire Brindis, DrPH, Principal Investigator

Primary Authors

Gorette Amaral, MHS

Diana Greene Foster, PhD

Contributors

M. Antonia Biggs, PhD

Mary Bradsberry

Mike Howell

Suggested Citation

Brindis CD, Amaral G, Foster DG, Biggs MA. Cost-Benefit Analysis of the California Family PACT Program for CY 2002. Submitted to the State of California, Department of Health Services, Office of Family Planning, 2005.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
I. INTRODUCTION.....	5
II. METHODS FOR ESTIMATING PREGNANCIES AVERTED.....	6
III. METHODS FOR ESTIMATING THE COST-EFFECTIVENESS OF PREGNANCY PREVENTION.....	7
IV. FINDINGS	8
V. CONCLUSION.....	11
TECHNICAL APPENDIX A: LITERATURE ON THE COSTS OF PREGNANCY AND CHILDBEARING	13
TECHNICAL APPENDIX B: PREGNANCIES AVERTED CALCULATIONS.....	15
TECHNICAL APPENDIX C: COST-SAVINGS CALCULATIONS	19
TECHNICAL APPENDIX D: SENSITIVITY ANALYSES.....	23
REFERENCES.....	25

EXECUTIVE SUMMARY

Overview of Study

- Since its implementation in 1997, California's Family PACT Program has had a significant effect on the lives and wellbeing of low-income individuals by preventing unintended pregnancy and preserving reproductive health. This study compared the cost of providing publicly-funded family planning services through the Family PACT Program in Calendar Year 2002 to the public sector expenditures which would have occurred in the program's absence as a result of unintended pregnancy. The results estimate local, state, and federal government savings from the investment in Family PACT services.

Pregnancies Averted by Family PACT

- Through the provision of contraceptive methods to nearly a million (926,218) women and 113,042 men in 2002, **the Family PACT Program averted an estimated 213,200 unintended pregnancies in California**, including 204,950 pregnancies to female clients and 8,250 to male clients.
- The 204,950 pregnancies averted to female clients would have led to approximately **93,970 live births, 78,620 abortions, 2,050 ectopic pregnancies, and 30,310 miscarriages**.

Public Sector Cost-Savings

- The prevention of an unintended pregnancy results in significant cost-savings to the federal, state, and local governments. Low-income pregnant women can qualify for several public programs which provide free or low-cost medical services before and after a delivery, as well as income support and social services for themselves and their children.
- Each pregnancy averted by Family PACT saved the public sector approximately \$5,431 in medical, welfare, and other social service costs for a woman and child from conception up to two years after birth and saved \$10,508 up to 5 years after birth.
- **The total public sector cost-savings of the pregnancies averted by Family PACT in CY 2002 was over \$1.1 billion up to two years after birth, and \$2.2 billion five years after birth.**
- Although adolescents account for approximately 21% of the total pregnancies averted by Family PACT, averting adolescent pregnancies accounts for over 30% of the cost-savings.
- The share of public sector cost-savings up to age 2 was 62% federal, 37% state, and 1% local. To age 5, the share of savings was 65% federal, 34% state, and 1% local.
- The Family PACT Program's total service expenditures were \$403.8 million in 2002. By reducing public health and welfare expenditures resulting from unintended pregnancies, **every dollar spent on Family PACT saved the public sector \$2.76 up to two years after birth and \$5.33 five years after birth.**
- Through the provision of effective methods of contraception to low-income individuals who have limited access to these services elsewhere, the Family PACT Program has reduced the number of unintended pregnancies in California resulting in substantial financial savings to local, state, and federal governments.

I. INTRODUCTION

Since its implementation in 1997, California's Family PACT Program has had a significant effect on the lives and well-being of low-income individuals. During its first full year of operation, Fiscal Year (FY) 1997/98, the Family PACT Program averted over 108,000 unintended pregnancies and saved an estimated \$512 million in public expenditures, including medical care and social services for women and children for two years after birth. Every dollar spent on Family PACT client services saved \$4.48 in medical and social service costs.¹

A number of changes have occurred in the Family PACT Program since 1997/98 and have prompted the need for an updated analysis:

1. The number of clients served annually has doubled from 750,000 to 1.5 million between FY 1997/98 and Calendar Year (CY) 2002.ⁱ
2. Program costs have increased significantly, from \$114 million in FY 1997/98 to \$403.8 million in CY 2002ⁱ, due to growth in the number of clients served, medical costs, and service utilization.
3. Eligibility requirements, funding levels, and participation rates in many federal and state public sector health and welfare programs have changed.
4. The Centers for Medicaid and Medicare Services (CMS) approved a Medicaid 1115(b) Waiver Demonstration Project for Family PACT in 1999, providing a federal match for the funding of contraceptive services. The primary goals of the demonstration project are to increase access to family planning for adolescents, women living in remote and underserved areas, and males. These populations are reflected in this analysis.

This study compares the cost of providing publicly-funded family planning services through the Family PACT Program to the public sector expenditures which would have occurred as a result of unintended pregnancy in the program's absence. Three sets of analyses were undertaken. The first estimated the number of pregnancies averted by Family PACT in CY 2002. The second estimated the public sector expenditures which would have resulted from those unintended pregnancies from conception to age two and age five of the child. The third synthesizes the first two analyses and estimates the cost-effectiveness of the Family PACT Program. Cost-effectiveness was measured as the ratio between averted costs and dollars invested in the Family PACT Program. The results reveal how much local, state, and federal governments save in the short-term by investing in Family PACT.

This study draws upon lessons learned in past research (see Technical Appendix A) to examine the cost-effectiveness of California's Family PACT services in CY 2002. This evaluation accounts for changes which have occurred in the funding, eligibility requirements, and time limits on various social service programs since the 1997/98 cost-benefit analysis. Coupled with the fact that the number of clients served by Family PACT, as well as program expenditures, have increased significantly since 1997/98, these changes have the potential to affect the costs and savings associated with Family PACT's pregnancy prevention efforts.

ⁱ Family PACT Paid Claims Data, FY 97/98 through CY 2002.

II. METHODS FOR ESTIMATING PREGNANCIES AVERTED

Calculating the Number of Pregnancies Averted

The number of pregnancies averted by Family PACT was calculated as the difference between the number of pregnancies expected among clients from the number of pregnancies expected in the program's absence. The estimate is based on the methodology established for the FY 1997/98 Family PACT evaluation and published in the *American Journal of Public Health* in August 2004², but updated with new program data regarding the clients served, methods dispensed, and contraceptive methods used in the absence of Family PACT. Estimates of the number of pregnancies averted to the partners of male clients are also presented, but are not included in the cost-benefit calculations since it is not known whether the partners of male clients would be eligible for public services.

Calculating the Number of Pregnancies Expected Among Family PACT Clients

The number of pregnancies expected among clients was estimated for the 926,218 female and 113,042 male clients who received contraceptive methods through Family PACT during the 2002 calendar year, according to paid claims data on contraceptive methods dispensed. See Technical Appendix B for details.

Calculating the Number of Pregnancies Expected in the Absence of Family PACT

Estimates of contraceptive use in the absence of Family PACT are based on reports of what methods clients used prior to enrollment, based on the first visits of 122 men and 868 women who were not pregnant or seeking pregnancy according to the FY 2000/01 Medical Record Review (MRR). See Technical Appendix B for details.

III. METHODS FOR ESTIMATING THE COST-EFFECTIVENESS OF PREGNANCY PREVENTION

Calculating the Cost-Effectiveness of the Family PACT Program

The net fiscal impact of the Family PACT Program is the difference between the public sector costs that would have resulted from unintended pregnancies in the program's absence and the cost of providing family planning services to prevent those pregnancies. Cost-effectiveness was measured as the ratio between averted costs and dollars invested in the Family PACT Program.

