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An Analysis of Nuptiality Data In the Colombia National Fertility Survey

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An Analysis of Nuptiality Data In the Colombia National Fertility Survey

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ERRATA

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National Fertility Survey

p. 16, Table 10, 2nd section (ENF 1969), Column 10, Common Law,
13.6 should read 13.8.

p. 17, L.H. Column, horizontal axis of Figure 4 refers to AGE.

p. 17, R.H. Column, last two lines should read:
"noted above in terms of a higher estimated mean value for the cohort
aged 20-24 at the time of the survey."

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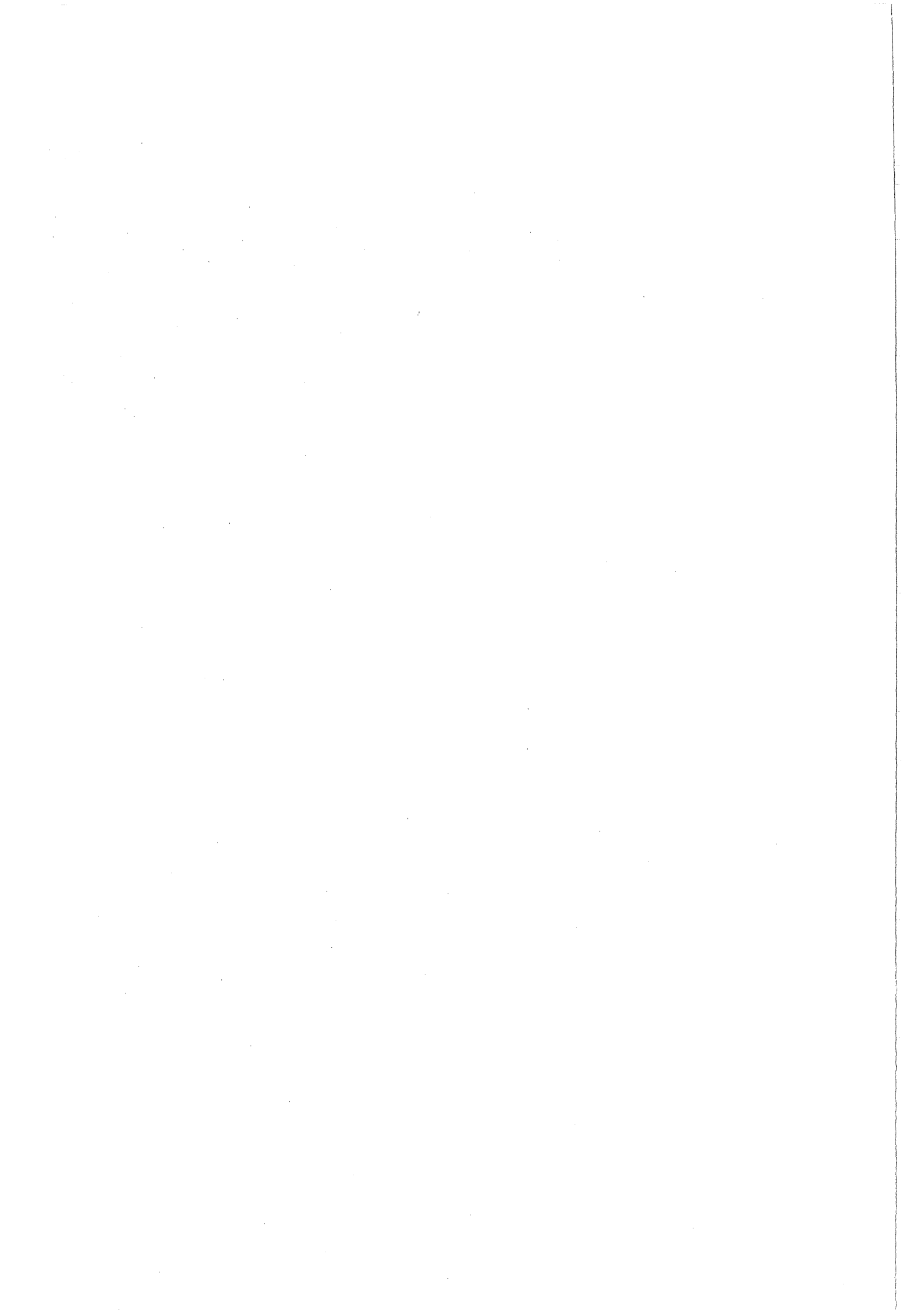
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1 Introduction

The Colombia National Fertility Survey (ENFC) was conducted in 1976 by the Regional Population Center Corporation (CCRP) and the National Administrative Statistics Department (DANE) in cooperation with the World Fertility Survey. The primary goal of the survey has been to estimate levels and trends of fertility in Colombia, in particular to investigate the rapid decline in fertility over the past decade. The Colombia National Fertility Survey is only the second national survey in Colombia which was designed to collect fertility information. Its predecessor, the National Fertility Survey (ENF, 1969), provided fertility estimates for the period 1960-1968 and indicated a rapid decline in Colombian fertility beginning around 1964.

The Colombia National Fertility Survey consists of both a Household Survey and a detailed Individual Survey. The Household Survey was based on a stratified cluster sample of 10,000 households (not self-weighted) from which 9,793 completed interviews were obtained. The Household Survey collected information on age and marital status of all members of the household, as well as data on the number of children ever born and the date of the last live birth. Detailed individual interviews were obtained from a self-weighted sample of 5,378 women from the households between the ages of 15 and 49. Unlike many of the other World Fertility Surveys, single as well as ever-married women were interviewed in the Individual Survey. The individual interviews obtained a complete marriage and fertility history consisting of information on date of onset (and date of dissolution, if applicable) of each marriage, type of marriage (consensual or legal), and date of birth (and age at death where applicable) of each child, in addition to detailed information on family planning practices. These data, if accurate, would make it possible to obtain estimates of the levels and trends of age at marriage, age specific fertility, and infant and child mortality for both the recent past and periods dating as far back as twenty or twenty-five years.

The purpose of this analysis is twofold: to examine the accuracy of individual responses in the ENFC in order to determine the extent of response error and its effect on demographic estimation; and, to examine trends in age at marriage by period and cohort, variations in age at marriage by region and education level, and contributions of a changing age at marriage to the rapid decline in fertility. The data quality analysis is based largely upon checks of the consistency of responses between the Household Survey and the Individual Survey and, wherever possible, validation of the data in the ENFC by a comparison with data from the 1951, 1964, and 1973 Censuses and the 1969 ENF. The data quality analysis focuses on reports of age, marital status, and date of first marriage. An evaluation of data in the birth histories has been presented in detail elsewhere (Hobcraft, 1980; Florez and Goldman, 1979) and will not be discussed here. The analysis of trends in nuptiality is based upon reported dates of marriage (onset and dissolution) in the detailed marriage history.

