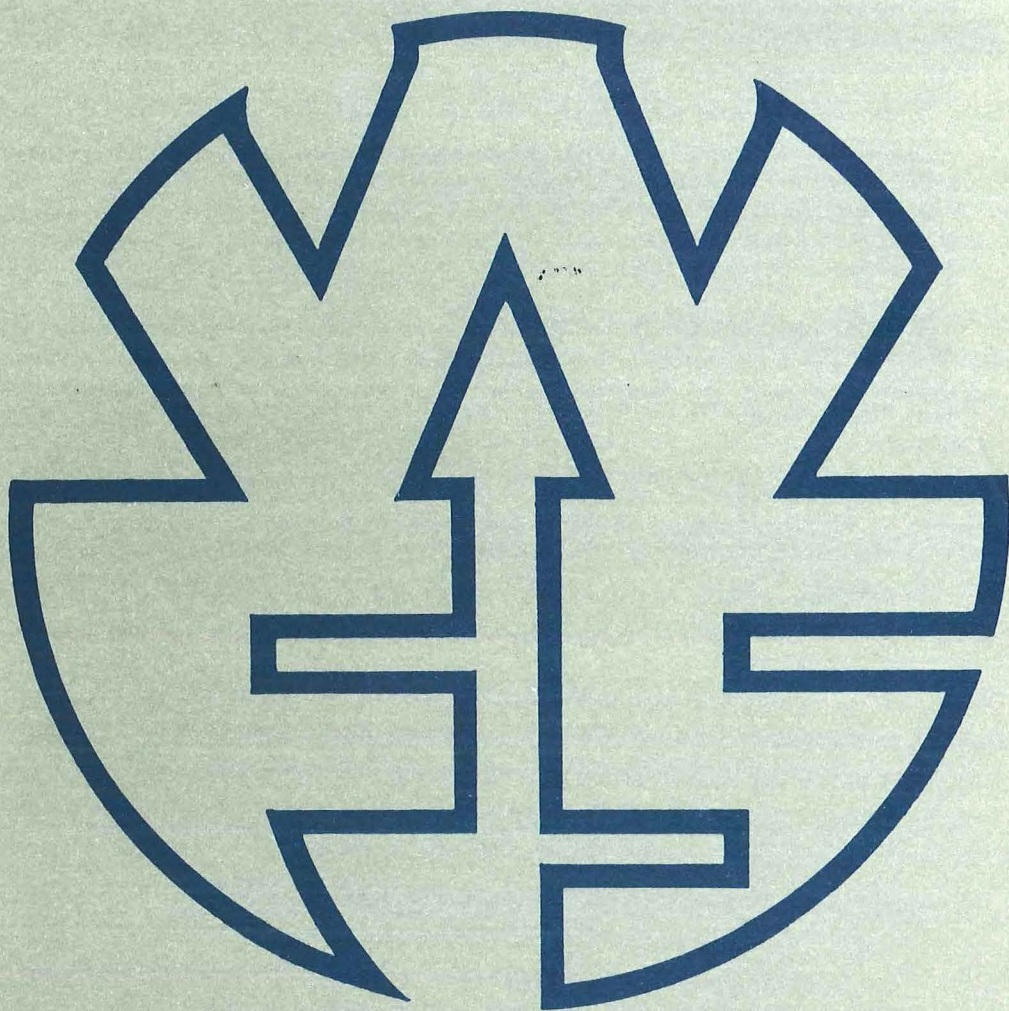


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SANTIAGO GASLONDE
ENRIQUE CARRASCO

The Impact of Some Intermediate
Variables on Fertility: Evidence from
the Venezuela National Fertility
Survey 1977

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Permanent Office • Director: E. Lunenberg
428 Prinses Beatrixlaan, PO Box 950
2270 AZ Voorburg
Netherlands

WORLD FERTILITY SURVEY

Project Director:
Dr Dirk J. van de Kaa
35-37 Grosvenor Gardens
London SW1W 0BS

The World Fertility Survey is an international research programme whose purpose is to assess the current state of human fertility throughout the world. This is being done principally through promoting and supporting nationally representative, internationally comparable, and scientifically designed and conducted sample surveys of fertility behaviour in as many countries as possible.

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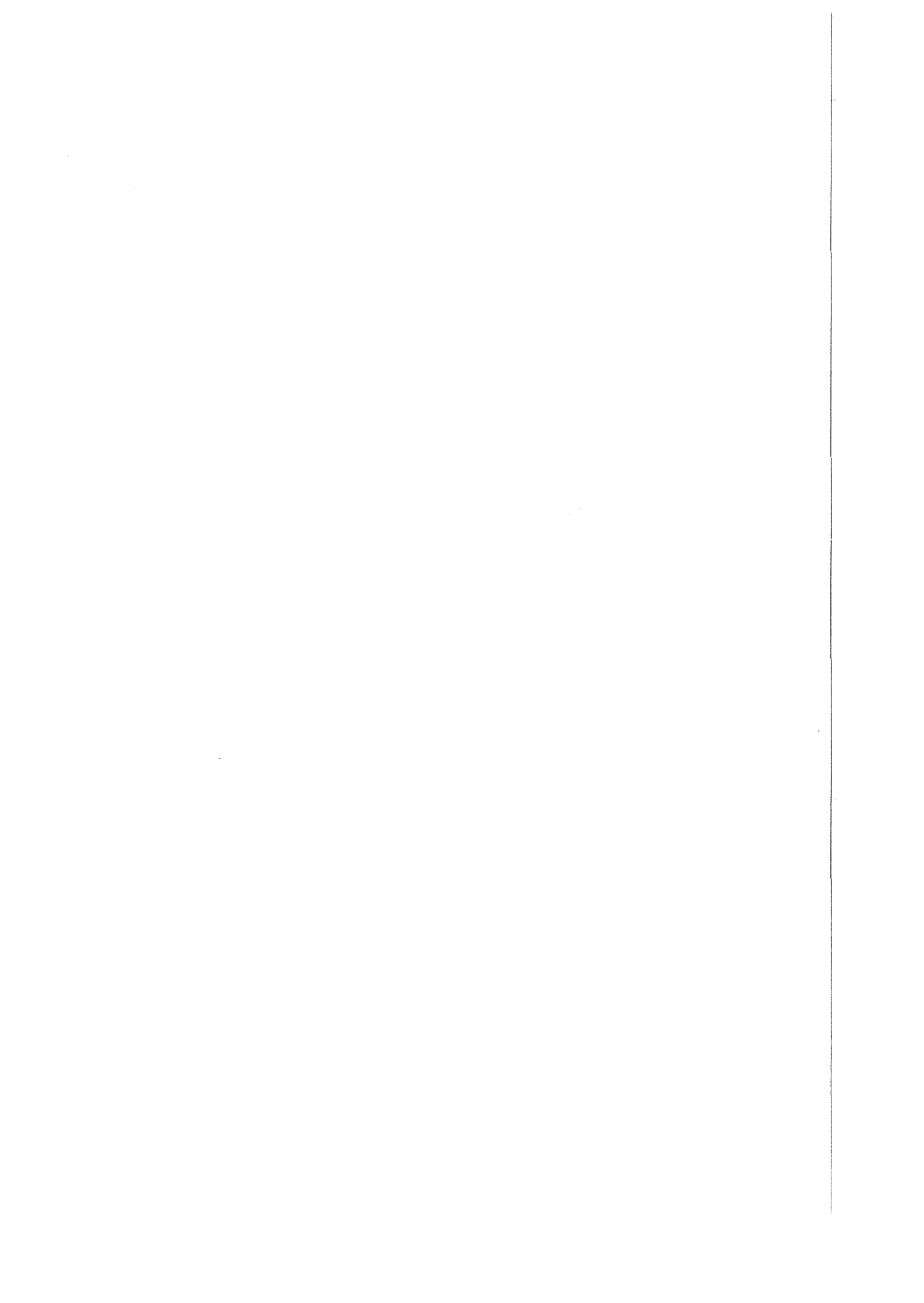
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The Impact of Some Intermediate
Variables on Fertility: Evidence
from the Venezuela National
Fertility Survey 1977

SANTIAGO GASLONDE
Chief, Department of Vital Statistics,
Ministry of Health, Venezuela

ENRIQUE CARRASCO
WFS Central Staff



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1 Introduction

1.1 WHY AND HOW FERTILITY IS REDUCED

In most developing countries there has been a rapid population growth during the last three decades, as a consequence of the steady decline of mortality and the persistently high birth rates. This rapid growth has given rise to considerable concern, both within and outside these countries.

On the one hand, this rapid growth has been considered a negative factor, hindering the development of these nations, and measures aimed at curbing fertility and slowing down the demographic expansion have been advocated. To this end, sometimes officially and sometimes through the initiative of private organizations, family planning programmes have been launched to modify the demographic situation of the country. On the other hand, it has been argued that the population trend should follow its normal course, in the belief that development can be achieved in spite of demographic expansion and that fertility will decline as the cultural level increases and standards of living improve.

The fact remains, however, that couples are attempting to prevent births before, and even during, the pregnancy with or without the help of family planning programmes designed to allow them to limit or space their children. Those couples are resorting both to contraceptive methods and induced abortion, a situation which can exist in countries with high fertility and those which have entered the demographic transitional stage, as well as those where the transition is completed.

1.2 THE IMPORTANCE OF ASSESSING INTERMEDIATE VARIABLES

With a knowledge of demographic changes, an accurate forecast of the future size and composition of the population can be made, enabling nations to plan their economic and social activities. Planning in any sector (health, education, public works, etc) must take account of these changes. In particular, planning for the health sector should take account of the extent to which the practice of abortion implies a serious risk to maternal health. The actual coverage and impact of family planning programmes must also be known so that programmes can implement their aims realistically. Service statistics of these programmes provide information about the content of family planning

activities. but it is imperative to assess not only their extent but also their efficiency in terms of reduced fertility and a lower incidence of illegal abortion.

The effect that family planning programmes have had on levels of fertility and abortion is difficult to assess, since contraceptives can often be obtained privately. On the other hand, contraceptive use and abortion are only two of the so-called intermediate variables¹ through which any social factor influencing the level of fertility must act (Davis and Blake 1967). Their role will be positive or negative in fixing this level and will therefore contribute either to an increase or a decrease according to circumstances. Ultimately, the observed fertility will be the balance of the impact of all these variables, reflecting the prevailing socio-economic conditions in the country. Hence the importance of estimating the role of each of them, an estimation we intend to make with the method presented in this paper.

¹ Intermediate variables can be outlined as follows:

- *variables affecting exposure to sexual intercourse*: 1 Age at entry into sexual union; 2 Celibacy; 3 Dissolution of union; 4 Voluntary abstinence; 5 Involuntary abstinence; 6 Frequency of sexual intercourse.
- *variables affecting the risk of pregnancy*: 7 Involuntary sterility; 8 Use of contraceptive methods; 9 Voluntary sterilization.
- *variables affecting births*: 10 Voluntary foetal mortality (induced abortion); 11 Involuntary foetal mortality (spontaneous abortion/miscarriage).

2 The Method

2.1 PURPOSES AND DESCRIPTION

The main purpose of the method is to measure the role of the intermediate variables in determining the level of fertility (see Gaslonde 1972; Gaslonde and Bocaz 1970; Gaslonde and Carrasco 1973). In order to achieve this, we compare the observed fertility rate among the women included in the survey population with the pregnancy rate these women would have attained if all of them had had regular sexual relations without using any means of control (either contraceptives or abortion). This rate (which we shall designate p'') is of a theoretical nature as opposed to the 'observed' fertility rate. Between the theoretical pregnancy rate and the observed fertility rate, there is a difference which is accounted for by the reducing effect of the absence of sexual relations, contraceptive use and foetal mortality (still births, spontaneous abortions and induced abortions).

This theoretical rate p'' is reduced, in the first place, by the effect of the absence of sexual relations (r_{ASR}). Thus:

$$p''(1 - r_{ASR}) = p'$$

Similarly, the rate p' is reduced by the effect of contraceptive practice (r_{CP}), and thus:

$$p'(1 - r_{CP}) = p$$

in which p represents the observed pregnancy rate.

Finally, the observed pregnancy rate is decreased by the effect of foetal mortality (r_{FM}), thus obtaining the observed fertility rate (f):

$$p(1 - r_{FM}) = f$$

Successive reductions of the theoretical pregnancy rate p'' , until the observed fertility rate is obtained, are expressed by the following formula:

$$p''(1 - r_{ASR})(1 - r_{CP})(1 - r_{FM}) = f$$

Another aim of this method, deriving from the main purpose, is to evaluate family planning achievements. In this respect, the assessment of the reducing effect of intermediate variables on the level of fertility is not enough.

Ultimately, and regardless of the objectives of the family planning programme, we

need to estimate the number of live births and foetal deaths averted by the programme. In turn, the number of live births and foetal deaths averted, related to the financial outlays made by the programme, would indicate its cost-efficiency.

