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Cost-Benefit Analysis of the California Family PACT Program for Calendar Year 2007

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All analysis, interpretations, or conclusions reached are those of UCSF, not the State of California.

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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 (CY) 2007 with projected public sector expenditures which would have occurred in the program's absence.

Pregnancies Averted by Family PACT

➢ Through the provision of contraceptive methods to nearly 1 million women and 100,000 men of reproductive age in 2007, **the Family PACT Program averted an estimated 296,200 unintended pregnancies in California,** which included 286,700 pregnancies to female clients, 9,500 to the partners of male clients, and 81,200 pregnancies to adolescents.

➢ The 296,200 pregnancies averted in 2007 would have led to approximately 133,000 live births, 122,200 abortions, 3,000 ectopic pregnancies, and 38,000 miscarriages.

Public Sector Cost-Savings

➢ The Family PACT Program has reduced the number of unintended pregnancies in California resulting in substantial financial savings to local, state, and federal governments. Low-income pregnant women can qualify for several public programs that 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 to a female Family PACT client saved the public sector approximately $6,557 in medical, welfare, and other social service costs for a woman and child from conception to age two and saved $14,111 from conception to age 5.**

➢ **The total public sector cost-savings of the pregnancies averted attributable to Family PACT female clients in 2007 was $1.88 billion from conception to age two, and over $4 billion from conception to age five.**

➢ Although adolescents account for approximately 27% of the total pregnancies averted by Family PACT, they account for 44% of the cost-savings.

➢ The share of public sector cost-savings from conception to age two was over $1 billion federal, nearly $623 million state, and over $11 million local. From conception to age five, the share of savings was nearly $2.7 billion federal, over $1.3 billion state, and nearly $14 million local.

➢ The Family PACT Program's total service expenditures were $437.3 million in 2007. By reducing public health and welfare expenditures resulting from unintended pregnancies, **every dollar spent on Family PACT saved the public sector $4.30 from conception to age two and $9.25 from conception to age five**.

➢ These findings indicate a substantial increase in the program's cost savings since the previous 2002 cost-benefit analysis, with the **overall savings nearly doubling** due to the increased public sector cost per pregnancy, a greater number of pregnancies averted per client, and decreased Family PACT expenditures per client. Despite the conservative methodological approaches used in the study, the fiscal impact of unintended pregnancy are over four times the cost of investing in prevention. This study, like numerous studies before it, underscores that investing in pregnancy prevention results in fiscal savings at every level of government.

BACKGROUND

California's family planning program, Family PACT (Planning, Access, Care and Treatment), provides contraception and reproductive health services to women and men of reproductive age whose incomes do not exceed 200% of the federal poverty guidelines[a] and who have no other reproductive health care coverage. More than 2,000 private and nonprofit enrolled clinician providers across the state deliver family planning services and receive reimbursements from the Family PACT Program on a fee-for-service basis. The program grew rapidly, serving 750,000 clients during its first full year of operation in Fiscal Year (FY) 1997/98 to more than 1.6 million in FU 07/08.[1] In 2007, nearly one million women (998,084) and 99,218 men of reproductive age (ages 15-44) were provided with contraceptives in Family PACT.

In 1999, the Centers for Medicaid and Medicare Services (CMS) approved a Medicaid 1115(b) Waiver Demonstration Project for Family PACT, providing a federal match for the funding of contraceptive services. Family PACT covers all contraceptive methods approved by the Food and Drug Administration at no cost to the client. Through its provision of contraceptive services, the Family PACT Program has an important role in the prevention of unintended pregnancies to low-income women in California. Unintended pregnancies occur increasingly and disproportionately to women with limited resources.[2] The adverse consequences of unintended pregnancies affect not only the children and families of these pregnancies, but also the society as a whole by increasing the costs of health, education, social and other services. The prevention of these pregnancies has the potential of contributing to the economic growth of the country and in decreasing the social disparities of its people.[3] Analyzing the benefits of Family PACT through cost-benefit analyses is an important component of the Family PACT evaluation. This analysis serves as a model for other states by providing an example of a comprehensive assessment of public costs associated with unintended pregnancy in relation to the cost of providing family planning services. Peer-reviewed journal articles based on this analysis have been widely cited.[4] [5] [6] [7]

Cost-benefit analyses have repeatedly shown substantial savings to the public in pregnancy-related medical expenses from the provision of contraceptive services to low-income women.[8] [9] [10] The California Office of Family Planning (OFP) has been evaluating the cost-benefit of family planning services since 1977. In 1988, Brindis & Jeremy[11] estimated that had all adolescent births in California in 1985 been delayed until the mothers were no longer adolescents, the public would have saved $287 million. 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 three to over seven $US from conception to age two.[12] [13] In its first evaluation of the

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[a] The poverty guidelines are updated periodically in the Federal Register by the U.S. Department of Health and Human Services under the authority of 42 U.S.C. 9902(2).

Family PACT Program in FY 1997/98, UCSF evaluators estimated that the Family PACT Program averted over 108,000 unintended pregnancies to female clients and saved an estimated $512 million in public expenditures, including medical care and social services for women and children from conception to age two.[14][15] These cost savings in public expenditures translated into every dollar spent on Family PACT client services saved $4.48 in public medical and social service expenditures. UCSF evaluators conducted a subsequent analysis using CY 2002 data to assess the impact of the implementation of the CMS waiver. For the first time, men were included as part of the study to address the goals and objectives set forth in the waiver. This study demonstrated that through the provision of contraceptive methods to nearly a million women and 113,042 men in 2002, nearly twice as many pregnancies were averted (204,950 pregnancies to female clients and 8,250 pregnancies to the partners of male clients), and the savings nearly doubled to $1.1 billion. Every dollar spent on Family PACT saved the public sector $2.76 from conception to age two and $5.33 from conception to age.[16]

This current 2007 cost-benefit analysis is one evaluation deliverable required by UCSF as part of the overall Family PACT evaluation. In addition, a number of changes have occurred in the Family PACT Program since 2002 that may affect the overall cost benefit of the program:

1. The number of clients served annually has increased from 1.5 million in 2002 to 1.66 million in 2007.[17]

2. The total provider reimbursements have increased 9% from $403.8 million in 2002 to $437 million in 2007. The cost per client decreased slightly from $266 in 2002 to $263 in 2007.

3. A number of efforts were undertaken by OFP to improve outcomes and possibly reduce costs:

    a. Two high cost screening laboratory tests for infertility were discontinued in November 2003 (LH 83002, and prolactin 84146). The balance of infertility laboratory tests were discontinued in August 2006 (83001, 84144, 84146, 84443, 89320 and 89330).

    b. Two over-utilized screening laboratory tests for Hepatitis B were discontinued in February 2003 (HBcAb 86704 and HBsAg 87340). Since FY 2002/03, the deletion of Hepatitis B testing has avoided an estimated $54.2 million in state and federal reimbursements.[18]

    c. Evidence-based nationally recognized guidelines of the American Society for Colposcopy and Cervical Pathology (ASCCP) were adopted by the program for HPV testing and cervical cytology testing and treatment (August 2005, updated June 2006). Data show that reimbursement for dysplasia services decreased by 9% from FY 05/06 to FY 07/08.[19]

    d. Provider education efforts commenced to reduce over-utilization of pregnancy tests (Clinical Practice Alert December 2005, audio-conferences and Provider Profiles bi-annually beginning September 2005). Claims data show a significant change in utilization from 2003 to 2007 as private providers decreased pregnancy testing from 52 per 100 encounters to 23 per 100 encounters.[20]

e. Dispensing of 13 cycles of oral contraceptives (OCPs) at a time rather than fewer cycles was encouraged. In 2003, it was estimated that, when compared to women who received a one year supply of OCPs at their first visits, Family PACT paid $99 more for women who received three cycles due to costs associated with additional visits.[21]

f. The contraceptive patch and ring, two highly cost-saving[22] methods were added as Family PACT benefits in November 2002.

g. Reimbursement rates for IUCs were adjusted periodically (April 2006, September and December 2007 and July 2008) to keep pace with increased costs. In addition, providers were informed about IUCs clinical considerations and their cost-effectiveness through a Clinical Practice Alert in October 2006. IUCs have been assessed to be among the most cost-saving methods, with cost savings of over $7 for every $1 spent in services and supplies.[23] Provision of IUCs in the program has increased slightly from 1.3% in 2002/03 to 2.5% FY 07/08.

Such efforts may have had an impact on the overall cost-benefit of the program. However to truly capture the potential impact of each effort on the program's cost-savings further analyses beyond the scope of this project are needed.

ABOUT THE STUDY

This study compares the cost of providing publicly-funded family planning services through the Family PACT Program in CY 2007, to the public sector expenditures which would have occurred as a result of unintended pregnancy in the program's absence. The results reveal how much local, state, and federal governments save in the short-term by investing in Family PACT services. As part of this study, three sets of analyses were undertaken to address the following:

1) An estimate of the number of pregnancies averted by Family PACT in 2007, by age and gender group.
2) An estimate of the public sector expenditures which would have resulted from those unintended pregnancies from conception to age two and conception to age five of the child.
3) A synthesis of the first two analyses and estimates of the cost-benefit of the Family PACT Program, as a result of pregnancies averted to female clients. Cost-benefit is measured as the ratio between averted costs and dollars invested in the Family PACT Program.