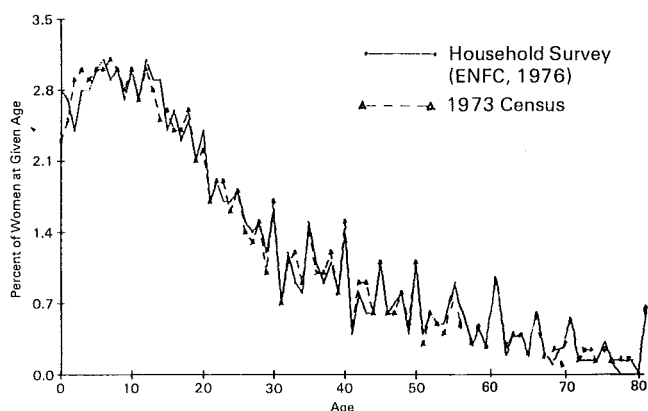
The analysis of the data quality points to large inconsistencies in reports of marital status between the Household Survey and the Individual Survey. These differences appear to be the result of more accurate reporting in the individual interviews. The analysis also suggests that data collected in the marriage histories of the ENFC are more accurate than data from the censuses. The data from the nuptiality histories indicate little change in age at marriage by cohort or by period for most of the past 25 or 30 years. However, there are some indications that an increase in age at first marriage has begun during recent years. In contrast, the data reveal a substantial decline in overall fertility and in marital fertility over the past fifteen years. A large reduction in fertility as indicated by data from the ENF (1969) and the 1973 Census has been previously noted by Elkins (1973), Potter *et al.* (1976), Prada and Bailey (1977), and Hobcraft (1980).

2 Assessment of Quality of Data

2.1 Reports of Age

The age distributions in the Colombia National Fertility Survey have been analyzed for age heaping and age misreporting. Although the two types of errors are related, the former denotes a tendency for respondents or interviewers to prefer and avoid certain digits in the reporting of age, whereas the latter reflects a more general tendency to understate or overstate ages. Figure 1 shows the percentage distribution by single years of age of females in the Household Survey compared with the corresponding distribution from the 1973 Census. The distributions show very similar patterns of heaping of reported ages at preferred numbers. A concentration of reported ages occurs most notably at numbers terminating in zero or five, and, to a lesser extent, at numbers ending in two or eight. The prevalence of heaping in a single-year age distribution can be summarized by

Figure 1. Reported Single-Year Age Distribution of Women (in Percent), Household Survey, Colombia National Fertility Survey, and 1973 Census of Colombia



an index of preference for terminal digits. Such indices, for example, Myers' blended index, measure the preference for, or avoidance of, each of the ten possible terminal digits in the reporting of a single-year distribution (Myers, 1940). The values of Myers' blended index for the 1964 and 1973 Census female age distributions (Potter and Ordóñez, 1976) and for the Household Survey are shown below. These values would be close to zero in the hypothetical case of no age heaping.

Myers' Blended Index (Ages 10-79)

1964 Census	9.4
1973 Census (Advance sample)	8.4
ENFC (1976) (Household Survey)	5.7

The above values indicate that the amount of age heaping is less in the Household Survey than in either of the two preceding censuses.

Figure 2 shows the percentage distribution of women interviewed in the Individual Survey (ages 15 to 49) together with the age distribution of women in the same age range in the Household Survey. Respondents in the Household Survey were asked to estimate their current age in years, whereas respondents in the Individual Survey were asked to supply the month and year of their birth before being asked their current age. All but 3.4 percent of women in the Individual Survey supplied a month and year of birth. The comparison in Figure 2 reveals more heaping on preferred numbers, particularly in the older ages (i.e. ages 35, 40, and 45) in the Household Survey. The distribution of respondents in the Individual Survey by reported year of birth (not shown) indicates some heaping on years ending in '0' (1940, 1950, 1960), but no heaping on years ending in '5' (1935, 1945, 1955).

Figure 2. Reported Single-Year Age Distribution of Women for Ages 15 to 49 (in Percent), Individual Survey and Household Survey

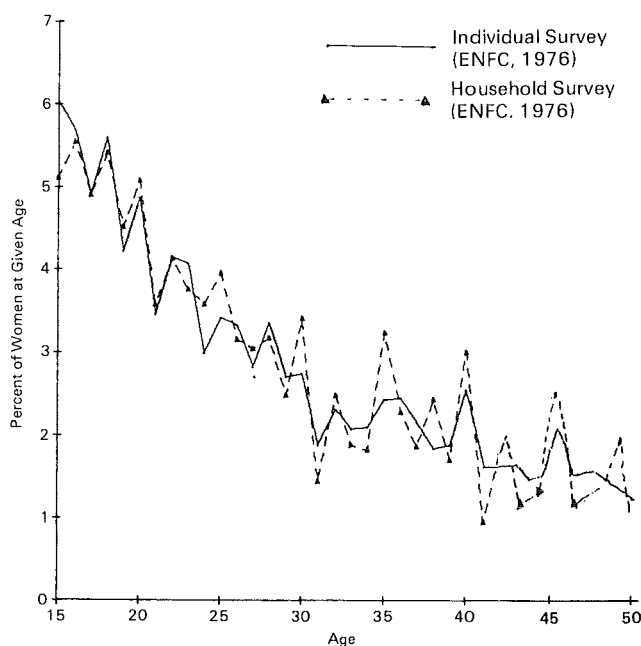
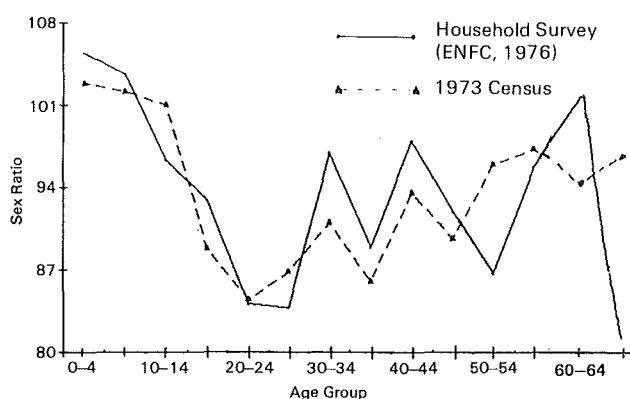


Figure 3 shows reported sex ratios by age group for respondents in the Household Survey and in the 1973 Census. The patterns are generally similar with a pronounced deficit of males in the age range 15 to 30. Such patterns were noted for the 1964 and 1973 Census (Potter and Ordóñez, 1976) and it has been suggested that they may result from either an underenumeration of males in the young adult ages or a tendency for too many females to report themselves in that age range (Potter and Ordóñez, 1976).

Figure 3. Sex Ratio, by Five-Year Age Group, Household Survey (Colombia National Fertility Survey, 1976) and 1973 Census of Colombia



A matching of interviews in the Household and Individual Surveys for those respondents in the Individual Survey enables one to examine the consistency of reports of age. (The interviews of 12 women could not be matched.) Table 1 shows the difference in years and in five-year age groups between ages reported in the household and in the individual interviews. We note that 61 percent of respondents have the same reported age in the two interviews and 89 percent have reported ages within the same five-year age groups. In general, the percent of inconsistent reports increases with increasing age. Interestingly, the tendency to underestimate ages is greater than the tendency to overestimate ages, particularly above age 35. For example, among women aged 40-44 (according to reported age in the Individual Survey), 10.7 percent were reported as 35-39 whereas 7.2 percent were reported as 45-49 in the Household Survey. Mortara has previously noted that Latin American women in middle age are likely to report themselves as younger than their true ages (Mortara, 1964; Potter and Ordóñez, 1976). Such a 'rejuvenation' process could explain the reporting of lower ages in the Household Survey, as compared with reports in the individual interviews, as well as the very low sex ratio in the age range 15 to 30.

