OPTIONS
SOCIAL SECURITY
PERU

PN-ABR-034

ANDEAN INSTITUTE OF POPULATION AND DEVELOPMENT STUDIES
TECHNICAL INFORMATION ON POPULATION FOR THE PRIVATE SECTOR

FINAL REPORT
RESULTS OF A COST-BENEFIT STUDY OF FAMILY PLANNING SERVICES DELIVERY AND UTILIZATION OF MATERNAL-CHILD HEALTH SERVICES IN THE PERUVIAN SOCIAL SECURITY INSTITUTE

Juan Luis Herrera

July, 1988

Lima, Peru

A C K N O L E D G E M E N T

This project would have not been completed if it had have not been for Alfredo Guzmán and Karen Foreit.

Dr. Guzmán, as the Family Planning National Director for IPSS, was not only one of the most interested officers in the development of this project but also the person who provided more ideas and all the aid that the completed research required.

Karen Foreit Ph.D. provided the technical support that the project needed: her consistant energy and her knowledge on the subject was a constant help and allowed the research to be completed according to a very tight schedule.

INANDEP is pleased to express its recognition of both.

Lima, September 1988.

PARTICIPANTS

OF THE IPSS COST-BENEFIT STUDY

Principal investigator	:	Juan Luis Herrera
Economic Analyst	:	Maritza Guabloche
Assistants	:	María Rosa Garate Alfonso Urtecho Jose Luis Pereira
Data entry	:	Iván Falcón
Secretary	:	Stephanie Benavides

TABLE OF CONTENTS

I. INTRODUCTION

The Cost-Benefit Study of Family Planning Services Delivery and Utilization of Maternal-Child Health Services in The Peruvian Social Security Institute (IPSS) was designed to provide first-hand information to the IPSS authorities regarding the reproductive behavior of the beneficiary population, as well as costs and benefits projected for family planning services which could modify this behavior.

In this way, the IPSS decision-makers would have the information necessary to establish and develop clinical and educational services and draw up an appropriate budget for program strengthening and expansion.

The project offers the following specific information to IPSS:

* Current levels of maternity-related behaviors (births, abortions, contraceptive use, etc) among insured women and wives of insured men.

* IPSS expenditures in maternity-related services and child care in the base period of the study (1987).

* Level of potential demand for family planning services among insured women and wives of insured men.

* Potential health benefits that could be obtained with familiy planning through improved birth spacing and reduction of unwanted pregnancy and induced abortions.

* Probable costs to the IPPS of providing family planning services in terms of equipment, instruments, training, education and information, personnel, supplies and consultations during a five-year period.

* Probable financial benefits to the IPSS, due to reduced expenditures for medical visits, hospitalization, maternity leave (pre-natal and post-partum), nursing subsidies, vaccines and other costs related to child medical care.

* Cost-Benefit measures, such as cash flow, pay-back period, benefit-to-cost ratio and internal rate of return, comparing the costs of providing family planning services as to the benefits generated by these services.

The IPSS cost-benefit study uses the methodology developed by the TIPPS project. It is based on the following assumptions:

1. Many IPSS beneficiaries who do not wish to have more children yet do not use contraception or use inadequate methods to control their fertility.

2. Low levels of contraceptive prevalence and the use of less effective methods result in high rates of unwanted pregnancies, high rates of induced abortion, and births of unwanted children.

3. The unwanted pregnancies and complications that arise from induced abortions create a financial burden in terms of pre-natal and post-partum assistance, hospitalization and use of operating rooms, maternal subsidies and pediatric care.

4. A family planning program could increase the rate of contraceptive use and promote the use of more effective contraceptive methods, reducing the rates of unwanted pregnancies and induced abortions.

5. The investment made in family planning (costs of medical visits, supplies, etc.) could be more than compensated for by the cost reduction in maternity-related services averted.

The present report summarized the results of a TIPPS analysis carried out in the Peruvian Social Security Institute's establishments of metropolitan Lima, taking 1987 as the base period. The analysis and data collection was performed by the Andean Institute of Population and Development Studies (INANDEP) with the assistance of Karen Foreit of TIPPS. Data collection instruments, the mathematical model and the computer programs for microcomputers were provided by TIPPS.

The report is organized in the following chapters:

II. Institute Description: General information and characteristics of the IPSS beneficiaries (Law-Decree 22488) as well as types and costs of benefits provided to insured women, wives of insured men and dependent children according to the above Law.

III. Methodology: Brief description of the TIPPS mehtodology and data sources used in the analysis.

IV. Current Maternity-Related Behavior: Birth and abortion rates among insured women and wives of insured men and current contraceptive behavior of both groups.

V. Projected Costs and Benefits of Providing Family Planning: Potential demand for family planning services, the impact of family planning on births and abortions among IPSS beneficiaries, program costs, and a comparison of expected financial costs and benefits.

VI. Conclusions and Recommendations for the IPSS Management: Ways of reducing Institute outlays for maternity and medical child care.

II. Institute Description:

A. General Information

The Peruvian Social Security Institute (IPSS) is an autonomous and decentralized public institute that is responsible for providing coverage to its insured population and to their dependents against illness, maternity, accidents, old age, death and any other situation stipulated by law.

IPSS includes various plans and systems, such as The National Health System (Law Decree 22482), The National Pension System (Law Decree 19990) and others of lesser importance. The first is of major interest for this study, since it is through this plan that maternity and child care benefits are granted to insured female workers and spouses of insured males.