Calculating the Public Sector Costs of Unintended Pregnancy

Low-income pregnant women can qualify for several public health and social programs which provide free or low-cost services before and after delivery for themselves and their children.ⁱⁱ The financial cost to society depends on each program's cost per enrollee, eligibility requirements, and actual participation levels. The estimate of public costs was derived from each program's budgetary and participation data. Although Family PACT collects data based on calendar year in accordance with waiver requirements, the costs of public programs are expressed in fiscal year dollars, for the year 2002/03. Eligibility of Family PACT clients for these programs was estimated from demographic data (e.g., income, family size, age, and immigration status) from the Family PACT client eligibility form. Costs were also adjusted for the likelihood that these costs were prevented rather than just postponed.ⁱⁱⁱ See Technical Appendix C for details. Total public sector costs were calculated from conception through the end of pregnancy. For pregnancies which would have resulted in a live birth, the costs from delivery to age two and age five of the child were also calculated.

Total Family PACT Program Costs

Total expenditures for Family PACT clinical services in CY 2002 were \$403.8 million according to paid claims data. Since most clients use a range of clinical services, not just contraceptives, the total cost of all Family PACT services is included in this analysis. The intent is to measure the cost-effectiveness of the program in its entirety.

ⁱⁱ The programs included in the calculation of medical costs of women and children are Medi-Cal (California's Medicaid program) and Healthy Families. Costs that apply to children with special health care needs are California Children's Services, Early Start, and Supplemental Security Income (SSI). Income support programs for mothers include cash grants from California's Temporary Assistance for Needy Families (TANF) program (known as Cal-WORKs), Cal-WORKs employment services, the Cal-WORKs special pregnancy payment, Food Stamps, and WIC. Other social service programs included Cal-WORKs Stage 1 child care, the California Department of Education's child care and development programs, foster care, and Head Start/Early Head Start. Programs for pregnant or parenting teens included Cal-Learn, Cal-SAFE, and the Adolescent Family Life Program.

ⁱⁱⁱ For pregnancies that are either entirely prevented or at least delayed to a point in time when a woman may no longer need to rely on public aid to cover the costs, governments save the whole set of associated costs. However, for some pregnancies which are merely delayed and for which the government will cover the costs later, the government saves the difference between paying for the pregnancy now and paying for it later.

IV. FINDINGS

Pregnancies Averted by the Family PACT Program

Based on method use before enrollment, 27 percent of Family PACT clients would use no contraception at all and nearly 40 percent of women would use an over-the-counter method in the program's absence. In CY 2002, Family PACT dispensed contraceptives to 926,218 women and 113,042 men.^{iv} On average, women received seven months of contraceptive coverage and men received three months. **One year of Family PACT services averted an estimated 213,200 unintended pregnancies, including 204,950 pregnancies to female clients and 8,250 to male clients and their partners.** Of the pregnancies averted to female clients, 161,340 pregnancies were averted to adults (age 20-44) and 43,610 to adolescents (age 15-19). (See Figure 1). Among the 204,950 pregnancies averted to females, Family PACT prevented 93,970 births, 78,620 abortions, 2,050 ectopic pregnancies, and 30,310 miscarriages.

Figure 1: Contraceptives Dispensed and Pregnancies Averted through the California Family PACT Program, 2002

Gender and Age Group*	Clients dispensed contraceptives	Average months of protection dispensed	Estimated pregnancies with Family PACT	Estimated pregnancies without Family PACT	Estimated pregnancies averted*	Estimated induced abortions averted	Estimated births averted
Total Females	926,218	6.91	24,760	229,710	204,950	78,620	93,970
Adolescents	202,289	6.37	6,145	49,760	43,610	15,700	21,370
Adults	723,929	7.06	18,615	179,950	161,340	62,920	72,600
Total Males	113,042	3.09	2,700	10,950	8,250	3,170	3,780
Adolescents	24,749	2.91	675	2,220	1,550	560	760
Adults	88,293	3.14	2,025	8,730	6,700	2,610	3,020
Total	1,039,260	6.49	27,460	240,660	213,200	81,790	97,750
Adolescents	227,038	5.99	6,820	51,980	45,160	16,260	22,130
Adults	812,222	6.63	20,640	188,680	168,040	65,530	75,620

*Adolescents refer to individuals aged 15-19. Adults refer to those aged 20-44.

Note: Pregnancies ending in birth or abortion are shown; those ending in miscarriage or ectopic pregnancy are shown in Appendix B, Figure 9.

Public Sector Costs of Unintended Pregnancies

Each pregnancy averted by Family PACT saved the public sector \$5,431 in medical, welfare, and other social service costs for a woman and child from conception up to two years after a birth (\$4,675 for women aged 20-44 and \$8,228 for those aged 14-19). Given the number of pregnancies averted to adult and adolescent females (161,340 and 43,610, respectively) and the likely outcomes of these pregnancies, **the estimated total cost-savings of the unintended pregnancies averted by Family PACT in 2002 was over \$1.1 billion over two years** (\$754 million for adults, \$359 million for adolescents)^v (See Figure 2).

^{iv} Based on Family PACT enrollment and claims data for CY 2002.

^v The number of pregnancies averted to males and their partners is not used in calculation of cost-savings because there is no way to know whether the partners of male clients would be eligible for publicly-funded programs.

Figure 2: Public Sector Costs* of Unintended Pregnancies Incurred by Women and Children to Age 2

Public Sector Costs	Adults (age 20-44)	Adolescents (age 14-19)	Overall
Medical costs, conception through end of pregnancy	\$243,702,449 (\$1,511 each)	\$85,104,151 (\$1,951 each)	\$328,806,600 (\$1,604 each)
Medical costs, woman and child, birth to age 2	\$166,484,409 (\$1,032 each)	\$64,981,937 (\$1,490 each)	\$231,466,346 (\$1,129 each)
Income support and social services, birth to age 2	\$328,361,613 (\$2,035 each)	\$203,220,501 (\$4,660 each)	\$531,582,114 (\$2,594 each)
Services for children with special needs, birth to age 2	\$15,645,816 (\$97 each)	\$5,526,548 (\$127 each)	\$21,172,364 (\$103 each)
Total savings per pregnancy, conception to age 2	\$754,194,287 (\$4,675 each)	\$358,833,137 (\$8,228 each)	\$1,113,027,424 (\$5,431 each)

* Costs have been adjusted for the likelihood a Family PACT client qualifies for (on the basis of income, age, and immigration status) and actually enrolls in each program, the likelihood that the costs were prevented rather than postponed, and discounting of future costs.

Over five years, Family PACT saved \$10,508 in public sector costs per averted pregnancy (\$9,338 for adults, \$14,837 for adolescents), for a total of \$2.2 billion (\$1.5 billion for adults, \$647 million for adolescents) (See Figure 3).

