

# MEMORANDUM

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
PUBLIC HEALTH SERVICE  
CENTER FOR DISEASE CONTROL

TO : William H. Foege, M.D.  
Director, Center for Disease Control (CDC)  
Through: Philip S. Brachman, M.D.  
Director, Bureau of Epidemiology (BE) *PMS*

DATE: May 30, 1979

FROM : Medical Officer, Epidemiologic Studies Branch and  
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SUBJECT: Foreign Trip Report (AID RSSA): Ministry of Health Data on Surgical  
Contraception, El Salvador, December 4-15, 1978

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## SUMMARY

Between July 1975 and June 1977, 24,267 women in El Salvador obtained a tubal sterilization in an MOH sponsored program. Following this, a decline in the birth rate was expected, but this was not immediately observed. To determine why the birth rate failed to decline, a survey was conducted to determine the demographic characteristics and the reproductive histories of these women. Results of the survey indicated that the women who received a tubal sterilization in the first year of the program were older, of a higher gravidity, and were better contraceptors and therefore had a lower fertility potential than women having the

operation in the second year of the program. It would therefore be expected that women sterilized in the first year of the program would not have as many potential births averted by sterilization as women sterilized in the second year. The averted births of the second group should be manifest by a decline in the El Salvador birth rate in 1978. This investigation illustrated the need to focus family planning resources on families with a high fertility potential if the objective of a government's program is to rapidly reduce the birth rate.

#### I. PLACES, DATES, AND PURPOSE OF TRAVEL

A. San Salvador, El Salvador, December 4-15, 1978, at the request of USAID/El Salvador and USAID/POP/LA/Washington, to provide technical consultation to the USAID Mission and the Ministry of Health (MOH) on the five items listed below by evaluating and interpreting computer programs initiated during the June 1978 visit (see CDC RSSA Report dated June 29, 1978) that were designed to:

1. Check the validity of the sampling methodology used in the MOH Sterilization Study.
2. Check the consistency of the patients' responses to the questionnaire.
3. Determine the demographic characteristics of the patients.
4. Combine data from three studies on the same patients into one final analysis for the MOH Sterilization Report.
5. Determine the effect on the birth rate given the age/parity distribution of sterilization acceptors.

This travel was in accordance with the Resources Support Services Agreement (RSSA) between the Office of Population, AID and CDC/FPED and was a follow-up to a project initiated during a previous trip to El Salvador (June 11-17, 1978).

#### II. PRINCIPAL CONTACTS

##### A. USAID/El Salvador

1. Ms. Dale Gibb, Chief, Health and Population Division
2. Mr. Robert Haladay, Population Advisor
3. Ms. Carol Dabbs, Population Intern

##### B. El Salvador Ministry of Health - Maternal Health Care/Family Planning (MCH/FP)

1. Dr. Vilma Aparicio, Director, MCH/FP
2. Dr. Jorge Zavaleta, MCH/FP

### III. OBSERVATIONS

#### A. Background

Between July 1975 and June 1977, 24,267 women in El Salvador obtained a tubal sterilization at Ministry of Health hospitals and clinics (about 3% of all ever-married women). In December 1976, a nationwide sample survey showed that 11% of all ever-married women age 15-44 had a surgical contraception. However, through 1977, there had not been a decline in the crude birth rate which has ranged between 39.9 and 41.8 per 1,000 population since 1972.

Three retrospective studies were performed by the MOH to determine: 1) the demographic characteristics of the women who obtained tubal sterilizations, 2) the most successful methods of attracting women into the FP program, 3) the reason why the birth rate has failed to decline, and 4) the psycho-sexual outcome of the tubal ligation on the women. In the first study, data was abstracted from the hospital consent forms on the total 24,267 women. In the second study, the hospital charts were reviewed on a 10% sample of this population with differing sampling fractions utilized based upon the number of procedures performed by the hospital. The sampling fractions ranged from 1/2 to 1/20 of the patients in a given hospital. In the third study, a 50% random sample of the 2,580 women in study number two were selected for personal interview. However, only a 50% completion rate was accomplished leaving only 604 women available for more detailed analysis. These studies were performed between October 1977 and March 1978. Analysis of the data obtained from these three studies was published in April 1978 by the Ministerio De Salud Publica Y Asistencia Social De El Salvador in a report titled Evaluacion De Intervencion Quirurgica De Planificacion Familiar.

In May 1978, Dr. Vilma Hercules de Aparicio, Director of the Division of Maternal-Child Health, Family Planning and Nutrition, Ministerio De Salud Publica Y Asistencia Social, contacted USAID/El Salvador and requested assistance in further analysis of this data. Accordingly, consultation was requested through AID/Washington to the Family Planning Evaluation Division, Bureau of Epidemiology, Center for Disease Control, Atlanta, Georgia.

An initial visit was made to El Salvador June 11-17, 1978 (see CDC El Salvador RSSA Report dated June 29, 1978). During this visit, the following tasks were done. The preliminary report, Evaluacion De Intervencion Quirurgica De Planificacion Familiar, was reviewed and computer programs were designed to: 1) check the validity of the sampling methodology used in the second and third of the three sterilization studies; 2) check the consistency of a given patient's response to the several questions that appeared identically in each of the studies. (The interview questionnaire, the consent form questionnaire, and the hospital chart review questionnaire.); 3) merge the data from the three studies into one final tape; and 4) perform cross-tabulations using this merged tape to evaluate the data by time period and to control for confounding (intervening) variables that might have affected the previous analyses.