1) Assistance Services:
   Medical attention (hospitalized and outpatient) during the pre-natal, childbirth and post-partum periods.

2) Preventive Services:
   Vaccines and child medical care up to 18 years of age.

3) Financial Benefits:
   Lactation and pre and post-natal maternity subsidies.

IPSS headquarters are located in the city of Lima. Activities throughout outside Lima are carried out in a decentralized fashion. Installations include:

1) Two large national hospitals located in metropolitan Lima (E. Rebagliati and G. Almenara). Seventy six percent of IPSS births in Lima take place in the Rebagliati Hospital.

2) Ten regional hospitals

3) Fifteen zonal hospitals

4) Eighty-four polyclinics and health centers including 12 in metropolitan Lima (Angamos, Los Pinceles, Villa María del Triunfo, Villa El Salvador, Vitarte, Parque Unión, Naranjal, Comas, Canto Grande, Castilla, Chorrillos and Grau).

The total IPSS budget for 1987 amounted to 16,466 million intis (523 million dollars), 7,688 million intis (224 million dollars) or 47% corresponded to the National Health System. The 1987 output of the National Health System included seven million outpatient consultations and 170 thousand hospital discharges, for a total registered population of 1'879,575 people.

B. Characteristics of IPSS's Beneficiary Population (LD-22482)

The insured beneficiary population registered in Lima totalled of 1'074,893 people, including 677,057 men and 397,836 women. There were 85,543 dependent wives registered. The data on Table 1 corresponds only to the insured women and wives of insured men whose contributions are up to-date. The rates of insurance in force and the rates of union were obtained from the National Nutrition Survey (ENNSA).

Table No. 1 shows the population of women in union of reproductive age, beneficiaries of LD-22482 in metropolitan Lima, by 5-year age groups. We see high concentration of women in the age groups of greater productive and reproductive capacity (25-39 years). This age structure, similar for insured women and dependent wives, differs substantially from the the national age structure, which follows a pyramid-type pattern. This is due to legal impediments of work for minors and the market's preference for workers under the age of 40, which produce a bulge in the intermediate age groups.

TABLE 1

AGE STRUCTURE OF THE BENEFICIARY FEMALE POPULATION IN UNION ACCORDING TO LAW DECREE 2248

	INSURED	%	SPOUSES	%	TOTAL	%
15-19	0	0.00%	987	1.65%	987	0.51%
20-24	6090	4.51%	6909	11.54%	12999	6.67%
25-29	32220	23.88%	16780	28.02%	49000	25.15%
30-34	48495	35.94%	15793	26.37%	64288	33.00%
35-39	28747	21.30%	12173	20.33%	40920	21.00%
40-44	12818	9.50%	4606	7.69%	17424	8.94%
45-49	6565	4.87%	2632	4.40%	9197	4.72%
TOTAL	134935	100.00%	59880	100.00%	194815	100.00%

C. Benefits for Insured Women and Dependent Wives According to LD-22428

Table 2 is a list of the benefits that IPSS grants to insured women, dependent wives, and children according to LD-22482.

There are two types of benefits: economic and health. Among the first we find maternity subsidies, to which only insured women are entitled, for 45 days before and 45 days after birth, and lactation subsidies for insured women and dependent wives are provided up to 240 days post-partum.

Health benefits include the following:

1) Outpatient medical assistance and hospitalization during the pre-natal, childbirth and post-partum periods and treatment for abortion complications for insured women and dependent wives.

2) Vaccines during the child's first year, child medical check ups and hospitalizations up to 18 years of age (according to the law and up to 14 years of age in practice).

D. Annual Costs of Benefits:

Table 3 shows the annual costs (expressed in dollars) for maternity and child benefits by child age-groups. Two phenomena can be seen:

1. In the year of the child's birth, the cost for maternity care attention and subsidies totals $747 for insured women and $446 for dependent wives. The difference lies on the fact that dependent wives do not receive maternity leave subsidies.

2. Average costs decrease as the child's age increases. This is due to the fact that vaccines are given only during the child's first year of life and to the fact that the number of children registered and medical visits per child decrease with increasing age.

TABLE 2

LIST OF BENEFITS PROVIDED BY IPSS
TO THE INSURED AND TO DEPENDENT WIVES
(LD No. 22482)

BENEFIT	BENEFICIARY		
	INSURED	SPOUSE	CHILDREN
BENEFITS			
Maternity Leave	x		
Lactation Subsidies	x	x	
HEALTH CARE			
Pre-Natal	x	x	
Birth	x	x	
Post-Partum	x	x	
Abortion Complications	x	x	
Check ups			x
Hospitalization			x
Vaccines			x

TABLE 3

ANUAL COSTS OF MATERNITY AND CHILD BENEFITS BY CHILD' AGE
(1987 DOLLARS)

BENEFIT	Child's Birth Year Insured	Spouses	CHILD'S AGE 0-1	2-6	7-10	11-14
MOTHER						
*Natal Assistance	437	437				
*Subsidies	310	9				
CHILD						
*Medical Assistance			106	49	43	36
TOTAL(*)	747	446	106	49	43	36

(*) Annual Average

III. METHODOLOGY

A. Introduction

The TIPPS cost-benefit model consists of the following submodels:

1) Base period fertility analysis.

2) Projection of births averted.

3) Projection of target contraception users and acceptors.

4) Projection of family planning service costs, and

5) Calculation of cost-benefit measures.