To calculate the number of live births and foetal deaths that have been averted, the method proposes to estimate the number of live births which could have been expected if women using highly efficient modern contraceptives (sterilization, IUD and pill) had instead used less efficient or inefficient methods, such as rhythm, condom, jelly or withdrawal. The number of expected live births minus the number of observed live births gives us an estimate of the number of live births averted. The same procedure can be applied to foetal deaths. The assumptions for calculating live births averted are as follows:

- modern methods of contraception are mainly used in family planning programmes;
- fertility between both groups of women (ie users of efficient and inefficient methods) is comparable, since they present similar risks of pregnancy. Precisely because a woman is aware of the fact that she may become pregnant, she resorts to the use of contraceptives. The same does not occur when considering women who are not using contraception, many of whom know of or suspect a possible infecundability or sterility.

On the other hand, this method allows the comparison of foetal mortality rates in different categories of women, according to use or non-use of contraceptive methods and their efficiency (higher or lower efficiency), enabling us to estimate the influence of contraceptive practice on foetal mortality.

This leads us to several further considerations. First, our concern is to measure the frequency of occurrence of pregnancy outcomes,² distinguishing between live births and foetal deaths. Foetal deaths should be decomposed into involuntary deaths (spontaneous abortions and still births) and voluntary deaths (induced abortions). Secondly, some of the women's characteristics, as related to contraceptive use and practice of sexual relations, should be taken into account. Thirdly, the observed time-unit would be each menstrual cycle. However, there are a number of practical reasons against choosing this unit in the case of a study based on a population survey. Therefore, our method proposes to consider the 'woman-month' as a unit for observation, that is to say, for each respondent we obtain information according to calendar months. Fourthly, we wish to obtain data about a recent situation, and therefore the information is registered in terms of the 12 completed months preceding the month of the interview. It is not advisable to include more than 12 months, if we wish to avoid lapses of memory, nor less than 12 months, since a seasonal variation is often found in live births and abortions.

The objectives of our method may be expressed as follows.

² This means that for completed pregnancies the number of months pregnant during the 12 months of reference is recorded, as well as the number of months pregnant for those pregnancies which started in this 12-month period but have not been completed as yet. Nevertheless, it is not intended to measure the probability of a woman becoming pregnant, thus removing the problem of accurate estimates of post-partum or post-abortion anovulatory periods or any other 'dead time'.

- 1 To assess the influence of intermediate variables on fertility levels.
- 2 To ascertain some characteristics of contraceptive practice, and the impact of contraception, considered in terms of live births averted.
- 3 To study the relationship between contraceptive practice and foetal mortality.

This approach is not new. Many investigators, using data from service statistics or surveys, have suggested methods for assessing the influence of intermediate variables on fertility, particularly contraception.

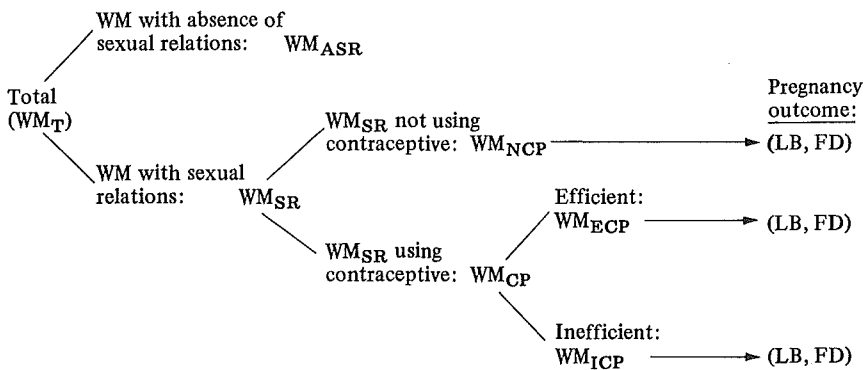
Keeny and Ross, using an empirical approach, have assessed the number of IUDs to be inserted in order to prevent one birth. The number of births averted is calculated by Potter, using the mean interval between live births, the risks of secondary sterility, divorce, etc. Lee and Isbister additionally seek to establish the fertility rates for women within the outside family planning programmes, continuity rates of contraceptive use and the exact number of active users. Others, in various simulation exercises, use probabilities of involuntary sterilization, marriage, widowhood and divorce, etc, each obtained in different populations and at different dates (see UN 1979).

The method presented here has the advantage, among others, of comparing women within the same country, and in the same year, and controlling exposure to sexual intercourse by age and cultural characteristics, the only variants being the risk of pregnancy and abortion. Therefore it may be considered more realistic and more reliable, in spite of the errors inherent in any sampling survey. As our approach uses data from within a survey, all errors due to the interviewer, the method of data collection and the respondent can be assumed similar for all groups under observation, and consequently their effects will not distort the analysis.

2.2 MEASURES

For the last year of sexual activity, we consider the following categories in each month.

Diagram 1 Categories of Woman-Month (WM) for the Study of the Last Year of Sexual Activity



The pregnancy outcomes – live births (LB) and foetal deaths (FD) – are classified according to the type of sexual relations preceding the pregnancy, ie with or without use of contraception (after the last menstruation observed). Sexual relations with contraceptives are subdivided into efficient and inefficient methods, and the specific contraceptive method can even be identified in this classification. The method also enables us to find out whether the specific method was obtained within the family planning programme.

In accordance with this scheme, each woman reports her experience of the last 12 months in which each month may figure in any of the categories. The total of woman-months equals the total of respondents multiplied by 12.

The measures used here are specific rates, including in the numerator live births, foetal deaths, or the sum of both (pregnancies), all of them classified according to the criteria described above. In the denominator, we follow the person-time criterion (a criterion observed, for example, in epidemiological studies for a population exposed to risk). This is done by adding the woman-months in the respective categories. In turn, this sum is divided by 12 in order to obtain annual rates, when finding the respective quotient.

Pregnancy or fertility rates calculated for different categories of woman-months enable us to estimate the reducing effects of the absence of sexual relations, contraceptive practice and foetal mortality. These effects are estimated by comparing rates in which the intermediate variable is present with those in which it is not present, and accordingly weighting the proportion of woman-months.

The Effect of Absence of Sexual Relations (r_{ASR})

The pregnancy rate of woman-months with absence of sexual relations (P_{ASR} , which is obviously zero) is compared to the rate of woman-months where sexual relations were present (P_{SR}). This is weighted by the proportion of woman-months with absence of sexual relations (WM_{ASR}) with regard to the total of woman-months (ie $WM_{SR} + WM_{ASR}$). Thus we obtain:

$$r_{ASR} = \left(1 - \frac{P_{ASR}}{P_{SR}} \right) \frac{WM_{ASR}}{WM_{ASR} + WM_{SR}}$$

The rate³ being $P_{ASR} = 0$, the value in brackets is 1. Hence:

$$r_{ASR} = \frac{WM_{ASR}}{WM_T}$$

In the first place, it can be seen that the reducing effect of the absence of sexual relations is 1, as was to be expected, and it decreases below 1 to the extent in which the proportion of woman-months with absence of sexual relations gradually decreases.

³ Though it may seem obvious, it should be pointed out that those pregnancies whose conception was the product of artificial insemination or any procedure excluding a heterosexual relation will be treated as originating from sexual relations for the purposes of the method.

The above formula is developed for the sole purpose of facilitating other calculations,⁴ thus obtaining:

$$r_{ASR} = 1 - \frac{P}{P_{SR}}$$

The Effect of Contraceptive Practice (r_{CP})

The pregnancy rate of woman-months using contraception (p_{CP}) is compared with the rate of those who did not use contraception (p_{NCP}). This is weighted by the proportion of woman-months using contraception (WM_{CP}) as opposed to the total (ie $WM_{CP} + WM_{NCP} = WM_{SR}$). We have:

$$\begin{aligned} r_{CP} &= \left(1 - \frac{p_{CP}}{p_{NCP}}\right) \times \frac{WM_{CP}}{WM_{CP} + WM_{NCP}} \\ &= \left(1 - \frac{p_{CP}}{p_{NCP}}\right) \times \frac{WM_{CP}}{WM_{SR}} \\ &= 1 - \frac{p_{SR}}{p_{NCP}} \end{aligned}$$

This reducing effect of contraceptive practice may be separated for efficient methods (r_{ECP}) and for the less efficient or inefficient methods (r_{ICP}). Thus:

$$\begin{aligned} r_{ECP} &= \left(1 - \frac{p_{ECP}}{p_{NCP}}\right) \times \frac{WM_{ECP}}{WM_{SR}} \\ r_{ICP} &= \left(1 - \frac{p_{ICP}}{p_{NCP}}\right) \times \frac{WM_{ICP}}{WM_{SR}} \end{aligned}$$

These formulae fulfil the condition: $r_{ECP} + r_{ICP} = r_{CP}$.

The Effect of Foetal Mortality (r_{FM})

This can easily be deduced, since the formula $p(1 - r_{FM}) = f$ must be fulfilled. Then:

$$r_{FM} = 1 - \frac{f}{p}$$

⁴ The development of this formula, as well as the following ones, is shown in appendix B.

3 Collection of the Information

The basic information was obtained in a special section of the individual questionnaire used in the Venezuela Fertility Survey (1977). This survey is part of the World Fertility Survey programme, and was applied to a national sample of 4361 women aged 15–44. The section containing the table of sexual activity⁵ was applied only to those respondents who reported that they ever had sexual relations, 2756 cases altogether.

In order to collect the basic information, the Sexual Activity Table (SAT) does not follow the same order presented in diagram 1 (see appendix D). It is advisable to distinguish mutually exclusive categories, ordered in such a way that the presence of a more important category invalidates the presence of a less important one (a competitive risk approach). In the SAT, the following are identified in each month: pregnancies (part B), absence of sexual relations, listed by reason (part C), and months with sexual relations, listed according to contraceptive use and specific method (part D). For the reason explained above, the months of pregnancy (part B) are classified according to use or non-use of any contraceptive method before the pregnancy occurred. The reporting of a pregnancy in a given month (one line, in the case of the SAT) makes it useless to continue probing if the woman has had sexual relations in that month and if she has used contraception, since that woman will not be able to get pregnant again. Similarly, it is preferable to ask about the months without sexual relations before the months with sexual activity. Among the causes of absence of sexual relations are celibacy, temporary absence of one of the partners, separation (or divorce), illness of one of the partners and other causes. Any month not included in parts B and C of the SAT is necessarily a month with sexual relations, and for each of these the respondent is asked if she has used contraception. If yes, the method is identified either as efficient (sterilization, IUD and pill) or inefficient (condom, foam, tablets, rhythm and others).

Every time we find a termination of pregnancy in part B, it is recorded in part E of the SAT, classified according to the type of termination: live birth, still birth, foetal loss (including spontaneous and induced abortions). Furthermore, the same information in part B allows us to classify each termination of pregnancy according to use or non-use of contraception prior to the pregnancy. Thus, part E represents the numerators of the rates required by the method. The denominators arise from parts B, C and D, bearing in mind that for the calculation of the rates we must add parts B and D. It must be

⁵ This table has been used in several Latin American surveys, such as the Programa de Encuestas Comparativas sobre Uso de Anticonceptivos y Práctica del Aborto (PEAL), the Comparative Survey Programme on Contraceptive Use and Abortion Practice co-ordinated by CELADE in Bogotá (1967), Panama (1966), Buenos Aires (1969) and Lima (1969); in the Paraguay Fertility Survey (FEPA 1971); the El Salvador National Fertility Survey (FESAL 1973); the survey carried out for evaluation purposes of the PSMIB-SNS project (Chile 1974). Within the World Fertility Survey project, besides Venezuela, Dominican Republic was also included (1975).

Table 1 Distribution by Age of Women Interviewed, According to the Total Sample of the Fertility Survey and the Sexual Activity Table (SAT)

Age group	Fertility survey (total sample)		Ever had sexual relations (SAT)		SAT women as proportion of total sample
	Number	%	Number	%	
15-19	1322	30.3	281	10.2	21.3
20-24	980	22.5	594	21.5	60.6
25-29	717	16.4	600	21.8	83.7
30-34	536	12.3	499	18.1	93.1
35-39	452	10.4	438	15.9	96.9
40-44	354	8.1	344	12.5	97.2
Total	4361	100.0	2756	100.0	63.2

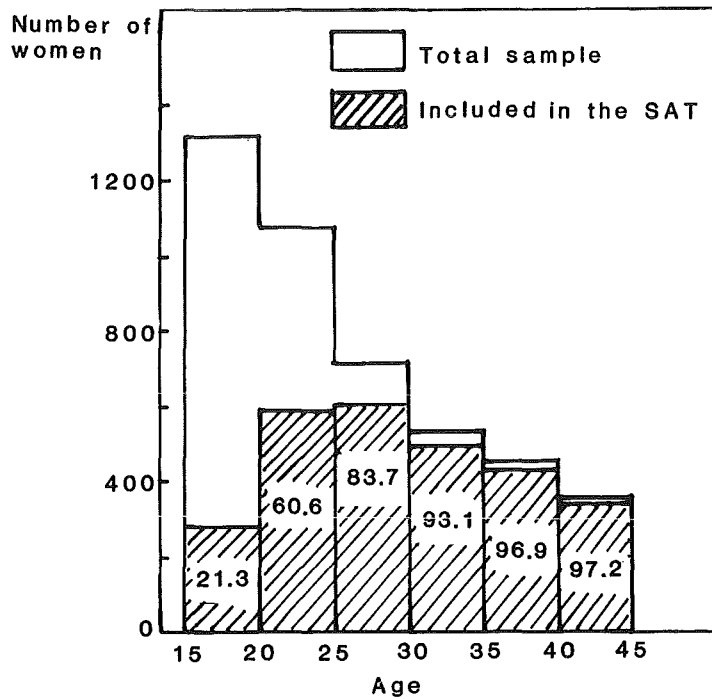


Figure 1 Proportion of Women Included in the Sexual Activity Table (SAT) Related to the Total Sample of the Survey

remembered that the rates are intended to measure the frequency with which pregnancy outcomes occur, and the extent of the population exposed to that risk is formed by the woman-months with sexual relations and those who are pregnant. Table 1 presents the distribution by age of the women included in the Sexual Activity Table (SAT), and they are compared to the distribution of all women interviewed. As might be expected, these distributions differ substantially, reflecting the varying age at entry into sexual union. Figure 1 shows, for each age group, the percentage of women who ever had sexual activity, which suggests that towards the end of their fertile life, almost all Venezuelan women have had sexual activity.