This study draws upon lessons learned in past research (see Technical Appendix A) to examine the cost-benefit of California's Family PACT services in 2007. This evaluation accounts for changes which have occurred in the funding, eligibility requirements, and time limits on various social service programs since the 2002 cost-benefit analysis. These changes have the potential to affect the costs and savings associated with Family PACT's pregnancy prevention efforts.

METHODS FOR ESTIMATING PREGNANCIES AVERTED

This section describes how the number of pregnancies experienced by Family PACT clients is estimated regardless of the contraceptive methods they used. Additionally, an estimate of the number of pregnancies clients might have experienced had they not received any contraceptive services is computed. These two estimates are necessary to calculate the total number of pregnancies averted by the program and thus, gauge the resulting cost savings. A more detailed methodology for estimating pregnancies averted can be found in Appendix B.

Estimating the number of pregnancies expected among Family PACT clients

All women and men who use birth control can experience contraceptive failure, the largest proportion of those failures being due to user error, and a small proportion due to a natural malfunction in the birth control method itself. To estimate the number of pregnancies expected among Family PACT clients we assumed that clients would experience "typical use" failure rates for the birth control methods received under Family PACT. The number of pregnancies expected was calculated for 99,268 male and 998,884 female clients aged 15-44 who received contraceptive methods between January and December 2007, according to paid claims data on contraceptive methods dispensed (current as of March 2009). These claims include clients for whom a pharmacy billed Family PACT for prescription or over-the-counter contraceptive methods, or a clinician billed Family PACT for contraceptive supplies, medications, or a medical procedure (sterilization and insertions of intrauterine contraceptives). Pregnancies among women who reported using natural family planning methods in Family PACT are not included because this cannot be reliably 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.[24] 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.

Estimating the number of pregnancies expected in the absence of Family PACT

The number of pregnancies expected in the absence of Family PACT was estimated from 2007 Medical Record Review (MRR) data regarding the contraceptive methods women and men used prior to program enrollment. Data were analyzed for the subset of clients new to Family PACT who were not pregnant or seeking pregnancy (567 women and 155 men).

Estimating the number of pregnancies averted among Family PACT clients

The number of pregnancies averted by Family PACT was calculated as the difference between the number of pregnancies expected among Family PACT clients and the number of pregnancies they might have experienced in the program's absence. The estimate relies on the methodology established for the previous evaluation of 2002 Family PACT services.[25] This current report contains updated estimates with new program data regarding the female and

male clients served in 2007, methods dispensed, and contraceptive methods used in the absence of Family PACT. Estimates for men and women are calculated separately.

METHODS FOR ESTIMATING THE COST-BENEFIT OF PREGNANCY PREVENTION

Estimating the cost-benefit 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-benefit was measured as the ratio between averted costs and dollars invested in the Family PACT Program.

Estimating 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. The programs included in the calculation of medical costs of women and children are Medi-Cal and Healthy Families. Costs that apply to children with special health care needs included California Children's Services, Early Start, and Supplemental Security Income (SSI). Income support programs for mothers and their children include Cal-WORKs cash grants, Cal-WORKs employment services, the Cal-WORKs special pregnancy payment, Food Stamps, and Women, Infants and Children (WIC) Program. 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. 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. Family PACT and Medi-Cal costs are presented for the 2007 calendar year, whereas all other public program costs are expressed in FY 2007/08 dollars. 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. 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 (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. The methodology used to estimate pregnancy related Medi-Cal costs are explained in more detail in Appendix D.

Total Family PACT Program costs

Total expenditures for Family PACT clinical services in CY 2007 were $437.3 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. This includes the costs of services for all Family PACT clients (i.e. men and women of all ages). The intent is to measure the cost-benefit of the program in its entirety.

FINDINGS

Pregnancies averted by the Family PACT Program

Approximately 27,000 pregnancies were conceived by female Family PACT clients during months in which they had contraceptive coverage through Family PACT (Figure 1). In the absence of Family PACT, it is estimated that these women would have experienced an estimated 313,700 pregnancies. The difference, 286,700 pregnancies, is the pregnancies averted by Family PACT services to female clients. For men, it was estimated that their partners experienced 1,800 pregnancies despite contraceptives dispensed in the program. In the absence of Family PACT, their partners would have experienced over 11,300 pregnancies. The difference, 9,500 pregnancies, is our estimate of the pregnancies averted through the provision of contraceptive services to men in 2007. Over the course of a year, Family PACT averted an estimated two pregnancies for every seven women who receive contraceptives and one pregnancy for every ten men who receive contraceptives.

For CY 2007, Family PACT services averted an estimated 296,200 unintended pregnancies, including 286,700 pregnancies to female clients and 9,500 to male clients and their partners. Of the pregnancies averted to female clients, 207,500 pregnancies were averted to adults (age 20-44) and 79,200 to adolescents (age 15-19). It was estimated that approximately 81,200 adolescent and 215,000 adult pregnancies were averted through the Family PACT Program.

By averting unintended pregnancies, contraceptive services provided through Family PACT prevent an estimated 122,200 abortions, 133,000 unintended births, including 40,600 adolescent births, 38,000 miscarriages and 3,000 ectopic pregnancies (Figure 2). The proportion of pregnancies that ended in various outcomes came from Finer and Henshaw's pregnancy outcome analysis of unintended pregnancies (see Appendix B for details).[26]

Figure 1: Pregnancies averted by Family PACT contraceptive services, CY 2007

Age and Gender Group	Pregnancies in the presence of Family PACT	Pregnancies in the absence of Family PACT	Clients	Average months of protection*	Pregnancies averted	Pregnancies averted per 100 clients	Pregnancies averted per client month of protection
Females	**27,000**	**313,700**	**998,084**	**7.3**	**286,700**	**29**	**0.039**
Adolescent	7,300	86,500	212,077	7.0	79,200	37	0.053
Adult	19,700	227,200	786,007	7.3	207,500	26	0.036
Males	**1,800**	**11,300**	**99,268**	**2.6**	**9,500**	**10**	**0.037**
Adolescent	500	2,500	21,040	2.6	2,000	10	0.037
Adult	1,300	8,800	78,228	2.6	7,500	10	0.037
Total	**28,800**	**325,000**	**1,097,352**	**6.9**	**296,200**	**27**	**0.039**
Adolescent	7,800	89,000	233,117	6.6	81,200	35	0.053
Adult	21,000	236,000	864,235	6.9	215,000	25	0.036

* The average months of protection refers to the months of contraceptive coverage that each Family PACT client received over the course of 2007. Duration of protection is capped at two years for tubal ligations and intrauterine contraceptives to avoid estimating pregnancies in the distance future. The average total number of months of protection is a weighted average of the figure for adults and adolescents. Since adolescents make up a small fraction of total clients, the total averages are closer to the figure for adults.

Note: The number of pregnancies is rounded to the nearest hundreds place.

Figure 2: Estimated outcomes of unintended pregnancies averted through one year of Family PACT services, CY 2007

| Age and Gender Group | Estimated Averted Outcomes | | | | |
	Pregnancies	Births	Induced Abortions	Miscarriages	Ectopic Pregnancies
Females	**286,700**	**128,800**	**118,200**	**36,800**	**2,900**
Adolescent	79,200	39,600	26,900	11,900	800
Adult	207,500	89,200	91,300	24,900	2,100
Males	**9,500**	**4,200**	**4,000**	**1,200**	**100**
Adolescent	2,000	1,000	700	300	-
Adult	7,500	3,200	3,300	900	100
Total	**296,200**	**133,000**	**122,200**	**38,000**	**3,000**
Adolescent	81,200	40,600	27,600	12,200	800
Adult	215,000	92,400	94,600	25,800	2,200

Note: The number of pregnancies is rounded to the nearest hundreds place.

Public sector costs of unintended pregnancies

The public sector costs of an unintended pregnancy to a female Family PACT client were calculated. The number of pregnancies averted to the partners of male Family PACT clients was not included in the calculation of cost-savings because there is no way to determine whether their partners would be eligible for publicly-funded programs. To assess a clients' eligibility for publicly-funded programs it is necessary to know their age, income, and immigration status. This information was not available for the female partners of male clients.

Each pregnancy averted to a female Family PACT client, saved the public sector $6,557 in medical, welfare, and other social service costs for a woman and child from conception up to age two ($5,110 for women aged 20-44 and $10,351 for those aged 15-19). Given the number of pregnancies averted to adult and adolescent female clients (207,500 and 79,200 respectively) and the likely outcomes of these pregnancies, the estimated total cost-savings of the unintended pregnancies averted by Family PACT in 2007 was nearly $1.88 billion from conception to age two ($1.06 billion for adults and nearly $820 million for adolescents, Figure 3). Although adolescents account for approximately 27% (81,200 adolescent pregnancies averted/296,200 total averted pregnancies) of the total pregnancies averted by Family PACT, averting adolescent pregnancies accounts for 44% of the cost-savings ($819,761,039/$1,879,984,528). Reasons include adolescents' higher per-pregnancy costs (because they are more likely to experience labor and delivery complications and their infants are at a higher risk of prematurity and low birth weight), slightly greater likelihood of carrying a pregnancy to term, the availability of special services for pregnant and parenting teenagers, and the greater likelihood of being eligible for public programs.