The model was programmed in the Host programming language (Research Triangle Institute INPLAN project). The Host program and TIPPS model were provided to INANDEP on diskettes for use in an IBM-compatible microcomputer.

The model can be divided in six stages:

1. Analysis of present fertility behavior
   a) Number of births and abortions
   b) Current contraceptive prevalence and method mix

2. Estimation of potential demand for family planning services
   a) Expressed interest in receiving family planning
   b) Future fertility intentions

3. Projection of future fertility under present conditions and under higher contaceptive prevalence/better method mix
   a) Births averted
   b) Induced abortions (or abortion complications) averted

4. Estimation of potential benefits (cost reductions) associated with births and induced abortions averted and other health improvements

5. Estimation of potential costs of offering or subsidizing family planning services delivery
   a) Training and capital costs
   b) Operating (recurring) costs

6. Calculation of benefits-to-costs ratios
   a) Cash flow
   b) Pay-back period
   c) Benefit-cost ratio
   d) Internal rate of return

In this study, separate simulations were run for insured female workers and dependent wives, due to their diferences in reproductive behavior and of benefits received. The results were later combined with Lotus 123.

B. Data Sources

The data required for application of the TIPPS model are fairly extensive and come from a variety of sources. To keep costs down and to speed the process of data collection, we attempted to use existing information whenever possible, and when not possible, we proceeded to collect the data directly.

1. The study used 1987 as the base period and the following information sources:

   1.1. Base-line Survey: The TIPPS model specifies the administration of a core questionnaire in order to obtain information about knowledge and practice of specific contraceptive methods, current fertility and future fertility intentions, and potential interest in receiving a family planning method from or subsidized by the Institute.

   In the present study, the questionnaire was elaborated by INANDEP, with the assistance of TIPPS and experts of other national and international organisms. (*) The questionnaire was accompanied by interviewers and coding manuals.

(*) The questionnaire covers additional aspects beyond those used in this study; a fuller report will soon be published.

This instrument was applied in July 1987, to a sample of 408 insured female workers and wives of male workers between the ages of 18 and 44 (*), visiting of 1987 at different IPSS health establishments in Lima:

a) Two national hospitals (Almenara and Rebagliati).

b) Two zonal hospitals (Sabogal and Vitarte, located in the West and East of Lima, respectively).

c) A polyclinic (Villa Maria del Triunfo) located south of Lima.

d) A polyclinic (Francisco Pizarro) located north of Lima.

e) A polyclinic (Chincha) located in the center of Lima.

Eleven interviewers (obstetrics students of the San Martin de Porres Private University), they were properly trained and supervised by a sociologist, a social worker and a midwife, participated in this task. The total number of cases eligible for analysis was 387.

The collected data was computer-entered using a special Pascal program and transformed to ASCII format.

(*)The sample size insures a true representation, with a 5% margin for error, assuming maximum heterogeneusness

1.2. IPSS Informatics Department:(*) This Department provided the following data:

a) Social security registrations by year of birth and sex (from 01/01/70 to 04/28/88)

b) Registration statistics of dependents, by region, zone and office, up to 04/28/88.

1.3. Hospital Records: A 5% sample study (one out of every twenty days of the year) of births and treatment for abortion complications was conducted at the Rebagliati Hospital for the 1987 calendar year.

1.4. Planning and Racionalization Department: We obtained the goals of coverage for insured women and dependent wives for the 1986-1990 period (IPSS National Development Plan 1986-1990, Base Document, Volume I, Lima 1986).

1.5. Besides these institute sources we referred to two national surveys:

a) National Survey of Nutrition and Health (INE and the Ministery of Health, 1984). Population data for metropolitan Lima, including IPSS coverage, payment status (up-to-date or not), and marriage rates.

b) Demografic and Family Health Survey (INE 1986-published information). Average duration of post-partum infecundability, global fertility rates, and other similar variables.

(*)The information obtained from the IPSS Statistics Department was not used because this Department deals with the potential insured population, estimated in base of the 1981 Census, and not with the current insured population.

The data obtained from these sources was used to derive the following indicators:

- Total number of women in union (legal marriage and consensual union) by insurance status (worker vs. dependent wife) and age.

- Total number of births to insured and dependent women in reproductive age.

- Contraceptive prevalence by age and insurance status.

- Contraceptive method mix by age and insurance status.

- Average duration of post-partum infecundability.

Other variables used in the TIPPS model such as maximum biological fecundability, contraceptive method effectiveness, rates of method continuation, and supplies needed for family planning acceptors, used universal values provided by the model.

2. The Cost-Benefit analysis included the following data sources:

2.1. IPSS and Ministry of Health regulations(*):
Type and number of cases attended and other benefits that IPSS should offer to insured women and dependents.

These regulations were:

a) Law Decree 22482 and its Regulations.

b) Regulations for Integral Health Assistance for Women in Decentralized Services (Community and Health Centers), Health Ministery, Lima, 1986.

c) Regulations for Control of Immuno-preventible Diseases (PAI), Ministry of Health, Lima, 1986.

(*)The Ministry of Health is the technical-normative organism that rules all health codes and is head of the Health Sector, which includes the Ministry, IPSS, Armed Forces and Police, and private intitutions.

There are no specific regulations in the IPSS regarding mother and child health services, and each center sets its own norms.