During a visit to El Salvador in July 1978, for other purposes (Contraceptive Prevalence Survey), Dr. Leo Morris also assisted by resolving certain technical difficulties that had occurred regarding the requested computer printouts. Copies of the computer printouts were not available so that they could be reviewed prior to this scheduled return visit for final evaluation of the data during December 4-15, 1978.

B. Evaluation of data resulting from suggestions made during June 1978 visit

1. Sample's representativeness of overall study population:

This analysis is still in progress and will be discussed in more detail in the final reports of MOH and Ms. Peggy McEvoy Doty. Analysis of data available in the published preliminary report found the sample of instrument number three to be statistically different from the universe with respect to the distributions of four of the five variables studied: age, region of residence, urban/rural residence, and method of contraception used. Possible explanations for these discrepancies will be discussed later (see C 2).

2. Validity of patients responses to the questionnaires:

This analysis is still in progress and when completed will be forwarded to the CDC and will be included in the final publication by the Salvador Ministry of Health.

3. Results of the record merging:

It was intended to merge the information on the patient interview (#3) and the hospital chart review (#2) tapes with the consent form (#1) tape. However, due to a lack of uniformity by locality in questionnaire administration for certain variables on tapes 1 and 2, the usable information on tapes 1 and 2 was instead merged on to tape 3. Consequently, the maximum number of patients in the subsequent analysis was only 604 instead of the desired 24,000 or even 2,400 as it would have been if tapes 1 or 2 respectively could have been used as the base.

4. The cross-tab analysis:

The analysis limited to 604 records did not permit standardization to adequately control for confounding (intervening) variables because when standardization was introduced, too many of the table cells contained either no or too few entries to be evaluated.

Therefore, the 3 x 3 analysis that had been designed in June 1978 had to be manually condensed into appropriate 2 x 2 tables for purposes of this report. We found that the computer printouts of all of the variables that we had chosen were usable after this manipulation. Although computer coding errors were identified in a few analyses, it was possible to interpret the data after manual adjustments. Most of these problems had been identified by MOH in advance to our arrival. The only substantial problem occurred with the variable we had included concerning operative complications. Operative complications were rarely recorded in the hospital charts (Study #2), and information obtained from the patients during Study #3 could also not be used because of poor patient understanding of the definition of operative complications.

C. Interpretation of cross-tab analysis

1. Demographic characteristics of the universe:

Fifty percent (49.9%) of the women in the universe were urban and 50% were rural. The median age of the women was 28 and 70% were in consensual union and 24% were in legal union.

This distribution may be compared to national data obtained from sample surveys which shows approximately 43% and 35% of ever-married women to be in consensual union and legal union, respectively. Thus women seeking sterilization are not typical of all women when marital status is considered.

The rural women had a median of six pregnancies and five living children while the urban women had a median of five pregnancies and four living children. Thirty-five percent of the women had had at least one abortion (spontaneous or induced) and the average number of abortions per woman was 0.5. Sixty-four percent of the urban women had previously used some form of contraception (29.4% had used oral contraceptives and 8.4% had used IUD's) while 46% of the rural women had previously used some form of contraception (22.1% had used oral contraceptives and 7.2% had used IUD's). Fifty-six percent of the universe had received a post-partum sterilization and 44% had received an interval sterilization. However, as will be discussed later, previous use of contraception and type of sterilization changed over time when the two-year period was broken down into four six-month periods.

2. Limitations of the sample data:

There are several factors that limit the conclusions which can be drawn from each of the three sterilization studies:

a. The first study is limited by two factors:

- (1) A lack of uniformity in question administration by locality.
- (2) A tendency of sterilization acceptors to "falsify" their answers on previous use of non-surgical methods of contraception, marital status, and family size so that they would not be disqualified from the program.

b. The second study is also limited by two factors:

- (1) A lack of completeness and/or uniformity in the quantity of information available for review in the hospital charts by locality and within locality.
- (2) The data tapes and printouts have not been weighted to compensate for the method of sample selection (different sampling fraction by size of hospital).

- c. The third study, upon which the majority of this report is based, is also limited by three factors:
- (1) The incompleteness and non-usable responses to certain questions may indicate poor interviewer training.
  - (2) The attempt to locate the sample in the field resulted in only a 50% completion rate. No study has yet been done to determine how the characteristics of the lost-to-follow-up acceptors will affect the results. There is an indication that a greater proportion of rural than urban women had complete interviews. However, a complete analysis of response rates is to be done by Ms. Peggy McEvoy Doty and will be included in her final report.
  - (3) As mentioned above, the data tapes and printouts have not been weighted to compensate for the method of sample selection. To determine if the unweighted sample results were representative of the universe, several variables, including age, urban - rural residence, marital status, previous method of contraception used, and method of sterilization, were used to compare the 2.5% sample with the universe of sterilizations. The sample was statistically different from the universe with respect to the distribution of age, urban - rural residence, region of residence, marital status and previous method of contraception used, but was similar to the universe with respect to the distribution of the method of sterilization. The distribution of age was slightly older in the sample than in the total study group. In the sample, there is also a higher percentage from the rural areas, a higher percentage of non-users of a contraceptive method and of users of oral contraceptives, a lower percentage of women in consensual union, and a lower percentage from San Salvador.