Figure 3: Public sector costs of unintended pregnancies (averted to female Family PACT clients) incurred by women and children from conception to age two, CY 2007

Public Sector Costs	Adults (age 20-44)	Adolescents (age 15-19)	Overall
Pregnancy related medical costs, conception through delivery	$245,565,189 ($1,183 each)	$121,649,058 ($1,536 each)	$367,214,247 ($1,281 each)
Medical costs, after delivery	$288,779,072 ($1,392 each)	$181,853,107 ($2,296 each)	$470,632,179 ($1,642 each)
Income support	$202,158,333 ($974 each)	$168,613,754 ($2,129 each)	$370,772,087 ($1,293 each)
Social services	$302,119,473 ($1,456 each)	$330,739,403 ($4,176 each)	$632,858,876 ($2,207 each)
Services for children with special needs	$27,099,035 ($131 each)	$15,355,183 ($194 each)	$42,454,219 ($148 each)
Total savings per pregnancy, conception to age 2	**$1,060,223,489** ($5,110 each)	**$819,761,039** ($10,351 each)	**$1,879,984,528** ($6,557 each)

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

Over five years, Family PACT saved an average of $14,111 in public sector costs per averted pregnancy ($11,441 on average for adults, $21,105 on average for adolescents), for a total of nearly $4.05 billion ($2.37 billion for adults, $1.67 billion for adolescents, Figure 4).

Figure 4: Public sector costs of unintended pregnancies (averted to female Family PACT clients) incurred by women and children from conception to age five, CY 2007

Public Sector Costs	Adults (age 20-44)	Adolescents (age 15-19)	Overall
Pregnancy related medical costs, conception through delivery	$240,067,575 ($1,157 each)	$ 123,199,592 ($1,556 each)	$363,267,168 ($1,267 each)
Medical costs, after delivery	$560,274,321 ($2,700 each)	$367,293,814 ($4,638 each)	$927,568,136 ($3,235 each)
Income support	$328,686,775 ($1,584 each)	$279,282,312 ($3,526 each)	$607,969,087 ($2,121 each)
Social services	$1,194,922,675 ($5,759 each)	$873,271,198 ($11,026 each)	$2,068,193,873 ($7,214 each)
Services for children with special needs	$50,117,617 ($242 each)	$28,461,589 ($359 each)	$78,579,206 ($274 each)
Total savings per pregnancy, conception to age 5	**$2,374,068,963** ($11,441 each)	**$1,671,508,507** ($21,105 each)	**$4,045,577,469** ($14,111 each)

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

Cost-benefit of the Family PACT Program

By reducing public health and welfare expenditures resulting from unintended pregnancies to female Family PACT clients, every dollar spent on Family PACT saved the public sector $4.30 from conception up to two years after birth and $9.25 from conception to age five (Figure 5).

Figure 5: Cost-benefit of preventing pregnancies through the Family PACT Program, from conception to age two and conception to age five, CY 2007

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
286,700	$6,557	$14,111	$1.88 billion	$4.05 billion	$437.3 million	$4.30	$9.25

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 from conception to

age two is 66.3% federal, 33.1% state, and 0.6% local (Figure 6). This results in savings of nearly $1.25 billion federally, $623 million to the state, and over $11 million locally. From conception to age five, the share of cost-savings is 66.2% federal, 33.5% state, and 0.3% local, for totals of nearly $2.7 billion federally, $1.4 billion to the state, and $13.6 million locally.

Figure 6: Share of cost savings by payer, CY 2007

Payer	Share of Cost Savings Conception to age 2		Share of Cost Savings Conception to age 5	
Federal	$1,245,689,096	66.3%	$2,677,223,163	66.2%
State	$622,947,996	33.1%	$1,354,715,350	33.5%
Local	$11,347,436	0.6%	$13,638,957	0.3%
Total	$1,879,984,528	100%	$4,045,577,469	100%

Sensitivity analyses

Sensitivity analyses examined the effect of various data inputs and assumptions on the cost-benefit ratio (see Technical Appendix E for details). They revealed that under reasonable alternative assumptions about contraceptive use, contraceptive continuation (whether clients use all or some of the methods supplied), and contraceptive failure rates, the number of pregnancies averted could range between 80,000 and 766,100 resulting in a cost-benefit ratio ranging from $1.11 to $10.55 for costs from conception to age two, and $2.52 to $23.00 for costs from conception to age five (Figure 7).

Figure 7: Sensitivity analyses: pregnancies averted to female clients and cost-benefit ratios from conception to age two and conception to age five

Scenarios	Number of Pregnancies Averted	Cost-Benefit Ratio	
		Conception to age 2	Conception to age 5
Base scenario	286,700	$4.30	$9.25
Alternative scenarios:			
Perfect use failure rates	300,300	$4.51	$9.70
Methods used according to 2000-01 MRR	231,800	$3.31	$7.17
Methods used according to 2007 CEI	80,000	$1.11	$2.42
Used all methods/supplies dispensed	346,700	$5.20	$11.19
No methods used without Family PACT	766,100	$10.55	$23.00

Note: 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 according to the 2007 MRR and experience typical use failure rates, and do not use all the contraceptive methods supplied.

The inputs used to calculate the expected public sector costs and savings are also subject to several assumptions. Alternative assumptions (of 25% lower or up to 25% higher) regarding the costs per enrollee, likelihood of public program participation, and Family PACT expenditures resulted in a range of cost-benefit ratios, from $3.22 to $5.73 saved from conception to age two and $6.94 to $12.34 saved from conception to age five for each dollar invested in Family PACT (Figure 8).

Figure 8: Sensitivity analyses: program costs and participation estimates

Inputs	Base value and range of alternative values	Cost-Benefit Ratio	
		To age 2	To age 5
Total Family PACT Program expenditures (-25%)	$437.3 million ($328- $437.3 million)	$4.30-$5.73	$9.25-$12.34
Average cost per pregnancy (±25%)	$6,557 to age 2 $14,111 to age 5 ($4,918-$8,197 to age 2) ($10,583-$17,639 to age 5)	$3.22-$5.37	$6.94-$11.56
Program participation rate (±25%)	25% lower -up to 25% higher	$3.22-$5.03	$6.94-$11.01

CONCLUSION

The Family PACT Program averted an estimated 296,200 unintended pregnancies in California by providing contraceptive methods to female and male clients in 2007, averting nearly 133,000 live births and 122,200 abortions. In doing so, the program saved the federal, state, and local governments $1.88 billion from conception to age two and over $4 billion from conception to age five, representing a substantial increase in savings from those estimated in 2002 ($1.1 billion and $2.2 billion respectively). By reducing public health and social service expenditures resulting from unintended pregnancies, every dollar spent on Family PACT saved the public sector $4.30 from conception to age 2, up from $2.76 in 2002, and $9.25 from conception to age 5, up from $5.33 in 2002. These figures fall within the range of many other published studies, including the initial cost-benefit analysis of the Family PACT Program for FY 97/98.[27] The findings of this study show that the costs and consequences of unintended pregnancies far exceed the costs of preventing them and that the program has become increasingly more cost-saving. 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 numerous 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 to avoid unintended pregnancies. In 2007, many more women and men received contraceptives than in the previous evaluation period (2002). Much of the program's fertility effect comes from method adoption among clients using no method of contraception in the program's absence and adoption of more effective methods among those who would otherwise use low-efficacy methods.

This estimate of pregnancies averted is relatively conservative owing to the assumptions about contraceptive failure and continuation rates. That is, it was assumed that clients experienced typical use failure rates and did not use all of the methods they were given. If it were assumed that clients used all of the contraceptives paid for by the Family PACT program, the program's cost-savings would increase 21%. Other scenarios modeled the possibilities that women experienced the lowest contraceptive failure rates or used methods as described in alternative data sources (MRR and Client Exit Interviews (CEI)) in the absence of Family PACT. These other sensitivity analyses yield results that range between 74% lower and 33% higher of the base scenario, all indicating that the Family PACT Program is cost-saving.

Given the high public sector costs of unintended pregnancy and the experience of the Family PACT Program in providing contraceptive methods, preventing pregnancy through Family PACT is very cost-beneficial. The prevention of unintended pregnancies results in significant cost-savings to federal, state, and local governments.

These cost-benefit estimates have nearly doubled since 2002. The overall increase in the cost-benefit of the program from 2002 to 2007 can be explained by a number of factors: overall Family PACT expenditures increased at a slower rate than the number of clients served (8.3% vs. 9.3%) which is also indicated by the slight decrease in the cost per client from $266 to $263, the number of pregnancies averted per client served increased 23%, and the base cost per pregnancy increased 21%. The rise in the base cost per pregnancy is in part due to the rising cost of services, as well as the methodological improvements that were used to determine the average costs of Medi-Cal services. For the first time, Medi-Cal managed care was included along with fee-for-service, in estimating the average Medi-Cal costs. This new methodology resulted in a more accurate assessment of Medi-Cal costs, but also caused an increase in the overall cost of these services.

Compared to many other cost-benefit analyses of family planning services, this analysis presents a conservative estimate. Previous studies use less conservative estimates of cost-savings, 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. 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-benefit than other studies. Additionally, this study considered all Family PACT service costs rather than only the costs of contraceptive services, as each of the program's components contribute to the quality, acceptability, and satisfaction by clients and thus contribute to their contraceptive adoption.[28] 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 over four 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.