2.2. Accounting Department of Lima's hospitals and IPSS Accounting Department: Unit costs for hospital care in obstetrics/gynecology, neonatology and pediatrics, at hospitalization level (bed-day and use of delivery and operating rooms), for outpatient care, and vaccinations.

This task was facilitated by Directive No.011.66. IPSS.88 that establishes a uniform system for calculating relative costs for health care.

2.3. Economic Aid Department of the General Health Department: Unit costs for maternity and lactation subsidies in metropolitan Lima.

2.4. USAID-Perú agreements 527-0230, 527-0167 and 527-0285: We obtained information regarding costs of AID support for IPSS family planning activities, including equipment, commodities, IEC material and training, logistical and supervision support.

2.5. Peru's Central Reserve Bank:

a) The discount rate that would be used in the estimation of future costs and benefits.

b) The mean 1987 dollar-inti exchange rate for calculating constant dollars.

IV. FERTILITY AND FAMILY PLANNING: CURRENT BEHAVIOR

A. Introduction

In this section, we will describe current fertility rates and use of family planning among married women in the IPSS. By married women we mean all women in union, married or consensual, who recieve maternity-related benefits as a result of their or their spouse/partner's insurance, according to Law Decree 22482.

The model makes use of age-specific fertility and contraception rates, for standard demographic 5-year age groups (15-19, 20-24, 25-29 etc.) These rates are expressed as fractions.

Marital fertility rates were calculated by dividing the number of births occurring during the last year to women in each group, by the number of women in the age group.

Contraception rates are similarly calculated from the base-line survey: the number of women in each age group using some recognized means of contraception (traditional or modern) is divided by the number of women in the age group. Because the sample's number of cases per method was small, contraceptive method groups had to be worked with instead of specific methods.

The third important variable in the fertility analysis in induced abortion. Abortions reduce the number of unwanted pregnancies, but can mean a high risk for a woman's health. Unfortunately, there are no adequate direct methods to estimate induced abortion rates: women frequently hide their abortions and, since not all abortions bring about complications, hospital records are incomplete on this subject (we estimate that only 15% of abortions result in complications treated in IPSS hospitals in Lima.) For these reasons, the model calculates abortion rates indirectly(*).

(*)For more information, refer to the Appendix.

B. Fertility

Table 4 shows the number of births and abortions for the base period, andage specific fertility and abortion rates for the period, by insurance category.

There are two remarkable differences between insured female workers and dependent wives as far as reproductive behavior:

1. While insured female workers show a total marital fertility rate (MTFR) of 3.1, aproximately half the fertility among urban women with at least high school education, dependent wives show a MTFR of 5.8.

2. The differences in fertility between insured women and wives is due more to the to the greater practice of abortions among insured female workers, than to differences in contraceptive use as we will later see.

   Insured female workers may be more likely to resort to induced abortion in order to avoid unwanted births because such births represent an obstacle to their employment.

TABLE 4

CURRENT BIRTH AND ABORTION RATES

INDICATOR	WOMEN'S AGE 15-19	20-24	20-29	30-34	35-39	40-44	45-49
INSURED							
No. Women in Union	0	6090	32220	48495	28747	12818	6565
Births (observed)	0	1663	4737	4619	1964	422	0
Fertility Rate	0	0.273	0.147	0.095	0.068	0.033	0
Abortions (estimated)	0	221	13113	17672	6516	507	810
Abortion Rate	0	0.036	0.407	0.364	0.227	0.040	0.123
SPOUSES							
No. of Women in Union	987	6909	16780	15793	12173	4606	2632
Births (observed)	344	2181	3042	2554	1301	115	29
Fertility Rates	0.349	0.316	0.181	0.162	0.107	0.025	0.011
Abortions (estimated)	192	-51	4206	2576	1419	693	252
Abortion Rate	0.195	-0.007	0.251	0.163	0.117	0.151	0.096

C. Contraceptive Behavior

Table 5 shows current contraceptive prevalence rates among insured female workers and dependent wives. We see that 40% of women at risk do not use any contraceptive method, and that among the women who use familiy planning, a considerable proportion (15%) resort to traditional methods (withdrawal and periodical abstinence). In sum, 55% of women in union in reproductive age have practically no protection against an unwanted pregnancy.

We found no significant differences between insured female workers and dependent wives, except in the case of barrier methods. The percentage of insured female workers who use these methods is twice as high as the percentage of dependent wives who use them.

TABLE 5

CURRENT RATES OF CONTRACEPTIVE USE BY METHOD

(IN PORCENTAJES)

METHOD	INSURED	SPOUSES	TOTAL
TRADITIONAL/LEAST EFFECTIVE	14.33%	15.33%	14.62%
Withdrawal	3.66%	5.11%	4.09%
Periodic Abstinence	10.67%	10.22%	10.54%
BARRIER/SOMEWHAT EFFECTIVE	13.11%	7.30%	11.40%
Condon	10.67%	5.11%	9.03%
Espermicidas	2.44%	2.19%	2.37%
VERY EFFECTIVE	29.27%	34.31%	30.75%
IUD	22.87%	22.63%	22.80%
Invection	0.00%	1.46%	0.43%
Pills	6.40%	10.22%	7.53%
PERMANENT (Female Sterilization)	3.66%	2.92%	3.44%
NON USERS	39.63%	40.15%	39.78%
No Method	39.63%	38.69%	39.35%
Douche	0.00%	0.73%	0.22%
Breast-feeding	0.00%	0.73%	0.22%
TOTAL	100.00%	100.00%	100.00%

V. BENEFITS AND COSTS OF PROVIDING FAMILY PLANNING SERVICES

A. Introduction:

In this chapter we will evaluate the potential demand for family planning services provided by the IPSS among insured female workers and dependent wives and project the impact that providing family planning services would have on maternity related behaviors and benefits paid out. Finally, the costs of providing family planning services are estimated and the benefits and costs accruing from the program are compared.