4 Results

4.1 THE INFLUENCE OF SOME INTERMEDIATE VARIABLES

In order to estimate the influence of intermediate variables on fertility levels, we must obtain the following: pregnancy rate for women-months with sexual relations and without contraceptive use (which have been designated p_{NCP}), pregnancy rate for woman-months with sexual relations (p_{SR}), pregnancy rate in all woman-months (p) and fertility rate in all woman-months (f). The absolute figures allowing the calculation of these rates (woman-months, pregnancies and live births) are presented in tables C2 and C3 in appendix C. It must be pointed out that the rate p_{NCP} represents the pregnancy rate p'' , ie the rate expected if all women had regular sexual relations, did not use contraception and did not resort to abortion (as previously defined in section 2.1).

Figure 2 and table 2 show the reducing effect of the absence of sexual relations (r_{ASR}), contraceptive practice (r_{CP}) and foetal mortality (r_{FM}), as well as the rates enabling their estimation.

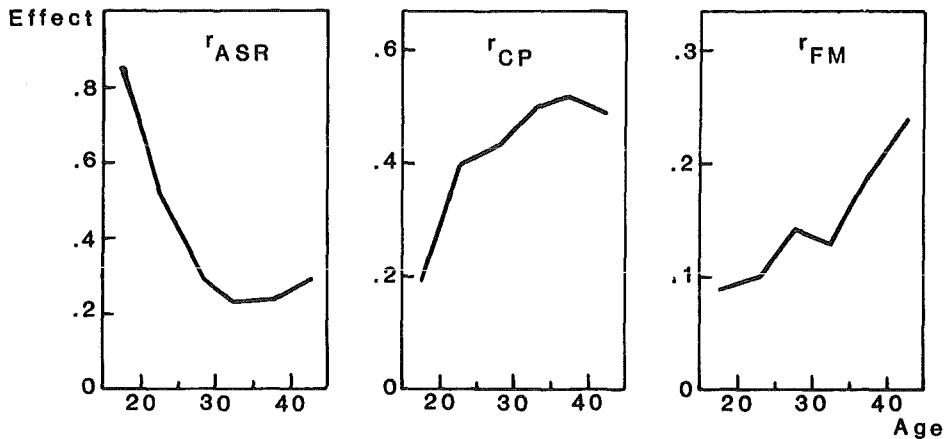


Figure 2 Reducing Effect of Absence of Sexual Relations (r_{ASR}), Contraceptive Practice (r_{CP}) and Foetal Mortality (r_{FM}), According to Age of the Respondents

Table 2 Estimation of the Reducing Effects r_{ASR} , r_{CP} and r_{FM}

Age group	Rates (per 1000)				Reducing effect		
	P_{NCP} (1)	P_{SR} (2)	p (3)	f (4)	r_{ASR} (5)	r_{CP} (6)	r_{FM} (7)
15-19	791	638	95	86	0.85	0.19	0.09
20-24	797	478	231	209	0.52	0.40	0.10
25-29	567	326	223	191	0.32	0.43	0.14
30-34	486	245	188	164	0.23	0.50	0.13
35-39	318	154	117	95	0.24	0.52	0.19
40-44	225	115	82	62	0.29	0.49	0.24
Total	563	320	159	140	0.50	0.43	0.12

NOTES: (5) = $1 - \frac{(3)}{(2)}$; (6) = $1 - \frac{(2)}{(4)}$; (7) = $1 - \frac{(4)}{(3)}$

Source: Tables C3 and C4

Once we have estimated the expected pregnancy rate for women exposed to sexual relations and not using contraception ($p'' = p_{NCP}$), we proceed to apply the reducing effects obtained in table 2 to describe how the expected level of pregnancies is progressively reduced until the observed fertility level is reached. This is shown in table 3 and figure 3, which should be read bearing in mind that the following formulae have been applied:

$$p''(1 - r_{ASR}) = p'; \quad p'(1 - r_{CP}) = p; \quad p(1 - r_{FM}) = f$$

Table 3 Progressive Reduction of the Expected Pregnancy Rate (Woman-Months with Sexual Relations, without Contraceptive Use) until Reaching the Observed Fertility Rate, through Application of the Reducing Effects (r_{ASR} , r_{CP} , r_{FM}), According to Age

Age group	$p'' = p_{NCP}$ (1)	$1 - r_{ASR}$ (2)	$p' = (1)(2)$ (3)	$1 - r_{CP}$ (4)	$p = (3)(4)$ (5)	$1 - r_{FM}$ (6)	$f = (5)(6)$ (7)
15-19	791	0.15	118	0.81	95	0.91	86
20-24	797	0.48	384	0.60	231	0.90	209
25-29	567	0.68	389	0.57	223	0.86	191
30-34	486	0.77	374	0.50	188	0.87	164
35-39	318	0.76	242	0.48	117	0.81	95
40-44	225	0.71	160	0.51	82	0.76	62
15-44	563	0.50	282	0.57	159	0.88	140

NOTE: The figures in this table have been rounded up to two decimals in relation to the original calculations.

Source: Table 2

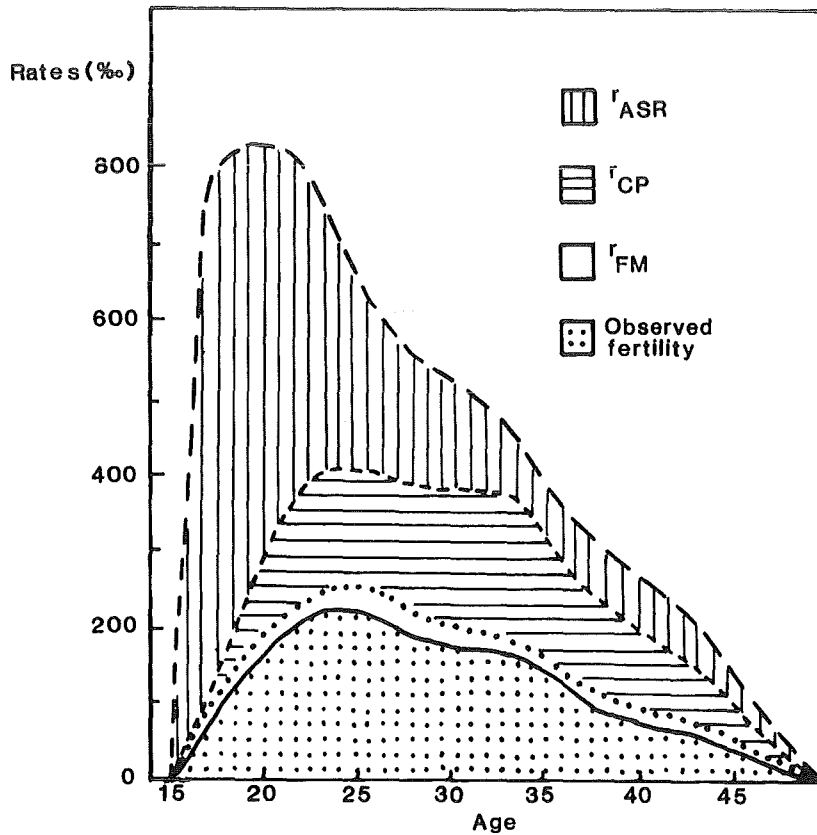


Figure 3 Progressive Reduction of the Expected Pregnancy Rate until Reaching the Observed Fertility Level through the Effects of Absence of Sexual Relations (r_{ASR}), Contraceptive Practice (r_{CP}) and Foetal Mortality (r_{FM}), According to Age of the Women

Absence of Sexual Relations

Table 3 and figure 3 show the very considerable influence of the absence of sexual relations, both temporary and permanent. On average for all ages, it reduces the expected pregnancy rate for women having sexual relations and not using contraception by 50 per cent. This reducing effect varies considerably according to women's ages, with very high values at the younger ages (where it reduces the expected rate of the 15–19 group by as much as 85 per cent), declining rapidly until reaching a minimum around the age of 35, and increasing gradually from then onwards. An explanation for this reversal of the

trend is found when separating the effect of the absence of sexual relations by specific causes, as we shall see in table 5.

As mentioned in chapter 2, the questions in the sexual activity table were asked exclusively of those women who reported ever having had sexual relations. To apply the method, women who never had sexual relations were computed as a 12-months input into the category of woman-months without sexual relations, under the heading of 'Permanent Celibacy' (see table C3). It is interesting to compare the effect of absence of sexual relations among women who never had any sexual relations and the total effect observed both among these women and women who have had a sexual relation at some time in their life, but in some of the months considered had no sexual relations. This comparison is shown in table 4.

It is also interesting to study the effect of absence of sexual relations by looking at the specific reasons for abstinence. The sexual activity table in appendix D lists the following reasons for absence of sexual relations: celibacy, separation of spouses (including divorce), temporary absence of either spouse, illness of either partner, and other reasons. Table 5 presents the percentage distribution of woman-months without sexual relations by reason, in each age group.

Celibacy is the most important reason for absence of sexual relations, representing 76.6 per cent of the total for all ages (15–44 years). Celibacy varies according to age, presenting very high values, as is to be expected, in the 15–19 age group (95.7 per cent),

Table 4 Reducing Effect of Absence of Sexual Relations during the Year Preceding the Survey: Total and Attributable to Women who Have Never Had Sexual Relations According to Current Age of the Women

Age group	Reducing effect of absence of sexual relations during the year preceding the survey		
	Total	Never had any sexual relations	Have had sexual relations
15–19	0.85	0.79	0.06
20–24	0.52	0.40	0.12
25–29	0.32	0.17	0.15
30–34	0.23	0.07	0.16
35–39	0.24	0.03	0.21
40–44	0.29	0.03	0.26
15–44	0.50	0.37	0.13

Source: Table C3

Table 5 Percentage Distribution of Woman-Months without Sexual Relations by Reason, in Each Age Group

Age group	Reason for absence of sexual relations					Total
	Celibacy	Separation	Illness	Temporary absence	Others	
15-19	95.7	2.1	0.1	0.3	1.8	100.0
20-24	80.5	10.2	0.7	0.9	7.7	100.0
25-29	55.8	26.0	3.2	2.6	12.4	100.0
30-34	32.1	40.6	2.3	7.3	17.7	100.0
35-39	14.4	53.2	12.4	3.3	16.7	100.0
40-44	10.8	55.0	7.2	4.6	22.4	100.0
15-44	76.6	13.6	1.6	1.4	6.8	100.0

Source: Table C3

declining monotonically with increasing age. In the 30-34 age group, it ceases to be the main reason and represents only 10.8 per cent in the 40-44 age group.

Separation, as a reason for absence of sexual relations, is next in importance. Its importance increases with age and it is the most frequently reported reason in the 30-34 age group (40.6 per cent) and above, reaching 55 per cent in the 40-44 age group. These figures show the instability of both marriages and consensual unions in Venezuela; indeed, separations explain the increase in the reducing effect of absence of sexual relations from the age of 35 upwards (a reversal of the trend noted above), as can be seen in figure 4. *Temporary absence* or *illness* of either partner are not of great significance. Among *other reasons* which were mentioned by respondents, it is worth noting the 'care' taken during the immediate post-partum or post-abortion period (puerperium), reported by young women, and the 'lack of interest in sexual relations' of the woman or her spouse, reported particularly by older women.

Effect of Contraceptive Use

Table 6 and figure 5 show the reducing effect of contraception, estimated after we have deduced the absence of sexual relations from the expected pregnancy rate. On average for all ages (15-44), it may be seen that the effect of contraception is considerable (43 per cent). The effect of contraception presents a well-differentiated pattern according to age (in the higher age groups the effect is double that of the 15-19 age group), and shows the efforts made by Venezuelan couples to avoid pregnancies. We must distinguish here the effects of the different methods used by the couples, ie modern efficient methods (sterilization, pill, IUD) and traditional, less effective or inefficient methods (all those not listed as efficient methods).