We have verbal assurances from Ms. Peggy McEvoy Doty who is working with the weighted data that weighting has not altered the results on the selective comparisons she has made to date. This will be further discussed at her final report. To check this assumption, we have repeated the above comparisons using her weighted data and found:

That the weighted sample was similar to the universe with respect to the distributions of urban - rural residence and age, but were statistically different from the universe with respect to the distributions of marital status, method of contraception used, method of sterilization and region of residence. ( $P < .05$  using Chi Square) However, as discussed above (see C2a), the discrepancies in marital status and method of contraception used may be secondary to a tendency for patients to falsify answers to avoid being declared ineligible, while the discrepancy in method of sterilization may be secondary to incomplete data in instruments #1 and #2, and to poor patient understanding in instrument #3. These hypotheses will be evaluated when the comparisons designed to check the consistency of patients' answers (discussed in B2) are completed. The discrepancy in region of residence on the other hand, is believed to be real due to the difficulty in locating patients in both the urban areas and in the regions near the nation's borders. Therefore, we conclude that all of the subsequent interpretations must be viewed with these limitations in mind.

3. Demographic and socioeconomic characteristics of the patient sample:

The following patient characteristics were evaluated: residence (region, urban - rural), previous use of contraception, duration of contraceptive use, type of sterilization procedure, duration of hospital stay, age, gravidity, number of living children, place of last delivery, outcome of last pregnancy, marital status, education, occupation, and economic status. The definitions of some of the variables used and/or the overall patient distribution with respect to these characteristics are presented below.

Urban - Rural:

Forty-one percent of the women in the sample lived in urban areas and 59% in rural areas.

Previous Use:

The form of contraception which the woman stated to be the primary contraceptive she had previously used was coded under previous use. The majority (55%) had never used any form of contraception, another 35% had used oral contraceptives, while the remaining 10% were distributed among the other methods. However, as will be discussed later, the percent of women previously using contraception changed over time during the two-year period under discussion.

Duration of Use:

The 45% who had used some form of contraception were asked how long they had used that method. Fifty-one percent had used the stated method for longer than 12 months and 35% for over 24 months.

Age:

The median age of the women was 30.8. (In the tables presented in this report, the reader should be aware of one error which was made in programming that resulted in two age groups not being five year age groups. These are 25-30 and 31-34. These table headings are not typographical errors. However, this will not effect the calculations of median age.)

Gravidity and Number of Living Children:

The median number of pregnancies in this sample was 5.7 and the median number of living children was 4.9.

Marital Status:

The majority of the women in the sample were either in a consensual union (54%) or a legal union (34%) while only 12% were not currently married.

Education:

The majority of the women in the sample (67%) had completed between one and six years of school (39% one to three years and 28% four to six years) while 26% had no formal education and 7% had over six years.

Occupation:

The majority of the women in the sample (55%) were not employed. The remainder were equally distributed as vendors (9.0%), domestic servants (6.0%), agricultural workers (8.3%), laborers (6.5%), and other low paying jobs (13.5%). Only 1.5% were employed as professional-administrative workers.

Economic Status:

An index to evaluate the patient's economic status was derived from various questions regarding income, type of residence, and number of people living in the same room as the patient, and patients were classified as having either an adequate or inadequate economic status. The majority (93%) of the sample had an inadequate economic status.

Other Variables:

Several other cross-tabulations concerning patient follow-up, migrational patterns, whether the woman had recommended the operation to others, the reasons the woman gave for the operation, psychosexual outcome of the operation, and who had recommended the operation to the woman were performed. However, due to lack of internal consistency of results and/or being outside the scope of this report, these will not be discussed.

4. Discussion of selected variables:

a. Time:

Analysis of many of the above characteristics over the two-year period by six-month periods does not support an immediate decline in the 1977 birth rate associated with the tubal ligation program of the MOH. It was found that the total number of procedures performed, the percentage of interval procedures performed, the percentage of younger women brought into the program, and the percentage of younger women with potential higher gravidity brought into the program (low age at first pregnancy and women who were previously non-contraceptors) all increased over time with subsequent effect expected probably no earlier than 1978. In addition, the length of hospital stay improved (decreased) over time. No

change was found to occur over time in respect to the following characteristics: education, marital status, number of living children, urban - rural residence, percentage of home deliveries, or outcome of last delivery. These variables are discussed below.

(1) Type of Procedure:

The percentage of tubal ligations performed as interval procedures increased during the four time periods from 27% for July - December 1975 to approximately 45% during July 1976 - June 1977.

Time Distribution By Type Of Procedure

	<u>Mini-Laparotomy</u>	<u>Laparoscopy</u>	<u>Culdoscopy</u>	<u>Post-Partum</u>	<u>Total</u>
July-Dec. 1975	4.4	17.7	5.3	72.6	100.0 (n=113)
Jan.-June 1976	12.4	21.7	3.9	62.0	100.0 (n=129)
July-Dec. 1976	16.4	23.3	3.8	56.6	100.0 (n=159)
Jan.-June 1977	14.3	26.3	4.0	55.4	100.0 (n=175)

(2) Age:

The median age of women in the sample decreased from 32.2 for July - December 1975 to 29.1 for January - July 1977.