Many potential users of family planning are not currently using an effective or appropriate contraceptive method because they are unaware that family planning can help them achieve their desired family size, or because family planning is unavailable to them because of high prices or inconvenient service outlets. Potential users are considered to be those women who would like to delay their next pregnancy but are not using any contraceptive method, or who do not wish to have any more children but are not using an effective contraceptive method. The larger the proportion of women who can be classified as potential users, the greater the potential demand for family planning and the greater the potential impact of offering IPSS-provided family planning services.

Lack of knowledge about contraception does not appear to be a significant factor in the low prevalence rates in the IPSS population. Virtually all women know at least one modern method, and the knowledge rates for all methods, except the implant and the diaphragm, are 50% or higher.

The central assumption of the TIPPS approach is that stimulating demand for family planning and satisfying that demand through IPSS provided or subsidized family planning services will lead to more widespread use of contraception and increased use of more effective methods. Greater and better contraceptive use will decrease the number of unwanted or mistimed pregnancies that occur to insures women and wives, which in turn will reduce the number of unwanted or mistimed births, number of abortions and abortion complications, and other health problems associated with high-risk pregnancies.

In chapter II, the maternity-related benefits offered by the IPSS to its beneficiaries and dependents were described and per-capita annual cost outlays for these benefits were estimated from IPSS financial records. Every unwanted pregnancy prevented by the use of family planning saves the IPSS money, in terms of cost outlays during the pregnancy and birth of the child, and yearly expenditures for health care during the child's first 14 year of life. Preventing unwanted pregnancies also benefits the woman and the Institute by reducing abortion rates and complications arising from incomplete induced abortions.

IPSS currently covers maternity care for insured female workers, dependent wives and children. The extension and strenghthening of family planning services will mean an additional cost. The amount the Institute spends on these services depends on several factors such as the information and education efforts needed to make the existence of services and the advantages of family planning widely known, as well as the volume of family planning services delivered. Previous experiences in other settings has shown that the first users of a new, subsidized family planning on their own. These women who switch to the new program incur costs without generating benefits. However, swithching is unavoidable and in the long run can be beneficial if the users who switch use their methods more effectively or adopt more effective methods.

The bottom line of the TIPPS model is the cost-benefit analysis. Using the costs and benefits (cost reductions) of the Family Planning Program, estimated previously, it will be shown that the costs can be compensated through reductions in the expenditures made in Maternal and Child health services and subsidies within six years of program inauguration. Four cost-benefit indices will be calculated: annual cash flow, which shows when the program will begin operating in the black; cumulative costs and benefits, which shows the period necessary to pay back the initial investment; benefits to cost ratio, which divides the present discounted value of all benefits accruing from the family planning program by the present discounted value of the cost of offering the program; and the internal rate of return on the investment in family planning.

B. Potential Demand for Family Planning Services

1. Unmet need for family planning: Table 6 (A and B) compare future fertility intentions of women at risk, beneficiaries of Law Decree 22482 with their current contraceptive behavior.

   The most remarkable fact in this table is that more than 76 thousand women (39% of total beneficiaries) who do not wish to have more children do not use any contraceptive method (44 thousand) or use the least secure methods (32 thousand)-traditional and barrier methods.

2. Current knowledge of contraceptive methods: According to Table 7 almost 100% of all women know at least one modern method, being the IUD the most widely known (by 97% of women) and the implant the least known (only by 5% of them).

   However, we must keep in mind that this knowledge may be superficial and that strong prejudice against some contraceptives predominates among IPSS women, especially against the pill, the injection and the IUD. Those women who have never used these methods but believe they cause harm, especially "discharges" (the pill and injection) and "physiological changes" (IUD), represent 44%, 44% and 30% of the Institute's total beneficiaries in Lima, respectively.

TABLE 6-A

F E R T I L I T Y I N T E N T I O N S A N D

C U R R E N T C O N T R A C E P T I V E B E H A V I O R

(IN PORCENTAGES)

FUTURE INTENTIONS OF FECUNDITY	CURRENT USERS: SECURE METHODS	CURRENT USERS: LESS SECURE METHODS	CURRENT USERS: SUBTOTAL	NON-USERS	TOTAL
WANT MORE CHILDREN					
Immediately	24.32%	21.62%	45.95%	54.05%	100.00%
Later	33.33%	25.00%	58.33%	41.67%	100.00%
DO NOT WANT MORE CHILDREN	37.23%	27.30%	64.54%	35.46%	100.00%
TOTAL	34.27%	25.86%	60.13%	39.87%	100.00%

TABLE 6-B

F E R T I L I T Y I N T E N T I O S A N D

C U R R E N T C O N M T R A C E P T I V E B E H A V I O R

(IN ABSOLUTE FIGURES)