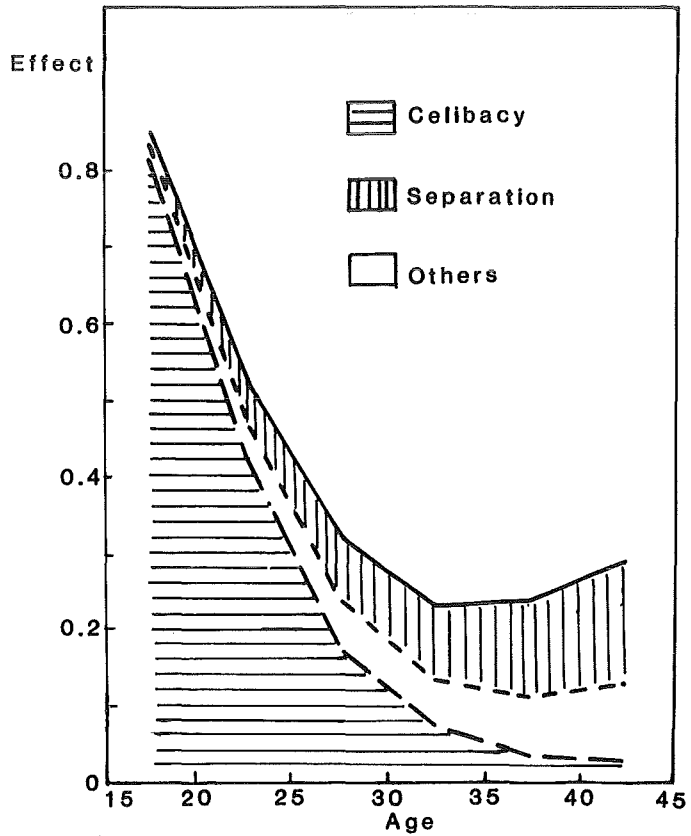


Figure 4 Reducing Effect of Absence of Sexual Relations According to Reason and Age

In order to make this distinction, it should be remembered that the effect of contraception may be expressed as the sum total of the effect of efficient and inefficient contraceptives, that is to say:

$$r_{ECP} + r_{ICP} = r_{CP}$$

where

$$r_{ECP} = \left(1 - \frac{PECP}{PNCP}\right) \times \frac{WM_{ECP}}{WM_{SR}}$$

$$r_{ICP} = \left(1 - \frac{PICP}{PNCP}\right) \times \frac{WM_{ICP}}{WM_{SR}}$$

Table 6 Reducing Effect of Contraception According to Type of Method, by Age Groups

Age group	$1 - \frac{P_{ECP}}{PNCP}$	$\frac{WM_{ECP}}{WM_{SR}}$	r_{ECP}	$1 - \frac{P_{ICP}}{PNCP}$	$\frac{WM_{ICP}}{WM_{SR}}$	r_{ICP}	r_{CP}	$\frac{(3)}{(7)} \times 100$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
15-19	0.84	0.16	0.13	0.65	0.09	0.06	0.19	68.4
20-24	0.93	0.33	0.31	0.66	0.14	0.09	0.40	77.5
25-29	0.86	0.37	0.32	0.64	0.17	0.11	0.43	74.4
30-34	0.93	0.35	0.33	0.75	0.22	0.17	0.50	66.0
35-39	1.00	0.36	0.36	0.78	0.21	0.16	0.52	69.2
40-44	1.00	0.32	0.32	0.91	0.19	0.17	0.49	65.3
15-44	0.92	0.33	0.30	0.73	0.17	0.13	0.43	69.8

NOTES: (3) = (1) × (2)

(6) = (4) × (5)

(7) = (3) + (6).

Source: Tables C2 and C4

Table 6 presents the calculation of the reducing effect of efficient contraceptives (r_{ECP}) and less effective or inefficient contraceptives (r_{ICP}).

Columns 1 and 4 of table 6, which show the effect of contraceptives (modern and traditional) without taking into account the proportion of women using them, merit a brief comment. The values, taken by themselves, are close to the 'use-effectiveness' usually mentioned in the literature on contraceptive methodology, with little over 90 per cent for modern (highly efficient) methods, and a little over 70 per cent for traditional (less efficient) methods.

At first glance, 73 per cent would seem to be a high value for the less efficient methods, though we should take into account the lower fecundity of the users (especially older women) and even unnecessary protection in cases of sterility, which some women may be unaware or uncertain of. Another explanation can be found in a deficiency common to all studies where information is given by the user herself, since it is possible that a large proportion of these women confuse 'non-use' of a less efficient method with 'forgetting' or 'wrong use'. For example, a woman who has used the rhythm method for two months may report that during the third month she did not use it and became pregnant, but what really happened was that she forgot to use it. This pregnancy is then classified as 'without use of contraception'. Although the more efficient methods (sterilization, IUD and, above all, the pill) are exposed to this kind of reporting error, it is considerably less likely to occur.

It is worth emphasizing the very different values of columns 2 and 5 which show the proportion of women with sexual relations using efficient and less efficient methods,

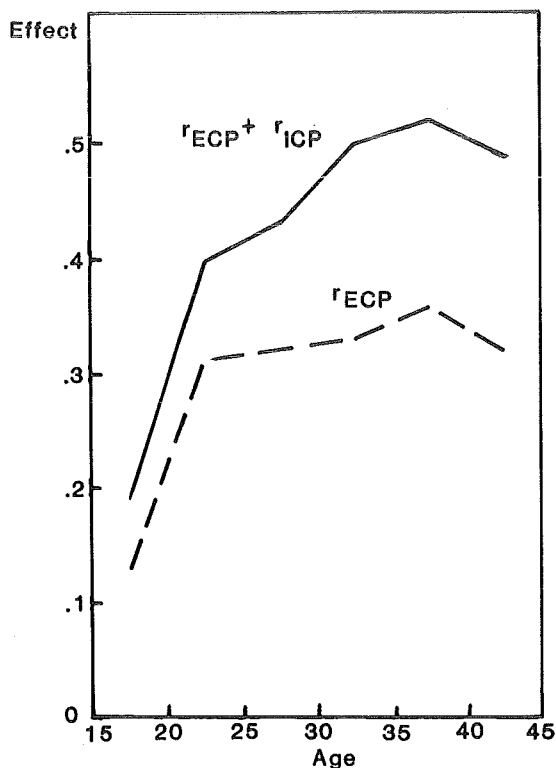


Figure 5 Reducing Effect of Contraception According to Type of Method, by Age

respectively. In general terms, women using efficient contraceptives are almost double the number of those using the less efficient ones, this ratio being even higher among the younger age groups. In other words, and leaving aside the level of contraceptive use, contraceptive practice in Venezuela during the 12 months preceding the survey shows a remarkably modern pattern. This is ultimately reflected in the reducing effect shown in columns 3 and 6 (also see figure 5). Slightly over two-thirds of the reducing effect of contraception can be attributed to efficient methods. The effect of these efficient contraceptives is even greater among younger women, especially in the age range 20–29, and the importance of this effect is further emphasized when we recall that fertility rates show their highest values in these age groups. Further details about contraceptive practice are presented in section 4.2.

Effect of Foetal Mortality

As mentioned above, we may expect considerable under-reporting of foetal mortality in single-round surveys,⁶ owing to the voluntary omission of induced abortion. This observation, which is valid in the case of the Venezuela Fertility Survey, applies equally to the sexual activity table. Actually, the SAT records, for each of the 12 months completely elapsed before the survey, any month in which the woman has been pregnant and, if the pregnancy was terminated during the period of reference, the result of this termination: live birth, still birth or abortion (see appendix D). Given the fact that the pregnancy history has been recorded before the SAT is completed, information on any form of termination of pregnancy in the latter must include at least the pregnancy terminations previously declared. Thus, it may be expected that under-reporting of foetal mortality in the SAT would not be higher than that recorded in the pregnancy history. Judging by the figures in table 2, the SAT hardly shows any reducing effect of foetal mortality in the general context of the reducing effects considered.

Summing up, we may say that for the year preceding the Venezuela Fertility Survey of 1976, the method of the sexual activity table shows a potential pregnancy rate of 563 per thousand women aged 15–44, assuming that all women had regular sexual relations without resorting to contraception and abortion. This rate is reduced to 282 per thousand when the effect of absence of sexual relations is taken into account, further reduced to 159 by the effect of contraception, finally decreasing to 140 per thousand by the effect of foetal mortality, this final figure corresponding to the observed general fertility rate. This reveals the great influence of absence of sexual relations, particularly at young ages, an influence which is displaced at older ages by contraception and, to a lesser extent, by the effect of foetal mortality.

Among the intermediate variables grouped under the heading of 'absence of sexual relations', celibacy and separation stand out prominently, the latter acquiring great importance after the age of 25. As for the influence of contraception, the level of practice is not very high, but the greater part of all users resort to modern, highly efficient methods.

In the following sections, the role of contraception and foetal mortality are examined in greater detail.

4.2 EFFECTIVENESS OF CONTRACEPTIVE USE

To complete the study of contraceptive use in Venezuela during the year preceding the survey, we present the estimated effectiveness of each contraceptive method in terms of the proportion of female users who did not become pregnant. We have used an adaptation of Pearl's Index in the case of the SAT, referred to 100 woman-years (ie 1200 woman-months):

⁶ In the case of multi-round surveys or longitudinal studies, though it is not possible entirely to eliminate the omission of induced abortions, the abortion level obtained is substantially higher (see the discussion "The Denominator" in appendix A).

$$\text{Probability of pregnancy} = \frac{\text{Pregnancies with prior contraceptive use}}{\text{Woman-months with use of the contraceptive}} \times 1200$$

Methods are presented in decreasing order of use-effectiveness, obtained in the calculation. The results are consistent, inasmuch as the first three places are occupied by the efficient methods. The relative order of sterilization, IUD and pill is explained by the fact that this estimate of use-effectiveness does not take into consideration the duration of use of the method (new users or old users). This consideration is meaningless in the case of sterilization, but it is particularly important in the case of the IUD, whose effectiveness often continues to be high after a certain time has elapsed. The pill, which in theory is more efficient than the IUD, can in practice be used inadequately. In any case, the estimates shown in table 7 reflect the haphazard conditions governing contraceptive use in real life, that is to say, they frequently eliminate the ideal conditions in which the theoretical effectiveness of the pill and the IUD is assessed.

The use-effectiveness of all less efficient or inefficient methods (85 per cent), though clearly lower than that of efficient methods (95 per cent), is none the less quite considerable.

Table 7 Estimate of Use-Effectiveness for Individual Methods

Individual method	Woman-months using method (1)	Observed pregnancies (2)	Probability of pregnancy per 100 woman-years' use (3)	Use-effectiveness in 100 woman-years (4)
Sterilization	1705	0	0	100.0
IUD	2308	7	3.64	96.4
Pill	4615	26	6.76	93.2
Condom	1172	8	8.20	91.8
Others, inefficient	2212	27	14.65	85.4
Rhythm	1011	17	20.18	79.8
Tablets and foams	128	5	46.87	53.1
Efficient	8628	33	4.58	95.4
Inefficient	4523	57	15.12	84.9

NOTES: (3) = [(2)/(1)] × 1200
(4) = 100 - (3).

Source: Tables C12 and C13

4.3 CONTRACEPTIVE PRACTICE AND FOETAL MORTALITY

One of the objectives of family planning is the reduction of the need for induced abortion. Obviously, prevention of induced abortion begins with the prevention of pregnancy. Based on these considerations, it is useful to study foetal mortality during the year preceding the survey in relation to the categories of woman-months without contraceptive use (WM_{NCP}), with use of less efficient (inefficient) contraceptives (WM_{ICP}) and with use of efficient contraceptives (WM_{ECP}). Table 8 shows the respective rates per thousand women, according to ten-year age groups.

The differences in foetal mortality rates per woman are so substantial as to need no commentary. In the age range 15–44, women not using contraception have a probability of experiencing foetal mortality three times as high as women using inefficient contraception, and five times as high as those using efficient contraception. When age groups are separated, the extent of these differences is systematically maintained in each group. Hence, it can be argued that contraceptive use means a reduction of foetal mortality. This is not surprising, as contraceptive use avoids pregnancies and, therefore, live births, still births and foetal losses. The frequency of foetal mortality is the result, first, of pregnancies occurring and, secondly, of the proportion of pregnancies terminating in foetal deaths. In other words, the foetal death rates for women in table 8 are equivalent to the product of two rates: the pregnancy rate per woman and the foetal mortality rate per pregnancy:

$$\frac{P}{W} \times \frac{FM}{P} = \frac{FM}{W}$$

Table 9 describes how the foetal mortality rates per woman are obtained as the product of these two rates.

Table 8 Foetal Mortality Rates per Thousand Women According to Contraceptive Use, by Age

Age groups	Rates per thousand women		
	WM_{NCP}	WM_{ICP}	WM_{ECP}
15–24	63.1	35.7	21.2
25–34	69.9	17.2	15.2
35–44	54.4	16.9	0
15–44	63.4	21.2	12.5

Source: Tables C2 and C4

Table 9 Pregnancy Rates per Woman, Foetal Mortality Rates per Pregnancy and Foetal Mortality Rates per Woman According to Contraceptive Use

Category of woman-months	Rates (per unity)				
	Pregnancy per woman (1)	FM per pregnancy		FM per woman	
		Total (2)	IA (3)	Total (4)	IA (5)
WM _{NCP}	0.5631	0.1126	0.0126	0.0634	0.0071
WM _{ICP}	0.1512	0.1404	0.0404	0.0212	0.0061
WM _{ECP}	0.0459	0.2727	0.1727	0.0125	0.0079

NOTES: NCP = not using contraceptives
 ICP = using inefficient
 ECP = using efficient
 FM = foetal mortality
 IA = induced abortion
 (3) = (2) - 0.1
 (4) = (1) (2)
 (5) = (1) (3).