Median Age For Each Time Period

	<u>July-Dec 1975</u>	<u>Jan-June 1976</u>	<u>July-Dec 1976</u>	<u>Jan-June 1977</u>	<u>Total</u>
Median Age	32.2	31.1	29.5	29.1	100.0
	n=114	n=132	n=161	n=180	n=587

(3) Previous Use of Contraception:

The percentage of previous non-contraceptors brought into the program increased from 50% during July - December 1976 to 61% during January - June 1977.

Previous Use Of Contraception Distribution By Time

	Non Contr.	IUD Users	Condom	Rhythm	Oral Contr.	Foam	Inject.	Total
July-Dec 1975	53.6	4.6	0.0	2.7	34.6	3.8	0.9	100.0 (n=110)
Jan-June 1976	48.8	5.3	0.8	1.5	39.7	0.8	3.0	100.0 (n=131)
July-Dec 1976	51.6	8.1	1.9	1.2	37.3	0.0	0.0	100.0 (n=161)
Jan-June 1977	61.7	5.0	0.0	2.2	29.4	0.5	1.1	100.0 (n=180)

(4) Age of First Pregnancy:

The percentage of women with early first pregnancies (less than 20 years old) increased during the four time periods of the program from 57% during June - December 1975 to approximately 64% during January 1977 - June 1977.

(5) Number of Living Children:

Even though the median age of the women decreased during the four time periods, the median family size did not change.

Time Distribution By Number Of Living Children

	<u>0-2 Living Children</u>	<u>3-5 Living Children</u>	<u>6-8 Living Children</u>	<u>9+ Living Children</u>	<u>Total</u>
July-Dec 1975	17.3	52.7	24.5	5.5	100.0 (n=110)
Jan-June 1976	9.8	58.3	28.8	3.0	100.0 (n=132)
July-Dec 1976	14.9	58.4	23.6	3.1	100.0 (n=161)
Jan-June 1977	13.9	52.4	23.3	3.3	100.0 (n=180)

(6) Region:

The number of procedures performed increased with time in regions I thru IV, but decreased in region V.

Time Distribution By Region

	<u>Region I</u>	<u>Region II</u>	<u>Region III</u>	<u>Region IV</u>	<u>Region V</u>	<u>Total</u>
July-Dec 1975	26	26	23	23	16	114
Jan-June 1976	29	26	27	34	16	132
July-Dec 1976	46	22	29	50	14	161
Jan-June 1977	55	32	36	46	8	177
TOTAL	n=156	n=106	n=115	n=153	n= 54	

(7) Urban - Rural:

Even though the program was designed to attract more rural women with time, no change was found to occur in the urban - rural distribution during the four time periods.

(8) Place of Last Delivery:

Even though more interval procedures were performed during the later time periods, no change occurred in the percentage of women having their last deliveries at home. This could be associated with the previous findings that no change occurred in the urban - rural distribution over the time periods.

Place Of Last Delivery Distribution By Time

	<u>Home</u>	<u>Health Center</u>	<u>Hospital</u>	<u>Total</u>
July-Dec 1975	17.3	14.5	68.2	100.0 (n=110)
Jan-June 1976	13.7	18.3	67.9	100.0 (n=131)
July-Dec 1976	19.3	18.0	62.7	100.0 (n=161)
Jan-June 1977	18.5	17.4	64.0	100.0 (n=178)

(9) Days in Hospital:

The median duration of the hospital stay following a tubal ligation was shortened during the four time periods of the program from 3.2 days during July - December 1976 to 2.1 days during January - June 1977. This is most likely associated with an increase in the percentage of interval procedures performed.

Median Duration of Hospital Stay for Each Time Period

	<u>July-Dec 1975</u>	<u>Jan-June 1976</u>	<u>July-Dec 1976</u>	<u>Jan-June 1977</u>	<u>Total</u>
Median Duration of Hospital Stay	3.18	2.93	2.39	2.06	100.0
	n=114	n=131	n=161	n=181	n=587

b. Type of Procedure

Since the performance of interval (i.e. non-post-partum) tubal ligations may be expected to have a greater effect on the birth rate than post-partum tubal ligations, various variables were evaluated for their association with interval procedures. The following demographic factors were associated with a greater chance of receiving or seeking an interval procedure: being more educated, urban residence, having less than three children, having had the last delivery at home, and having been a previous contraceptive. The following factors did not influence the patient's getting an interval procedure: marital status, age, and outcome of last pregnancy. The degree of these associations were as follows:

(1) Age

Interval procedures were approximately equally distributed over all age groups with only a slight decrease in older women.

Type of Procedure Distribution By Age

	<u>20-24</u>	<u>25-30</u>	<u>31-34</u>	<u>35-39</u>	<u>40 +</u>
Mini-Laparotomy TL	15.8	13.5	7.1	13.7	8.8
Laparoscopy TL	19.7	22.6	26.6	15.8	20.0
Culdoscopy TL	5.3	2.6	5.8	5.0	0.0
Post-Partum TL	59.2	61.3	60.4	64.6	71.4
TOTAL	100.0 n= 76	100.0 n=231	100.0 n=139	100.0 n=110	100.0 n= 7

(2) Previous Use

Women with a history of IUD use received interval procedures (50%) less frequently than did women with a history of oral contraceptive use (76%). Women without a history of previous contraceptive use received the lowest percentage of interval procedures (32%).