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

A number of reports published between the late 1970s and early 2000s sought to quantify the economic impact of adolescent pregnancy on society.[29] [30] [31] 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.[32] [33] [34] [35] [36] [37] [38] [39] 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 would have completed high school).[40] Still other studies have projected cost estimates of a single birth or a cohort of births over 20 years.[41] [42] 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, lost income to society in the way of sales tax and income taxes not paid to state and local governments, and increased costs for state prison systems).[43] [44]

In 1997, the Urban Institute published an award-winning and widely cited book *Kids Having Kids: Economic Costs and Social Consequences of Teen Pregnancy* edited by Rebecca Maynard,[45] which offered a comprehensive analysis of the consequences of teen childbearing for the mothers, the fathers, the children, and society. This book was later updated in 2008.[46] In this book, various researchers developed a complex algorithm and assessed the consequences of delaying teen childbearing for an average of 4 years, until the child reaches age 20 to 21. In 2003, Constantine and Nevarez applied the algorithm, developed by Maynard and colleagues, to California and presented the costs of teen pregnancy to taxpayers and society by legislative districts.[47] Here they showed how the annual societal cost of teen childbearing per district ranges from a low of $27 million to a high of $192 million. They also assessed that California's dramatic decrease in its teen birth rate over the last decade translated into an annual savings to society of $2.2 billion. More recently, the National Campaign to Prevent Teen and Unplanned Pregnancy published a state by state comparison of teen pregnancy costs, also utilizing Maynard's methodology, where it was estimated that at a national level, teen childbearing costs taxpayers at least $9.1 billion annually or $1,430 per child born to a teen mother.[48] A review of the cost-benefit 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.[49] [50]

Few studies have considered the costs of unintended pregnancies to adult women. Most studies, which have examined the cost-benefit 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, 27 states in the past two decades 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.[51] 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).[52] They estimated that for every $1 spent on family planning services, $4.02 was saved. In 2006, the Guttmacher Institute estimated that requiring states to provide coverage of Medicaid family planning services to women up to 200% Federal Poverty Level (FPL) would expand eligibility to more than 3.5 million women a year, prevent more than 500,000 unintended pregnancies, and save the federal government and states approximately $1.56 billion.[53] Most recently, Frost, Finer and Tapales (2008)[54] estimated the cost savings of all Title X family planning clinics both nationally and for each state, where they found that the largest net savings came from California, which saved $568 million from public funding for family planning clinics.

TECHNICAL APPENDIX B: METHODS FOR ESTIMATING PREGNANCIES AVERTED

This section describes the methods used for estimating the number of pregnancies averted for Family PACT clients. The model of pregnancies averted relies on various data inputs—including contraceptive failure rates, pregnancy outcomes, and contraceptive methods used through Family PACT and in the absence of Family PACT. The model and its inputs are described below.

Estimating the number of pregnancies averted among Family PACT clients

The number of pregnancies averted by Family PACT was modeled as the difference between the number of pregnancies expected among Family PACT clients and the number of pregnancies they might have experienced in the program's absence. The estimate relies on the methodology established for the previous evaluation of 2002 Family PACT services.[55] This current report contains updated estimates with new program data regarding the female and male clients served in 2007, methods dispensed, and contraceptive methods used in the absence of Family PACT. Estimates for men and women are calculated separately.

The number of pregnancies expected in the absence of Family PACT was estimated from the 2007 MRR regarding the contraceptive methods women and men 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.

The number of pregnancies expected among Family PACT clients was estimated for 99,268 male and 998,887 female clients aged 15-44 who received contraceptive methods between January and December 2007, according to paid claims data on contraceptive methods dispensed (current as of March 2009). These include clients for whom a pharmacy billed for prescription or over-the-counter contraceptive methods, or a clinician billed for contraceptive supplies, medications, or a medical procedure (sterilization, and insertions of intrauterine contraceptives).[b] 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.

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[b] Pregnancies among women who reported using natural family planning methods in Family PACT are not included because the number of pregnancies experienced can't be reliably 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.

Contraceptive failure rates

The probabilities of pregnancy by method were based on reported first year pregnancy rate estimates from Trussell (2007) (Appendix B, Table 1).[56] The monthly probability of pregnancy is: $1 - (1-\% \text{ of women pregnant at one year})^{1/12}$

Appendix B, Table 1: Contraceptive failure rates

Contraceptive Method	Percentage Pregnant at One Year (typical use)		Perfect Use
	Adults	Adolescents	
Tubal Ligation	0.5%	0.5%	0.5%
Vasectomy	0.15%	0.15%	0.10%
Intrauterine Contraception	0.8%	0.8%	0.6%
Injectables (Depo Provera)	3.0%	3.5%	0.3%
Oral Contraceptives	8.0%	9.4%	0.3%
Patch	8.0%	9.4%	0.3%
Ring	8.0%	9.4%	0.3%
Diaphragm	16.0%	18.9%	6.0%
Condom	15.0%	17.8%	2.0%
Spermicide/Foam/Jelly/Cream	29.0%	34.3%	18.0%
Emergency Contraception	25.0%	29.5%	25.0%
No contraceptive method	85.0%	90.0%	85.0%

Source: Adapted from Trussell J. Contraceptive efficacy. In Hatcher RA, Trussell J, Nelson AL, Cates W, Stewart FH, Kowal D. *Contraceptive Technology: Nineteenth Revised Edition*. New York NY: Ardent Media, 2007 and Kost K, Singh S, Vaughan B, Trussell J, Bankole A. Estimates of contraceptive failure from the 2002 National Survey of Family Growth. *Contraception* 2008;77(1): 10-21.

Pregnancy outcomes and duration of infecundity

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 conceiving two pregnancies in the same year is small. This study used pregnancy outcome estimates based on Finer & Henshaw's analysis of unintended pregnancies.[57] Their analysis used 2002 National Survey of Family Growth (NSFG) and 2001 National Center for Health Statistics (NCHS) tabulations of birth certificate files. A special data run was requested from by Dr. Larry Finer to identify all outcomes of unintended pregnancies. Information regarding ectopic pregnancies was not available from Finer & Henshaw's analysis, so this study used the figure 1% for ectopic pregnancies as reported by Saraiya and colleagues.[58] These data show that unintended pregnancies are less likely to end in a birth than are intended pregnancies. Appendix B, Table 2 describes the proportion of unintended pregnancies that result in abortions, births, miscarriages, and ectopic pregnancies, used in this study.

Appendix B, Table 2: Unintended pregnancy outcomes by age group

Age	Abortion	Birth	Miscarriage	Ectopic Pregnancy	Total
Ages 15-19	34%	50%	16%	1%	100%
Ages 20-44	44%	43%	12%	1%	100%
Total	**41%**	**44%**	**13%**	**1%**	**100%**

Source: Distribution of births, abortions and miscarriages are based on special tabulations of a 2001 unintended pregnancy analysis published in Finer LB & Henshaw SK. Disparities in Rates of Unintended Pregnancy In the United States, 1994 and 2001, *Perspectives on Sexual and Reproductive Health*, 2006, 38(2):90–96. Estimates of ectopic pregnancies are from Saraiya M, 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.

For this analysis, all births were assumed to have occurred at nine months, followed by two months of postpartum amenorrhea. Since 88% of abortions occur in the first trimester,[59] induced abortions were assumed to have occurred at month three, followed by one month of amenorrhea. Miscarriages would have occurred at month three since the majority of miscarriages occur during the first trimester,[60] followed by one month of infecundity. Ectopic pregnancies would remove women from the risk of pregnancy for 11 months.

Estimating the probability of pregnancy: A Markov model

The risk of pregnancy was modeled as a Markov process[c] 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:

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

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 in 2007 according to paid claims data updated through March 2009. 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.

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[c] 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.

To estimate the pregnancies averted to the partners of men accessing Family PACT contraceptive services, it was assumed that each male client had only one female partner. This study models pregnancies which occur to that partner assuming she is using only contraceptives provided to the male through Family PACT, either condoms or vasectomy. Assuming one partner per male client leads to a conservative estimate of pregnancies averted. Since one man can conceive pregnancies with several women 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 2007 may prevent pregnancies for many years into the future. The fertility effect for long-term methods such as IUC and sterilization 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, 2008 (a maximum cap of two years). For example, a woman receiving a sterilization procedure on January 1, 2007 was assumed to have 24 months of coverage. A woman receiving that procedure on December 31, 2007 was assumed to have 12 months of coverage. Although the December 2008 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 benefits should not have a major effect on the estimate of the program's impact on fertility.

For short-term methods, such as barrier methods and hormonal contraceptives[d] such as oral contraceptives (OCs), the contraceptive patch, and vaginal ring, 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 OCs, 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 from the 2007 MRR[61] For pharmacy dispensing, the exact quantity of supplies dispensed was used, since this data was 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.

Contraceptive use in the absence of Family PACT according to Medical Records Review

It was estimated that one out of three Family PACT female clients and almost two out of five male clients would use no contraception at all in the absence of the Family PACT Program. This estimate is based on the contraceptive methods used by women and

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[d] For the purposes of this analysis hormonal methods excluded the Mirena IUC which is classified as a long-term method.

men prior to their first Family PACT visit based on the 2007 MRR. Appendix B, Table 3 shows the contraceptive methods that it was assumed Family PACT clients would use in the absence of the program. Given this profile of method use, it was estimated that 47% of adult women, 64% of adolescent women, and 62% of men would experience an unintended pregnancy in the absence of the Family PACT Program.