Although adolescents account for approximately 21% of the total pregnancies averted by Family PACT, averting adolescent pregnancies accounts for over 30% of the cost-savings.^{vi}

Figure 3: Public Sector Costs* of Unintended Pregnancies Incurred by Women and Children to Age 5

Public Sector Costs	Adults (age 20-44)	Adolescents (age 14-19)	Overall
Medical costs, conception through end of pregnancy	\$243,702,449 (\$1,511 each)	\$85,104,151 (\$1,951 each)	\$328,806,600 (\$1,604 each)
Medical costs, woman and child, birth to age 5	\$305,251,427 (\$1,892 each)	\$126,811,846 (\$2,908 each)	\$432,063,272 (\$2,108 each)
Income support and social services, birth to age 5	\$920,125,668 (\$5,703 each)	\$421,945,902 (\$9,675 each)	\$1,342,071,570 (\$6,548 each)
Services for children with special needs, birth to age 5	\$37,446,768 (\$232 each)	\$13,227,265 (\$303 each)	\$50,674,033 (\$247 each)
Total savings per pregnancy, conception to age 5	\$1,506,526,312 (\$9,338 each)	\$647,089,164 (\$14,837 each)	\$2,153,615,476 (\$10,508 each)

* Costs have been adjusted for the likelihood a Family PACT client qualifies for (on the basis of income, age, and immigration status) and actually enrolls in each program, the likelihood that the costs were prevented rather than postponed, and discounting of future costs.

Cost-effectiveness of the Family PACT Program

By reducing public health and welfare expenditures resulting from unintended pregnancies, **every dollar spent on Family PACT saved the public sector \$2.76 from conception up to two years after birth and \$5.33 including costs up to five years after birth** (See Figure 4).

^{vi} Reasons include their higher per-pregnancy costs and slightly greater likelihood of carrying a pregnancy to term.

Figure 4: Cost-effectiveness of preventing pregnancies through the Family PACT Program, CY 2002

Pregnancies averted to female clients	Public cost of each pregnancy		Cost-savings from averting pregnancy		Cost of Family PACT services	Cost-benefit ratio	
	To age 2	To age 5	To age 2	To age 5		To age 2	To age 5
204,950	\$5,431	\$10,508	\$1.1 billion	\$2.2 billion	\$403.8 million	\$2.76	\$5.33

Share of Cost-Savings

The prevention of unintended pregnancies through Family PACT results in significant cost-savings to the federal, state, and local governments. Given the share of funding contributed by each level of government to each of the social service programs a Family PACT client could qualify for, the overall share of the cost-savings to age two is 62 percent federal, 37 percent state, and 1 percent local. This results in savings of \$690 million federally, \$412 million to the state, and \$11 million locally. To age five, the share of cost-savings is 65 percent federal, 34 percent state, and 1 percent local, for totals of \$1.4 billion federally, \$732 million to the state, and \$22 million locally.

Sensitivity Analyses

Sensitivity analyses examined the effect of various data inputs and assumptions on the cost-benefit ratio. They revealed that under reasonable alternative assumptions about contraceptive use and contraceptive failure rates, the number of pregnancies averted could range between 199,000 and 582,000, resulting in a cost-benefit ratio from \$2.64 to \$7.79 for costs up to two years after birth, and \$5.14 to \$15.13 for costs up to five years after birth. Similarly, alternative assumptions regarding the costs per enrollee, likelihood of public program participation, and Family PACT expenditures resulted in a range of cost-benefit ratios, from \$2.53 to \$2.86 saved two years after birth and \$5.06 to \$5.59 saved five years for each dollar invested in Family PACT. See Technical Appendix D for details.

Comparison to the Family PACT Budget Neutrality Analysis

In 2004, the California Department of Health Services Fiscal Forecasting and Data Management Branch prepared a Family PACT budget neutrality analysis in accordance with federal requirements. The analysis differs from the Family PACT cost-benefit study in several ways, which is reasonable to expect given the different cost parameters and time frames they considered. First, the budget neutrality analysis included only the federal share of Family PACT expenditures and medical cost savings of a single year when calculating a cost-benefit ratio. In contrast, UCSF estimated federal, state, and local costs and savings, as well as potential savings in the way of social service programs for mothers and children to age 2 and age 5. Second, to estimate fertility in the absence of Family PACT, the budget neutrality analysis estimated a base year fertility rate based on Medi-Cal deliveries in 1998 and the population of uninsured women from the Census and California Health Interview Survey. UCSF's estimates were based on contraceptive method use reported by a sample of female Family PACT clients prior to enrollment. Third, to estimate fertility in the presence of Family PACT services, the budget neutrality analysis calculated a rate based on actual deliveries in Medi-Cal among Family PACT

clients with social security numbers. UCSF's estimates were based on contraceptive method dispensing within the program. Fourth, the budget neutrality analysis assumes that all pregnancies result in a live birth, thereby not accounting for the costs of an unfulfilled pregnancy. Finally, the treatment of a prevented pregnancy as mistimed or as unwanted is a major difference between the two analyses and explains much of the differences between them.

V. CONCLUSION

The Family PACT Program averted an estimated 204,950 unintended pregnancies in California by providing contraceptive methods to female clients in 2002, averting nearly 94,000 live births and 79,000 abortions. In doing so, the program saved the federal, state, and local governments more than \$1.1 billion over two years and \$2.2 billion over five years. By reducing public health and welfare expenditures resulting from unintended pregnancies, every dollar spent on Family PACT saved the public sector \$2.76 over two years and \$5.33 over five years. The findings of this study show that the costs and consequences of unintended pregnancies far exceed the costs of preventing them. Through the provision of effective methods of contraception to low-income individuals who have limited access to these services elsewhere, the Family PACT Program effectively reduces the number of unintended pregnancies in California resulting in substantial financial savings to local, state, and federal governments.

Provision of contraceptive services through Family PACT enables many low-income women and men avoid unintended pregnancy. In 2002, nearly twice as many women received contraceptives as in the previous evaluation period (FY 1997/98). Many clients might use no contraception or a low-efficacy method in the absence of Family PACT services. Much of the program's fertility effect comes from method adoption among women using no method of contraception in the program's absence and adoption of more effective methods among women who would otherwise use low-efficacy methods.

This estimate of pregnancies averted is relatively robust to the assumptions about contraceptive failure rates and continuation rates. Under the unlikely scenario that all women use no method of contraception in the absence of the program, pregnancies averted by the program would be three times higher. Other scenarios modeled the possibilities that women used all methods they were dispensed, experienced the lowest contraceptive failure rates, or used condoms in the absence of Family PACT. These other sensitivity analyses yield results that are within 20% of the base scenario.

Given the high public sector costs of unintended pregnancy among low-income women and the experience of the Family PACT Program in providing contraceptive methods to these women, preventing pregnancy through Family PACT is very cost-effective. The prevention of unintended pregnancies results in significant cost-savings to federal, state, and local governments. The cost-savings of preventing pregnancies, estimated as \$1.1 billion up to age two, is more than twice that estimated for FY 1997/98. Likewise, the number of pregnancies averted in 2002 was nearly twice the number averted in FY 1997/98. As the program has expanded, Family PACT Program expenditures have risen since FY 1997/98, leading to a lower cost-benefit ratio than the past evaluation.

The federal, state, and local governments benefit from the cost-savings to different degrees since the proportion of funding they each contribute to the health and social service programs varies from program to program. For example, the state covers all abortion services to low-income women, as well as services rendered to undocumented immigrants. As a result of this cost-sharing arrangement, California stands to save 70 percent of the cost of providing pregnancy-related care (including care for miscarriage, abortion, ectopic pregnancy, prenatal care, and delivery) for each averted pregnancy. When additional costs that would have been incurred by women and children following birth are considered – including social service programs which are largely federally-funded, such as welfare, food stamps, WIC, and Head Start – the share of the cost-savings is 62 percent federal up to two years after birth and 65 percent up to five years after birth.