Previous Use of Contraception Distribution By Type of Procedure

	<u>Non Contr.</u>	<u>IUD Users</u>	<u>Oral Contr.</u>
Mini-Laparotomy TL	10.2	11.8	23.0
Laparoscopy TL	17.6	38.2	37.8
Culdoscopy TL	4.3	0.0	6.8
Post-Partum TL	67.8	50.0	32.4
TOTAL	100.0 n=323	100.0 n= 34	100.0 n=148

(3) Number of Living Children

Interval procedures were performed in a higher percentage of women with less than three children than in women with more than three children (53% versus approximately 37%). However, this was not associated with an age differential.

Type of Procedure Distribution By Number of Living Children

	<u>0-2 Living Children</u>	<u>3-5 Living Children</u>	<u>6-8 Living Children</u>	<u>9+ Living Children</u>
Mini-Laparotomy	14.5	12.4	12.4	13.0
Laparoscopy	33.7	23.5	16.2	13.0
Culdoscopy	4.8	2.9	6.6	13.0
Post-Partum	47.0	61.2	66.9	61.0
TOTAL	100.0 n= 83	100.0 n=340	100.0 n=145	100.0 n= 23

(4) Region

A higher percentage of interval procedures were performed in Regions I (59%) and V (48%) than in Regions II (32%), IV (32%), and III (25%). This association most likely reflects the urban rural distribution of the regions with Regions I and V having the highest urban concentration. Women from urban regions were found to more likely receive an interval procedure (48%) than women from rural regions (34%).

Type of Procedure Distribution By Region

	<u>Region I</u>	<u>Region II</u>	<u>Region III</u>	<u>Region IV</u>	<u>Region V</u>
Mini-Laparotomy TL	19.5	8.6	12.0	11.3	5.2
Laparoscopy TL	35.8	7.6	13.0	19.3	43.1
Culdoscopy TL	3.1	18.2	0.0	1.3	0.0
Post-Partum TL	41.5	67.6	75.0	68.0	51.7
TOTAL	100.0 n=159	100.0 n=105	100.0 n=108	100.0 n=150	100.0 n= 58

(5) Place of Last Delivery

As expected, interval procedures more frequently followed home deliveries (84%) than hospital deliveries (32%) and health center deliveries (18%). However, since the percentage of home deliveries remained constant over time while the percentage of interval procedures increased over time, the increase in interval procedures must have occurred primarily in women already in the health care system (women who had delivered their last child at either a hospital or health center).

Type of Procedure Distribution By Place of Last Delivery

	<u>Home</u>	<u>Health Center</u>	<u>Hospital</u>
Mini-Laparotomy	28.7	18.1	7.1
Laparoscopy	41.6	0.0	23.4
Culdoscopy	13.9	0.0	2.6
Post-Partum	15.8	81.9	66.9
TOTAL	100.0 n=101	100.0 n=105	100.0 n=381

(6) Days in Hospital

Women who received culdoscopic tubal ligations and laparoscopic tubal ligations had shorter median hospital stays (1.54 for culdoscopic and 1.58 for laparoscopic) than did women receiving mini-laparotomies (1.88 days and post-partum tubal ligations 4.46 days).

Median Duration of Hospital Stay  
For Each Type of Procedure

	<u>Mini-Laparotomy</u>	<u>Laparoscopy</u>	<u>Culdoscopy</u>	<u>Post-Partum</u>
Median Duration of Hospital Stay	1.88	1.58	1.54	4.46
	n= 75	n=133	n= 25	n=358

c. Age

To have the greatest effect on reducing a country's birth rate, a sterilization program should attempt to attract women who have not yet reached a high gravidity. Since a woman's gravidity is highly associated with her age, it is also important to attract younger women into the program. To determine what variables were associated

with the younger women who were receiving tubal ligations, age was cross-classified with region, marital status, and education. Younger women were found to more likely receive tubal ligations if they were educated, unmarried, and living in Regions IV and V. These variables are discussed below:

(1) Region

Regions IV (56%) and V (53%) had the highest percentage of younger women receiving tubal ligations with approximately 55% of their population receiving tubal ligations before the age of 30. Region I had the lowest percentage of younger women with 48% of their population receiving tubal ligations before the age of 30. Region III sterilized the highest percentage of older women with 27% of their population being equal to or over 35.

Age Distribution By Region

<u>Region</u>	<u>20-24</u>	<u>25-30</u>	<u>31-34</u>	<u>35-39</u>	<u>40-44</u>	<u>45 +</u>	<u>Total</u>
I	11.7	36.2	23.2	18.4	4.3	1.2	100.0 (n=163)
II	10.3	40.6	23.6	19.8	4.7	0.9	100.0 (n=106)
III	13.7	37.6	21.4	21.4	5.1	0.9	100.0 (n=117)
IV	14.9	40.3	20.1	18.8	4.5	0.6	100.0 (n=154)
V	8.6	44.8	22.4	15.5	5.2	3.4	100.0 (n= 58)

(2) Marital Status

A higher percentage of the younger women (equal to or less than 30 years old) were unmarried with 63% of the unmarried women being less than 31 years old versus 50% of the married women.

