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LATIN AMERICAN FERTILITY TRENDS AND
INFLUENCING FACTORS

I N D E X

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A B S T R A C T

A review of fertility measures for the twenty Latin American republics up to 1968-70 shows that of the eighteen nations with crude birth rates (CBR) above 30 per 1000 in 1960, two countries, Chile and Costa Rica, have since then experienced clear fertility declines. While the evidence is less clear, declines in CBRs also appear to have occurred in Brazil, Colombia, Cuba, Ecuador, El Salvador, Guatemala and Panama, and possibly in Peru and Venezuela. Four countries seemed to have essentially stable CBRs during the 1960s: the Dominican Republic, Honduras, Mexico and Nicaragua. Little information was available for Bolivia, Haiti and Paraguay whose CBRs possibly remained stable. Although the information is limited, not all the changes in fertility appear to be explained by nuptiality related variables, thereby implying that there were likely to be changes in the volitional intermediate variables within unions. Since most of the fertility declines began around 1960, before national level family planning services were instituted, socio-economic changes in the countries must account for the inception of the declines. Selected indicators of socio-economic factors were found to be somewhat related to fertility declines but no threshold values could be discerned.

R E S U M E

Une révision des niveaux de fécondité des vingt républiques latino-américaines, relatifs à la période 1968-70, met en relief une baisse appréciable de fécondité dans deux des dix-huit pays dont le taux brut de natalité était supérieur à 30 pour 1000 en 1960. Une chute du taux brut de natalité semble avoir été enregistrée également, quoique de façon bien moins évidente, au Brésil, en Colombie, à Cuba, en Equateur, au Salvador, au Guatémala, à Panama, et peut-être au Pérou et au Vénézuéla. Au cours de la décade 1960-70, apparemment le taux brut de natalité est resté constant en République Dominicaine, au Honduras, au Mexique et au Nicaragua. Malgré qu'on dispose de peu d'information pour la Bolivie, Haiti et le Paraguay, on pense que dans ces pays le taux brut de natalité probablement n'a pas changé.

En dépit des limitations de l'information disponible, la baisse de fécondité généralement observée ne se semble pas découler de variations de la structure de la nuptialité, ce qui implique alors que probablement elle est due a des modifications dans les variables intermédiaires d'origine volitive. Etant donné que la baisse a commencé aux environs de 1960, c'est-à-dire avant l'institution des services de planification familiale à l'échelle nationale, elle serait donc le produit de changements survenus dans la situation sociale et économique des pays concernés. On a trouvé effectivement certaine relation entre quelques indicateurs socio-économiques et la baisse de la fécondité, néanmoins il n'a pas été possible d'établir des niveaux critiques dans cette relation.

Introduction

After an examination of the available fertility data up to 1960 for the twenty Latin American republics, Carleton (1965:15) concluded that "almost all the significant changes which have taken place in this century occurred prior to World War II". In 1960 only five of the countries had crude birth rates (CBRs) below 40 per 1000 total population and in most of the countries the CBRs had been either constant or gradually rising since the 1930s (Carleton, 1965:28; Collver, 1968:42-45). However, on the basis of more recent data through 1967-68, a United Nations report (1972:26-27) found that "in many respects the changes since 1960 in the Middle and South American countries are more striking than in any other region". Decreasing fertility was noted in eight and possibly nine of the republics. It will be shown here that there now may be up to twelve countries with declining fertility, eleven of which had CBRs over 30 in the early 1960s (considered here "high" fertility countries).

This document will summarize the available evidence for these fertility trends in the twenty independent non-English speaking Latin American countries (recent fertility data for the other areas of the region, excluded here for reasons of space, can be found in the United Nations report, 1972). The analysis will consider whether the observed changes in the CBRs of each country reflect real changes in fertility and not merely changes in data quality or in age and sex distribution and will examine the intermediate variables through which all factors logically must pass to affect fertility (Blake and Davis, 1956). For purposes here, these variables, eleven in total, will be grouped into three sets: (a). nuptiality related variables including loss of exposure to inter-course because of unstable unions; (b). volitional variables acting within unions, such as voluntary steriliza-tion , contraceptive use and induced abortion; and (c). health related variables. The last set of variables will not be discussed since overall health conditions in Latin America have been improving rapidly (see, for example, Column 5 of Table 2) and this is more likely to have slightly increased fertility than to have decreased it (Ridley and Sheps, et al, 1967).

A key question will be the extent to which the volitional intermediate variables have or are beginning to affect national fertility levels, since in the past, CBRs below 30 normally have been achieved through the volitional variables (United Nations, 1935:75). After establishing the countries in which fertility may be declining, at least in part due to changes in the volitional variables, the analysis will focus on the roles that national family planning programs and changes in socio-economic factors have played in producing the fertility trends.

The Fertility Data and Its Quality

Table 1 contains most of the age specific fertility rate (ASFR) series available for the period 1960-70, as well as some for the 1950s. When more than one set of rates was found for a country for the same dates, preference was given to those rates which include corrections and adjustments. The original sources are given in Table 1.