Compared to many other cost-benefit analyses of family planning services, this analysis presents a conservative estimate of cost-effectiveness. For instance, a major innovation of this study is the treatment of the costs and timing of pregnancies averted by the program. Previous studies have over-estimated the cost-savings of public services associated with unintended pregnancies by assuming that all unintended pregnancies averted were entirely prevented, rather than merely delayed. The estimates in this study assume that family planning efforts effectively delay some pregnancies, but do not prevent them altogether.³ For the case of a delayed pregnancy, the government saves the cost of paying for it later rather than now. Only a portion of the costs of mistimed pregnancies is saved, resulting in a significantly more conservative, and realistic, measure of cost-effectiveness than other studies. Another way in which this study acted conservatively was that it considered all Family PACT service costs rather than only the costs of contraceptive services, as each of the program's components contribute to the acceptability and satisfaction by clients and thus contribute to their contraceptive adoption.^{vii} Had this study compared the lower costs of providing contraceptive services only versus the costs which would have occurred in Family PACT's absence, the cost-benefit ratio would have been higher.

Despite the conservative methodological approaches taken in the study, the financial consequences of unintended pregnancy are nearly three times the cost of prevention. This study, like numerous studies before it, confirms that investing in pregnancy prevention results in fiscal savings at every level of government.

^{vii} As demonstrated in the 2003 Family PACT Client Exit Interview study, 80 percent of clients were very satisfied with the birth control choices available, 88 percent were very satisfied with the overall clinic experience, 98 percent would recommend the clinic to family or friends, and 89 percent of clients were very likely to return to the clinic.

TECHNICAL APPENDIX A: LITERATURE ON THE COSTS OF PREGNANCY AND CHILDBEARING

Several reports published between the late 1970s and early 2000s sought to quantify the economic impact of adolescent pregnancy on society.^{4,5} Although various measures of the cost of adolescent pregnancy are found in the research literature, the most common approach has been to estimate the costs of medical care, welfare, and other social services that would have been incurred in a single year to support families begun as a result of adolescent birth.^{6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21} Some studies have focused on the savings that would result if adolescent pregnancies were postponed until all mothers reached 20 years of age (and presumably could have completed high school).^{6,7,14,15} Still other studies have projected cost estimates of a single birth or a cohort of births over 20 years.^{6,22} A few studies have incorporated more complex estimates of economic costs (e.g., lost earnings to the individual whose employment prospects are adversely affected by an adolescent birth, and lost income to society in the way of sales tax and income taxes not paid to state and local governments).^{9,14,15,23} A recent review of this literature conducted by the Joint Center for Political and Economic Studies concluded that in every study – whether national, state, or local in scope – the costs and consequences of adolescent pregnancies far exceeded the costs of preventing them.^{4,5}

Few studies have focused on the cost-effectiveness of specific pregnancy prevention interventions and far fewer have considered the costs of unintended pregnancies to adult women. One study that did incorporate costs to both adolescent and adult women focused on the costs borne by the Medicaid program and found that every dollar spent to provide publicly funded contraceptive services saved an average of \$3.00 in Medicaid costs for pregnancy-related health care and medical care for newborns.²⁴

Other studies which have examined the cost-effectiveness of preventing pregnancies to both adolescents and adults have occurred at the state level. There is tremendous interest in measuring how investments in state-level family planning interventions contribute to public sector cost-savings. This interest has been fueled by the devolution of welfare to the states, the welfare program's emphasis on preventing out-of-wedlock births, and tight budgets at state and local levels. Moreover, 18 states in the past decade have obtained federal waivers to allow them to extend eligibility for Medicaid-covered family planning services to individuals who would not qualify for such services.²⁵ An evaluation of six of the states with federal waivers was commissioned by CMS. Not only did the report find that state programs were budget-neutral – that is, that spending under the waiver did not exceed what spending would have been without the waiver – but also found that they resulted in substantial net savings. California, one of the states included in the evaluation, was found to have averted 21,335 births in 1999/00 with a net savings of \$76 million in the way of prenatal, delivery and pregnancy-related costs, as well as costs for infant medical care and social services through the fifth year of life (\$64 million state, \$12 million federal).²⁶

The California Office of Family Planning has a long history of evaluating the cost-effectiveness of its services.^{viii} Brindis & Jeremy (1988) estimated that the administrative and direct service costs of welfare, Medi-Cal (California's Medicaid program), and food stamps at the federal, state, and local levels in California were \$3.08 billion in 1985. Had these births been postponed until the mother was age 20, 40 percent of the cost (\$1.23 billion) would have been saved. Families started by adolescents in California in 1985 would have cost taxpayers \$717.6 million over the 20-year period from 1985 to 2004. If this entire cohort of births had been delayed until the mothers were no longer adolescents, the public would have saved \$287 million over those twenty years. Subsequent cost-savings studies based on California family planning data demonstrated that a reduction in unintended pregnancy was linked to significant savings in health and social service expenditures, with cost-savings ratios ranging from \$3 to \$7.^{24,27}

^{viii} The first study was done in 1977 and updated by the California Department of Health Services in 1981. The Center for Reproductive Health Research and Policy at the University of California, San Francisco conducted further updates in 1983, 1989, 1995, and 1998.

TECHNICAL APPENDIX B: PREGNANCIES AVERTED CALCULATIONS

The number of pregnancies averted by Family PACT was calculated as the difference between the number of pregnancies expected among clients from the number of pregnancies expected in the program's absence. The estimate is based on the methodology established for the FY 1997/98 Family PACT evaluation and published in the *American Journal of Public Health* in August 2004, but updated with new program data regarding the clients served, methods dispensed, and contraceptive methods used in the absence of Family PACT.²⁸ Estimates of the number of pregnancies averted to the partners of male clients are also presented, but are not included in the cost-benefit calculations because these estimates are less reliable than those for female clients.

The number of pregnancies expected in the absence of Family PACT was estimated from self-reported data from the 2000/01 Medical Record Review regarding the contraceptive methods women were using prior to program enrollment. Data were analyzed for the subset of clients new to Family PACT who were not pregnant or seeking pregnancy. Figure 5 shows the contraceptive methods women would use in the absence of Family PACT services.

Figure 5: Primary contraceptive method used prior to first Family PACT visit by men and women who are not pregnant or seeking pregnancy, 2000/01

Primary contraceptive method used prior to first Family PACT visit	Adult females (age 20 and older) n=656	Adolescent females (under age 20) n=212	All women n=868	All men n=122*
No method	27%	25%	27%	25%
Natural family planning	3%	2%	3%	1%
Condoms	34%	52%	38%	74%
Oral contraception	19%	12%	18%	n/a
Injectables (Depo Provera)	10%	7%	9%	n/a
Implants (Norplant)	0%	1%	1%	n/a
Intrauterine contraception	6%	1%	5%	n/a
Total	100%	100%	100%	100%

*Sample not large enough for age breakdown.

The number of pregnancies expected among clients was estimated for the 926,218 female and 113,042 male clients who received contraceptive methods through Family PACT between January and December 2002, according to paid claims data on contraceptive methods dispensed. These include clients for whom a pharmacy billed for prescription or over-the-counter contraceptive methods, or a clinician billed for contraceptive supplies or medications, or a medical procedure (sterilization, and insertions of intrauterine contraceptive and Norplant).^{ix} Pregnancies averted were calculated only for those clients for whom providers billed and received payment for providing contraceptive methods, and only for those months they were covered by these contraceptive methods. Figure 6 displays 2002 claims data on contraceptive dispensing for women and Figure 7 displays these figures for males.

^{ix} Pregnancies among women who received natural family planning methods in Family PACT are not included because this cannot be determined from the data. The impact of excluding natural family planning methods is negligible since the failure rate of these methods is very close to what women would likely experience in the absence of Family PACT. See Hatcher R, Trussell J, Stewart F, Cates W, Stewart G, Guest F, Kowal D. *Contraceptive Technology*. New York, NY: Ardent Media; 1998.