Age Distribution By Marital Status

	<u>Unmarried</u>	<u>Married</u>	<u>Consensual Union</u>
20-24	20.8	9.8	12.7
25-30	43.1	38.4	38.5
31-34	11.1	23.2	26.1
35-39	18.1	22.7	17.1
40+	6.9	5.9	5.6
Total	100.0 n= 72	100.0 n=203	100.0 n=322

(3) Education

The younger women receiving tubal ligations were more educated than the older women receiving tubal ligations with approximately 41% of the women under 31 having over 3 years of education in contrast with 29% of the women over 30, however, this is true of the general population.

Age Distribution By Education

<u>Years</u>	<u>20-24</u>	<u>25-30</u>	<u>31-34</u>	<u>35-39</u>	<u>40 +</u>
0	25.0	22.2	25.7	31.6	34.3
1-3	35.5	38.8	42.9	43.8	34.3
4-6	30.3	35.0	25.7	15.8	22.9
7+	9.2	6.0	5.7	8.8	8.6
TOTAL	100.0 n= 76	100.0 n=234	100.0 n=140	100.0 n=114	100.0 n= 35

(4) Duration of Hospital Stay

Median duration of hospital stay was approximately the same for all age groups.

Median Duration of Hospital Stay For Each Age Group					
	<u>20-24</u>	<u>25-30</u>	<u>31-34</u>	<u>35-39</u>	<u>40 +</u>
Median Duration of Hospital Stay	2.65	2.46	2.48	2.47	2.57
	n= 76	n=234	n=140	n=114	n= 35

d. Previous Use of Contraception

For a sterilization program to have a lowering affect on a country's birth rate, it must attract women who are at risk of having additional pregnancies. Since women who are currently not contracepting are at a greater risk of having additional pregnancies, multiple cross-classifications were performed to determine which demographic characteristics were associated with the history of previous use of contraception. A history of previous use was found to be associated with: a higher education, a higher economic status, marriage, urban living, lower gravidity, working in the labor, administrative - professional - technical, vendor fields, a higher chance of getting an interval procedure, and having a shorter hospital stay. Previous use was not found to be associated with: place of last delivery, outcome of last pregnancy, or with age. The only demographic factors associated with longer duration of use were being older, having over seven years of education, and living in urban areas. The characteristics associated with previous use of contraception are described below.

(1) Duration of Contraceptive Use

Forty-eight percent of the women who had used oral contraceptives used them for less than one year, however, 35% of oral contraceptive users had used contraceptives for greater than two years.



(3) Gravidity

IUD users had lower gravidity than their counterparts with 71% having fewer than six pregnancies versus 57% for oral contraceptive users and 52% for non-contraceptors. Women with less than six pregnancies were also more likely to be contraceptors for over one year than women with more than six pregnancies (25% versus 20%).

Gravidity By Previous Use of Contraception And Length of Use

	No Previous Use	Previous Use	Total	Preg.	Duration of Contraceptive Use (Months)					
					1-2 Mos	3-6 Mos	7-12 Mos	13-24 Mos	25-60 Mos	61+ Mos
0-2 Preg.	6.2	6.9	100.0	6.9	0.0	35.3	17.6	17.6	11.8	11.8
3-5 Preg.	45.8	54.7	100.0	0.7	14.0	13.3	22.0	16.0	21.3	12.7
6-8 Preg.	38.7	28.6	100.0	0.0	12.3	21.9	11.0	15.1	19.2	20.6
9+ Preg.	16.4	12.4	100.0	0.0	14.7	20.6	14.7	14.7	29.4	6.9
TOTAL	n=330	n=274								

(4) Education

The percentage of women who were ever-users increased with increasing education with 60% of the women with over seven years of education being contraceptors in contrast to 36% of the women without education. However, education did not effect the duration of use in the ever-users except in the category of women with over seven years of education.

Education By Previous Use of Contraception And Length of Use

	<u>No Previous Use</u>	<u>Previous Use</u>	<u>Total</u>	<u>Preg.</u>	<u>1-2 Mos</u>	<u>3-6 Mos</u>	<u>7-12 Mos</u>	<u>13-24 Mos</u>	<u>25-60 Mos</u>	<u>61+ Mos</u>
No Education	30.6	21.2	100.0	0.0	20.7	8.6	17.2	16.5	20.7	17.2
1-3 Years Education	40.6	37.2	100.0	0.0	13.7	21.6	17.6	14.7	21.6	10.8
4-6 Years Education	23.6	32.5	100.0	2.2	7.9	22.5	19.1	18.9	20.2	11.2
7+ Years Education	5.2	9.1	100.0	0.0	8.0	8.0	16.0	16.0	24.0	28.0
TOTAL	n=330	n=274								

(5) Marital Status

Married women were more likely to be contraceptors than unmarried women (47% versus 37%).

Previous Use of Contraception By Marital Status

	<u>Unmarried</u>	<u>Married</u>	<u>Consensual Union</u>
Non-Contraceptors	63.0	53.0	53.3
IUD Users	4.1	5.4	6.2
Condom	1.4	0.5	0.6
Rhythm	2.7	3.0	1.3
Oral Contraceptives	27.4	36.1	30.4
Foam	0.0	1.6	0.0
Injectables	1.4	1.6	1.3
TOTAL	100.0 n= 73	100.0 n=202	100.0 n=321

(6) Urban - Rural

Urban women used all forms of contraception more frequently than their rural counterparts. In addition, urban women were likely to use some form of contraception for a significant period of time than were their rural counterparts (57% versus 44%).