Appendix B, Table 3: Primary contraceptive method used prior to first Family PACT visit by men and women who are not pregnant or seeking pregnancy, CY 2005

Primary contraceptive method used prior to first Family PACT visit	Adult females (age 20 to 44) n=437	Adolescent females (age 15-19) n=130	All men (age 15-44) n=155*
Tubal Ligation and Vasectomy	0%	0%	0%
Intrauterine Contraception	5%	1%	n/a
Injectables (Depo Provera)	6%	7%	n/a
Oral contraceptives/Patch/Ring	18%	11%	1%
Diaphragm	0%	0%	0%
Condom	37%	35%	59%
Spermicide/Foam/Jelly/Cream	0%	0%	0%
NFP /withdrawal/ LAM/FAM	1%	1%	0%
No contraceptive method	31%	43%	39%
Abstinence	2%	3%	1%
Total	**100%**	**100%**	**100%**
Associated Annual Pregnancy Rate	**47%**	**64%**	**62%**

*   Sample not large enough for age breakdown.
Note: Male partners could say they were relying on partner's method.
            NFP=Natural Family Planning, LAM=Lactational Amenorrhea Method, FAM= Fertility Awareness Method
Source: 2007 Family PACT MRR, Male and Female General Samples. Clients with no documentation of the method
            were excluded from the analysis (n=168 women, 93 men).

Contraceptive use in the absence of Family PACT according to Client Exit Interviews

In 2007, Family PACT clients participating in the CEI were asked about what they would use for contraceptive protection if they were unable to get contraceptives for free through Family PACT.[62] The survey was conducted at 73 provider sites in 13 counties throughout California. Analysis of the responses included 1,195 women and 168 men who were neither pregnant nor seeking pregnancy. If clients reported more than one method, the most effective method was selected as their "main" method. Respondents were not explicitly given the option of saying they would use no method of contraception, yet, 6% of adult women, 4% of adolescent women and 12% of men volunteered that they would use no method of contraception. Less than 1% said they would abstain from intercourse. Five percent (not shown) said they did not know what method they would use. It was conservatively assumed that these women and men who could not name

what method they would use would use the same mix of methods as those who did give a response (Appendix B, Table 4). This alternative model of contraceptive use in the absence of Family PACT results in a lower expected pregnancy rate than when the contraceptive methods used prior to program enrollment are used.

Appendix B, Table 4: Most effective contraceptive method clients say they would use if they could not get them for free through Family PACT

Primary contraceptive method used in the absence of Family PACT	Adult females (age 20 to 44) n=972	Adolescent females (age 15-19) n=223	All men (age 15-44) n=168
Tubal Ligation and Vasectomy	1%	0%	2%
Intrauterine Contraception	4%	3%	0%
Injectables (Depo Provera)	7%	8%	0%
Oral Contraceptives/Patch/Ring	34%	31%	7%
Condoms	46%	52%	77%
NFP/withdrawal/LAM/FAM	2%	0%	2%
No contraceptive method	6%	4%	12%
Abstinence	0%	1%	1%
Total	**100%**	**100%**	**100%**
Associated Annual Pregnancy Rate	**20%**	**21%**	**34%**

Note: Male partners could say they were relying on partner's method.
          NFP=Natural Family Planning, LAM=Lactational Amenorrhea Method, FAM= Fertility Awareness Method
Source: 2007 Client Exit Interview

Contraceptive use in the Family PACT Program according to claims data

Nearly one million women (998,084) and 99,218 men ages 15-44 were provided with contraceptives in Family PACT in 2007. Appendix B, Tables 5 and 6 display 2007 administrative claims data on contraceptive dispensing for women and men. The total, 1.09 million clients, represents a 5% increase in the number of clients receiving contraceptives since our previous evaluation of pregnancies averted among the 1.04 million women and men served in 2002. On average, in 2007, women received 7.3 months of contraceptive coverage and men received 2.6 months. There has been a small increase in the quantity of months of protection for women and a small decrease for men since 2002. In that year, women received an average of 7 months of contraceptive protection and men received an average of 3 months of protection. The increase in months of protection for women is a result of a small increase in oral contraceptive cycles dispensed (from 7.6 in 2002 to 7.9 in 2007) and a larger increase in dispensing of months of protection among patch and ring users. Women received four more months of patch and ring coverage in 2007 than in 2002.

Appendix B, Table 5: Dispensing of contraceptives as a primary method to women age 15-44 through Family PACT in CY 2007

Contraceptive method	Number of women receiving method*			Average months of protection**		
	Adults	Adolescents	Total	Adults	Adolescents	Total
Tubal Ligation	3,444	N/A	3,444	18.0	N/A	18.0
Intrauterine Contraception	28,577	2,507	31,084	16.2	15.6	16.2
Injectables (Depo Provera)	111,411	29,055	140,466	6.3	5.5	6.2
Oral Contraceptives	388,109	112,435	500,544	7.9	7.9	7.9
Patch	59,322	13,511	72,833	6.2	4.8	5.9
Ring	53,555	15,603	69,158	6.1	5.6	6.0
Diaphragm	541	40	581	1.5	1.5	1.5
Condom	283,150	81,841	364,991	2.6	2.6	2.6
Spermicide/Foam/Jelly/Cream	1,485	218	1,703	2.4	2.1	2.3
Emergency Contraception	41,354	22,626	63,980	1.7	1.7	1.7
Total distinct female clients	**786,008**	**212,076**	**998,084**	**7.4**	**7.0**	**7.3**

*   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.
**   The average months of protection refers to the months of contraceptive coverage that each Family PACT client received over the course of 2007. Duration of protection is capped at two years for tubal ligations and intrauterine contraceptives to avoid estimating pregnancies in the distance future. The average total number of months of protection is a weighted average of the figure for adults and adolescents. Since adolescents make up a small fraction of total clients, the average total is closer to the figure for adults.
N/A   Not applicable because adolescents are not eligible to receive sterilization procedures through Family PACT.
Source: 2007 paid claims data current as of March 2009.

Appendix B, Table 6: Dispensing of contraceptives as a primary method to men age 15-44 through Family PACT in CY 2007

Contraceptive method	Number of men receiving method*			Average months of protection**		
	Adults	Adolescents	Total	Adults	Adolescents	Total
Vasectomy	876	N/A	876	17.7	N/A	17.7
Condoms	77,617	21,038	98,655	2.4	2.6	2.4
Spermicide/Foam/Jelly/Cream	17	4	21	2.2	2.0	2.2
Total distinct male clients	**78,228**	**21,040**	**99,268**	**2.6**	**2.6**	**2.6**

*   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.
**   The average months of protection refers to the months of contraceptive coverage that each Family PACT client received over the course of 2007. Duration of protection is capped at two years for tubal ligations and intrauterine contraceptives to avoid estimating pregnancies in the distance future. The average total number of months of protection is a weighted average of the figure for adults and adolescents. Since adolescents make up a small fraction of total clients, the average total is closer to the figure for adults.
N/A   Not applicable because adolescents are not eligible to receive sterilization procedures through Family PACT.
Source: 2007 paid claims data current as of March 2009.

TECHNICAL APPENDIX C: METHODS FOR ESTIMATING COST SAVINGS

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-benefit 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 2007 were $437.3 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. This includes the costs of services for all Family PACT clients (i.e. men and women of all ages). The intent is to measure the cost-benefit of the program in its entirety.

Estimating 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 methodology used to estimate pregnancy related Medi-Cal costs are explained in more detail in Appendix D.

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 adolescent clients ages 15-29 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):

Public cost per pregnancy (through end of pregnancy) =	(% of unintended pregnancies ending in the specific outcome) x
	(average cost of the service associated with that pregnancy outcome) x
	(% of eligible women who would use Medi-Cal to pay for the service)

Estimating the adjusted medical care and social service costs post delivery

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 of the child.

The specific programs included in the calculation of medical costs of mothers and children are Medi-Cal and Healthy Families. The methodology used to estimate post-pregnancy Medi-Cal costs to the infant and the mother are explained in more detail in Appendix D.

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 and their children include Cal-WORKs cash grants, 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:

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

The cost of program participation per female participant was based on each program's FY 2007/08 budgetary data or CY 2007 data when available. 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. The number of pregnancies averted to the partners of male Family PACT clients was not included in the calculation of cost-savings because information about their age, income and immigration status was not available. Thus there is no way to determine whether males' partners would be eligible for publicly-funded programs.

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 2007 MRR 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 2007 were discounted to present values at a 3% annual rate.[63] [64] The net present value of a pregnancy was the sum of the yearly costs, after discounting.[e]

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

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.

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 public sector 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 public sector the entire cost of the pregnancy. 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 public sector will cover the costs later, the public sector 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 the CEI. Between September 2007 and March 2008 1,238 women ages 15-44 were interviewed. 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 (8% of the adolescent pregnancies and 30% of adult pregnancies),

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

and the remainder were considered mistimed and, therefore, merely delayed by use of contraceptive services.

According to the CEI, adult women (ages 20-44) wanted to wait an average of 3.7 years and adolescents wanted to wait an average of 6.6 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 National Survey of Family Growth (NSFG).[65] 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 3.7 or 6.6 years is the difference between the cost at the time the pregnancy occurred and the discounted cost 3.7 or 6.6 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: ESTIMATING MEDI-CAL COSTS OF PREGNANCY EPISODES AND POST-DELIVERY MOTHER AND INFANT SERVICES

Introduction

In the course of evaluating the cost-benefit ratio of publically funded pregnancy prevention programs, it is necessary to attach a public cost to a pregnancy. This section describes a methodology for estimating the average Medi-Cal cost of a delivery and costs for the mother and infant subsequent to the delivery.