As expected, inconsistencies in reports of age are more frequent among illiterate women. However, the differences are not large: 10 percent of literate women as compared with 14 percent of illiterate women had different reported five-year age groups in the Individual and Household Surveys.

Some of the differences in Table 1 may be the result of interview by proxy in the Household Survey. Specifically, any woman (or man) over 18 years of age could supply the household interview; thus many of women in the Household Survey who were eligible to be included in the Individual Survey (i.e. women who spent the previous night in the household and who were between 15 and 49 years of age) had not supplied their own information in the Household Survey. Table 2 shows the percentage of eligible women who were their own informants in the Household Survey, by age and marital status. Single and younger women were less likely to have been found at home by interviewers and hence were less likely to have supplied the household interview. Note further, however, that, for almost all age groups and marital statuses, a larger percentage of interviewed women had been their own informants in the Household Survey. Table 3 which is the reverse tabulation of Table 2 shows this more clearly: in all age groups, a higher percentage of women who served as their own informants in the Household Survey were interviewed as compared with women who were not informants. The extent to which this bias has resulted in differences in response between the Household and Individual Surveys is discussed below and in the next section.

Table 4 shows the difference in five-year age groups between ages reported in the household and individual interviews (for those women interviewed in the Individual Survey), by whether or not women served as their own informants in the Household Survey. We expect a much higher degree of consistency for those women who were their own informants. The data in Table 4 reveal that for all age groups except 15-19 the discrepancies are smaller for own-informants. For ages over 20-24, the percent of inconsistent reports is approximately twice as large for women who were not their own informants in the Household Survey.

Table 1. Difference Between Age Reported in Individual Survey and Household Survey (in Percentages), by Age Reported in Individual Survey

Difference*	Age in Individual Survey							
	Total	15-19	20-24	25-29	30-34	35-39	40-44	45-49
<i>In Years</i>								
-3 and more	4.6	0.2	1.7	4.4	7.2	6.1	10.7	14.0
-1 and -2	16.5	10.5	17.1	20.0	18.6	22.7	17.1	16.7
0	61.3	72.5	61.8	59.2	54.0	54.5	52.6	56.1
1 and 2	15.5	15.2	18.0	13.6	17.4	15.1	15.4	12.3
3 and more	2.1	1.6	1.4	2.9	2.8	1.7	4.2	1.0
<i>In Five-Year Age Groups</i>								
-2 and more	0.7	-	-	0.0	1.2	1.2	2.5	3.2
-1	5.6	-	5.3	7.4	8.0	6.6	10.7	11.0
0	88.7	95.6	89.8	86.7	83.6	87.7	79.6	85.8
1	4.5	3.7	4.6	4.8	6.9	4.0	7.2	-
2 and more	0.5	0.7	0.3	1.2	0.3	0.5	-	-

* Reported age (group) in Household Survey minus reported age (group) in Individual Survey.

Source: Colombia National Fertility Survey, 1976.

Table 2. Percent of Eligible Women in the Household Survey who were Own Informants by Whether or Not Interviewed in the Individual Survey, by Age and by Marital Status

Age and Marital Status	Percent Own Informant	
	Interviewed	Not Interviewed*
<i>Age</i>		
15-19	31.7	32.8
20-24	56.5	54.7
25-29	68.3	65.0
30-34	77.7	74.3
35-39	79.8	71.0
40-44	74.6	68.4
45-49	73.8	69.2
<i>Marital Status</i>		
Single	33.4	30.7
Legally Married	79.5	76.4
Common Law	79.5	80.5
Widowed	71.1	65.7
Separated/Divorced	70.1	62.4

* The Household Survey consists of a weighted sample of households. However, eligible women were drawn from the households with probabilities proportional to the household weights so as to render the Individual Survey self-weighting. Hence, estimates for women who were interviewed in the Individual Survey are based on unweighted responses. However, estimates for women not interviewed are somewhat complicated to derive because the "removal" of the interviewed women renders the original weights for the remaining women inapplicable. Modified weights for eligible women in the Household Survey who were not interviewed in the Individual Survey were derived by the following procedure: Numerators (numbers of own informants) and denominators (total numbers of women) for each age group and marital status were derived for (1) all women, based on the original household weights; and (2) interviewed women, based on unweighted responses. Numerators and denominators for those women not interviewed were derived by subtraction of (2) from (1). The resulting ratio (percent own informants) yields a "reweighted" estimate for the not-interviewed subgroup of eligible women.

Source: Colombia National Fertility Survey, 1976.

Table 3. Percent of Eligible Women in the Household Survey who were Interviewed in the Individual Survey, by Age, Marital Status, and Informant Status in the Household Survey*

Age and Marital Status	Percent Interviewed	
	Own Informant	Another Informant
<i>Age</i>		
15-19	45.6	44.4
20-24	43.9	41.3
25-29	44.6	41.6
30-34	44.9	37.9
35-39	47.6	34.0
40-44	44.2	37.7
45-49	43.9	36.1
<i>Marital Status</i>		
Single	46.5	43.0
Legally Married	44.7	38.8
Common Law	42.0	43.7
Widowed	44.2	37.2
Separated/Divorced	49.1	37.9

* Eligible women were drawn from the households with probabilities proportional to the household weights so as to render the Individual Survey self-weighting. So that the above comparison does not reflect these weights we have weighted each response (interviewed or not interviewed) inversely proportional to the household weight of the woman.

Source: Colombia National Fertility Survey, 1976.

Table 4. Difference Between Age Reported in Individual Survey and Household Survey (in Percentages) by Age Reported in Individual Survey and by Informant Status in Household Survey

Difference in Five-Year Age Groups*	Age in Individual Survey							
	Total	15-19	20-24	25-29	30-34	35-39	40-44	45-49
	<i>Own Informant</i>							
-2 and more	0.5	—	—	0.0	0.6	0.7	1.1	2.1
-1	5.1	—	4.4	5.4	5.4	5.0	10.1	7.5
0	89.7	94.6	91.7	89.3	86.7	89.9	83.6	90.4
1	4.2	4.1	3.7	4.1	7.1	3.7	5.2	—
2 and more	0.6	1.4	0.2	1.2	0.2	0.7	—	—
	<i>Another Informant</i>							
-2 and more	1.0	—	—	0.0	3.1	2.5	6.5	6.1
-1	6.3	—	6.7	11.8	17.8	12.5	12.1	19.3
0	87.5	96.1	87.0	81.2	72.9	80.0	69.4	74.6
1	4.8	3.5	5.8	5.9	5.4	5.0	12.1	—
2 and more	0.5	0.4	0.4	1.2	0.8	0.0	—	—

* Reported age group in Household Survey minus reported age group in Individual Survey.

Source: Colombia National Fertility Survey, 1976.

2.2 Evaluation of Data in the Marriage Histories

Distribution of Marital Status in the Household and Individual Surveys

The Household Survey provides information on current marital status for each member of the household. For the selected subsample of women aged 15 to 49, the Individual Survey provides a complete marriage history which includes date of onset of union, type of union, and date of dissolution of union (if the union dissolved) for each legal marriage and consensual union. Since single women were included in the Individual Survey, distributions of current marital status can be obtained from both the household and individual interviews in the Colombia National Fertility Survey.