Previous Use of Contraception Distribution By Urban - Rural

	<u>Non- Contr.</u>	<u>IUD Users</u>	<u>Condom</u>	<u>Rhythm</u>	<u>Oral Contr.</u>	<u>Foam</u>	<u>Inject.</u>	<u>Total</u>
Urban	46.7	7.9	0.8	2.5	39.7	1.6	0.8	100.0 (n=242)
Rural	59.9	4.3	0.6	1.4	31.5	0.6	1.7	100.0 (n=352)

(7) Occupation

Women in the laborer category were more likely oral contraceptive users than non-contraceptors. When all categories of contraception were considered, women in the administrative, professional, technical, and vendor categories were more likely to have been contraceptors than non-contraceptors. Women working in the service, agriculture, and other low paying categories were more likely to have been non-contraceptors than contraceptors.

(8) Economic Status

As can be expected, women with an adequate economic status had a higher frequency of use of one of the forms of contraception than did women with an inadequate economic status.

(9) Duration of Hospital Stay

IUD users have the shortest median duration of hospital stay (0.97 days) and non-contraceptors had the longest median hospital stay (1.63 days). However, women with a history of IUD use were less likely to have received an interval procedure than were women with a history of oral contraceptive use.

e. Number of Living Children

To beneficially effect the birth rate, a sterilization procedure program should seek to attract women before they achieve a large family. Therefore, various variables were evaluated to determine what demographic factors might be associated with a woman seeking a tubal ligation before she had obtained large family size. The women who sought a tubal ligation before obtaining a large family were more likely to have a higher education, to work in a professional, technical or service fields, to be urban, and to be younger. Factors not associated include: marital status, economic status, having a bad outcome of the last pregnancy, and duration of contraceptive use. These variables are discussed below:

(1) Urban - Rural

Rural women had slightly larger families with 34% having equal to or greater than six living children versus 20% for urban wives. In contrast, 19% of the urban women had equal to or less than two children versus 10% of the rural women.

Distribution of Number of Living Children By Urban - Rural

	<u>No Children</u>	<u>1-2 Children</u>	<u>3-5 Children</u>	<u>6-8 Children</u>	<u>9+ Children</u>	<u>Total</u>
Urban	0.4	18.9	60.9	18.0	3.7	100.0 (n=243)
Rural	0.3	10.2	55.0	30.6	4.0	100.0 (n=353)

(2) Education

Women with higher education had fewer living children with only 6% of the non-educated women having equal to or less than two living children versus 13% of the more educated women. This association was strengthened when the next larger family size was looked at with only 18% of more educated women having six or more children versus 54% of the non-educated women.

Distribution of Number of Living Children By Education

	<u>0-2</u> <u>Children</u>	<u>3-5</u> <u>Children</u>	<u>6-8</u> <u>Children</u>	<u>9-11</u> <u>Children</u>	<u>12+</u> <u>Children</u>	<u>Total</u>
No Education	5.8	41.0	37.2	14.1	1.9	100.0 (n=156)
1-3 Years Education	5.5	54.5	31.5	6.4	2.1	100.0 (n=235)
4-6 Years Education	9.0	65.1	19.3	6.0	0.0	100.0 (n=166)
7+ Years Education	13.2	68.4	15.8	2.6	0.0	100.0 (n= 38)

(3) Occupation

Women working in the professional-technical fields had the lowest number of living children with only 11% having equal to or greater than six children versus 27% of the women working in the service fields, 31% for labor, 33% for vendors, 41% for unemployed, and 49% for agriculture fields.

(4) Economic Status

Women with a higher economic status had more living children than women with a lower economic status even though women with lower economic status had had more pregnancies.

Distribution of Number of Living Children By Economic Status

	<u>No Children</u>	<u>1-2 Children</u>	<u>3-5 Children</u>	<u>6-8 Children</u>	<u>9-11 Children</u>	<u>12+ Children</u>	<u>Total</u>
Adequate	3.4	16.6	66.7	14.3	0.0	0.0	100.0 (n= 42)
Inadequate	0.0	6.7	53.6	29.8	8.7	1.4	100.0 (n=554)

f. Urban - Rural

The rural women who received a tubal ligation had more pregnancies, larger families, were slightly younger at first pregnancy, were more likely to have had their last delivery at home, and were less likely to live in Region V than urban women. Rural women were similar to urban women in the outcome of the last pregnancy, age, and marital status.

(1) Region

Region V differed from Regions I through IV by having only 9% of the women being rural versus approximately 65% for the other four regions. However, the majority of Region V consists of metropolitan San Salvador.