FUTURE FECUNDITY INTENTIONS	CURRENT USERS: SECURE METHODS	CURRENT USERS: LESS SECURE METHODS	CURRENT USERS: SUBTOTAL	NON USERS	TOTAL
WANT MORE CHILDREN					
Immediately	7557	6718	14275	16794	31070
Later	15115	11336	26451	18894	45345
DO NOT WANT MORE CHILDREN	44085	32329	76415	41986	118400
TOTAL	66758	50383	117141	77674	194815

TABLE 7

WOMEN'S KNOWLEDGE OF CONTRACEPTIVE METHODS
(% WHO STATE THAT THEY 'HAVE HEARD OF' THE METHOD)

METHOD	INSURED	SPOUSES	TOTAL
Withdrawal	68.00%	57.60%	64.90%
Periodic Abstinence	93.20%	90.80%	92.50%
Condom	89.10%	83.80%	87.50%
Spermicide	79.60%	76.00%	78.60%
Diaphram	39.50%	32.30%	37.40%
IUD	96.80%	96.80%	96.80%
Inyection	93.10%	94.20%	93.40%
The Pill	96.40%	96.40%	96.40%
Implant	5.20%	2.80%	4.50%
Female Sterilization	94.10%	92.30%	93.60%
Vasectomy	54.10%	47.90%	52.90%
Know 0 modern methods	0.70%	1.00%	0.70%
Know 1 or more modern methods	99.30%	99.00%	99.30%

3. Potential Demand for IPSS Family Planning Services:

The potential demand for IPSS family planning services is shown on Table 8 (A and B). According to this table, the majority of women (84%) who currently use a contraceptive method would change their supply source to IPSS.

Half of current non-users who want to control their fertility also would use IPSS as a future supply source. This tendency is similar for women who wish to space their pregnancies and for those who do not wish to have more children.

To summarize, there is a high potential demand for IPSS family planning services in Lima, since more than 130 thousand women (2 out of every three beneficiaries) wish to use these services to control their fertility.

TABLE 8-A

POTENTIAL DEMAND FOR IPSS PROVIDED FAMILY PLANNING SERVICES

(IN PORCENTAGES)

CURRENT USE OF CONTRACEPTIVES	WOULD USE IPSS SERVICES		
	YES	NO	TOTAL
Current Users	84.00%	16.00%	100.00%
Current Non-users	54.46%	45.53%	100.00%
Spacers	47.83%	52.17%	100.00%
Limiters	57.45%	42.55%	100.00%

TABLE 8-B

POTENTIAL DEMAND FOR IPSS PROVIDED FAMILY PLANNING SERVICES

(IN ABSOLUTE FIGURES)

CURRENT USE OF CONTRACEPTIVES	WOULD USE IPSS PROVIDED SERVICES		
	YES	NO	TOTAL
Current Users	98,398	18,743	117,141
Current Non-users	33,159	27,722	60,881
Spacers	24,122	17,865	41,987
Limiters	9,037	9,857	18,894
TOTAL	131,557	46,465	178,022

TABLE 9

TARGET OF CONTRACEPTIVE USE RATES BY METHOD

METHOD	TOTAL
TRADITIONAL/LEAST EFFECTIVE	6.93%
BARRIER/SOMEWHAT EFFECTIVE	7.15%
VERY EFFECTIVE	50.41%
IUD	36.29%
The Pill	14.12%
PERMANENT(Female sterilization)	6.32%
NON USERS	29.18%
TOTAL	100.00%

C. Impact of Providing Family Planning

1. Target contraceptive prevalence: The IPSS family planning program (with a theoretical duration of 5 years) intends to modify the current prevalence rate of contraceptive use, as previously seen in Chapter IV, in order to reach the rates shown on Table 9. In this way, it is expected to lower the percentage of:
   a) Non-users, from 40% to 29%
   b) Users of scarcely effective methods (withdrawal and periodical abstinence) from 15% to 7%, and
   c) Users of partially effective methods (condom and spermicide) from 11% to 7%

   On the other hand, it hopes to increase the percentage of:
   a) Users of very effective methods (IUD, injection and the pill) from 31% to 50%, and
   b) Users of permanent methods (female sterilization) from 3% to 6%

2. Program impact on births and abortions:
   With the target contraceptive prevalence rates, the family planning program would be able to lower the fertility of IPSS female beneficiaries in year 6 from 3.1 to 2.8 children among insured women and from 5.8 to 5.2 children for dependent wives.

As can be seen in Table 10, the family planning program could avert more than 3 thousand births (1,811 among insured female workers and 1,600 among dependent wives) and almost 13 thousand abortions(*) (8,556 among insured female workers and 4,064 among dependent wives). This translates into savings of:

a) 42,830 obstetric/gynecological medical visits (equal to closing 4 consulting offices for a year.);
b) 17,135 bed days (equal to closing a 46-bed hospital completely for one year); and
c) 17,604 surgical minutes (equal to closing an operating room that works 24 hours a day for 12 days).

D. Costs of Family Planning Services

Obviously, the saving derived from the family planning program could not be achieved without some costs.

The costs of the family planning program (expressed in dollars) during its five years of operation are expressed in Table 11.

Two types of program costs are considered:

a) Fixed costs (equipment and instrumental, training and IEC, salaries and others) which do not depend on the demand of family planning services, and

b) Variable costs (medical visits and contraceptives) which depend on the demand.

(*) Only 15% of all abortions result in complications treated at IPSS hospitals.