Table 5 shows percentages of females by age group who have ever been married, calculated for three subgroups of women:

- (1) women in the Household Survey who were eligible for the individual interview (i.e. women who spent the previous night in the household and who were between 15 and 49 years of age), but who were not interviewed;
- (2) women in the Individual Survey according to their responses in the Household Survey;
- (3) women in the Individual Survey according to their responses in the Individual Survey.

Table 5. Percent of Women Ever-Married by Five-Year Age Groups for Eligible Women in the Household Survey, by Whether or Not Interviewed in Individual Survey, and for Women in the Individual Survey

Age	Percent Ever Married		
	Household Survey		Individual Survey
	Not Interviewed*	Interviewed	
15-19	14.9	13.4	15.1
20-24	51.6	51.8	56.0
25-29	72.6	72.8	77.7
30-34	83.3	84.4	88.7
35-39	84.2	84.4	87.7
40-44	86.2	87.1	91.2
45-49	82.1	86.5	90.9

* These estimates are based on weighted responses. The procedure for calculating the weights is analogous to that for Table 2.

Source: Colombia National Fertility Survey, 1976.

As noted previously, an eligible woman was not necessarily the informant for the household in the Household Survey, but always supplied the individual interview.

Comparing percentages ever married for the first two groups, as obtained from reports in the Household Survey, we note that percentages ever married are approximately equal for those eligible women who were individually interviewed and for the remaining eligible women. A large discrepancy arises only for women aged 45-49, for whom

the percentage ever married is approximately four percentage points higher among interviewed women. This difference may be the result of a selection or non-response bias: that is, it may be the case that older single eligible women were either less likely to be selected for the Individual Survey or were less likely to respond to the Individual Survey.¹ However, since the differences are one percentage point or less for all age groups except 45-49, there is little evidence of a significant selection or non-response bias.

On the other hand, when we compare proportions ever married from the Household and Individual Surveys, we note that proportions ever married obtained from reports in the individual interviews are considerably larger than those obtained from the *same* women from reports in the Household Survey. We suggest that some or all of the following factors were operating to produce the differences between responses in the Individual and Household Surveys:

1. Errors supplied by another informant in the Household Survey in reporting marital status of eligible women.
2. The absence of a probe question in the Household Survey to insure that women reported as never married had not in fact been previously married.
3. Errors in the coding procedure in the Household Survey.

Table 6 shows a cross-classification of reported marital status in the Household and Individual Surveys for only those women interviewed in the Individual Survey. Under the assumption that reported marital status in the Individual Survey is correct, the data in Table 6 indicate that a large proportion of women who are in common-law unions or who are widowed, separated, or divorced, have had their marital status reported as single or legally married in the Household Survey. For example, 19 percent of women in common-law unions and 54 percent of separated or divorced women had been reported as single or legally married in the Household Survey. In fact, among the separated and divorced women, more women had been reported as *single* than as separated or divorced in the household interview. In terms of overall percentages ever married shown in Table 5, the lower values obtained from the Household Survey are partly a result of the misclassification of women formerly married or in consensual unions as single.

¹ We have no information as to who was *selected* from the households for the individual interview. That is, we can only identify women actually interviewed in the Individual Survey. (Approximately five percent of selected women did not respond to the individual interview.) Hence, we can not separate between a selection bias and a non-response bias: i.e., whether older married women were more likely to be selected for interview than older single women or whether the married women were more likely to respond to the interview. It is also possible that coders altered responses in the Household Survey after having obtained responses in the Individual Survey.

Table 6. Distribution of Respondents According to Reported Marital Status in Individual Survey and Household Survey

Household Survey	Individual Survey					Total
	Single	Legally Married	Common Law	Widowed	Separated/ Divorced	
Single	2047	9	45	9	154	2264
Legally Married	14	2035	96	1	47	2193
Common Law	2	13	611	3	13	642
Widowed	0	1	2	84	12	99
Separated/Divorced	5	4	7	4	145	165
Total	2068	2062	761	101	371	5363

Source: Colombia National Fertility Survey, 1976.

It is possible that these discrepancies in reported marital status may be the result of interview by proxy in the Household Survey. That is, an informant other than the eligible woman herself may have been more apt to misreport the woman's marital status, particularly if the woman was not currently in a legal marriage. It has also been noted (Table 2) that own informants were more frequent among interviewed women than among those eligible but not interviewed. Table 7 shows a cross-classification of reported marital status in the Household and Individual Surveys, according to whether or not women were their own informants. Table 8 shows the percentage of consistent reports of marital status according to age group and marital status in the Individual Survey and informant status in the Household Survey. As noted previously, while most women reported as single or legally married in the individual interview had consistent responses in the Household interview, the number of discrepancies is large for the widowed, separated and divorced, and women in common-law unions. This is true regardless of whether a woman reported her own marital status in the Household Survey. In general, however, the consistency of responses between the Household and Individual Surveys is greater for women who were their own informants; this is particularly true of women in common-law unions.

The inconsistent responses in the upper half of Table 7 come only from women who reported their own marital status. It is possible that a probe question within the individual questionnaire produced some of these inconsistencies. The interviewer in the Household Survey asked a single question with regard to marital status: 'What is your current marital status? (1) Single, (2) Legally married, (3) Common-law union, (4) Widowed, (5) Separated or divorced.'² A woman who was not currently married at the time of the survey may have answered such a question in the affirmative immediately upon hearing the word 'single'. In the Individual Survey, the interviewer asked a similar question³, but for those respondents who answered 'single', the interviewer followed with the question, 'Were you ever married?' An affirmative answer to the second question provided an inconsistency and forced the interviewer to alter the reported marital status from single to the appropriate category. Information from the raw data tape shows a total of 71 women who provided just this type of inconsistent response.

Another possibility is that errors in coding the data from

the Household Survey may have produced some of the discrepancies in reported marital status. Specifically, the coding of 'Single' ('Soltera') and 'Separated/Divorced' ('Separada/Divorciada') by the shorthand notation 'S' on the part of interviewers could have resulted in the misclassification of single and separated/divorced women.⁴

Distribution of Marital Status as of Census and Survey Dates

Using reported dates of marriage in the individual histories, one can reconstruct percentages ever married as of any date in the past. However, since no women older than 49 were interviewed in the Individual Survey, one can only obtain marital status for women younger than 49 — x for a date x years in the past. Percentages ever married for the census dates (1951, 1964, and 1973) and for the ENF Survey date (1969) have been reconstructed from ENFC data and are compared with the corresponding census and survey data in Table 9. We note that percentages ever married reconstructed from the ENFC (1976) are consistently higher than those from the census for the same dates.⁵ The differences are often quite large. For example, percentages ever married from the ENFC (1976) for 1964 are approximately ten percentage points higher than those obtained from the 1964 Census, across all age groups. On the other hand, the differences between the ENFC (1976) and the ENF (1969) are much smaller in magnitude, with the ENF (1969) providing higher estimates in some age groups. The reasons for such large discrepancies between reported marital status in the ENFC and in the censuses are explored below.