Source: Tables C2 and C4

This table shows clearly that the frequency of foetal deaths per woman (column 4) is considerably lower among users of contraception than non-users. At the same time, that frequency is substantially lower within the group of users of efficient methods than the users of inefficient ones. Hence, as regards the prevention of foetal mortality, the higher the efficiency of contraception the stronger the influence. However, the use of contraceptives does not reflect a reduction of the need for induced abortion, as shown in column 5.

From the components of foetal mortality, we know that the proportion of pregnancies terminating in still births is very low. Actually, the experience gained from various Latin American surveys has shown that it never exceeds 2 per cent. In the case of spontaneous abortions, it may be accepted that these represent about 10 per cent of all pregnancies (United Nations 1954). Then, by subtracting 0.1 from column 2, the induced abortion rate per pregnancy is obtained. These rates show that contraceptive users, once pregnant, are more likely to resort to abortion, especially if they are using efficient methods. This finding should not necessarily be interpreted in the sense that contraceptive use increases abortion, but rather as evidence that those users who become pregnant in spite of using contraception chose to terminate their pregnancies. Those women who try to avoid pregnancy by contraception will also prevent the live birth, if necessary, by abortion. The final result, in the case of Venezuela, is that differences among non-users and users (of both efficient and inefficient methods) are hardly to be seen, as the induced abortion rates per woman show.

Table 10 Expected Induced Abortion Rates per Woman under the Assumption of Same Pregnancy Rate for Users and Non-Users of Contraception

Category of woman-months	Rates (per unity)			
	Pregnancy per woman (1)	IA per pregnancy (2)	IA per woman	
			Expected (3)	Observed (4)
WM _{NCP}	0.5631	0.0126	0.0071	0.0071
WM _{ICP}	0.5631	0.0404	0.0227	0.0061
WM _{ECP}	0.5631	0.1727	0.0972	0.0079

NOTES: (3) = (1) × (2); IA = induced abortion
 Source: Table 9

However, this poses a further problem: what would happen to the users of efficient and inefficient methods if they were not using contraception at all? They would easily reach the pregnancy rate of non-users, ie 0.5631. Now, it can be assumed that they would resort to abortion as shown in column 3 of table 9, finally reaching expected induced abortion rates per woman, as illustrated in table 10.

Table 10 shows clearly the enormous differences between the expected and observed values of induced abortion rates per woman, for contraceptive users. The preventive effect of contraception or abortion is properly highlighted when the prevention of pregnancies through contraception is considered.

4.4 ESTIMATION OF AVERTED LIVE BIRTHS AND FOETAL DEATHS

Calculation of cost-effectiveness (or cost-benefit) of a family planning programme implies knowledge of the number of live births and, ultimately, of the number of foetal deaths prevented by the programme. Estimation of these live births and foetal deaths may be expressed roughly as the number of live births which would have occurred if the programme had not been implemented. In the case of the SAT, the categories of woman-months examined and their respective fertility rates enable us to attempt an estimate.

This estimate could be expressed in the following terms: how far would the number of live births per woman-month decline, if non-users had in fact been using contraception. However, this calculation is not wholly adequate, given both the lower fecundability of women who are not using contraceptives and the lower motivation towards contraceptive use, which may indeed be partly due to lower fecundability. Several studies (Gaslonde and Carrasco 1973) have pointed out these differing levels of fertility showing that women who have used some contraceptive method had more children than women who

had never used any method, in spite of both groups beginning their sexual relations at approximately the same age. This is explained by the fact that the contraceptive users had more births in the years before they started to use contraception.

A comparison may be made between women using inefficient methods and those using efficient methods (generally those provided by the Venezuelan family planning programme). Fecundability in these two groups is similar, and because the women in both groups are aware that they may become pregnant, they use some kind of contraception. It is plausible to assume that women using inefficient contraception are not using the efficient methods for reasons of ignorance, lack of supplies and fear of possible side-effects. This is precisely the kind of problem all family planning programmes are faced with, and it is interesting to estimate the number of live births and foetal deaths which would have occurred among the users of efficient contraception if they had been forced to resort to inefficient methods.

Table 11 shows the estimate of live births and foetal deaths averted, which has been obtained by means of the following formulae:

$$\text{Averted live births} = (f_{\text{ICP}} - f_{\text{ECP}}) \times \frac{WM_{\text{ECP}}}{12}$$

$$\text{Averted foetal deaths} = (fm_{\text{ICP}} - fm_{\text{ECP}}) \times \frac{WM_{\text{ECP}}}{12}$$

where *f* and *fm* represent the fertility and foetal mortality rates, respectively.

Table 11 Averted Live Births and Foetal Deaths: Use of Efficient instead of Inefficient Methods

Age group	WM _{ECP} (1)	f _{ECP} (2)	f _{ICP} (3)	Averted live births (4)	fm _{ECP} (5)	fm _{ICP} (6)	Averted foetal deaths (7)
15-19	373	0.0643	0.2727	+ 6.5	0.0643	0	- 2.0
20-24	1888	0.0445	0.2287	+ 29.0	0.0127	0.0457	+ 5.2
25-29	2188	0.0658	0.1800	+ 20.8	0.0164	0.0240	+ 1.4
30-34	1754	0.0205	0.1096	+ 13.0	0.0137	0.0110	- 0.4
35-39	1470	0	0.0424	+ 5.2	0	0.0282	+ 3.4
40-44	955	0	0.0210	+ 1.7	0	0	0
Total				+ 76.2			+ 7.6

NOTES: (4) = [(3) - (2)] $\frac{(1)}{12}$ (7) = [(6) - (5)] $\frac{(1)}{12}$

Source: Tables C2 and C4

According to the figures presented in table C4 in appendix C, during the 12 months preceding the survey, 609 live births occurred among all women interviewed, 24 of them to women who reported having used efficient contraceptive methods, 49 to women who had used inefficient methods and 536 to women who had not used any contraception at all. According to the estimate in table 10, if the women using efficient methods had been using inefficient ones, this would have resulted in 76 additional live births. Thus, instead of 609 there would have been 685, ie 12.5 per cent more. In the case of foetal deaths, there would be 93 instead of the 85 declared, ie 9.4 per cent more.

4.5 SOME SOCIO-ECONOMIC FACTORS RELATED TO SEXUAL BEHAVIOUR

As with the study of differential fertility, we present the results of the SAT according to differentials in certain socio-cultural variables. To this effect we have chosen the woman's current place of residence (urban or rural) and her level of education (classified as illiterate, some primary, completed primary, secondary and university). These two variables always show a remarkable differential in the fertility level, and the SAT allows us to acquire a more detailed knowledge of this differential, since it enables a comparison to be made with important aspects such as sexual relations, contraceptive practice and foetal mortality.

In studying the following results, it is important to remember that this comparison may be affected by the different age structure of the various groups of women. One should bear in mind that in the urban-rural composition, there exists a selectivity in the

Table 12 Per Cent Distribution by Age of Women Interviewed, According to Current Place of Residence or Level of Education

Age group	Current place of residence		Level of education				
	Urban	Rural	Illiterate	Some primary	Completed primary	Secondary	University
15-19	30.3	28.6	8.3	26.6	26.7	43.7 ^a	10.2 ^a
20-24	23.1	19.1	11.6	16.6	24.7	24.7	49.2
25-29	16.4	17.9	17.7	16.1	18.3	14.5	21.5
30-34	11.9	14.1	21.0	14.3	12.7	8.6	8.5
35-39	10.1	11.9	21.7	13.5	10.2	5.6	6.8
40-44	8.2	8.3	19.6	12.9	7.4	2.9	4.0
15-44	100.0	100.0	100.0	100.0	100.0	100.0	100.0

^a Because the survey is a cross-sectional study, many of the women 15-19 classified as 'secondary' are likely to reach university level. Nevertheless, the figures are properly exhibiting the very different age-composition by level of education and place of residence, in the year preceding the survey.

ages of rural migrants (usually they migrate to the urban area at young ages, causing the rural population to appear older). In the distribution by age according to educational level, older women are predominant in the low schooling categories. In countries where women's access to university is fairly recent, as in the case of Venezuela, one might expect the great majority of female university students to be concentrated in the 20–29 age group. This different age structure can be seen in the figures given in table 12, extracted from the First Country Report of the Venezuela Fertility Survey.

Place of Residence

We now consider the two categories, urban and rural, having adopted the definition applied in the 1971 population census.

Absence of Sexual Relations, According to Reason for Abstinence

Table 13 presents the percentage distribution of woman-months without sexual relations according to reason, by place of residence.

Celibacy constitutes the main reason for absence of sexual relations in both urban and rural areas, but it is substantially higher in the former (78.3 compared to 63.5 per cent). Celibacy presents such a high value in urban areas that *a fortiori* it follows that the values for the remaining reasons are low, to the extent that these values are systematically lower than those of rural areas. The reader must interpret this urban-rural 'differential' with caution, especially the figures relating to separation. According to these figures, given in table 13, the importance of separation would be 45 per cent higher in rural areas (18.7 per cent compared to 12.9 per cent), which would not be consistent with the greater instability of unions in the urban sector, which has been discussed in the literature on the subject. If we relate woman-months of separation to the population at risk (in this case, the total of woman-months minus woman-months without sexual relations, for reasons of celibacy) we obtain 10.2 per cent for urban areas and 9.3 per cent for rural areas,⁷ showing a higher incidence of separation in the urban sector.

Table 13 Absence of Sexual Relations According to Reason, by Place of Residence

Reason for absence of sexual relations	Percentages	
	Urban	Rural
Celibacy	78.3	63.5
Separation	12.9	18.7
Illness	1.6	2.2
Absence	1.2	2.7
Others	6.0	12.9
Total	100.0	100.0

Source: Table C6

⁷ These percentages are obtained by relating, in the urban sector, 2981 woman-months separated (numerator) to 21,373 woman-months with sexual relations, plus 5009 woman-months without sexual relations (absence, illness, other causes apart from celibacy) plus the same 2981 woman-months of separation (denominator). In the rural area, the corresponding figures are 599 (numerator), and 4650, 1166 and 599 (denominator).

Table 14 Distribution of Various Categories of Woman-Months in the SAT, by Place of Residence

Place of residence	WM _{ECP} (1)	WM _{ICP} (2)	WM _{NCP} (3)	WM _{SR} (4)	WM _{ASR} (5)	Total (6)
A Percentage distribution based on sexually active women						
Urban	36.2	18.9	44.9	100.0		
Rural	19.1	10.3	70.6	100.0		
B Percentage distribution based on total						
Urban	17.4	9.1	21.6	48.1	51.9	100.0
Rural	11.3	6.1	41.8	59.2	40.8	100.0

NOTES: (4) = (1) + (2) + (3)

(6) = (4) + (5).

Source: Table C5

Sexual Activity in Relation to Contraceptive Use

Table 14 analyses the distribution of woman-months according to contraceptive use, by the woman's place of residence. Two percentage distributions are shown, one based on the total of woman-months and the other based on the number of sexually active women.

Looking at the percentages for the total of woman-months, we observe a higher incidence of absence of sexual relations in urban areas (51.9 compared to 40.8 per cent), which to a certain extent could be explained by the high percentage of urban celibacy already mentioned in table 13.

Among the sexually active women, contraceptive use (columns 1 and 2) is much higher in urban areas than rural areas (55.1 compared to 29.4 per cent, ie 87 per cent higher). This difference is hardly surprising when we consider both the better distribution of contraceptives in urban areas and the higher motivation of urban women. Nevertheless, the proportions using efficient and inefficient methods are similar in both urban and rural areas, since approximately two out of three users resort to efficient methods. In other words, the level of contraceptive practice in the rural areas of Venezuela during the year preceding the survey was low but adequate in the proportions found using efficient methods. It would be useful to carry out a special study of this aspect of Venezuelan fertility.

Reducing Effect of Absence of Sexual Relations, Contraceptive Use and Foetal Mortality

Table 15 shows the pregnancy and fertility rates which enable an estimate of the reducing effects to be made (table 16). Table 17 shows how the expected pregnancy rate, if unaffected by either foetal mortality, contraception and absence of sexual relations, is reduced to the observed level of fertility. It illustrates the urban-rural fertility differential and also explains the reason for this differential. The women's potential fertility is very similar in both urban and rural areas (being slightly higher, indeed, in the urban area).

Table 15 Pregnancy and Fertility Levels in Various Categories of Woman-Months, by Current Place of Residence

Current place of residence	Rates (per thousand)			
	P _{NCP}	P _{SR}	p	f
Urban	567	299	144	124
Rural	545	410	243	226

Source: Table C5 and C6

Table 16 Reducing Effect of Absence of Sexual Relations (r_{ASR}), Contraceptive Use (r_{CP}) and Foetal Mortality (r_{FM}) by Current Place of Residence

Current place of residence	Reducing effect		
	r_{ASR}	r_{CP}	r_{FM}
Urban	0.5194	0.4721	0.1370
Rural	0.4076	0.2472	0.0692

Source: Table 15

Table 17 Reduction of Expected Fertility Rate (if Unaffected by Foetal Mortality, Contraception, and Absence of Sexual Relations) to the Observed Fertility Level, by Current Place of Residence

Current place of residence	$p'' = P_{NCP}$ (1)	$1 - r_{ASR}$ (2)	$p' = (1)(2)$ (3)	$1 - r_{CP}$ (4)	$p = (3)(4)$ (5)	$1 - r_{FM}$ (6)	$f = (5)(6)$ (7)
Urban	567	0.4806	272	0.5279	144	0.8630	124
Rural	545	0.5925	323	0.7528	243	0.9308	226
Difference			-16%		-41%		-45%

Source: Tables 15 and 16

However, each of the reducing effects is systematically higher in the urban sector. Column 3 in table 17 shows that the expected pregnancy rate is already lower in the urban area when the effect of absence of sexual relations is taken into account (16 per cent lower than in the rural sector). Contraceptive practice accentuates this differential substantially (the observed pregnancy rate in the urban sector is 41 per cent lower), and following that, though to a lesser degree, is the effect of foetal mortality, accounting for an urban fertility rate 45 per cent lower than the rural rate (124 compared to 226).