TABLE 10
IMPACT OF THE FAMILY PLANNING ON BIRTHS AND ABORTIONS
TO THE SIXTH YEAR

INDICATOR	WOMAN'S AGE 15-19	20-24	25-29	30-34	35-39	40-44	45-49	TOTAL
				INSURED				
No. of Women in Union	0	7491	39635	59655	35362	15768	8076	165987
Births Expected without Program	0	2046	5827	5682	2416	519	0	16490
Births Expected with Program	0	2013	5291	4946	2039	391	0	14679
BIRTHS AVERTED	0	33	537	736	377	129	0	1811
Abortions Expected without Program	0	272	16131	21739	8014	623	997	47776
Abortions Expected with Program	0	203	13889	17523	6294	313	997	39219
ABORTIONS AVERTED	0	69	2241	4216	1720	310	0	8556
				SPOUSES				
No. of Women in Union	1214	8499	20641	19427	14974	5666	3238	73659
Births Expected without Program	423	2683	3742	3142	1600	141	36	11767
Births Expected with Program	423	2369	3496	2536	1217	90	36	10167
BIRTHS AVERTED	0	314	246	605	384	51	0	1600
Abortions Expected without Program	236	-62	5173	3169	1746	853	310	11425
Abortions Expected with Program	236	-62	4426	1276	575	600	310	7361
ABORTIONS AVERTED	0	0	748	1893	1171	253	0	4064
				TOTAL				
No. of Women in Union	1214	15990	60276	79082	50336	21434	11314	239646
Births Expected without Program	423	4728	9569	8824	4016	661	36	28257
Births Expected with Program	423	4381	8786	7482	3256	481	36	24845
BIRTHS AVERTED	0	347	783	1341	761	180	0	3411
Abortions Expected without Program	236	210	21304	24908	9760	1476	1307	59201
Abortions Expected with Program	236	141	18315	18799	6869	913	1307	46580
ABORTIONS AVERTED	0	69	2989	6109	2891	563	0	12621

TABLE 11

COSTS OF IPSS FAMILY PLANNING PROGRAM IN LIMA
(EXPRESSED IN US $)

CATEGORY	PROGRAM YEAR				
	1	2	3	4	5
FIXED COSTS	26663	7497	7497	7497	7497
Equipment	13842	0	0	0	0
Instrumental	1020	1020	1020	1020	1020
Training	1467	1467	1467	1467	1467
IEC	2425	2425	2425	2425	2425
Salaries	1823	1823	1823	1823	1823
Others(*)	6087	763	763	763	763
VARIABLE COSTS	557315	966120	1478108	2151300	2748530
Medical visits	473838	832208	1280802	1876775	2410895
Contraceptives	83477	133912	197306	274525	337635
TOTAL	583978	973617	1485606	2158797	2756028

(*) Base Survey, Initial Programming, Unforseen expenditures

While fixed costs decline over time ($2,663 in year 1, and $7,497 for the next four years), variable costs increase $557,315 in the first year and increases to an average annual rate of 47%, due to the increase of the projected demand of IPSS beneficiaries for family planning services from 20% of users and acceptors (year 1) to 75% (year 5).

It should be pointed out that that the mean annual cost of 1.6 million dollars represents less than 1% of the IPSS budget for health services in 1987 (224 million dollars).

E. Comparison between Costs and Benefits:

1. Cash Flow:

Table 12 shows that the annual benefits (economy in health care and subsidies) first exceed the family planning program costs in year 6.

2. Pay back Period:

Cumulative undiscounted program benefits exceed cumulative costs in year 7.

3. Benefit-Cost Ratio:

The benefit-cost ratio is the ratio of discounted benefits to discounted costs. A ratio lower than 1 indicates that the total costs exceed the total benefits and vice versa.

In this study, the benefit-cost ratio has been estimated with a 15% discount rate, that is the legal interest rate currently in force for operations in dollars, according to the Central Bank of Reserves of Perú.

TABLE 12

ANNUAL AND ACCUMULATED COSTS AND BENEFITS OF IPSS
FAMILY PLANNING SERVICES IN LIMA

	ANNUAL			ACCUMULATED		
YEAR	BENEFIT	COST	DIFFERENCE	BENEFIT	COST	DIFFERENCE
1	72397	1237904	-1165507	72397	1237904	-1165507
2	472739	1415512	-942773	545136	2653416	-2108280
3	985447	1722252	-736805	1530583	4375668	-2845085
4	1596835	2158797	-561962	3127418	6534466	-3407048
5	2317412	2756028	-438616	5444830	9290493	-3845663
6	2966850	0	2966850	8411680	9290493	-878813
7	3037513	0	3037513	11449193	9290493	2158700
8	2309591	0	2309591	13758784	9290493	4468291
9	1508918	0	1508918	15267703	9290493	5977209
10	849265	0	849265	16116968	9290493	6826475
11	764858	0	764858	16881826	9290493	7591333
12	740010	0	740010	17621836	9290493	8331343
13	719945	0	719945	18341781	9290493	9051288
14	702940	0	702940	19044721	9290493	9754228
15	678564	0	678564	19723285	9290493	10432792
16	647009	0	647009	20370294	9290493	11079801
17	596286	0	596286	20966581	9290493	11676087
18	534950	0	534950	21501531	9290493	12211037
19	458767	0	458767	21960298	9290493	12669804
20	363294	0	363294	22323592	9290493	13033099
21	239699	0	239699	22563291	9290493	13272797
22	116103	0	116103	22679394	9290493	13388901
23	37519	0	37519	22716913	9290493	13426420
TOTAL	22716913	9290493	13426420	342420037	191320827	151099210

The rate for insured female workers is of 1.4 dollars saved per dollar invested in family planning and of 2.1 for dependent wives. The average is 1.6.