The estimation of the average Medi-Cal costs for a pregnancy resulting in a delivery and costs subsequent to a delivery requires calculations within three cost categories. First, are the costs associated with the delivery, prenatal, and post-partum. Second, is the cost incurred by providing ongoing Medi-Cal services to mothers who now qualify for Medi-Cal as a result of the delivery. Third, is the cost of ongoing Medi-Cal services provided to the infant/child. Once these costs are determined and appropriate denominators are identified, an average cost subsequent to a delivery is calculated. The methodology and justification for each of these calculations are provided herein.

Mothers and children may be served through a fee-for-service arrangement where the provider is reimbursed for the specific services delivered, or though a managed-care arrangement. In the later scenario, a health plan is contracted to provide for a specified range of an individual's health care needs. Medi-Cal pays the health plan a per-member-per-month (PMPM) rate, also known as capitation, that reflects the risk associated with each member's enrollment, regardless of which services, if any, are provided.

Previous attempts to quantify post-delivery costs have relied upon fee-for-service claims only because the actual amounts paid are readily available from paid claims. However, a preponderance of healthy mothers and children, who qualify for Medi-Cal, are enrolled into managed-care plans. Many of those who remain in fee-for-service are high-cost special cases. For example, California Children's Services provides care for life-threatening conditions that require care in neonatal intensive care units, or produce disabilities requiring surgical and/or rehabilitation services. As such, limiting analysis to fee-for-service claims only would most certainly overestimate the average cost of care in Medi-Cal as a whole. Therefore, Medi-Cal costs incurred in both fee-for-service and managed-care delivery systems are included in this analysis.

The costs associated with individuals served through fee-for-service are obtained by summing the amounts paid on their claims. The managed-care costs are a function of the capitation rate paid PMPM plus paid claims for excluded services. This capitation rate is determined by a combination of the individual's aid code, which identifies the range of

services for which he/she is eligible in a given month, and the specific health plan(s) in which he/she is enrolled. The capitation rates used in this study are those published for January 2007.[66] Each month of capitation is calculated and then summed across the period of interest. Children may have a third coverage source which is enrollment in California's Healthy Families Program. Although this is also a capitated program, specific services are carved out and paid fee-for-service. Overtime, individuals may migrate among these health delivery systems. Therefore a hybrid approach is required to account for all publically funded medical, dental, and mental health care costs – regardless of the mode of reimbursement.

Data sources

- Fee-for-Service Medi-Cal claims between 2003 and 2008

- Medi-Cal Managed-Care encounter data between 2003 and 2008

- Medi-Cal Eligibility Data System (MEDS) containing client eligibility information by month for dates between 2002 and 2008

- Two-Plan Model Capitation Reports[67, 68]

Cost of pregnancy resulting in a delivery

The average cost of a pregnancy resulting in a delivery is obtained through analysis of fee-for-service claims for 2007 using the Ingenix MIS/DSS Symmetry Episode Treatment Grouper[69] (ETG). This tool provides a classification methodology for identifying episodes of care. The episodes include prenatal care, the delivery, and post-partum care. The use of fee-for-service claims for estimating the cost of a pregnancy episode is justified in the following ways: 1) the actuarial methodology to calculate the PMPM capitation includes the same sets of services that women experience in fee-for-service Medi-Cal,[70] 2) analysis shows that the distribution of episode sub-types (e.g., vaginal delivery, cesarean delivery, delivery with complications) within fee-for-service are representative of the distribution within Medi-Cal as a whole, 3) California State law requires that capitated expenditures not exceed those that would have occurred within a fee-for-service delivery system,[f] and finally, 4) nearly three-quarters of Medi-Cal deliveries and miscarriages, and two-thirds of abortions and ectopic pregnancies are funded through fee-for-service.

Mother and infant costs subsequent to a delivery

Universe of mothers and infants
To obtain average costs it is first necessary to select the women and children for whom these averages will be calculated. Our first limitation is that the rates paid to health plans are only publically available for select counties. Since we must be able to fully account for all costs incurred by individuals who migrate between fee-for-service and managed-care

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[f] CCR Title 22, §53321(b)

systems, we limit this analysis to the 12 study-counties for which the capitation rates are available: Alameda, Contra Costa, Fresno, Kern, Los Angeles, Riverside, San Bernardino, San Francisco, San Joaquin, Santa Clara, Stanislaus, and Tulare. Individuals who are served by a county other than those listed are excluded from the analysis, even if some of their services were provided by a study-county.

Women, who would likely have been eligible for enrollment in Medi-Cal even if they had not had a child, are also excluded from the analysis. These include women who are eligible because of a non-delivery related disability, refugee status, medically indigent status, AIDS diagnosis, breast cancer, or prior foster care status.

Identification of Medi-Cal deliveries
To sum the costs associated with women subsequent to a delivery, it is first necessary to identify a cohort of women who had a Medi-Cal paid delivery. This is accomplished by selecting procedure codes (Current Procedural Terminology (CPT) codes; and Health Care Common Procedure Codes (HCPCS) and diagnosis codes (International Classification of Diseases, 9th Revision (ICD-9 codes) from the fee-for-service claims and the managed-care encounter data. Appendix D, Table 7 includes the procedure and diagnosis codes used to identify a delivery.

Post-partum costs
Post-partum costs are included in the calculation of the average cost per pregnancy with delivery. Therefore, when calculating the average cost for mothers' post-delivery costs, post-partum costs need to be identified and excluded. In managed-care systems however, post-partum costs are covered under the capitation payments and as such do not add to the cost of serving the mother. Therefore post-partum costs are removed from the fee-for-service claims only. Appendix D, Table 7 includes the diagnosis and procedure codes that are used to identify the provision of post-partum services. Claims with a post-partum diagnosis or procedure code that occur within 30 days after the date of delivery are excluded. This window of time is assumed to capture nearly all post-partum claims.

Appendix D, Table 7: Medi-Cal codes for identifying pregnancy related claims and encounters

Diagnosis Codes[*]	Procedure Codes[**]
Deliveries	
	59400, 59409, 59410, 59510, 59514, 59515, 59610, 59612, 59614, 59618, 59620, 59622, 01967, 01960, 01961, 00850, 720 , 721 , 722 , 723 , 724 , 725 , 726 ,727 , 728 , 729 ,730 , 731 , 732 , 733 , 734 , 735 ,736 , 7221, 7229, 7231, 7239, 7251, 7252, 7253, 7254, 7271, 7279, 7301, 7309, 7321, 7322, 7351, 7359, 7399, 740 , 741 , 742 , 744 , 749 , 7499
Post-partum Visits	
Claim did not contain a procedure code for delivery, abortion, miscarriage or ectopic *and* had one of: V24 or (640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677) where 5th digit equals 4	Z1038
Pregnancies	
First 3 digits=640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 650, V30, V31, V32, V33, V34, V35, V36, V37, V39, 635, 636, 637, 630, 631, 633, 632, 634, 638	59840, 59841, 59850, 59851, 59852, 59855, 59856, 59857, X7724, X7726, Z0336, 59100, 59120, 59121, 59130, 59135, 59136, 59140, 59150, 59151, 59160, 59812, 59820, 59821, 59830, 59400, 59409, 59410, 59510, 59514, 59515, 59610, 59612, 59614, 59618, 59620, 59622, Z1032, Z1034, Z1038, 01961, 00850, 01967, 01960

* Two different diagnosis code variables were searched for any matching code: PRIMARY_DIAG_CD variable and the DTL_DIAG_CD variable. Diagnosis Code selections were based on ICD-9-CM 2006.

** Two different procedure code variables were searched for any matching code: PROC_CD variable and the INPAT_PRIM_SURG_CD variable. Procedure code selections were based on the 2006 CPT Codes for Delivery / Medi-Cal Codes for Global or Per Visit Delivery Care or Anesthesia for Vaginal or Cesarean Delivery or ICD-9-CM Volume 3 2006 Procedure Codes for delivery related procedures.

Mother costs

Once the deliveries are identified, the subsequent Medi-Cal cost for these mothers is calculated. However, some portion of these women would have been eligible for Medi-Cal for reasons other than adding a Medi-Cal eligible child to the family unit. The discernment for inclusion of a mother's post-delivery claim requires inspection of her diagnosis code and aid code. Only costs incurred by mothers that meet one of the following criteria are included:

- Paid claims or capitation payments with the one of the following aid codes: 3D, 3E, 3G, 3H, 3L, 3M, 3N, 3P, 3R, 3U, 30, 33, 34, 35, 36, 37, 81, which indicate that eligibility is the likely the result of adding a child to the family unit.

- Paid claims or capitation payments to women with aid codes that indicate a disability resulting from a complication of pregnancy. These include: 6G, 6X, 6Y, 60, 63, 64, 67, 68, 8G, provided that the first instance of any of these aid codes occurs in the month of delivery.

- Paid claims and encounters with a diagnosis code for a pregnancy complication that occurs within 30 days after the delivery.

All paid claims and capitation payments within a period of interest are summed, with the exception of post-partum claims and those that are associated with subsequent pregnancies. It is not reasonable to attribute the cost of subsequent pregnancies to the consequent eligibility of the initial delivery. See Appendix D, Table 8 for list of codes indicating a complication to a pregnancy diagnosis.