Camisa (1968:18-20) compared the observed 1955-60 CBRs with those estimated and found that ten of the twenty Latin American countries, Argentina, Costa Rica, Cuba, Chile, Ecuador, El Salvador, Guatemala, Mexico, Panama and Venezuela, had differences between the observed and estimated CBRs of 10 percent or less, which was defined as "acceptable". For the 1960s, the United Nations (1972:69-70) classified these same countries, except Cuba, Ecuador and Venezuela, as having "complete" birth registration data. Most of the remaining countries in Latin America were considered to have "incomplete birth registration statistics (but) not so deficient as to be useless for identifying trends". Information on the input data quality and characteristics and certain aspects of the correction and calculation procedures are given in the Basis column of Table 1.

Observed Trends in Fertility

Trends in the unstandardized CBR for all high fertility Latin American countries with suitable data are shown in Graph 1, which has a logarithmic CBR scale so that trends may be visually compared. Age-sex standard-ization appears to have relatively little effect on the general direction of change as can be seen by comparing the unstandardized and standardized CBRs for various Latin American countries over long periods of time (see Collver, 1965:26-28).

Because adequate CBR estimates were not available, Bolivia, Haiti and Paraguay were excluded from Graph 1. The CBRs given by the United Nations (1972:70) for the Dominican Republic were not graphed since there is a

gross discrepancy between the CELADE estimates of 45-48 per 1000 in 1962 and 46.3 in 1970 (provisional figure calculated by García, A., 1972a using the 1970 census and vital statistics) and the United Nations figures which varied around 35 per 1000.

Argentina and Uruguay, both of which went from high to lower fertility earlier this century are not shown on the graph, although information on them is given in the Tables. It is worth noting that Uruguay, which had a CBR of 25.3 in 1963, had declined to 21.7 in 1968 (United Nations, 1972:70).

Graph 1 shows data going as far back as the beginning of the twentieth century in order to place the trends in historical perspective. The fact that the five year CBR averages up to 1959 calculated by Collver and the year by year CBR estimates for the 1960s (calculated independently of the Collver work; see sources to Graph 1) link up rather well in most countries (the double lines in Graph 1 indicate breaks in the data series) gives one a certain confidence in the data for trend determination. Only for Colombia and Cuba are there poor linkages. The recent Colombian data, while judged by the 1972 United Nations report as acceptable for trend determination, are likely to have important omissions since they are based on Church baptism registration. The large difference between the 1955-59 and the 1960 points may be real in the case of Cuba since the CBR seems to have risen rapidly after the 1959 Revolution (Cuba, 1972; Landstreet, 1971:107-108).

On the basis of the CBRs in Graph 1 and the CBRs in Table 1, the countries were divided into groups roughly defined by the degree of observed change in the CBR and the likelihood of their being, at least in part, true fertility declines and not due to age-sex structure shifts or measurement error. Column 1 of Table 2 shows the groupings. Within groups with a decline, the countries are in order of the observed CBR percentage change.

Of the nine high fertility countries with apparent CBR declines of 10 percent or more from their highest point in the 1960s, two, Costa Rica and Chile, starting from very different levels, exhibited declines of about 30 percent by 1970 in both their CBRs and GRRs, suggesting little overall effect of changing age-sex distribution. An examination of the ASFR divided into three child-bearing age groups, younger (15-19), middle (20-29), and older (30-39), indicates rather different patterns of change for each of these countries. Chile tended to follow the "classical" type of decline (Freedman and Adlakha, 1968:185-187) with the largest decreases in the older group (particularly after 1965), while the fertility of the middle age group declined slowly and that of the younger very little. Setting the 1960 ASFR of each group to 100, the indices of the three age groups in 1970 were 92, 77 and 60 for the younger to older groups, respectively. In Costa Rica, on the other hand, the early pattern was counter-classical; the middle group declined more rapidly than the older group. Again setting the 1960 ASFRs to 100, the 1966 values for three age groups in Costa Rica were 96, 81 and 88, respectively, although by 1969 the middle and older groups had each achieved an index of nearly 60. As in Chile the younger group had only a relatively small decline.

Since the fertility of the older group fell so rapidly in Chile it is unlikely that the overall change in the fertility level can be accounted for by nuptiality related variables alone. Gómez (1970:298-299) was able to show for Costa Rica that although the crude nuptiality rate did fall from 6.8 per 1000 in 1958-61 to 5.6 in 1967, this probably accounted for only 20 to 25 percent of the total CBR fall. It seems likely, then, that the volitional variables in both countries were important in accounting for the fertility decline.