These values seem fairly low for a 23 year period, especially for the insured female workers. However, it must be kept in mind that these calculations were based on the expected benefits of a low fertility urban population with a high abortion rate.

4. Internal Rate of Return (IRR)

In times of economic uncertainty, it is not always easy to predict an appropriate annual discount rate. Therefore we use several economic indices such as the internal rate of return, the effective rate of return of invested funds that equates the present values of benefits and costs.(*)

An internal rate of return of 32% was projected for insured females workers and of 55% for dependent wives.

The IPSS administration can compare this last amount with the internal rate of return of other alternative projects.

(*)The IRR is the discount rate for which the Present Discounted Value is equal to zero. It reflects the value of the project's total profitability.

VI. CONCLUSIONS AND RECOMMENDATIONS

1. Many IPSS beneficiaries who do not wish to have more children are not using any contraception or use less effective methods. There are more than 76,000 of these women in metropolitan Lima alone.

2. The low rates of contraceptive use and the use of less effective methods result in large numbers of unwanted pregnancies and induced abortions. The induced abortion rates are especially high among insured female workers.

3. Failure to use adequate contraception is not due to lack of knowledge of contraceptive methods (even though there is still prejudice against some of them), but to difficult access to family planning services. Implementation of family planning services within the IPSS is very recent and hasn't been sufficiently publicized among the population.

4. There is a high potential demand for these services: more than 130,000 IPSS beneficiaries in metropolitan Lima alone wish to use them. For this reason it is necessary to strengthen, increase and publicize the services and undertake a massive educational campaign in order to correct personal misconceptions regarding contraception.

5. Unwanted pregnancies and induced abortion complications represent a financial burden for the IPSS in terms of:

   a) Pre-natal, post-partum and post-abortion medical visists.

   b) Hospitalization and use of operating rooms for births and abortion complications.

   c) Maternity and lactation subsidies.

   d) Pediatric care until the child is 14 years old.

   For the IPSS, the cost of a child's birth and medical care for 14 years is nearly $1,300. The cost for treating an abortion complication is $235.

6. The IPSS family planning program has already started offering high quality services to its beneficiaries. This program can increase contraceptive prevalence and promote the use of more effective methods, reduce the fertility rate, averting unwanted births and induced abortions, and diminish the burden that the users of gynecology-obstetric and pediatric services represent for the Institute's hospital facilities.

   In only one year, the program would avert more than 3,000 births and almost 13,000 abortions, equivalent to shutting down 4 medical offices and a 46-bed hospital for one year and closing a 24-hour-a-day operating room for 12 days.

7. The start up costs of the IPSS family planning program have already been, largely with international help. Annual average operating costs will represent less than 1% of the Institute's health budget.

   Furthermore, the program is profitable, since the investment is more than compensated for by cost reductions in health services and maternity-related subsidies and child care:

   a) The annual benefits are projected to surpass the annual costs in the sixth year of program operations.

   b) The accumulated benefits surpass the accumulated costs in the seventh year, recuperating in this year the invested capital.

   c) The program's benefit to cost ratio is 1.6 dollars saved per dollar invested. and its internal rate of return is 39%, (compared to the dollar discount rate that is of 15%.)

   These findings are presented to the IPSS authorities so that they might compare them with those of other alternative projects and make an empirically-based decision to assign an adequate budget for strengthening and expanding family planning services.

APPENDIX

METHODOLOGY FOR CALCULATING ABORTION RATES BY AGE FOR THE BASE PERIOD IN THE TIPPS MODEL

1. Base period abortion rates (BMASAR)(*)are estimated by dividing the difference between estimated maximum fertility rates and potential fertility rates (BPOTFERT), by the estimated number of births averted by one abortion (BBAA). Estimated maximum fertility is calculated as the product of maximum biological fertility (MAXFERT) and a lactation index (LACTINDX):

   BMASAR(a)=[LACTINDX(a)*MAXFERT(a)-BPOTFERT(a)]/BAA(a)

   where a is age.

2. The lactation index is a function of the age-specific average length of postpartum infecundability (POSTPART):

   LACTINDX(a) = 20/[18.5+POSTPART(a)]

   where 20 and 18.5 are constants and POSTPART > = 1.5

3. The potential fertility rates of the base period are estimated as a function of age-specific fertility rates (BMASFR), contraceptive prevalence rates (BCONPREV), average contraceptive effectiveness (BAVEFFCT), and of fecundability rates (FECUND):

   BPOTFERT(a) = BCONPREV(a)/[1-[BCONPREV(a)*BAVEFFCT(a)/FECUND(a)]]

   where 1 is a constant and
   FECUND(a) = BCONPREV(a)
   if BCONPREV(a) > FECUND(a)

4. The number of births averted by one abortion in the base period is estimated as a function of contraceptive prevalence and of the average contraceptive effectiveness:

   BBAA(a) = 0.4*[1+BCONPREV(a)*BAVEFFCT(a)]

   where 0.4 and 1 are constants.

5. The user must provide estimates of BFEMRISK, BBIRTHS, POSTPART, BCONPREV and BMETHMIX. MAXFERT and FECUND assume universal values. LACTINDX, BPOTFERT, BBAA, BMASFR and BAVEFFCT are calculated by the Model.