Educational Level of the Woman

The respondent's educational level is divided into the following categories: illiterate (no completed year of schooling); some primary (1-4 years); completed primary (5-6 years); secondary; and university.

Absence of Sexual Relations, According to Reasons for Abstinence

Table 18 presents the percentage distribution of woman-months without sexual relations, according to reasons for this absence, by the respondent's educational level. The reasons for absence of sexual relations follow the same order of importance as in the total of woman-months without sexual relations (table 5).

Celibacy is the main reason for absence of sexual relations in each category of educational level and reaches very high percentages among better educated women. It should be remembered that this comparison may be affected by the large number of young women in the higher educational groups, and the differences in celibacy between the different educational groups, shown in table 18, could in fact be smaller.

Table 18 also shows the proportions which fall into the category of separation. The effect of separation is better expressed if we observe the principle applied in table 11 and relate woman-months of separation to the population at risk (ie the total of woman-months minus woman-months without sexual relations, for reasons of celibacy). Through this estimate we obtain the percentages shown in table 19.

The incidence of separation is clearly related to educational achievement, with the proportion of separated illiterate women 53 per cent higher than women with university education.

Table 18 Absence of Sexual Relations According to Reason, by Level of Education

Level of education	Reason for absence of sexual relations					Total
	Celibacy	Separation	Illness	Temporary absence	Others	
Illiterate	57.8	23.4	3.2	2.5	13.1	100.0
Some primary (1-4 years)	68.2	17.9	2.2	1.8	9.9	100.0
Completed primary (5-6 years)	62.2	23.5	2.3	2.1	9.9	100.0
Secondary	88.4	6.5	0.9	0.8	3.4	100.0
University	92.8	4.1	0.1	1.0	2.0	100.0

Source: Table C9

Table 19 Estimate of Separation Rates, by Level of Education

Level of education	Woman-months for cause of separation	Population at risk ^a	Percentages
Illiterate	600	4736	12.7
Some primary (1–4 years)	931	7927	11.7
Completed primary (5–6 years)	1217	11001	11.1
Secondary	771	7799	9.9
University	61	735	8.3
Total	3580	32198	11.1

^a Total of woman-months, minus woman-months without sexual relations for reasons of celibacy.

Sexual Activity in Relation to Contraceptive Use

Table 20 presents the distribution of woman-months according to contraceptive use, by the respondent's level of education. The percentages shown are based on sexually active women and the total of woman-months.

Table 20 Distribution of the Different Categories of Woman-Months in the SAT, by Level of Education

Level of education	WM _{ECP} (1)	WM _{ICP} (2)	WM _{NCP} (3)	WM _{SR} (4)	WM _{ASR} (5)	Total (6)
A Percentage distribution based on sexually active women						
Illiterate	24.7	7.7	67.6	100.0		
Some primary (1–4 years)	28.3	12.8	58.9	100.0		
Completed primary (5–6 years)	35.7	19.6	44.7	100.0		
Secondary	39.1	22.5	38.4	100.0		
University	33.4	36.0	30.0	100.0		
B Percentage distribution based on total						
Illiterate	14.6	4.5	39.7	58.8	41.2	100.0
Some primary (1–4 years)	15.5	7.0	32.2	54.7	45.3	100.0
Completed primary (5–6 years)	22.7	12.4	28.5	63.6	36.4	100.0
Secondary	13.7	7.9	13.5	35.2	64.8	100.0
University	9.9	10.6	9.1	29.6	70.4	100.0

NOTES: (4) = (1) + (2) + (3) (6) = (4) + (5).

Source: Tables C8 and C9

The percentages for all women suggest that there is a smaller proportion of sexually active women among the better educated. Nevertheless, this smaller proportion shows a higher proportion of contraceptive use, as shown by the percentages for women having sexual relations. Indeed, the use of efficient and inefficient methods increases with the increasing level of education, which is consistent with findings in other countries. But what is surprising is that the lower the level of education, the higher the incidence of efficient contraception among the users of any methods. This finding merits further analysis, which is unfortunately beyond the scope of the present study.

Reducing Effect of Absence of Sexual Relations, Contraceptive Use and Foetal Mortality
Table 21 shows the pregnancy and fertility rates which enable an estimate of the reducing effects to be made (table 22). Table 23 shows the reduction of the expected pregnancy rate (assuming there is no interference of foetal mortality, contraception or absence of sexual relations) to the level of observed pregnancy.

Table 21 Pregnancy Rates and Fertility Rates in Various Categories of Woman-Months, by Level of Education

Level of education	Rates (per thousand)			
	PNCp	PSR	p	f
Illiterate	442	312	183	166
Some primary (1-4 years)	559	356	195	168
Completed primary (5-6 years)	590	313	199	172
Secondary and more ^a	640	301	104	93

^a Because of the small number of pregnancies among women with university education, these women are included in the 'secondary' education group.

Source: Table C11

Table 22 Reducing Effect of Absence of Sexual Relations (r_{ASR}), Contraceptive Use (r_{CP}) and Foetal Mortality (r_{FM}) by Level of Education

Level of education	Reducing effects		
	r_{ASR}	r_{CP}	r_{FM}
Illiterate	0.4120	0.2945	0.0949
Some primary (1-4 years)	0.4531	0.3631	0.1347
Completed primary (5-6 years)	0.3640	0.4695	0.1350
Secondary and more	0.6541	0.5294	0.1075

Source: Table 21

Table 23 Reduction of Expected Pregnancy Rate (Assuming Non-Interference of Foetal Mortality, Contraception and Absence of Sexual Relations), up to the Level of Observed Fertility, by Level of Education

Level of education	$p'' = p_{NCP}$ (1)	$1 - r_{ASR}$ (2)	$p' = (1)(2)$ (3)	$1 - r_{CP}$ (4)	$p = (3)(4)$ (5)	$1 - r_{FM}$ (6)	$f = (5)(6)$ (7)
Illiterate	442	0.5880	260	0.7055	183	0.9051	166
Some primary (1-4 years)	559	0.5469	306	0.6369	195	0.8653	168
Completed primary (5-6 years)	590	0.6360	375	0.4695	199	0.8644	172
Secondary and more	640	0.3459	221	0.4706	104	0.8925	93

Source: Tables 21 and 22

Table 23, column 7, shows two well-differentiated levels of fertility: one low, with a general fertility rate equal to 93 per thousand, for women with at least one year of secondary education, and the other moderately high, oscillating around 170 per thousand. The potential pregnancy rate (column 1) is higher for women in the category 'secondary and more', and because of the considerably reducing effect of the absence of sexual relations and the use of contraception, it eventually becomes the group with the lowest fertility level.

It should be pointed out that the comparison between the various educational groups may have been affected by the uneven age structure, with older women generally in the lower educational groups. Standardized by age, the rates in column 1 would probably be more homogeneous, and furthermore, the fertility of women included in the 'secondary and more' group would be somewhat higher.

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Appendix A - Measures: Definitions and Commentary

OBSERVED RATES

Observed Pregnancy Rates

We define below general and specific observed pregnancy rates for five-year age groups. Other characteristics of the respondents, such as level of education and type of place of residence may be substituted for age.

General Rate

$$\text{GPR}^t = p^t = \frac{P^t}{N_{F(15-44)}^t} \times 1000$$

where P^t = total pregnancies and $N_{F(15-44)}^t$ = female population of childbearing age, in the year t .⁸

For woman-months instead of women, given that $N_F = \frac{WM}{12}$ the formula is:

$$\text{GPR} = \frac{P}{WM_T} \times 1200$$

Specific Rates by Five-Year Age Groups (x, x + 4)

$$p_{x, x+4} = \frac{P_{x, x+4}}{WM_{T(x, x+4)}} \cdot 1000$$

Observed Fertility Rates

We define below general and specific observed fertility rates by five-year age groups. As before, other characteristics may be substituted.

General Rate

$$\text{GFT} = \frac{LB}{N_{F(15-44)}} \times 1000 = \frac{LB}{WM_T} \times 1200$$

where LB = live births.

⁸ In the case of the SAT, t does not represent the calendar year, but the 12 months prior to the fieldwork date. In the following formulae, the superscript is omitted.

Specific Rates by Five-Year Age Groups

$$f_{x, x+4} = \frac{LB_{x, x+4}}{WM_{T(x, x+4)}} \cdot 1200$$

Observed Rates of Foetal Mortality

General Rate

$$GFMR = fm = \frac{FM}{N_{F(15-44)}} = \frac{FM}{WM_T} \cdot 1200$$

Specific Rates by Five-Year Age Groups

$$fm_{x, x+4} = \frac{FM_{x, x+4}}{N_{F(x, x+4)}} \cdot 1000 = \frac{FM_{x, x+4}}{WM_{T(x, x+4)}} \cdot 1200$$

THEORETICAL RATES

The rates defined below are known as expected or theoretical, as opposed to observed rates, because they do not correspond to a real situation but to categories artificially devised for the purposes of analysis. For example, a theoretical pregnancy rate without contraceptive use would only be observed in a real situation for those women who besides never using contraception have had sexual relations during the whole year, not interrupted in any month. It is unlikely that this observation would often be made. Similarly, a theoretical pregnancy rate for women using inefficient contraceptive methods would involve all women using these methods, who had had sexual relations during the whole year, with an uninterrupted use of inefficient methods, and no use of efficient methods at any time.

For this reason the theoretical rates consider only woman-months (WM) in the denominator of the rate, unlike observed rates which include integered values or unsplit women, either N_F , WM_T or $WM_{T(x, x+4)}$.

General or age-specific theoretical pregnancy rates for WM with sexual relations, may be expressed as follows:

$$PSR = \frac{P_{SR}}{WM_{SR}} \cdot 1200; \quad PSR_{(x, x+4)} = \frac{P_{SR(x, x+4)}}{WM_{SR(x, x+4)}} \cdot 1200$$

In a similar way we can define expected pregnancy rates by using the categories of woman-months without contraceptive use (NCP), with contraceptive use (CP), and with use of efficient contraceptives (ECP).

To obtain theoretical fertility rates and theoretical foetal mortality rates, we substitute LB (live births) or FM (foetal mortality) for P (pregnancies) in the numerator.

COMMENTARY

The Denominator

The brief period of reference considered in the SAT (the 12 months preceding the date of the interview) inevitably means that the information is censored (as is the case in any cross-sectional data): some women 'enter' the SAT already pregnant, some become pregnant during the period under observation, with their pregnancies ending within the period, while others become pregnant towards the end of the period and 'leave' the SAT while they are pregnant. The same is true of contraceptive use. Thus, the assumption in the analysis of the SAT information is that a compensation takes place between outputs and inputs. For example, in the case of pregnancies, this assumption allows us to add the total of months of pregnancy to the women with sexual relations in the same category, making up the denominator for estimating the rates of pregnancy, fertility or foetal mortality. We may assume that this compensation occurs as long as fertility does not vary substantially from one year to the next.

An excellent opportunity to prove this compensation was provided by a demographic survey carried out for detecting abortion, which compared cross-sectional and longitudinal data collection.⁹ The information for the SAT could be obtained in the longitudinal questionnaire (monthly visits) as well as in a cross-sectional retrospective questionnaire (one visit only at the end of 12 months' investigation). The majority of the women interviewed belonged to the lower middle class or lower class, were married or cohabiting, and aged 25–39, and the investigation was carried out during 1969–70, at a time when fertility in Chile was declining rapidly, especially in Santiago. The results showed a great difference in the detection of abortion (the level being much higher in the results obtained by the prospective or longitudinal method), despite a similar distribution of woman-months in the SAT of each survey. Unfortunately, the SAT procedure cannot avoid the misreporting of current pregnancies which is a pitfall common to all fertility surveys. Accordingly, the number of woman-months with pregnancies is under-reported.

The Numerator

The numerator is reliable in the case of live births, since it is unlikely that a woman has forgotten a birth within the last 12 months, and there are no apparent reasons for concealing live births.

The same is not true, however, of foetal deaths, especially abortions, and there may be under-reporting of pregnancies which have terminated in foetal deaths. In Venezuela, as in other Latin American countries, with the exception of Cuba, induced abortion is

⁹ Investigation carried out by CELADE and the University of Chile in the northern health area of Santiago, known as PEAL/TRANSLONG.

illegal except in very special circumstances where there are health risks involved in continuing a pregnancy. Because of the existence of legal sanctions, as well as moral pressures, we cannot expect complete accuracy in the reporting of clandestine induced abortions, however much we may emphasize the confidentiality of the interview.¹⁰ It is often impossible, moreover, to interview the respondent in private, particularly in small homes where it is difficult for interviewer and respondent to isolate themselves from other members of the family, neighbours and onlookers.