Figure 6: Dispensing of contraceptives as a primary method to women age 15-44 through Family PACT in 2002

Contraceptive method	Number of women receiving method*			Average woman-months of protection**		
	Adults	Adolescents	Total	Adults	Adolescents	Total
Tubal ligation	4,017	5	4,022	18.25	16.00	18.25
Intrauterine Contraception	15,913	937	16,850	16.91	16.71	16.89
Implants (Norplant)	69	15	84	18.07	17.80	18.02
Injectables (Depo Provera)	146,793	40,406	187,199	6.22	5.60	6.09
Oral Contraceptives	370,085	108,278	478,363	7.73	7.17	7.60
Patch	5,647	1,450	7,097	2.10	2.02	2.08
Ring	253	75	328	2.25	2.05	2.21
Emergency contraception	15,532	11,511	27,043	1.20	1.22	1.21
Diaphragms	1,051	96	1,147	2.23	2.17	2.23
Condoms	315,450	91,242	406,692	3.01	2.76	2.96
Foam/gel	3,236	471	3,707	2.25	2.07	2.23
IUC/Implant out***	1,678	73	1,806	2.04	1.85	1.97
Total distinct female clients	723,929	202,289	926,218	7.06	6.37	6.91

* The total number of distinct clients is less than the column totals because women are counted once for each method of contraceptives they were dispensed.

**Duration of protection is capped at two years for tubal ligations, intra-uterine contraceptives and Norplant.

*** For the removal of intrauterine contraceptives and implants, months of contraceptive coverage begin at first visit and continue until removal of the method.

Figure 7: Dispensing of contraceptives as a primary method to men age 15-44 through Family PACT in 2002

Contraceptive method	Number of men receiving method*			Average man-months of protection**		
	Adults	Adolescents	Total	Adults	Adolescents	Total
Vasectomy	1,070	1	1,071	17.80	13.00	17.79
Condoms	87,586	24,747	112,333	2.95	2.90	2.94
Foam/gel	9	2	11	2.00	2.00	2.00
Total distinct male clients	88,293	24,749	113,042	3.14	2.91	3.09

* The total number of distinct clients is less than the column totals because men are counted once for each method of contraceptives they were dispensed.

**Duration of protection is capped at two years for vasectomy.

The probabilities of pregnancy by method were based on reported first year pregnancy rate estimates from *Contraceptive Technology* (1998)²⁹ and Trussell et al., 1997.³⁰ The monthly probability of pregnancy is: $1 - (\% \text{ of women pregnant at one year})^{1/13}$

This study used estimates by Henshaw (1998) for the percentage of unintended pregnancies that end in abortion or birth, as was done in the previous evaluation.³¹ These data show that the outcomes of unintended pregnancies are less likely to end in a birth than the outcomes of intended pregnancies.

The outcome of each pregnancy influences the total number of pregnancies a woman can experience in a twelve month period. For example, if all pregnancies end in abortion, a woman could become pregnant several times in a year, while if she carried all pregnancies to term, the chance of becoming pregnant twice in the same year is small. To estimate the number ending in

spontaneous abortion, this study applied the technique specified in Henshaw’s article whereby spontaneous abortions equal 20% of births and 10% of induced abortions. Their technique did not include ectopic pregnancies, so this study used the figure 1% for ectopic pregnancies as reported by Saraiya (1999) and Trussell (1997).^{32,33} Figure 8 lists the pregnancy outcome distribution assumptions used in this study.

Figure 8: Outcomes of Adult and Adolescent Unintended Pregnancies

Unintended pregnancy outcomes	Adults (age 20 and older)	Adolescents (under age 20)
Spontaneous abortion	15%	14%
Induced abortion	39%	36%
Ectopic pregnancy	1%	1%
Live birth	45%	49%
Total	100%	100%

For this analysis, all births were assumed to have occurred at nine months, followed by two months of postpartum amenorrhea. Induced abortions were assumed to have occurred at month three, followed by one month of amenorrhea. Spontaneous abortions would have occurred at month three, followed by one month of infecundity. Ectopic pregnancies would remove women from the risk of pregnancy for 11 months.

The risk of pregnancy was modeled as a Markov process^x because in each month, the risk of pregnancy depends on the probability of being infecund due to a pregnancy in a previous month. A woman’s probability of pregnancy in a given month was estimated to be the monthly method failure rate times the probability she did not become pregnant in the previous four months and did not carry a pregnancy to term that began five to eleven months before. Therefore, the probability of pregnancy in a given month is modeled as:

$$p_n = f * \left[\prod_{j=1}^a (1 - p_{n-j}) - \prod_{k=1}^i b * (1 - p_{n-k}) \right]$$

- where
- p_n = probability of pregnancy in month n
 - b = probability a pregnancy is brought to term
 - f = monthly failure rate
 - a = gestation at time of induced or spontaneous abortion
 - i = 9 months plus duration of postpartum infecundity

The number of months of contraceptive coverage provided under the Family PACT Program was derived from the type and quantity of contraceptives dispensed according to paid claims data. Pregnancies averted were calculated only for those women for whom providers billed and received payment for providing contraceptive methods, and only for those months they were covered by these methods.

To estimate the pregnancies averted through the provision of services to men, this study assumed that each male client had only one female partner. With this assumption, this study models

^x A Markov process is an algorithm which produces estimates for discrete time periods and in which future probabilities are determined by its most recent values. In this case, the probability of pregnancy in a given month depends on the likelihood of pregnancy in the previous month.

pregnancies which occur to that partner assuming she is using only contraceptives provided to the male. Assuming one partner per male client leads to a conservative estimate of pregnancies averted. Since one man can make several women pregnant in a given time period, providing contraceptives to a male with multiple partners may avert more pregnancies than providing contraceptives to a male with a single partner. However, if the female partner is using an additional method of contraception, the fertility effect of the male client's method would be less than estimated in this model.

The contraceptive methods provided during 2002 may prevent pregnancies for many years into the future. The fertility effect for long-term methods was capped at two years to avoid predicting pregnancies far into the future. Months of coverage for a long-term method were calculated to be the number of months between the provision date and December 31, 2003 (a maximum cap of two years). For example, a woman receiving a sterilization procedure on January 1, 2002 was assumed to have 24 months of coverage. A woman receiving that procedure on December 31, 2002 was assumed to have 12 months of coverage. Although the December 2003 cut-off date is arbitrary, it was useful for determining the short-term fertility impact of the Family PACT Program. The number of clients receiving long-term methods is expected to be relatively small, so excluding the full duration of contraceptive benefit will not have a major effect on the estimate of the program's impact on fertility.

For short-term methods, such as condoms and hormonal contraceptives, the months of contraceptive coverage were adjusted to make a conservative estimate of pregnancies averted and to account for method discontinuation since clients do not necessarily use all the supplies they are dispensed. For oral contraceptives, patches, and rings, it was assumed that a woman who did not return for refills uses half the months of contraceptives she was dispensed. For condoms and barrier method supplies, clinic dispensing was assumed to provide two months of contraceptive coverage based on findings of the last medical record review. In the case of pharmacy dispensing, the exact quantity of supplies dispensed is available. A month of protection is assumed for every 12 condoms dispensed. Each Depo Provera injection was assumed to provide three months of contraceptive coverage.