² The question in Spanish reads, 'Cual es su estado civil actual? (1) Soltera, (2) Casada, (3) Union libre, (4) Viuda, (5) Separada o divorciada.'

³ In the Individual Survey the question reads 'Actualmente es Ud. soltera, casada, conviviente, viuda, separada or divorciada?' ('Are you currently single, legally married, in common-law union, widowed, separated or divorced?')

⁴ As noted by Martin Vaessen of the World Fertility Survey, this type of coding error did occur on the original interview sheets of the ENFC. However, no estimate of the frequency of coding errors is available.

⁵ Overestimates of percentages of single women in the 1964 and 1973 censuses as compared with the 1969 and 1976 surveys have been noted previously by Hernandez (1977).

Table 7. Percent Distribution of Respondents According to Reported Marital Status in Individual Survey and Household Survey, by Informant Status in Household Survey

Household Survey	Individual Survey				
	Single	Legally Married	Common Law	Widowed	Separated/Divorced
	<i>Own Informant</i>				
Single	97.9	0.2	3.8	9.3	42.8
Legally Married	1.1	99.2	11.1	1.3	10.4
Common Law	0.3	0.5	84.4	4.0	2.8
Widowed	0.0	0.0	0.2	81.3	2.8
Separated/Divorced	0.5	0.2	0.5	4.0	41.2
Total	100.0	100.0	100.0	100.0	100.0
	<i>Another Informant</i>				
Single	99.2	1.5	12.9	8.0	39.2
Legally Married	00.5	97.3	16.9	0.0	16.7
Common Law	0.0	1.0	68.0	0.0	5.0
Widowed	0.0	0.2	0.0	88.0	4.2
Separated/Divorced	0.1	0.0	2.2	4.0	35.0
Total	100.0	100.0	100.0	100.0	100.0

Source: Colombia National Fertility Survey, 1976.

Table 8. Percent of Respondents who Reported Marital Status Consistently in the Individual Survey and the Household Survey, by Age and Marital Status in the Individual Survey, and by Informant Status in the Household Survey

Individual Survey	Percent Reporting Marital Status Consistently		
	Total	Own Informant	Another Informant
<i>Age</i>			
15-19	95.8	93.0	97.0
20-24	91.2	91.1	91.5
25-29	91.1	91.9	89.4
30-34	91.0	91.6	88.4
35-39	88.6	89.7	85.0
40-44	90.1	91.4	86.3
45-49	87.7	89.0	86.0
<i>Marital Status</i>			
Single	98.8	97.9	99.2
Legally Married	98.7	99.2	97.3
Common Law	80.3	84.4	68.0
Widowed	83.2	81.3	88.0
Separated/Divorced	39.1	41.2	35.0

Source: Colombia National Fertility Survey, 1976.

Using reported dates of marriage for first and for higher-order marriages, as well as data on type of union and dates of dissolution for those marriages which dissolved, one can reconstruct distributions of marital status for dates in the past. These distributions are shown in Table 10 for the last two census dates (1964, 1973) and for the date of ENF (1969), as derived from ENFC data and as recorded in the censuses and survey. We note that percentages single for 1964 and 1973 for all age groups are considerably higher according to census data than as derived from the marriage histories in the ENFC. In contrast, percentages of women in common-law union and percentages separated or divorced are much lower as given in the censuses. As we would expect, discrepancies in proportions separated or divorced are most notable in the older age groups. For example, for women aged 30-34 in 1964, the census reports that only 2.2 percent were separated or divorced whereas the ENFC (1976) data yield an estimate of 9.1 percent. Percentages legally married as given in the censuses and as derived from the ENFC are in approximate agreement.

Table 9. Reconstruction of Percent of Women Ever Married, by Five-Year Age Groups for Census Dates (1951, 1964, 1973) and Survey Date (ENF, 1969), from Reported Dates of Marriage in the Colombia National Fertility Survey (ENFC, 1976)

Age	Percent Ever Married							
	1951		1964		1969		1973	
	ENFC (1976)	1951 Census	ENFC (1976)	1964 Census	ENFC (1976)	ENF (1969)	ENFC (1976)	1973 Census
15-19	23.7	16.4	26.2	15.7	22.2	19.7	20.6	13.5
20-24	58.2	51.1	62.6	53.4	61.9	59.4	58.9	48.8
25-29	--	--	80.1	72.2	79.7	80.2	80.1	70.9
30-34	--	--	89.7	78.8	85.2	87.6	86.0	80.0
35-39	--	--	--	--	91.7	89.9	88.5	83.2
40-44	--	--	--	--	--	--	92.5	84.1

Sources: 1951 Census: DANE (1954), Table 14. 1964 Census: DANE (1967), Table 11. ENF (1969): Rico, V. (1973), Table 1. 1973 Census: DANE (1978a), Table 3.

Marital status distributions for 1969, as given in the ENF (1969) and as derived from the ENFC (1976) are in fairly close agreement. Although percentages in common-law unions are slightly higher according to the ENFC, the differences are small when compared to the discrepancies between the ENFC and census data. With the exception of the age group 30-34, percentages single, legally married, widowed, and separated or divorced differ by at most 3 percentage points between the ENF and the ENFC. This approximate agreement suggests that data collected in the marital histories of the Colombia National Fertility Survey are generally correct. In contrast, distributions of marital status as given in the 1964 and 1973 Censuses largely underestimate the percent ever married (Table 9). Specifically, as shown in Table 10, in the younger age groups census data overestimate the percentage single while they underestimate the percentage in legal and in common-law unions, particularly the latter. In the older age groups, the census also overestimates the proportions single but this surplus is accompanied by deficits in proportions in common-law union and separated or divorced. The misclassification of separated and divorced women and of women in common-law unions as single women seems to have occurred in both the 1964 and 1973 Censuses as well as in the Household Survey.⁶ It thus appears that the detailed questionnaires on marriage as administered in the 1969 and 1976 fertility surveys were more successful instruments than simple questions on current marital status for obtaining accurate distributions of marital status.

⁶ The question on marital status in the 1973 Census reads, 'Cual es su estado civil actual? (1) Union libre, (2) Casado, (3) Separado-divorciado, (4) Soltero, (5) Viudo.'

Table 10. Reconstruction of Marital Status Distribution (in Percentages) for Women, by Five-Year Age Groups, Census Dates (1964, 1973) and Survey Date (ENF, 1969), from Reported Dates of Marriage in the Colombia National Fertility Survey (ENFC, 1976)

Marital Status	1964 Census							
	15-19		20-24		25-29		30-34	
	ENFC (1976)	Census	ENFC (1976)	Census	ENFC (1976)	Census	ENFC (1976)	Census
Single	73.8	84.3	37.4	46.6	19.9	27.8	10.3	21.2
Legally Married	16.7	11.2	44.4	40.5	53.9	55.7	64.0	60.3
Common Law	8.4	4.2	14.6	11.0	20.0	13.5	12.8	13.7
Widowed	0.1	0.1	0.5	0.6	1.1	1.2	3.9	2.7
Separated/Divorced	0.9	0.3	3.1	1.2	5.1	1.8	9.1	2.2