In many cases, women inaccurately refer to their induced abortions as 'spontaneous abortions' or 'miscarriages'. Miscarriages, which are recognized as involuntary, do not carry either legal or social sanctions and women are more willing to report them. The interviewer asks about these 'miscarriages', without requiring the respondent to specify whether they were spontaneous or induced abortions.

Still births are added to the number of abortions, and they are then all grouped as foetal deaths.¹¹ Separate tabulation of still births is not felt to be justified, because of their insignificant number (they have decreased markedly with improved pre-natal care).

A study of abortion using hospital records, which was carried out in Venezuela in 1977, sponsored by WHO, confirms our suspicions of the under-reporting of induced abortions. During the individual interview of the Venezuelan Fertility Survey, a number of women whose records showed they had had a spontaneous or induced abortion a few months before the interview were mixed with the respondents selected for the survey. Neither the respondent nor the interviewer knew that an investigation additional to the National Fertility Survey was being carried out, ie 'double-blind' technique was used.

A total of 103 women with a history of an induced abortion and 93 women with a history of a spontaneous abortion were included in the investigation, classified according to their recent clinical records. Of these women, 152 reported spontaneous abortions and 4 women reported induced abortions, with 40 women (ie 20 per cent of the total sample) denying ever having had an abortion. These 40 false denials came mainly from young women, as reliability increased with age (50 per cent of the false denials were in the 15-19 age group, with only 11.5 per cent in the 35-39 age group).

In consequence, the numerator is not very reliable for the observed foetal mortality rates, being a little more reliable, however, for the pregnancy rates.¹² But the theoretical

¹⁰ These circumstances, though always present, may vary from one country to another, from one region to the other, according to the prevailing traditions, religiosity, degree of emancipation of the women, etc.

¹¹ Internationally, foetal deaths are divided into three categories: early, if gestation was under 20 weeks; intermediate, with 20-27 weeks' gestation; and late, if gestation was 28 weeks or more. Abortions belong to the two former categories (less than 28 weeks) and still births to the third.

¹² For example, if foetal deaths represent one-tenth of the pregnancies (and live births the remaining nine-tenths) and the sub-reporting of foetal deaths is 20 per cent, the observed pregnancy rate would be underestimated by 2 per cent, the same as the theoretical rates PR_S , $PASR$ and PCP , so that the reducing effect of the absence of sexual relations and contraceptive use would not be changed, but only the foetal mortality rate which would undergo a change of 20 per cent.

rates may be accepted as valid as regards their comparison. There is no reason to suspect that there is greater misreporting in any particular category within age groups. The error arising from omission will exist in all the categories and, most probably, in the same direction and to the same extent, so that the error is reduced or cancelled out.

Appendix B – Estimate of the Reducing Effect of the Absence of Sexual Relations, Contraceptive Use and Foetal Mortality

The effect of any of these intermediate variables (absence of sexual relations, contraceptive use and foetal mortality) is always negative at the level of fertility, and is designated a reducing effect or impact. Each of these effects is assessed by comparing pregnancy rates (or fertility rates, as the case may be) in two groups of woman-months: the group whose variable is intervening (numerator) and the group in which there is no intervention (denominator). This quotient must be weighted by the proportion of woman-months in which there has been intervention of the reducing variable. Without this weighting, we only obtain a 'net' effect equivalent to estimating the effect of the variable in the absence of others. When weighting, we consider the weight of the variable within the relevant sample, obtaining a 'crude' effect. For purposes of the analysis, we study only the crude effect (the net effect being implicit in each calculation), and for this reason we only use the term 'reducing effect'.

REDUCING EFFECT OF THE ABSENCE OF SEXUAL RELATIONS

The pregnancy rate for woman-months with absence of sexual relations (p_{ASR}) is compared with the pregnancy rate of women with sexual relations (p_{SR}). This is weighted by the proportion of woman-months with absence of sexual relations as regards the total of woman-months (that is to say, $WM_{ASR} + WM_{SR}$). Thus we obtain:

$$r_{ASR} = \left(1 - \frac{p_{ASR}}{p_{SR}}\right) \times \frac{WM_{ASR}}{WM_T}$$

But rate p_{ASR} is nil (women without sexual relations do not have any pregnancies), and the whole parenthesis has value 1.

$$r_{ASR} = \frac{WM_{ASR}}{WM_T}$$

For the purpose of carrying out other calculations, the above formula is developed as follows:

$$r_{ASR} = \frac{WM_{ASR}}{WM_T} = 1 - \frac{WM_{SR}}{WM_T} = 1 - \frac{P \times WM_{SR}}{P \times WM_T} = 1 - \frac{P/WM_T}{P/WM_{SR}}$$

Since the pregnancies only arise in the group of woman-months with sexual relations, we may write $P = P_{SR}$, and replacing P by P_{SR} in the denominator of the above formula, we obtain:

$$r_{ASR} = 1 - \frac{P/W_{MT}}{P_{SR}/W_{MSR}} = 1 - \frac{p}{P_{SR}}$$

REDUCING EFFECT OF CONTRACEPTIVE USE

The pregnancy rate of woman-months using contraceptives (p_{CP}) is compared with the pregnancy rate of those not using contraception (p_{NCP}). This is weighted by the proportion of woman-months using contraception (W_{MCP}), with regard to the total of women using and not using contraceptives ($W_{MCP} + W_{MNCP} = W_{MSR}$).

$$\begin{aligned} r_{CP} &= \left(1 - \frac{P_{CP}}{P_{NCP}}\right) \times \frac{W_{MCP}}{W_{MSR}} = \left(1 - \frac{P_{CP}/W_{MCP}}{P_{NCP}/W_{MNCP}}\right) \times \frac{W_{MCP}}{W_{MSR}} \\ &= \left(1 - \frac{P_{CP} \times W_{MNCP}}{P_{NCP} \times W_{MCP}}\right) \times \frac{W_{MCP}}{W_{MSR}} = \frac{W_{MCP}}{W_{MSR}} - \frac{P_{CP} \times W_{MNCP} \times W_{MCP}}{P_{NCP} \times W_{MCP} \times W_{MSR}} \end{aligned}$$

Cancelling the W_{MCP} , and subtracting the two fractions we get:

$$r_{CP} = \frac{P_{NCP}W_{MNCP} - P_{CP}W_{MNCP}}{P_{NCP}W_{MSR}}$$

In the numerator, we add and subtract $P_{NCP}W_{MNCP}$

$$\begin{aligned} r_{CP} &= \frac{P_{NCP}W_{MCP} + P_{NCP}W_{MNCP} - P_{CP}W_{MNCP} - P_{NCP}W_{MNCP}}{P_{NCP}W_{MSR}} \\ &= \frac{P_{NCP}(W_{MCP} + W_{MNCP}) - W_{MNCP}(P_{CP} + P_{NCP})}{P_{NCP}W_{MSR}} \end{aligned}$$

Bearing in mind that:

$$W_{MCP} + W_{MNCP} = W_{MSR}$$

$$P_{CP} + P_{NCP} = P_{SR}$$

Then we obtain:

$$r_{CP} = \frac{P_{NCP}W_{MSR} - P_{SR}W_{MNCP}}{P_{NCP}W_{MSR}} = 1 - \frac{P_{SR}W_{MNCP}}{P_{NCP}W_{MSR}} = 1 - \frac{P_{SR}/W_{MSR}}{P_{NCP}/W_{MNCP}}$$

Finally,

$$r_{CP} = 1 - \frac{P_{SR}}{P_{NCP}}$$

REDUCING EFFECT OF CONTRACEPTIVES, DECOMPOSED INTO EFFICIENT AND INEFFICIENT CONTRACEPTIVES

In the above development, we obtained (after cancelling by WM_{CP}):

$$r_{CP} = \frac{P_{NCP}WM_{CP} - P_{CP}W_{NCP}}{P_{NCP}WM_{SR}} = \frac{WM_{CP}}{WM_{SR}} - \frac{WM_{NCP}P_{CP}}{WM_{SR}P_{NCP}}$$

By definition, we have:

$$WM_{CP} = WM_{ECP} + WM_{ICP}; \quad P_{CP} = P_{ECP} + P_{ICP}$$

$$r_{CP} = \frac{WM_{ECP}}{WM_{NCP}} + \frac{WM_{ICP}}{WM_{SR}} - \frac{P_{ECP}WM_{NCP}}{P_{NCP}WM_{SR}} - \frac{P_{ICP}WM_{NCP}}{P_{NCP}WM_{SR}}$$

$$r_{CP} = \frac{WM_{ECP}}{WM_{SR}} - \frac{P_{ECP}WM_{NCP}}{WM_{SR}P_{NCP}} \times \frac{WM_{ECP}}{WM_{ECP}} + \frac{WM_{ICP}}{WM_{SR}} - \frac{P_{ICP}WM_{NCP}}{WM_{SR}P_{NCP}} \times \frac{WM_{ICP}}{WM_{ICP}}$$

$$r_{CP} = \frac{WM_{ECP}}{WM_{SR}} - \frac{P_{ECP}}{P_{NCP}} \times \frac{WM_{ECP}}{WM_{SR}} + \frac{WM_{ICP}}{WM_{SR}} - \frac{P_{ICP}}{P_{NCP}} \times \frac{WM_{ICP}}{WM_{SR}}$$

$$r_{CP} = \left(1 - \frac{P_{ECP}}{P_{NCP}}\right) \frac{WM_{ECP}}{WM_{SR}} + \left(1 - \frac{P_{ICP}}{P_{NCP}}\right) \frac{WM_{ICP}}{WM_{SR}}$$

$$r_{CP} = r_{ECP} + r_{ICP}$$

That is to say:

$$r_{ECP} = 1 - \frac{P_{ECP}}{P_{NCP}} \frac{WM_{ECP}}{WM_{SR}}$$

$$r_{ICP} = 1 - \frac{P_{ICP}}{P_{NCP}} \frac{WM_{ICP}}{WM_{SR}}$$

REDUCTION OF THE EXPECTED PREGNANCY RATE (WITHOUT INTERVENTION OF FOETAL MORTALITY, OR CONTRACEPTIVE USE, OR ABSENCE OF SEXUAL RELATIONS) TO THE LEVEL OF FERTILITY

This reduction is expressed as follows:

$$p''(1 - r_{ASR})(1 - r_{CP})(1 - r_{FM})$$

Replacing:

$$p'' = p_{ASR} = p_{ASR}/WM_{ASR}$$

$$1 - r_{ASR} = WM_{SR}/WM_T$$

$$1 - r_{CP} = p_{RS}/p_{NCP}$$

$$1 - r_{FM} = f/p = LB/P$$

The above formula may be expressed as follows:

$$\frac{p_{NCP}}{WM_{NCP}} \times \frac{WM_{SR}}{WM_T} \times \frac{p_{SR}}{p_{NCP}} \times \frac{WM_{NCP}}{WM_{SR}} \times \frac{LB}{P}$$

All terms of the numerator have an equivalent in the denominator allowing cancelling (remembering that $p_{SR} = P$), and the only ones remaining are:

$$\frac{LB}{WM_T} = f$$

So that the formula is verified:

$$p''(1 - r_{ASR})(1 - r_{CP})(1 - r_{FM}) = f$$

Appendix C – Tables containing Basic Data

Table C1 Woman-Months with Pregnancy According to Prior Contraceptive Use and Woman-Months with Sexual Relations According to Contraceptive Method Used, by Age Group

Age group	WM with pregnancy with or without prior use				WM with sexual relations									
	ECP (1)	ICP (2)	None (3)	Total (4)	With use of efficient contraception				With use of inefficient contraception				Not using (14)	
					Sterilization (5)	IUD (6)	Pill (7)	Total (8)	Condom (9)	Foam (10)	Rhythm (11)	Others (12)		Total (13)
15-19	21	69	1026	1116	0	32	320	352	21	0	35	95	151	734
20-24	81	167	1704	1952	41	354	1412	1807	162	14	160	284	620	1293
25-29	118	143	1239	1500	166	680	1224	2070	267	39	136	415	857	1471
30-34	46	95	728	869	296	524	888	1708	271	15	252	462	1000	1371
35-39	5	24	422	451	734	357	374	1465	260	11	198	357	826	1388
40-44	0	2	191	193	468	310	177	955	113	6	83	367	569	1305
15-44	271	500	5310	6081	1705	2257	4395	8357	1094	85	864	1980	4023	7562

NOTES:

WM = Woman-months of observation

IUD = Intra-uterine device

ECP = Efficient contraceptive (sterilization, IUD, pill)

ICP = Inefficient contraceptive (condom, foam or tablets, rhythm and others, including folk methods).

Table C2 Woman-Months with Sexual Relations According to Use of Contraception

Age group	Total of WM according to use of contraception			WM with sexual relations (18)
	Efficient (15)	Inefficient (16)	None (17)	
15-19	373	220	1 760	2 353
20-24	1 888	787	2 997	5 672
25-29	2 188	1 000	2 710	5 989
30-34	1 754	1 095	2 099	4 948
35-39	1 470	850	1 810	4 130
40-44	955	571	1 496	3 022
15-44	8 628	4 523	12 872	26 023

NOTES:

(15) = (1) + (8)

(16) = (2) + (13)

(17) = (3) + (14)

(18) = (15) + (16) + (17) = (4) + (8) + (13) + (14).