Figure 9: Contraceptives Dispensed and Pregnancies Averted through the California Family PACT Program, 2002

Gender and Age Group*	Clients dispensed contraceptives	Average months of protection dispensed	Estimated pregnancies with Family PACT	Estimated pregnancies without Family PACT	Estimated pregnancies averted*	Estimated induced abortions averted	Estimated births averted	Estimated mis-carriages averted	Estimated ectopic pregnancies averted
Total Females	926,218	6.91	24,760	229,710	204,950	78,620	93,970	30,310	2,050
Adolescents	202,289	6.37	6,145	49,760	43,610	15,700	21,370	6,110	430
Adults	723,929	7.06	18,615	179,950	161,340	62,920	72,600	24,200	1,620
Total Males	113,042	3.09	2,700	10,950	8,250	3,170	3,780	1,230	70
Adolescents	24,749	2.91	675	2,220	1,550	560	760	220	10
Adults	88,293	3.14	2,025	8,730	6,700	2,610	3,020	1,010	60
Total	1,039,260	6.49	27,460	240,660	213,200	81,790	97,750	31,540	2,120
Adolescents	227,038	5.99	6,820	51,980	45,160	16,260	22,130	6,330	440
Adults	812,222	6.63	20,640	188,680	168,040	65,530	75,620	25,210	1,680

*Adolescents refer to individuals aged 15-19. Adults refer to those aged 20-44.

TECHNICAL APPENDIX C: COST-SAVINGS CALCULATIONS

The net fiscal impact of the Family PACT Program is the difference between the public sector costs that would have resulted from unintended pregnancies in the program's absence and the cost of providing family planning services to prevent those pregnancies. Cost-effectiveness was measured as the ratio between averted costs and dollars invested in the Family PACT Program. Total public sector costs were calculated from conception through the end of pregnancy. For pregnancies which would have resulted in a live birth, the costs from delivery to age two and age five of the child were also calculated.

Total Family PACT Program costs

Total expenditures for Family PACT clinical services in CY 2002 were \$403.8 million, according to paid claims data. Since most clients use a range of clinical services, not just contraceptives, the total cost of all Family PACT services is included in this analysis. The intent is to measure the cost-effectiveness of the program in its entirety.

Calculating the adjusted pregnancy-related costs through delivery

The prevention of unintended pregnancies results in significant cost-savings to the federal, state, and local governments. Low-income women who become pregnant can qualify for several public programs which provide free or low-cost medical services, income support, and social services for themselves and their child before and after birth. The cost to the public sector of an unintended pregnancy depends on eligibility for services, actual participation levels in the program, and cost per enrollee. Eligibility for publicly-subsidized services differs by program but is generally based on income, family size, age, and immigration status.

The largest source of pregnancy related medical care to low-income women in California is Medi-Cal, California's Medicaid program. The cost of pregnancy-related costs that would have been incurred by the Medi-Cal program was estimated using the cost of each of the possible outcomes of a pregnancy (miscarriage, ectopic pregnancy, abortion, or live birth) and multiplying each cost by the likelihood that it would occur.

The costs associated with live births included prenatal care, labor and delivery services, and 60 days of postpartum care. Cost estimates represent the average amount reimbursed for each service, including expenditures for related medical complications. For instance, the cost of delivery is a weighted average of cesarean and vaginal births. The costs included in the model are from published reports, budgetary data, and data analyses conducted by state-level program managers. Only the costs of direct services, not administrative services, were included in the model. Costs for teenage clients were calculated separately because pregnancy outcomes differ by age.

Each cost was adjusted by the likelihood a Family PACT client would be eligible to use Medi-Cal for each service and the likelihood that an eligible person would actually use Medi-Cal to pay for their care. Since undocumented immigrants are eligible to receive pregnancy-related services under Medi-Cal, 100% of Family PACT clients were considered "immigrant eligible"

for these services. These adjusted costs were combined to arrive at the total average pregnancy-related medical cost.

The basic formula used to calculate the average adjusted public sector cost per unintended pregnancy through delivery (including a 60-day postpartum period) is the following, summed across all possible pregnancy outcomes (miscarriage, ectopic pregnancy, abortion, live birth):

$$\begin{aligned} \text{Public cost per pregnancy} & & & (\% \text{ of unintended pregnancies ending in the specific outcome}) \times \\ \text{(through end of pregnancy)} & = & & \text{(average cost of the service associated with that pregnancy outcome)} \times \\ & & & (\% \text{ of eligible women who would use Medi-Cal to pay for the service}) \end{aligned}$$

Calculating the adjusted medical care and social service costs following a birth

For those averted pregnancies which would have resulted in a live birth, the costs of providing publicly-subsidized medical and social services following delivery for the woman and child were estimated. Estimates were modeled in two ways: to age two of the child and to age five.

The specific programs included in the calculation of medical costs of mothers and children are Medi-Cal and Healthy Families (California’s S-CHIP program for children). Costs that apply to children with special health care needs are California Children’s Services, Early Start, and Supplemental Security Income (SSI). Income support programs for mothers include cash grants from California’s Temporary Assistance for Needy Families (TANF) program (known as Cal-WORKs), Cal-WORKs employment services, the Cal-WORKs special pregnancy payment, Food Stamps (modeled for two people, mother and child), and WIC (modeled for both mother and child). Other social services programs considered in the cost calculations include Cal-WORKs Stage 1 child care, the California Department of Education’s child care and development programs, foster care, and Head Start/Early Head Start. Programs for pregnant or parenting teens included Cal-Learn, Cal-SAFE, and the Adolescent Family Life Program.

The financial cost to society depends on each program’s cost per enrollee, eligibility requirements, and actual participation levels. The formula used to calculate an average public sector cost per unintended pregnancy for social services rendered to women and their newborn children following a delivery was the following, summed across all of the health and social service programs considered in this study:

$$\begin{aligned} \text{Public cost per pregnancy} & & & \text{(average annual cost per enrollee in the program)} \times \\ \text{(following delivery)} & = & & (\% \text{ of unintended pregnancies that end in live birth}) \times \\ & & & (\% \text{ of Family PACT female clients who would be income-eligible for the social service program} \\ & & & \text{after the addition of one person to the family size}) \times \\ & & & (\% \text{ of Family PACT female clients who would be age-eligible for the program}) \times \\ & & & (\% \text{ of clients eligible on the basis of immigrant status}) \times \\ & & & (\% \text{ of eligibles who actually use the program services}) \end{aligned}$$

The cost of program participation per enrollee was based on each program's FY 2002/03 budgetary data. When data from FY 2002/03 were unavailable, costs were adjusted for inflation using the Consumer Price Index.³⁴

$$2002 \text{ cost} = \text{Cost in Year A} \times \frac{2002 \text{ Consumer Price Index}}{\text{Year A Consumer Price Index}}$$

The per-participant costs were each adjusted for the probability that a Family PACT female client would qualify for each program on the basis of each programs' income, age, and immigration status eligibility requirements. Eligibility of Family PACT clients for these programs was estimated from demographic data (e.g., income, family size, age, and immigration status) from the Family PACT client eligibility form. The proportion of the female Family PACT client population that would be income-eligible for various social service programs is based on the income status with the addition of one person to the family size.

Since various programs limit eligibility to citizens or legal residents only, an estimate of the proportion of Family PACT clients who are undocumented was derived. Using data from the 2000/01 Medical Record Review study, the percent of native-born women who had a missing Social Security Number (SSN) was compared to the percent of foreign-born women with a missing SSN. It was assumed that all native-born women are citizens and any missing SSN data among them was missing at random; any proportion of missing SSN data above that level among foreign-born women was assumed to reflect the proportion that are undocumented.

An adjustment was also made for the proportion of eligible women and children who would actually participate in each program. This was estimated using actual program participation rates as calculated by the specific programs. When a program participation rate was not available, it was estimated to be the ratio of total program enrollment to the eligible population by income according to Current Population Survey data.