Urban - Rural Distribution By Region

	<u>Region I</u>	<u>Region II</u>	<u>Region III</u>	<u>Region IV</u>	<u>Region V</u>
Urban	38.0	34.0	32.8	34.0	21.2
Rural	62.0	66.0	67.2	66.1	78.8
TOTAL	100.0 n=163	100.0 n=106	100.0 n=116	100.0 n=152	100.0 n= 57

(2) Age at First Birth

Rural women had only a slightly younger age at first pregnancy than their urban counterparts with a median age at first pregnancy of 18.8 years for rural women and 19.3 years for urban women.

g. Place of Last Delivery

Since one index of an effective government sponsored tubal ligation program may be how well women who had their last delivery at home are attracted into the program (women who previously had possibly not been involved in the medical system), the place of last delivery was stratified against various demographic factors. The following women were more likely to have had a tubal ligation after a home delivery: those with a lower occupational level, lower economic levels, rural women, younger women, women with fewer living children, and women with lower gravidities (the last two possibly being related to age). The percentage of post home deliveries did not change with marital status, previous contraceptive use, or with time (even though the percentage of interval procedures changed with time). The degree of these associations are discussed below:

(1) Urban - Rural

Rural women had slightly more of their preceding deliveries at home than did urban women, 20% versus 14%.

(2) Occupation

Women in the professional, administrative, vendor, and service fields had 11% of their last deliveries at home versus 19% for the other categories.

(3) Economic Status

Women with adequate economic status had fewer of their preceding deliveries at home than the women with inadequate economic status (10% versus 18%).

Place of Last Delivery Distribution By Economic Status

	<u>Home</u>	<u>Health Center</u>	<u>Hospital</u>	<u>Total</u>
Adequate	9.5	23.8	66.6	100.0 (n= 42)
Inadequate	17.7	17.6	64.6	100.0 (n=557)

5. Program effect on crude birth rate as of 1977:

Three studies have recently been conducted which suggest that the decrease in the birth rate due to this program would be small at this point in time. These studies are discussed below:

- a. "During the 18-month period between July 1975 and December 1976, the Ministry of Health in El Salvador provided surgical contraception services to approximately 18,000 women, or almost 4% of the married women of childbearing age, but no decline in the crude birth rate in 1977 was observed compared to either 1975 or 1976. Although prevalence surveys are scheduled at 3-year intervals in El Salvador to provide data for program evaluation, a supplement was added to the December 1976 National Labor Force Survey to obtain current data on contraceptive use. There was an absolute increase of only 1.5% in use of contraception in the 18-month period between the 2 surveys (from 19.3% to 20.9%). The small overall net increase was due to a decrease in reliance on non-permanent methods of contraception while sterilization had increased. The usage of sterilization had increased by 4 percentage points, which was offset by a decrease in users of non-permanent methods of contraception of 2.5 percentage points. Thus, evidence was available to show that the increase in use of sterilization was not a net additive increase to total contraceptive use. The 1978 Contraceptive Prevalence Survey is currently under analysis and will provide updated information to measure program achievement or document the lack of program achievement." (Morris, L. et. al. The Use of Contraceptive Prevalence Surveys to Evaluate the Family Planning Program in El Salvador and Other Countries in Latin America, paper presented to Annual Conference of the Epidemiologic Intelligence Service 1979)
- b. According to one regression analysis, an increase of 2 to 6 percentage points in the proportion of couples using contraception takes one point off of the crude birth rate (Northman, D.L. and E. Hofstatter. Population and Family Planning Programs (9th Edition), Population Council, New York, 1978). Since the 25,000 women sterilized in El Salvador represents only 5-6% of the married reproductive aged women in El Salvador, the crude birth rate would only be expected to drop at most 1 point. However in light of the data discussed in (a) above, an absolute increase of only 1.5% in the use of contraception that actually occurred would be expected to result in less than a 1 point drop in the birth rate.

- c. A recent evaluation of data from the 1971-1975 sterilization program in Panama using marriage duration specific birth rates and birth rates specific for duration since the birth of the last-wanted child found that the number of births averted by sterilization ranged from 0.8 births per woman to 1.1 births per woman. Applying this data to The El Salvadorian program would mean that a total of 25,000 births would have been averted. Since this number would not have all occurred in one year but would be spread out over the remaining 10 to 15 years of reproductive life, one could expect to see very little change in the crude birth rate in one to two years. (Westoff, C., J. McCarthy, N. Goldman and F. Mascarin. "Contraceptive Sterilization and Births Averted in Panama," *unpublished data*).
- d. In addition to the above points, results of the present survey also indicate that a fall in the 1977 birth rate should not have been expected. These results indicated that the women who received a tubal sterilization in the first year of the program were older, of a higher gravidity and were better contraceptors and therefore had a lower fertility potential than women having the operation in the second year of the program. It would therefore be expected that women sterilized in the first year of the program would not have as many potential births averted by sterilization as women sterilized in the second year. The averted births of the second group should be manifested by a decline in the El Salvador birth rate in 1978.

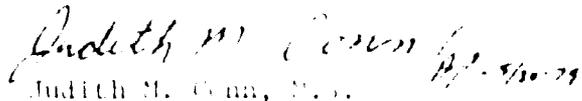
#### IV. CONCLUDING COMMENTS

This investigation illustrated the need to focus family planning resources on families with a high fertility potential if the objective of the government program is to rapidly reduce the birth rate. In conclusion, we feel that the cross-tab analysis performed in this study were very useful in describing the characteristics of the women who received sterilizations. However, the reader is again reminded of the methodological problems that are discussed on pages 6-8 of this report. These problems illustrate the handicap that the MOH personnel must bear when performing program evaluation. That handicap is due to the lack of

sufficient personnel in the government sector who are sufficiently trained in computer programing technology. Such assistance on a local level would be extremely useful.



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