Columns (1) to (14) are shown in table C1.

Table C3 Woman-Months According to Reason for Absence of Sexual Relations, by Age Group

Age group	WM without sexual relations								WM with SR (9)	WM total (10)
	Permanent celibacy (1)	Temporary celibacy (2)	Temporary absence (3)	Separation (4)	Illness (5)	Other (6)	(7)	(8)		
15-19	12 492	438	38	290	16	237	1 019	13 511	2 353	15 864
20-24	4 632	268	56	620	43	469	1 456	6 088	5 672	11 760
25-29	1 404	105	71	705	86	335	1 302	2 706	5 898	8 604
30-34	444	33	108	603	34	262	1 040	1 484	4 948	6 432
35-39	168	18	43	688	161	216	1 126	1 294	4 130	5 424
40-44	120	12	57	674	88	275	1 106	1 226	3 022	4 248
15-44	19 260	874	373	3 580	428	1 794	7 049	26 309	26 023	52 332

NOTES:

SR = Sexual relations

(1) = Never had SR

(2) = Ever had SR, though not in all the months recorded in the SAT

(7) = (2) + (3) + (4) + (5) + (6)

(8) = (1) + (7)

(10) = (8) + (9).

Table C4 Events (Live Births, Foetal Deaths and Pregnancies) According to Prior Use of Contraception, by Age Group

Age group	Type of event according to prior use of contraceptive											
	Live births				Foetal deaths				Pregnancies			
	ECP (1)	ICP (2)	None (3)	Total (4)	ECP (5)	ICP (6)	None (7)	Total (8)	ECP (9)	ICP (10)	None (11)	Total (12)
15-19	2	5	107	114	2	0	9	11	4	5	116	125
20-24	7	15	183	205	2	3	16	21	9	18	199	226
25-29	12	15	110	137	3	2	18	23	15	17	128	160
30-34	3	10	75	88	2	1	10	13	5	11	85	101
35-39	0	3	40	43	0	2	8	10	0	5	48	53
40-44	0	1	21	22	0	0	7	7	0	1	28	29
15-44	24	49	536	609	9	8	68	85	33	57	604	694

NOTES:

Pregnancies = Live births + foetal deaths

ECP = Efficient contraception

ICP = Inefficient or less efficient contraception.

Table C5 Woman-Months with Pregnancy and with Sexual Relations According to Type of Contraceptive Used, by Current Place of Residence

Distribution of woman-months	Current place of residence		
	Urban	Rural	Total
(1) <i>WM with pregnancy with</i>	<u>4 597</u>	<u>1 484</u>	<u>6 081</u>
(2) Efficient contraception	265	6	271
(3) Inefficient contraception	426	74	500
(4) No contraceptive use	3 906	1 104	5 310
(5) <i>WM with sexual relations with use of efficient contraception</i>	<u>7 472</u>	<u>885</u>	<u>8 357</u>
(6) Sterilization	1 575	130	1 705
(7) IUD	2 077	180	2 257
(8) Pill	3 820	575	4 395
(9) <i>WM with sexual relations with use of less efficient contraception</i>	<u>3 619</u>	<u>404</u>	<u>4 023</u>
(10) Condom	1 034	60	1 094
(11) Foam	78	7	85
(12) Rhythm	782	82	864
(13) Others	1 725	255	1 980
(14) <i>WM with sexual relations without contraceptive use</i>	<u>5 685</u>	<u>1 877</u>	<u>7 562</u>
(15) <i>WM totals according to use or non-use of contraception</i>	<u>21 373</u>	<u>4 650</u>	<u>26 023</u>
(16) Efficient	7 737	891	8 628
(17) Less efficient	4 045	478	4 523
(18) Without contraceptive use	9 591	3 281	12 872

NOTES:

(15) = (16) + (17) + (18) = (1) + (5) + (9) + (14)

(16) = (2) + (5)

(17) = (3) + (9)

(18) = (4) + (14).

Table C6 Woman-Months According to Reason for Absence of Sexual Relations, by Current Place of Residence

Reason for absence of sexual relations	Place of residence		
	Urban	Rural	Total
Celibacy	18 102	2 032	20 134
Temporary absence	287	86	373
Separation	2 981	599	3 580
Illness	358	70	428
Other	1 383	411	1 794
Total	23 111	3 198	26 309

Table C7 Events (Live Births, Foetal Deaths and Pregnancies) According to Prior Use of Contraception, by Current Place of Residence

Event and type of contraceptive	Current place of residence		
	Urban	Rural	Total
<i>Live births</i>	<u>460</u>	<u>148</u>	<u>608</u>
Efficient contraception	24	0	24
Inefficient contraception	40	9	49
No contraceptive use	396	139	535
<i>Foetal deaths</i>	<u>73</u>	<u>11</u>	<u>84</u>
Efficient contraception	9	0	9
Inefficient contraception	7	1	8
No contraceptive use	57	10	67
<i>Pregnancies</i>	<u>533</u>	<u>159</u>	<u>692</u>
Efficient contraception	33	0	33
Inefficient contraception	47	10	57
No contraceptive use	453	149	602

NOTE: Pregnancies = live births + foetal deaths.

Table C8 Woman-Months with Pregnancy and Woman-Months with Sexual Relations According to Type of Contraceptive, by Level of Education

Level of Education	WM with pregnancy				WM with sexual relations									
					Efficient contraceptive				Inefficient contraceptive				Without contraceptive (14)	
	ECP (1)	ICP (2)	None (3)	Total (4)	Sterilization (5)	IUD (6)	Pill (7)	Total (8)	Condom (9)	Foam (10)	Rhythm (11)	Other (12)		Total (13)
Illiterate and level not known	12	24	879	915	259	226	408	893	20	6	61	169	256	1591
Some primary (1-4 years)	40	53	1407	1499	348	571	815	1734	226	16	104	405	751	2288
Completed primary (5-6 years)	153	172	1749	2065	650	832	1594	3076	441	15	230	911	1597	2296
Secondary (7-9 years)	46	150	793	989	263	369	936	1568	201	27	235	277	740	890
Secondary (10-11 years)	20	74	334	428	142	162	467	771	135	9	121	135	400	321
University	0	21	94	115	21	61	128	210	51	12	95	47	205	98
Technical ^a	0	6	54	60	22	36	47	105	20	0	18	36	74	78
Total	271	500	5310	6071	1705	2257	4395	8357	1094	85	864	1980	4023	7562

^a Belongs to the secondary level.

NOTES:

ECP = Efficient contraception

ICP = Inefficient or less efficient contraception.

Table C9 Woman-Months without Sexual Relations According to Reasons for Absence of Sexual Relations, by Level of Education

Level of education	Reason for absence of sexual relations					Total
	Celibacy	Temporary absence	Separation	Illness	Other	
Illiterate	1 480	64	600	82	335	2 561
Some primary (1-4 years)	3 545	96	931	114	513	5 199
Completed primary (5-6 years)	3 219	107	1 217	119	515	5 177
Secondary and technical (7-11 years)	10 465	92	771	111	401	11 840
University	1 389	14	61	2	30	1 496
Total	20 098	373	3 580	428	1 794	26 273

Table C10 The SAT Categories of Woman-Months by Level of Education

Level of education	WM _{ECP}	WM _{ICP}	WM _{NCP}	WM _{SR}	WM _{ASR}	WM _T
Illiterate	905	280	2 470	3 655	2 561	6 216
Some primary (1-4 years)	1 774	804	3 695	6 273	5 199	11 472
Completed Primary (5-6 years)	3 229	1 769	4 045	9 043	5 177	14 220
Secondary and technical (7-11 years)	2 510	1 444	2 470	6 424	11 840	18 264
University	210	226	192	628	1 496	2 124
Total	8 628	4 523	12 872	26 023	26 273	52 296

Table C11 Events (Live Births, Foetal Deaths and Pregnancies) According to Prior Use of Contraception, by Level of Education

Event and type of contraceptive	Level of education					Total
	Illiterate	Some primary (1-4 years)	Completed primary (5-6 years)	Secondary and technical (7-11 years)	University	
<i>Live births</i>	<u>86</u>	<u>161</u>	<u>204</u>	<u>149</u>	<u>9</u>	<u>609</u>
ECP	1	3	15	5	0	24
ICP	2	7	16	21	3	49
None	83	151	173	123	6	536
<i>Foetal deaths</i>	<u>9</u>	<u>25</u>	<u>32</u>	<u>19</u>	<u>0</u>	<u>85</u>
ECP	1	3	3	2	0	9
ICP	0	1	3	4	0	8
None	8	21	26	13	0	68
<i>Pregnancies</i>	<u>95</u>	<u>186</u>	<u>236</u>	<u>168</u>	<u>9</u>	<u>694</u>
ECP	2	6	18	7	0	33
ICP	2	8	19	25	3	57
None	91	172	199	136	6	604

NOTES:

ECP = Efficient contraception

ICP = Inefficient or less efficient contraception.

Table C12 Distribution of Pregnancies Observed in the 'Year of Sexual Activity', According to Contraceptive Method Used Prior to the Pregnancy, by Various Characteristics of the Women

Characteristic	Efficient contraception				Inefficient contraception						
	Sterilization	IUD	Pill	Total	Condom	Foam	Rhythm	Douche	Withdrawal	Other	Total
<i>Age group</i>											
15-19	0	0	2	2	2	0	2	1	1	0	6
20-24	0	0	9	9	3	2	4	2	5	1	17
25-29	0	4	11	15	2	1	5	3	6	0	17
30-34	0	2	3	5	1	1	4	1	4	0	11
35-39	0	1	1	2	0	1	2	2	0	0	5
40-44	0	0	0	0	0	0	0	0	0	1	1
<i>Current place of residence</i>											
Urban	0	6	25	31	7	5	12	9	12	2	47
Rural	0	0	0	0	1	0	5	0	4	0	10
<i>Level of education</i>											
Illiterate	0	1	0	1	0	1	1	0	0	0	2
Some primary (1-4 years)	0	1	4	5	0	1	2	2	2	1	8
Completed primary (5-6 years)	0	4	13	17	2	1	5	2	9	0	19
Secondary (7-9 years)	0	0	6	6	3	2	4	5	4	0	18
Secondary (10-11 years)	0	0	2	2	3	0	3	0	0	1	7
University	0	0	0	0	0	0	2	0	1	0	3
Technical	0	0	0	0	0	0	0	0	0	0	0
Total	0	6	25	31	8	5	17	9	16	2	57

NOTE: Sterilization includes female and male sterilization.

Table C13 Distribution of Women with Use of Efficient and Inefficient Contraception in the Year Preceding the Survey, According to Number of Months and Type of Method Used

Type of method	Months of use												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
Sterilization	7	3	7	2	6	1	4	1	5	10	6	115	167
IUD	5	6	12	5	8	15	9	7	5	16	10	135	233
Pill	42	34	47	33	25	36	35	28	30	23	34	194	561
Efficient contraception	54	43	66	40	39	52	48	36	40	49	50	444	961
Condom	26	12	11	7	8	8	7	4	5	3	5	57	153
Foam	4	2	1	0	4	2	1	0	0	0	1	2	17
Rhythm	9	16	13	16	11	6	4	4	5	5	6	34	129
Other	26	32	17	17	8	10	11	12	13	10	15	93	264
Inefficient contraception	65	62	42	40	31	26	23	20	23	18	27	186	563

Table C14 Distribution of Women without Sexual Relations According to Reason and Number of Months of Absence of Sexual Relations

Reason	Number of months												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
Celibacy	12	15	9	8	10	14	9	18	11	10	7	13	136
Temporary absence	63	30	20	3	1	6	2	3	7	0	0	3	138
Separation	12	13	19	13	18	17	7	7	12	6	8	240	372
Illness	39	31	14	7	6	5	2	0	3	0	0	13	120
Other	253	369	47	11	8	9	3	4	2	0	3	35	744
Total	379	458	109	42	43	51	23	32	35	16	18	304	1510

Appendix D – Facsimile of Sexual Activity Table
in the Twelve Months Preceding the Interview

HISTORY IN THE LAST YEAR

P A R T D

409. Did you use anything to avoid pregnancy in those months with sexual relations (not a pregnancy month) ?

Months with use of CP Months without use

410. What method (s) did you use ?

411. In what months did you use _____ (METHOD) ?

E C P			I C P					WITHOUT USE OF CP
Sterilisation	I U D	Pill, In-jection	Condom	Foam	Tablets	Rhythm	Other	
9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17

FOR CODING ONLY

PART E			
Type of delivery	Method used prior to the pregnancy		
	ECP	ICP	No use

1st pregnancy

Live birth	46	47	48
Still birth	49	50	51
Miscarriage	52	53	54

2nd pregnancy

Live birth	55	56	57
Still birth	58	59	60
Miscarriage	61	62	63

Pregnancy order	Method used	
First	64	65
Second	66	67

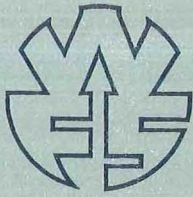
Age Educ. Living Ch.

68 70 72

 = 12

28 30 32 34 36 38 40 42 44





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