Once the adjusted costs were calculated for each program, a model was designed to account for the duration of services and when the costs would be incurred on a year-by-year basis up to age five of the child. For instance, mothers and children might become eligible for certain programs, such as Medi-Cal, immediately following birth whereas they would not qualify for certain programs, such as Head Start, until the child is a certain age. Also, time limits on some of the programs were taken into consideration and conservative estimates of how long a mother and/or child would participate in each program were made.

The schedule of pregnancies averted was merged with the cost of a pregnancy per year. Costs occurring after 2002 were discounted to present values at a 3% annual rate.^{35,36} The net present value of a pregnancy was the sum of the yearly costs, after discounting.^{xi}

$$\text{Present Value of Cost} = \sum_{t=1}^n \frac{C_t}{(1+i)^t}$$

After an average adjusted per pregnancy cost was estimated, the pregnancy-related costs and the post-delivery costs were summed and then multiplied by the total number of pregnancies averted to arrive at a total cost-savings estimate.

^{xi} Note that C_t represents the cost incurred in year t , and that i is the discount rate, e.g., 0.03. The present value of costs averted are calculated in the same manner. This discount rate is recommended by the Public Health Service Panel on Cost-Effectiveness in Medicine.

Although there is the possibility that many of the health and social services programs that were included in this cost benefit analysis may experience budget cuts or enrollment caps in the future, it is not possible to predict with certainty what changes, if any, will be made to these programs. For the purposes of this analysis, it is assumed that no major changes in the financing, eligibility requirements, and enrollment of participants in these programs will occur when future costs of participation are modeled. It is assumed that expenditures for a service or program were constant over the time a service was used.

Adjusting for delayed versus prevented pregnancies

This study accounts for the fact that the state does not save the whole cost of a pregnancy if it is merely delayed to a later date. A pregnancy which is prevented saves the state the entire cost. For pregnancies that are either entirely prevented or at least delayed to a point in time when a woman may no longer need to rely on public aid to cover the costs, governments save the whole set of associated costs. However, for some pregnancies which are merely delayed and for which the state will cover the costs later, the state saves the difference between paying for the pregnancy now and paying for it later.

To estimate the proportion of pregnancies which were delayed versus prevented, questions on reproductive intentions were included in 2002 Client Exit Interview for 1,142 women interviewed between November 2003 and March 2004. Respondents were asked whether they would like a/another child and if so, when. The percentage who did not want a/another child were considered to be unwanted, and therefore prevented, through use of contraceptive services (6% of the adolescent pregnancies and a third of adult pregnancies), and the remainder were considered mistimed and, therefore, merely delayed by use of contraceptive services.

According to Client Exit Interviews conducted as part of the evaluation of the Family PACT Program, adult women (age 20+) wanted to wait an average of 4.3 years and adolescents wanted to wait an average of 7 years to have a/another child. During the interim years before a woman became pregnant, some women's economic status may have improved. For 60% of pregnancies to women under 20, and for 25% of pregnancies to women 20 and over that were delayed, it was estimated that public benefits would no longer be needed. The likelihood that a woman would access public benefits after this delay was based on the percentage of women who used Medi-Cal to pay for delivery by age, using data from the 1995 NSFG.³⁷ It was assumed that the remaining women who postponed their pregnancies would still have needed public services. The estimated public costs for a birth postponed for either 4.3 or 7 years is the difference between the cost at the time the pregnancy occurred and the discounted cost 4.3 or 7 years later.

Share of cost savings

For each public program included in the analysis, the percent of the program that is funded by the local, state, and federal governments was determined. The distribution of cost-sharing was based on budgetary documents or other program reports detailing the program's funding sources. The cost of each program was multiplied by those percentages to arrive at the dollar amounts expected to be saved by each level of government. These amounts were summed across all the programs to arrive at a total estimate of cost savings for each level of government.

TECHNICAL APPENDIX D: SENSITIVITY ANALYSES

Sensitivity analyses were conducted to examine the effect of various data inputs and assumptions on the cost-benefit ratio, including:

- Alternative assumptions about contraceptive behaviors of women in the absence of Family PACT, such as the use of no methods at all and the use of only over-the-counter methods
- Alternative higher contraceptive failure rates and perfect use failure rates
- Alternative models of contraceptive continuation, i.e., what would the fertility effect be if women use all the supplies they were given
- High and low estimates of public costs and enrollment into public programs

The estimate of pregnancies averted is subject to many assumptions. If women experienced higher than average failure rates for methods which have room for user error such as the condom and pill, Family PACT would have averted nearly 14% more pregnancies (233,395) (See Figure 10). The reason for the higher number of pregnancies averted under higher failure rates is that Family PACT's effectiveness is in large part due to switching women to more effective methods such as Depo Provera which have little room for user error. If women experienced perfect use failure rates, Family PACT would avert slightly fewer pregnancies (199,436) because fewer women would become pregnant in the absence of the program. The assumption that women do not use all the methods that they are dispensed lowers the pregnancies averted estimate by nearly 20% (from 247,542 to 204,950).

If women used no method of contraception in the absence of the program, Family PACT would have averted over 580,000 pregnancies, nearly three times as many as the base model. If, in the absence of Family PACT, women who were using contraceptives switched from whatever they were using to over-the-counter methods such as condoms, Family PACT would avert 6% more pregnancies than the base scenario. The idea behind this last scenario is that women who cannot afford doctors' visits for prescriptions would switch to over-the-counter methods, but would not go without contraception entirely (as in the previous scenario). Alternate scenarios regarding the number of pregnancies averted resulted in a cost-benefit range of \$2.64 to \$7.79 to age 2, and \$5.14 to \$15.13 to age five.

Figure 10. Sensitivity Analyses: Pregnancies Averted to Female Clients

Scenarios	Number of Pregnancies Averted Under Each Scenario	Cost-Benefit Ratio, to age 2	Cost-Benefit Ratio, to age 5
Base scenario*	204,950	\$2.76	\$5.33
Alternative scenarios:			
Perfect use failure rates	199,436	\$2.64	\$5.14
Contracepting clients use condoms in absence of Family PACT	217,446	\$2.88	\$5.61
Higher failure rates	233,395	\$3.00	\$5.87
Women use all methods/ supplies dispensed	247,542	\$3.29	\$6.40
Clients use no method in absence of Family PACT	581,936	\$7.79	\$15.13

* The base scenario assumes that in the hypothetical case of the absence of Family PACT, women use the same methods they reported using before program enrollment and experience typical use failure rates, and that not all contraceptive methods supplied are used.

The inputs used to calculate the expected public sector costs and savings are also subject to several assumptions. Those with the greatest range of possible values are listed in Figure 11. For example, although total Family PACT Program expenditures in 2002 totaled \$403.8 million, net program expenditures are approximately \$393.6 million when drug rebates (which offset the overall program costs) are factored in. The effect of this is to drive the cost-benefit ratio higher, so that every dollar invested in Family PACT saves \$2.83 two years after birth and \$5.47 five years after birth. Other alternate assumptions are modeled for data inputs when there were multiple or conflicting estimates present in the literature or other data source (such as the Food Stamps cost and participation rate, and CalWORKs participation rate). Alternate assumptions about program costs and participation rates resulted in a cost-benefit ratio range from \$2.53 to \$2.86 to age two, and \$5.06 to \$5.59 to age five.