Appendix D, Table 8: ICD-9 codes Indicating a pregnancy complication

Range		Add fifth character of:	Description
From	**To**		
642.0	642.94	"2" or "4"	Hypertension complicating pregnancy, childbirth or puerperium
646.2		"2" or "4"	Unspecified renal disease in puerperium
646.4		"2" or "4"	Peripheral neuritis in pregnancy
646.5		"2" or "4"	Asymptomatic Bacteriuria
646.6		"2" or "4"	Infections of the GU tract
646.8		"2" or "4"	Other specified comps of pregnancy - herpes, low wt gain, fatigue
647.0	647.94	"2" or "4"	Infectious disease and conditions complicating puerperium
648.0	649.44	"2" or "4"	Other conditions complicating puerperium
665.2		"2" or "4"	Inversion of uterus
665.3		"2" or "4"	Cervical laceration
665.4		"2" or "4"	High vaginal laceration
665.5		"2" or "4"	Injury to pelvic organs
665.6		"2" or "4"	Damage to pelvic joints and ligaments
665.7		"2" or "4"	Pelvic hematoma
665.8		"2" or "4"	Other specified obstetrical trauma
665.9		"2" or "4"	Unspecified obstetrical trauma
666.0	666.34	"4"	Hemorrhage complicating puerperium
668.0	668.94	"4"	Anesthesia or sedation complicating puerperium
669.0	669.94	"4"	Other L&D complications NOS in puerperium
670.0	677	"2" or "4"	Other complications of puerperium
679.0			Maternal complications of an in-utero procedure

Note: Codes indicating a complication to an abortion are not included in this table.

The mothers' post-delivery costs are examined over three spans of time: the first year after the delivery, the second year after the delivery, and the third through fifth years. Time periods are chosen for which data are available and most current for the analysis.

Mother Costs Algorithm
Costs 0-1 (first year after delivery)

- Identify women who gave birth in base year 2007.

- Sum all paid claims and capitation payments incurred by this cohort for the 12 months after the delivery.

- To obtain an average cost for year one, divide the sum of costs by the number of deliveries in 2007.

Costs 1-2 (second year)

- Identify women who gave birth in base year 2006.

- Sum all paid claims and capitation payments incurred by this cohort between 13 and 24 months after the delivery.

- To obtain an average cost for year one, divide the sum of costs by the number of deliveries in 2006.

Costs 2-5 (third, fourth and fifth years)

- Identify women who gave birth in base year 2003.

- Sum all paid claims and capitation payments incurred by this cohort between 25 and 60 months after the delivery.

- To obtain an average cost for years three through five, divide the sum of costs by the number of deliveries in 2003.

Infant costs

All fee-for-service paid claims and capitation payments for children aged 0 through 4 are included in this analysis. Infant claims have some distinct features that must be considered. First, for the initial 60 days of an infant's life it is common that services are billed under his or her mother's Medi-Cal Client Identification Number (CIN). Infant services may also be billed under the infant's own CIN. Claims contain a newborn indicator to make this distinction where 0= Not a newborn claim, 1= Newborn claim with newborn CIN, and 2= Newborn claim with mother CIN.

Unfortunately, there is no link between the mother's CIN and the newborn's CIN. Therefore it is not known if an infant was served under the mother's CIN only, the infant's CIN only, or both. Analysis of Medi-Cal claims shows that among all the CINs used to bill for newborn services (either the infant's or the mother's), approximately 62% are billed under the infant's CIN. Furthermore, the number of infants receiving services under their own CIN is more than twice the number of Medi-Cal funded deliveries. Thus, acknowledging that an unknown number of infants are born outside of the Medi-Cal system (e.g., out-of-state, home births, private insurance, parents' insurance), but go on to receive Medi-Cal services, and vice versa, we make the assumption that nearly all infants resulting from a Medi-Cal delivery go on to receive Medi-Cal services in their first year. Furthermore, we assume that nearly all infants who are served under their mother's CIN in the first 60-days of life go on to receive services under their own CIN.

It is also possible for an infant to receive services in his or her first year, but not in subsequent years or vice versa. Nevertheless, the former is more likely than the later given that the number of children receiving services declines after year one. In a given year, the number of 0-1 infants is 1.2 times larger than children served in their second year of life. Taken together, the features of the infant-claims and capitation payments lend support to our decision to create infant-cohorts comprised of de-duplicated CINs for infants with a date of birth in a base year that have either a paid fee-for-service claim, a month of paid capitation or both. These cohorts will be used to identify costs incurred by the child during the first five years of life. Even so, the infant claims billed under the mother's CIN will be included as costs incurred by the cohort during the first year of life.

As is done with the mother's post-delivery costs, infant costs are examined over three spans of time: the first year of life, the second year after the delivery, and the third through fifth years. Time periods are chosen for which data are available and most current for the analysis. Time spans and cohorts are selected as follows:

Infant Costs Algorithm
Costs 0-1 (first year)

- Identify a cohort of all infants born in base year 2007.

- Sum all paid infant claims billed under either their mother's or their own CIN and capitation payments incurred by this cohort up to age one.

- To obtain an average cost for year one, divide the sum of costs by the number of infants born in 2007.

Costs 1-2 (second year)

- Identify a cohort of all infants born in base year 2006.

- Sum all paid claims and capitation payments incurred by this cohort between the ages of one and two.

- To obtain an average cost for year two, divide the sum of costs by the number of infants born in 2006.

Costs 2-5 (third, fourth and fifth years)

- Identify a cohort of all infants born in base year 2003.

- Sum all paid claims and capitation payments incurred by this cohort between the ages of two and five.

- To obtain an average cost for years three through five, divide the sum of costs by the number of infants born in 2003.

State and federal share of cost

Most Medi-Cal costs are shared between the state and federal governments. The federal portion is termed federal financial participation (FFP). The FFP rate varies in accord with the service provided and the aid code under which it is provided. For most services and aid codes, the FFP rate is 50%. However, there are some services and programs that garner enhanced FFP. Appendix D, Table 9 provides the FFP rates by aid codes and diagnosis codes for services. Abortion services do not garner FFP. In fee-for-service claims, these services are identified by the diagnosis codes listed in the table. In Managed Care however, there are a published amounts paid to health plans by the State for abortion services.[71]

Appendix D, Table 9: Federal Financial Participation (FFP) by aid code

Aid Codes	Rate of FFP
Federal Only 0A, 01, 02, 08, 56, 57, 6T	100%
S-CHIP 7X, 7Y, 8N, 8P, 8R, 8T, 8X, 9H	65%

State Only
    0L, 0R, 0T, 0U, 0V, 0X, 0Y, 1D, 2D, 4H, 5F, 5X, 5Y, 50, 53, 65, 7M, 7N,
    7P, 7R, 71, 73, 8F, 8Y, 81, 84, 85, 88, 89, 9J, 9M, 9N, 9R, 9U, C1, C2,
    C3, C4, C5, C6, C7, C8, C9, D1, D2, D3, D4, D5, D6, D7, D8, D9, E1
	0%

Diagnosis Codes	
Contraception V25, V2635-V2641	90%
Abortion 635, 636, 637, 638, & V617	0%

Results

Appendix D, Table 10 provides the statewide average costs of pregnancy events within Medi-Cal fee for service by the age of the mother. Reimbursements include prenatal and post-partum care associated with the episode. Among adult women, the average cost of a Medi-Cal delivery is $5,260, an abortion is $610, an ectopic pregnancy is $2,978, and a miscarriage is $890. Costs for teens are slightly lower across all these categories.

Appendix D, Table 10: Medi-Cal Fee-For-Service pregnancy related episodes CY 2007

Pregnancy Event	Ages 15-19			Ages 20-44		
	# of Episodes	Reimbursement	Average Reimb.	# of Episodes	Reimbursement	Average Reimb.
Abortion	7,294	$3,934,298	$540	24,391	$14,872,817	$610
Delivery	19,140	$98,075,755	$5,124	112,522	$591,821,824	$5,260
Ectopic	207	$583,475	$2,819	2,036	$6,063,565	$2,978
Miscarriage	2,308	$1,965,389	$852	16,586	$14,753,394	$890

Source: Symmetry Episode Treatment Grouper, data current as of June 2009.

Appendix D, Table 11 provides the mother and child costs subsequent to a delivery for women and children served within the 12 study-counties. All deliveries meeting this condition are included in the counts of mothers (the denominator). However, only costs for services for which these women would not have been otherwise eligible are included in the cost summations. The counts and sums are provided by the age of the mother, the time period after birth, and by the state and federal shares as indicated on the claims.

Note that younger mothers incur higher average costs than those aged 20-44; nearly 40% higher in the first two years and also that the cost of fee-for-service mothers and infants is

significantly higher than those in managed-care. Appendix D, Table 12 provides average Medi-Cal costs incurred by mother and infant per delivery. The averages are divided up by state and federal share, by age of the mother, and by period subsequent to the birth. Overall, FFP for these services is a little less than 50%. On average, adult mothers and their infants garner Medi-Cal costs of $9,855 for the delivery and during the first year of the infant's life. For teen mothers, that number is slightly higher at $9,944. Through the first five years of the child's life, that average is $12,715 for adult mothers and $13,058 for teen mothers.