Marital Status	ENF 1969									
	15-19		20-24		25-29		30-34		35-39	
	ENFC (1976)	ENF (1969)	ENFC (1976)	ENF (1969)	ENFC (1976)	ENF (1969)	ENFC (1976)	ENF (1969)	ENFC (1976)	ENF (1969)
Single	77.8	80.8	38.1	41.5	20.3	20.8	14.8	12.7	8.3	9.8
Legally Married	11.3	11.5	43.6	41.7	58.9	60.4	55.4	64.9	64.1	65.1
Common Law	9.2	5.8	15.0	12.2	15.8	11.7	20.4	14.6	13.6	13.4
Widowed	0.2	0.2	0.4	0.5	0.5	1.1	1.9	2.7	4.8	3.4
Separated/Divorced	1.6	1.7	2.9	4.1	4.5	6.0	7.6	5.1	9.2	8.3

Marital Status	1973 Census											
	15-19		20-24		25-29		30-34		35-39		40-44	
	ENFC (1976)	Census	ENFC (1976)	Census	ENFC (1976)	Census	ENFC (1976)	Census	ENFC (1976)	Census	ENFC (1976)	Census
Single	79.4	86.5	41.1	51.2	19.9	29.1	14.0	20.0	11.5	16.8	7.5	15.9
Legally Married	10.0	8.7	36.8	35.8	56.4	53.9	59.0	60.9	57.0	62.4	57.5	60.9
Common Law	9.2	4.4	18.4	11.4	17.3	13.7	19.9	13.7	18.5	13.0	14.7	11.9
Widowed	0.0	0.1	0.2	0.4	0.8	1.1	2.0	2.4	3.4	4.1	8.9	7.1
Separated/Divorced	1.4	0.3	3.4	1.2	5.5	2.1	5.1	3.1	9.6	3.7	11.4	4.3

Source: See Table 9.

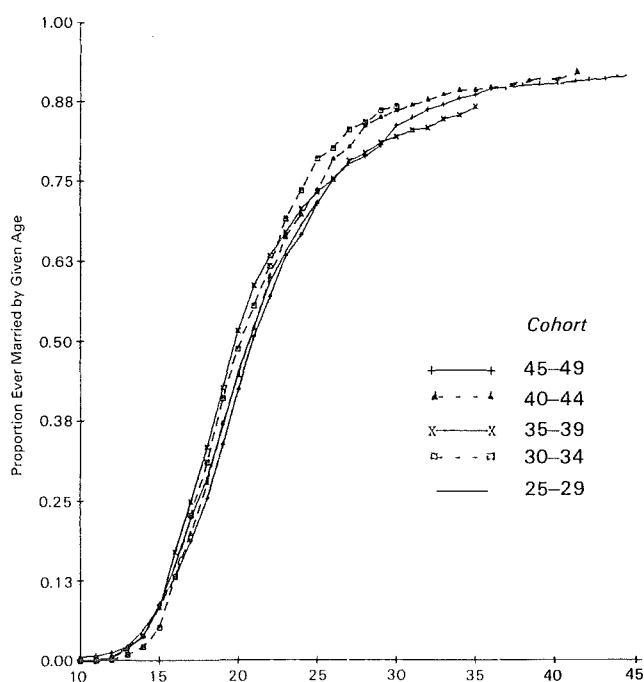
3 Trends in Nuptiality and Effect on Fertility

3.1 AGE AT MARRIAGE BY COHORT AND PERIOD

In order to estimate the time trend in age at marriage, one can reconstruct the marriage experience of a series of cohorts or the marital distribution of females during successive time periods. Both sets of calculations are based on reported dates of marriage in the Individual Survey.

Using reported dates of first marriage for ever-married women, one can reconstruct cumulative proportions ever married by age for five-year birth cohorts (five-year rather than single-year to reduce the effect of sampling error). Cumulative proportions ever married by age, for the cohorts aged 25-29, 30-34, 35-39, 40-44, and 45-49, as of the survey date are shown graphically in Figure 4. Because a cohort cannot have experienced a first marriage at an age greater than its current age, the first marriage experiences are truncated at the lowest age of a five-year cohort. One can fit model first marriage schedules (Coale and Trussell, 1974) to the actual first marriage experience up to the current age and thereby obtain estimates of first marriage rates for the remaining ages for each cohort. The mean of the fitted model schedule provides an estimate of the mean age at first marriage for each cohort at the end of its lifetime.

Figure 4. Cumulative Proportions of Women Ever-Married by Successive Ages, by Five-Year Cohorts, Derived from Dates of First Marriage in the Individual Survey



Source: Colombia National Fertility Survey, 1976

The values of mean age at first marriage shown in Table 11 indicate that over a period of approximately thirty years, mean age at marriage was subject to a slight decline, followed by a plateau and then an increase for the youngest cohort aged 20-24. However, the estimated mean for the youngest cohort is speculative since much of its marriage experience has been estimated from model schedules. The extent to which the values for the older cohorts reflect an actual decline in age at marriage in the past rather than misreporting by the older women is also speculative. Since misreporting of marital status in the censuses is extensive, estimated mean ages at marriage for the older cohorts in the ENFC cannot be checked with census data. The overall change in mean age at marriage indicated by the values in Table 11 is negligible: estimates for the cohorts now aged 20-24 and 45-49 are practically identical. The interlacing of the curves of cumulative proportions ever married shown in Figure 4 illustrates the similar marriage experiences of different cohorts.

Table 11. Mean Age at First Marriage Derived from Fitted Model Schedules,¹ by Cohort, Current Residence and Education Level

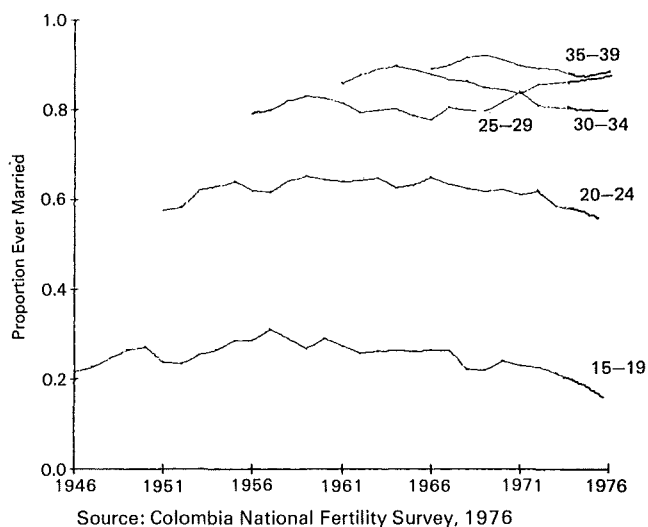
Age at Survey	Mean Age at First Marriage				
	Total	Current Residence		Education	
		Urban	Rural	Less Than Complete Primary	At Least Complete Primary
20-24	21.6	21.9	20.7	19.8	23.3
25-29	21.2	22.3	19.3	19.2	23.6
30-34	20.6	20.8	20.2	20.2	21.1
35-39	20.5	20.9	19.6	20.1	21.0
40-44	21.2	21.4	20.9	20.8	22.3
45-49	21.7	21.6	21.9	21.7	21.6

¹ Model first marriage schedules (Coale and Trussell, 1974) have been fitted to the distributions of reported proportions ever-married by successive ages (up to age at survey) by a maximum-likelihood procedure.

Source: Colombia National Fertility Survey, 1976.