Figure 11. Sensitivity Analyses: Program Costs and Participation Estimates

Inputs	Base value and range of alternative values	Cost-Benefit Ratio, to age 2	Cost-Benefit Ratio, to age 5
Total Family PACT Program expenditures	\$403.8 million (\$393.6-403.8 million)	\$2.76 – 2.83	\$5.33 – 5.47
Food Stamps, annual cost per person	\$2,028 (\$957-\$2,364)	\$2.67 – 2.78	\$5.14 – 5.39
Food Stamps, participation rate	47% (12.3% - 80%)	\$2.64 – 2.86	\$5.06 – 5.59
Cal-WORKs grant, child participation rate	100% (39%-100%)	\$2.53 – 2.76	\$5.10 – 5.33

REFERENCES

- ¹ Brindis C, Darney P. Family PACT Program Evaluation Report. San Francisco, CA: Center for Reproductive Health Research and Policy, University of California, San Francisco; 2000.
- ² Foster DG, Klaisle CM, Blum M, Bradsberry ME, Brindis CD, Stewart FH. Expanded state-funded family planning services: Estimating pregnancies averted by the Family PACT Program in California, 1997-1998. *Am J of Pub Health*. 2004;94(8):1341-1346.
- ³ Brown S, Eisenberg L, editors. *The Best Intentions: Unintended Pregnancy and the Well-Being of Children and Families*. Washington DC: National Academy Press; 1995.
- ⁴ Leigh WA. State/local costs of teen pregnancy and teen pregnancy prevention: What we know. Washington, DC: Joint Center for Political and Economic Studies; 2003.
- ⁵ Leigh WA. National costs of teen pregnancy and teen pregnancy prevention: What we know. Washington, DC: Joint Center for Political and Economic Studies; 2003.
- ⁶ Brindis CD, Jeremy RJ. Adolescent pregnancy and parenting in California: A strategic plan for action. San Francisco, CA: UCSF Publications; 1988.
- ⁷ Armstrong E, Waszak C. Teenage pregnancy and too-early childbearing: Public costs, personal consequences (Costs to the federal government and select states and cities), 5th Edition. Washington, DC: Center for Population Options; 1990.
- ⁸ Kreutzer TA. Expenditures and investments: Adolescent pregnancy in the South, Volume II. Washington, DC: Southern Regional Project on Infant Mortality; 1997.
- ⁹ Parker D. The economic impact of adolescent pregnancy on South Carolina. Columbia, SC: South Carolina Campaign to Prevent Teen Pregnancy; 1997.
- ¹⁰ Mullen MD. Report of the health care components and cost/benefit projects on teen pregnancy prevention (Draft). Hartland, CT: The Hartford Action Plan on Infant Health; 1997.
- ¹¹ DC Campaign to Prevent Teen Pregnancy. The 747 million dollar question? Washington, DC. 2002.
- ¹² Chamie M, Henshaw S. The costs and benefits of government expenditures for family planning programs. *Fam Plann Perspect*. 1981;13(3):117-124.
- ¹³ Feijoo AN. Teenage Pregnancy, The Case For Prevention: An Updated Analysis Of Recent Trends In Federal Expenditures Associated With Teenage Pregnancy, 2nd Edition. Washington, DC: Advocates for Youth; 1999.
- ¹⁴ Maynard RA. Kids Having Kids: A Robin Hood Foundation Special Report on the Costs of Adolescent Childbearing. New York, NY: The Robin Hood Foundation; 1996.
- ¹⁵ Maynard, RA. Kids Having Kids: Economic Costs and Social Consequences of Teen Pregnancy. Washington, DC: The Urban Institute Press; 1987.
- ¹⁶ Flinn SK, Hauser D. Teenage Pregnancy, The Case For Prevention: An Updated Analysis Of Recent Trends In Federal Expenditures Associated With Teenage Pregnancy. Washington, DC: Advocates for Youth; 1998.
- ¹⁷ Gans JE, Alexander B, Chu RC, Elster AB. The cost of comprehensive preventive medical services for adolescents. *Arch Pediatr Adolesc Med*. 1995;149:1226-1234.
- ¹⁸ Fine J. Adolescent pregnancy prevention in managed care. *Women's Health Issues*. 1998;8(3):148-158.
- ¹⁹ Olds DL, Henderson CR, Phelps C, Kitzman H, Hanks C. Effect of prenatal and infancy nurse home visitation on government spending. *Medical Care*. 1993;31(2):155-174.
- ²⁰ Moore KA, Burt MR. Private crisis, public cost: Policy perspectives on teenage childbearing. Washington, DC: The Urban Institute Press; 1982.
- ²¹ Moore KA. Teenage childbirth and welfare dependency. *Fam Plann Perspect*. 1978;10(4):233-235.
- ²² Burt MR. Estimating the public costs of teenage childbearing. *Fam Plann Perspect*. 1986;18(5):221-226.
- ²³ Reis J. Teenage pregnancy and parenthood in Illinois: Estimated 1979-1983 costs. *J Adolesc Health Care*. 1987;8:177-187.
- ²⁴ Forrest JD, Samara R. Impact of publicly funded contraceptive services of unintended pregnancies and implications for Medicaid expenditures. *Fam Plann Perspect*. 1996;28:188-195.
- ²⁵ Gold RB. Doing more for less: Study says state Medicaid family planning expansions are cost-effective. The Guttmacher Report on Public Policy. New York, NY; 2004.
- ²⁶ Edwards J, Bronstein J, Adams K. Evaluation of Medicaid Family Planning Demonstrations. CNA Corporation; 2003.
- ²⁷ Brindis CD, Korenbrot CC. The cost-effectiveness of family planning expenditures for contraceptive services in the state of California. Center for Reproductive Health Research & Policy, University of California, San Francisco; 1995.
- ²⁸ Foster DG, Klaisle CM, Blum M, Bradsberry ME, Brindis CD, Stewart FH. Expanded state-funded family planning services: Estimating pregnancies averted by the Family PACT Program in California, 1997-1998. *Am J of Pub Health*. 2004;94(8):1341-1346.
- ²⁹ Hatcher R, Trussell J, Stewart F, Cates W, Stewart G, Guest F, Kowal D. *Contraceptive Technology*. New York, NY: Ardent Media; 1998.
- ³⁰ Trussell J, Koenig J, Stewart F and Darroch J. Medical care cost-savings from adolescent contraceptive use. *Fam Plann Perspect*. 1997;29(6):248-55,295.
- ³¹ Henshaw S. Unintended pregnancy in the United States. *Fam Plann Perspect*. 1998;30(1):24-29,46.
- ³² Saraiya Mm, Berg CJ, Shulman H, Green CA, Atrash HK. Estimates of the annual number of clinically recognized pregnancies in the United States, 1981-1991. *Am J Epidemiol*. 1999;149(11):1025-9.
- ³³ Op. cit. 30.
- ³⁴ Smith M. Frequently Asked Health Economics Questions. Website. Menlo Park, CA: Health Economic Resource Center, Department of Veterans Affairs; 2003. Available at: http://www.herc.research.med.va.gov/FAQ_A3.htm, accessed December 15, 2003.
- ³⁵ Barnett PG. Frequently Asked Health Economics Questions. Website. Menlo Park, CA: Health Economic Resource Center, Department of Veterans Affairs; 2001. Available at: http://www.herc.research.med.va.gov/FAQ_A4.htm, accessed December 15, 2003.
- ³⁶ Lipscomb J, Weinstein MC, Torrance GW. "Time Preference", Chapter 7. In Gold MR, Siegel JE, Russell LB, Weinstein, MC. *Cost-effectiveness in Health and Medicine*. New York: Oxford University Press; 1996.
- ³⁷ Abma JC, Chandra A, Mosher WD, Peterson LS, Piccinino LJ. Fertility, family planning, and women's health: New data from the 1995 National Survey of Family Growth. *Vital Health Stat*. 1997; 23(19):1-114.