Appendix D, Table 11: Post-delivery Medi-Cal costs and mother/infant count in 12 study-counties*

| Health Plan | Base Year | Period | Group | Costs** | | | Average Cost | | |
				State Share	Fed Costs	Denominator***	State Share	Federal Share	Total
Fee-For Service	2007	0-1 yrs	Mothers 14-19	$3,850,587	$4,099,818	23,820	$162	$173	$334
	2006	1-2 yrs		$2,507,860	$2,645,064	25,751	$97	$103	$200
	2003	2-5 yrs		$6,332,034	$6,609,445	29,777	$71	$74	$145
	2007	0-1 yrs	Mothers 20-44	$10,036,704	$10,735,272	92,738	$108	$116	$224
	2006	1-2 yrs		$7,668,790	$7,980,860	111,148	$69	$72	$141
	2003	2-5 yrs		$27,644,571	$28,296,673	161,204	$57	$59	$116
	2007	0-1 yrs	Infants	$447,659,976	$432,236,794	255,407	$1,753	$1,692	$3,445
	2006	1-2 yrs		$62,190,958	$63,729,167	246,056	$253	$259	$512
	2003	2-5 yrs		$126,096,131	$128,746,394	222,854	$189	$193	$381
Managed Care	2007	0-1 yrs	Mothers 14-19	$5,394,622	$5,335,473	23,820	$226	$224	$450
	2006	1-2 yrs		$4,715,039	$4,663,397	25,751	$183	$181	$364
	2003	2-5 yrs		$13,430,272	$13,282,030	29,777	$150	$149	$299
	2007	0-1 yrs	Mothers 20-44	$15,648,544	$15,477,454	92,738	$169	$167	$336
	2006	1-2 yrs		$15,139,994	$14,974,162	111,148	$136	$135	$271
	2003	2-5 yrs		$55,153,370	$54,546,241	161,204	$114	$113	$227
	2007	0-1 yrs	Infants	$75,852,479	$75,025,002	255,407	$297	$294	$591
	2006	1-2 yrs		$81,861,713	$83,162,638	246,056	$333	$338	$671
	2003	2-5 yrs		$180,316,395	$182,046,629	222,854	$270	$272	$542

*   Analysis is restricted to women and children who only received services in the 12-study counties with two-plan managed-care models: Alameda, Contra Costa, Fresno, Kern, Los Angeles, Riverside, San Bernardino, San Francisco, San Joaquin, Santa Clara, Stanislaus, and Tulare.

**   Fee-for Service costs are obtained from paid claims. Managed-Care costs are obtained from 2007 capitation reports.

***   The numbers of unique individuals in the base year among both fee-for-service paid claims and managed-care enrollees for whom capitation was paid serves as the denominators.

Source: Medi-Cal MIS/DSS data current 12/31/2009.

Appendix D, Table 12: Average Medi-Cal costs incurred by mother and infant by mother's age and number of years after delivery

Age group	Mother		Infant
	14-19	20-44	
State Share			
Delivery	$2,562	$2,630	
Year 1	$388	$277	$2,050
Year 2	$280	$205	$585
Years 3-5	$221	$171	$458
Total Year 1-5	$3,451	$3,283	$3,093
Federal Share			
Delivery	$2,562	$2,630	
Year 1	$396	$283	$1,986
Year 2	$284	$207	$597
Years 3-5	$223	$171	$465
Total Year 1-5	$3,465	$3,291	$3,048
Total			
Delivery	$5,124	$5,260	
Year 1	$784	$560	$4,036
Year 2	$564	$412	$1,182
Years 3-5	$444	$343	$923
Total Year 1-5	$6,916	$6,575	$6,141

Note: Analysis is restricted to women and children who only received services in the 12-study counties with two-plan managed-care models: Alameda, Contra Costa, Fresno, Kern, Los Angeles, Riverside, San Bernardino, San Francisco, San Joaquin, Santa Clara, Stanislaus, and Tulare.

Source: Medi-Cal MIS/DSS data current 12/31/2009.

TECHNICAL APPENDIX E: SENSITIVITY ANALYSES

While all the assumptions used in this study were carefully chosen and are believed to be the most accurate estimates available, they are subject to uncertainty. Sensitivity analyses can be used to test the overall robustness of a model by varying its assumptions. For example, in this study's model it was assumed that in the absence of the program, Family PACT clients would use the same methods they reported to use prior to their first family PACT visit. However, it is impossible to know exactly what clients would use in the hypothetical case of the absence of Family PACT. Because the accuracy of this study's findings depends on assumptions included in the model, we test these assumptions to determine how robust the findings are to the assumptions made. A series of sensitivity analyses were conducted to examine the effect of altering various data assumptions, that are subject to the most uncertainty, on the overall cost-benefit ratio of the program. The alternate assumptions included in the sensitivity analyses included:

- Alternative assumptions about contraceptive behaviors of women in the absence of Family PACT, such as the use of no methods at all, use of methods as reported in the 2007 CEI, and the use of methods as reported in the 2000/01 MRR
- Alternative assumptions regarding contraceptive 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

Altering assumptions for pregnancy averted calculations

They study's results are very sensitive to our assumptions about what women and men would do in the absence of Family PACT services. In Alternate Model 1, if all clients used no method of contraception in the absence of Family PACT, they would have experienced over 800,000 pregnancies, resulting in 788,000 averted pregnancies by Family PACT (Appendix E, Table 13).

In Alternate Model 2, if women and men adopted the methods that clients claimed they would have used in the absence of Family PACT according to the 2007 CEI study, they would have experienced 112,100 pregnancies in the absence of the program and the number averted by Family PACT would have been 83,300.

The data represented in the 2007 MRR showed a higher percentage of women and men using no method prior to their first Family PACT visit compared to the 2000/01 MRR (the basis for the 2002 pregnancies averted estimate.)[72] In Alternative Model 3, assuming that the distribution of contraceptive methods among new clients in the 2000/01 MRR reflected what women and men would have used in the absence of Family PACT services in 2007 as opposed to the 2007 MRR, Family PACT would have averted almost

237,000 pregnancies, an 11% increase over the 2002 estimates. Therefore, 11% of the increase in pregnancies averted from 2007 to 2002 was due to improvements in the number of clients served and the type and quantity of contraceptive methods. The remainder of the growth was due to changing assumptions about what women and men would have used in the absence of Family PACT services.

If it is assumed that clients experienced perfect use rather than typical use failure rates for the contraceptives dispensed through the Family PACT Program (Alternate Model 4), the number of pregnancies averted to clients increases from 296,200 to 311,300. In this scenario, clients would have experienced 5% fewer pregnancies (Appendix E, Table 14). Moreover, if in Alternative Model 5 it is assumed that clients used all of the contraceptive methods dispensed through the program instead of assuming that clients used only a proportion of the methods dispensed, then the number of pregnancies averted increases to 362,500, resulting in 22% more averted pregnancies under this scenario.

Appendix E, Table 13: Alternative assumptions regarding contraceptive method use in the absence of Family PACT and their impact on the number of pregnancies averted

Age and Gender Group	Pregnancies with Family PACT	Base model: Clients would use methods as reported in the 2005 MRR		Alternate Model 1: Clients would use no method		Alternate Model 2: Clients use methods as reported in 2007 CEI		Alternate Model 3: Clients use methods as reported in 2000/01 MRR	
		Pregnancies							
		Without Family PACT	Averted	Without Family PACT	Averted	Without Family PACT	Averted	Without Family PACT	Averted
Females	**27,000**	**313,700**	**286,700**	**793,100**	**766,100**	**107,000**	**80,000**	**258,800**	**231,800**
Adolescent	7,300	86,500	79,200	140,900	133,600	22,300	15,000	57,300	50,000
Adult	19,700	227,200	207,500	652,200	632,500	84,700	65,000	201,500	181,800
Males	**1,800**	**11,300**	**9,500**	**23,700**	**21,900**	**5,100**	**3,300**	**6,900**	**5,100**
Adolescent	500	2,500	2,000	4,600	4,100	1,100	600	1,500	1,000
Adult	1,300	8,800	7,500	19,100	17,800	4,000	2,700	5,400	4,100
Total	**28,800**	**325,000**	**296,200**	**816,800**	**788,000**	**112,100**	**83,300**	**265,700**	**236,900**
Adolescent	7,800	89,000	81,200	145,500	137,700	23,400	15,600	58,800	51,000
Adult	21,000	236,000	215,000	671,300	650,300	88,700	67,700	206,900	185,900

Note: The number of pregnancies is rounded to the nearest hundreds place.

Appendix E, Table 14: Alternative assumptions regarding contraceptive failure rates and contraceptive continuation

Age and Gender Group	Alternate Model 4: Clients experience perfect use failure rates for contraceptives dispensed through Family PACT			Alternate Model 5: Clients use all methods supplied through the Family PACT Program		
	Pregnancies					
	With Family PACT	Without Family PACT	Averted	With Family PACT	Without Family PACT	Averted
Females	13,400	313,700	300,300	35,600	382,300	346,700
Adolescent	3,100	86,500	83,400	9,300	105,300	96,000
Adult	10,300	227,200	216,900	26,300	277,000	250,700
Males	300	11,300	11,000	3,100	18,600	15,500
Adolescent	100	2,500	2,400	800	4,000	3,200
Adult	200	8,800	8,600	2,300	14,600	12,300
Total	13,700	325,000	311,300	38,700	401,200	362,500
Adolescent	3,200	89,000	85,800	10,100	109,600	99,500
Adult	10,500	236,000	225,500	28,600	291,600	263,000

Note: All figures are rounded to the nearest hundreds place.

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