Trends in age at marriage can also be analyzed by an examination of changes in proportions ever married by time period. Figure 5 shows proportions ever married in each five-year age group from 15-19 to 35-39 by calendar year. Due to censoring at interview, observations for the older age groups are restricted to the more recent past. The data in Figure 5 reveal almost constant proportions ever married in each age group over the past 20 to 30 years. There is some indication of lower proportions marrying in the crucial age groups (15-19 and 20-24) in the past five years. This ostensible trend toward a higher age at marriage was noted above in terms of a higher estimated value of SMAM for the cohort aged 20-24 at the time of the survey.

Figure 5. Proportions Ever-Married, by Five-Year Age Group, 1946-1975



3.2 VARIATIONS IN NUPTIALITY BY REGION AND EDUCATION LEVEL

Urban-Rural Differences in Age at Marriage

Figure 6 shows proportions ever married in the age groups 15-19, 20-24, and 25-29 by calendar year and current residence. Note that these data refer to region of residence at the time of the survey rather than during the calendar year of interest. Of those women currently residing in urban areas approximately 20 percent had been born in rural areas.

The data reveal a fairly constant urban-rural differential since the late 1950's, with proportions ever married higher in rural areas as expected. Declines in proportions ever married for 15 to 19 year olds have occurred over the past decade for rural as well as for urban residents. However, declines in the age groups 20-24 and 25-29 over the past five to ten years have occurred mainly in urban areas. The estimated singulate mean ages at marriage (SMAM) by cohort (Table 11) show an increase of more than a year between women aged 30-39 and women aged 20-29, in urban areas. There appears to be no notable recent change in age at marriage in rural areas.

Figure 6. Proportions Ever-Married, by Five-Year Age Group and by Current Residence, 1946-1975

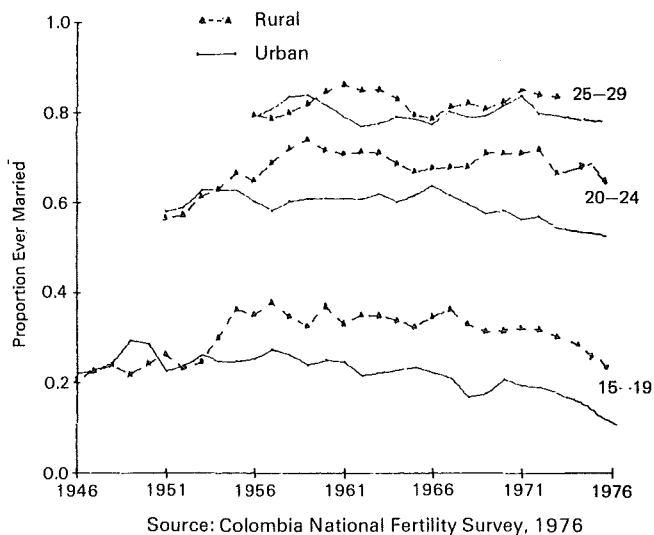


Figure 6 further indicates an increase in proportions ever married in the 1950's for women in rural areas. Similarly, the estimated SMAM's in Table 11 indicate a decrease in age at marriage of more than two years between the cohort 45-49 and the cohort 35-39, in rural areas. If accurate, these data would imply an even *higher* mean age at marriage for the rural cohort aged 45-49 (21.9) than the urban cohort aged 45-49 (21.6). As suggested earlier, the apparent decrease in age at marriage in the past may be due to the misreporting of dates of marriage by the older women, in this case the older rural women.

Figure 7 shows proportions ever married by calendar year for women with less than a complete primary education and for women with at least a complete primary education (education level is defined as of the survey date). The data clearly indicate that declines in proportions ever married have been almost entirely experienced by the more educated women. Among those women who finished primary school, the percentage of 15-19 year olds who had been married declined from about 23 to 11 over the past fifteen years. The change for the age group 20-24 began more recently but showed an even more rapid drop from about 60 percent to 44 percent in ten years. Data for the less educated women show almost no change in age at marriage. Estimated values of the mean age at marriage by cohort and education level are given in Table 11. The values for the youngest cohorts show a large differential in age at marriage (three to four years) between the less educated and better educated women.

A larger increase in proportions ever married during the 1950's for the less educated women (Figure 7) suggests that these women may have been more apt to misreport dates of marriage in the past. Of course, the data in Figures 6 and 7 could reflect an actual decline in age at marriage during the 1950's among rural women and women with little education.

Data on the proportion of all births which were illegitimate (i.e. which occurred prior to the date of first union) indicate that the older rural women and older women with little education had higher illegitimacy rates than younger cohorts (Table 12). This finding is consistent with the higher age at marriage reported by these older cohorts (Table 11). However, a misreporting of date of marriage but not of dates of early births also would produce the apparent trends in Tables 11 and 12.

Figure 7. Proportions Ever-Married, by Five-Year Age Group and by Education Level, 1946-1975

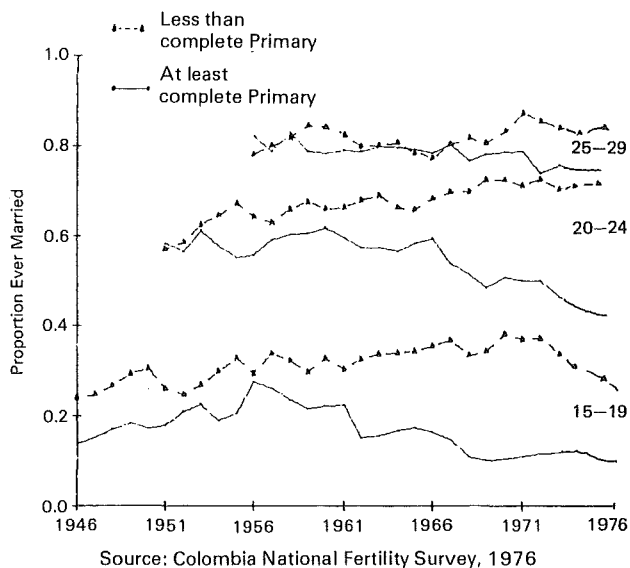


Table 12. Percent of Births before Age 25 which occurred prior to Date of First Union, by Cohort, Current Residence and Education Level

Age at Survey	Total	Current Residence		Education	
		Urban	Rural	Less than Complete Primary	At Least Complete Primary
25-29	5.3	5.5	5.2	5.3	5.4
30-34	6.0	6.1	5.8	6.2	5.4
35-39	5.8	4.5	7.8	7.3	2.7
40-44	7.4	4.9	11.5	8.5	3.5
45-49	7.3	4.9	11.5	9.1	0.6

Source: Colombia National Fertility Survey, 1976.

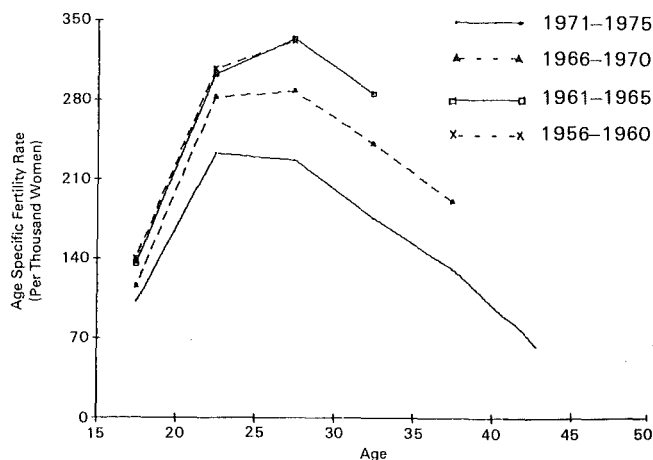
3.3 TRENDS IN FERTILITY

Previous analyses of fertility data in the 1969 ENF and the 1973 Census have indicated a very large decline in fertility beginning in the mid-1960's. For example, the crude birth rate in Colombia was approximately 45 in the period 1965-1966 (Elkins, 1973), and fell to a value of 33 for the period October 1972 to October 1973 (DANE, 1978b). In terms of the Total Fertility Rate (TFR), fertility data indicate a decline from a value of 6.5 for the period 1965-1966 (Elkins, 1973) to a value of 4.7 for the period October 1972 to October 1973 (DANE, 1978b), a decline of 28 percent in approximately seven years. The detailed fertility data available in the Individual Survey of the Colombia National Fertility Survey can be used to substantiate the rapid decline in fertility over the past fifteen years.

Age specific fertility rates for five-year periods in the past derived from reports of births in the individual interviews are shown graphically in Figure 8. The data show a dramatic decline in fertility in all age groups from the period 1961-1965 to the most recent period 1971-1975. The declines in fertility are particularly steep in the older age groups. For example, fertility in the age groups 25-29 and 30-34 dropped by approximately 32 percent and 38 percent, respectively, from 1961-1965 to 1971-1975. On the other hand, age specific fertility rates show virtually no change from the period 1956-1960 to the period 1961-1965. (See also Table 13.)

Having seen that age at marriage varied only slightly over the past ten to fifteen years (Figure 5), we can surmise that the declines in overall fertility are mostly due to a reduction in marital fertility rates. Figure 9 and Table 13 present age specific fertility rates for ever-married women for five-year periods in the past.⁷ The declines in marital fertility from 1961-1965 to 1971-1975 parallel those in overall fertility. For example, marital fertility in the age groups 25-29 and 30-34 dropped by 33 percent and 35 percent, respectively, from 1961-1965 to 1971-1975. Fertility declines have occurred in all age groups, but the decreases are most pronounced in the older age groups. Marital fertility rates for 15 to 19 year olds show no change between the two most recent periods; the small decline in overall fertility (Figure 8) is due to the recent decrease in proportions ever married for the age group 15-19 (Figure 5).

Figure 8. Age Specific Fertility Rates (Per Thousand Women), for Five-Year Periods in the Past, Derived from Fertility Histories in the Individual Survey



Source: Colombia National Fertility Survey, 1976

By and large, the data in Table 13 indicate that the reductions in fertility are the result of reductions in marital fertility. As we saw previously, age at marriage has changed only slightly since the early 1960's, the time when fertility rates began their rapid descent. If the recent declines in proportions ever married for the age groups 15-19, 20-24, and 25-29, were to continue, the resulting increase in age at marriage would cause still lower fertility in the younger age groups. However, a compensating increase in the contribution of illegitimate fertility to the total fertility rate could occur.

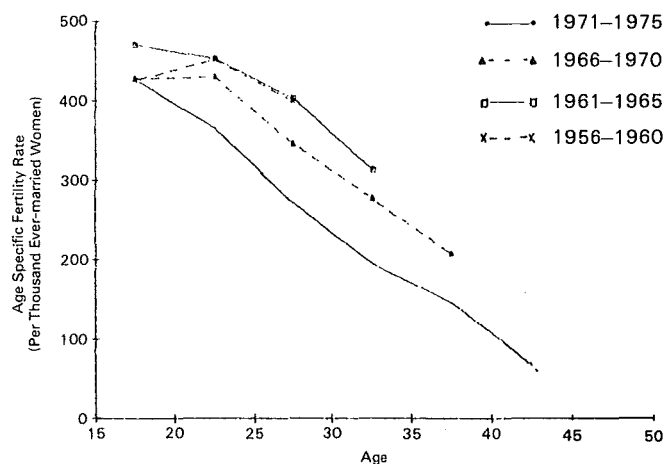
⁷ In order to simplify the calculations, we have approximated marital fertility rates in the following manner: the numerators consist of all births to ever-married women that occurred after the date of first union, by period and age group at time of birth; the denominators are estimates of the average numbers of ever-married women in each age group in the specified periods. Hence, these rates include formerly married women in the denominator, as well as their illegitimate births (births which occurred after the date of dissolution of their marriage) in the numerator. Nevertheless, these rates should approximate the more refined concept of a marital fertility rate (births within marriage per person-year exposure of married women).

Table 13. Age Specific Fertility Rates (per thousand women) for all Women and for Ever-Married Women by Five-Year Periods in the Past and Five-Year Age Groups, derived from Fertility Histories

Age	1971-1975	1966-1970	1961-1965	1956-1960	1951-1955
<i>All Women</i>					
15-19	102	115	135	140	124
20-24	233	283	303	308	294
25-29	227	289	334	333	—
30-34	176	242	286	—	—
35-39	131	191	—	—	—
40-44	67	—	—	—	—
<i>Ever-Married Women*</i>					
15-19	427	428	470	426	425
20-24	366	430	453	452	454
25-29	272	346	403	400	—
30-34	195	277	314	—	—
35-39	146	207	—	—	—
40-44	70	—	—	—	—

* Excludes births which occurred prior to date of first union.
 Source: Based on Tables 7.2.1 and 7.2.2, *Encuesta Nacional de Fecundidad Colombia, 1976. Resultados Generales.*

Figure 9. Age Specific Fertility Rates (Per Thousand Ever-Married Women), for Five-Year Periods in the Past, Derived from Fertility Histories in the Individual Survey



Source: Colombia National Fertility Survey,

4 Conclusions

This analysis of the Colombia National Fertility Survey attempts to assess the quality of data in reports of age, marital status, and dates of marriage. In addition, the study examines the trends in nuptiality and fertility as derived from the detailed data in the Individual Survey.

A check on the consistency of individual responses between the Household and Individual Surveys reveals discrepancies in reports of age and marital status. The latter inconsistencies are substantial and indicate higher proportions of females ever married from the Individual Survey. These discrepancies appear to be largely due to the misclassification of women's marital status in the Household Survey, a result of both interview by proxy and the absence of a probe question in the Household Survey.

In spite of these errors, comparisons of demographic estimates derived from reports of marriages in the Individual Survey with the corresponding estimates obtained from

data in the censuses and in the ENF (1969) suggest that reports of marital status in the ENFC and the ENF are considerably more accurate than those in the three censuses.

An examination of trends in age at marriage by period and cohort obtained from reported dates of first marriage in the Individual Survey reveals only small changes in age at marriage throughout the past 25 to 30 years. However, there are indications of a recent increase in age at marriage, most notably for the more educated women. An examination of trends in age specific fertility rates for all women and for ever-married women reveals a dramatic decline in overall and in marital fertility since the mid-1960's. The declines have been particularly outstanding in the older age groups, but a continued increase in age at marriage could produce equally dramatic drops in fertility for younger women.

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