The second category of countries listed in Table 2 is labeled "probable decline" since the available CBRs appear to exhibit rather clear falls but the necessary supporting GRR and ASFR information is either lacking or does not show much change (unfortunately most of the GRR series are not as long as those of the CBR). Of these countries, the trend in Colombia, with the largest apparent CBR change is very uncertain because of the use of Church Baptisms registers and because no ASFRs are available except for 1951 and 1965. However, there is some evidence from 1964 and 1969 fertility surveys in Bogota to suggest decreasing fertility as well as increasing use of contraceptives, at least in that important city (Simmons and Cardona, 1972). For Cuba there is also little supporting evidence although both the upward and downward movements are not illogical (see Landstreet, 1971:107-108).

Although the GRR information is limited for Ecuador, Guatemala and El Salvador, all seem to have had small GRR declines suggesting that changes in age structure may not fully account for the CBR declines. For Brazil only 10-year averages of the CBR are available, but a very recent estimate of the intercensal GRR from the four censuses between 1940 and 1970, made without assuming constant prior fertility (Arretx, 1972), strongly supports the likelihood of a decline. Using census sample data from the CELADE data bank, comparison of the 1970 Census data on children ever born by age of women with that for 1960 shows the former to be lower in almost all age groups (Arretx,

1970). Within four of the five very different physiogeographic regions of Brazil, the same pattern was found; only in the scarcely populated Northern region were there increases in the number of children ever born between the two censuses (ECLA, 1972a:10-11).

For Panama, the CBRs and GRRs each declined about 10 percent during the 1960s. Araica (1970), making adjustments for omissions, calculated rates about 4 percent higher for 1960 and 1968 than those used here, which implies that the longer series of uncorrected rates shown on the graph are underestimates but that the trend is unaffected.

While the CBR changes in the "probable decline" group under discussion seem to be at least partially due to real fertility declines, the amount of change due to nuptiality related variables is more difficult to ascertain, in part because of the high percentage of consensual unions in many of the Latin American countries. Careful studies of nuptiality changes in the 1960s are required, similar to that done by Camisa (1971:32) for 15 Latin American countries in the 1950-60 intercensal period. For that period she found that the percentage of women married or in consensual unions went up in most age groups in Colombia, Ecuador, El Salvador and Guatemala and only in Panama did the percentages remain constant. If these trends continued into the 1960s, the effect would have been an increase rather than a decrease in fertility. However, the assumption that the nuptiality levels continued to increase in the 1960s is not necessarily true, at least for Costa Rica, because although Camisa found an increase in that country during the 1950s, Gómez (1970:298) noted a decrease in the 1960s. The effect of the increasing tendency to legalize consensual marriages found by Camisa (1971:41) in Panama and Guatemala conceivably could have led to a decrease in fertility since Miró (1965:45-47) found that in Panama City legal marriages seem to have lower fertility.

Taking 1960 as the base and the same three age groups as before, Ecuador, Guatemala and Brazil seem to present a rather classical ASFR decline patterns; El Salvador and Panama had decline patterns more similar to the initial counter-classical Costa Rican one.

Venezuela and Peru have been put into the "possible decline" category implying a small CBR decline of 5-10 percent but little or no supporting evidence. The Peru GRR rate appears to have declined but the 1969 value is based on data from a relatively small (about 3 300 women aged 15-49) national fertility sample.

Of the countries placed in the "probable stability" category, Mexico, with essentially complete registration statistics, has the most clearly stable CBRs and GRRs. The Dominican Republic with uncertain statistics may have had a small GRR decline from 1960 to 1970. Honduras seems to have had no net decline, a conclusion supported by a multi-round demographic survey presently in progress which found a provisional CBR of 48.9 in 1971-72 (CELADE, 1972), a value higher than any shown on the graph. For Nicaragua a calculation of the CBR using the 1970 ASFRs and the census population gives a provisional value of 47.1 which is probably closer to the true value than the rates, without corrections, shown on the graph.

For the remaining three high fertility countries, Bolivia, Haiti and Paraguay, there is little information to indicate either change or stability. As stability seems more likely than a significant downward movement, the category for these countries has been labeled "possible stability".

Factors That May be Influencing Fertility Declines

Since neither the nuptiality nor the health related intermediate variables appear to be accounting significantly for the fertility declines observed, the declines should be due to changes in the volitional variables. A logical place to begin the discussion of factors which may have led to variation in these variables is with an analysis of the role which family planning programs, now quite numerous in Latin America, has played in producing the fertility declines. It often has been suggested that the programs can directly affect fertility regardless of the type and developmental level of a society, essentially in the same manner as public health measures have been used to reduce mortality throughout Latin America since the 1930s (Arriaga and Davis, 1969). While the situation in Latin America up to now does not permit the demonstration of the truth or falsity of this belief, it will be shown that family planning programs were unlikely to have initiated the declines, which, in turn, seems to imply that the nature of the societies and socio-economic changes in them underlie the fertility trends.

Family Planning Programs

To show the effect of institutionalized family planning programs on fertility, the letter F has been placed on the curve of each country in Graph 1 around the date when a program, if any, began at the national level. The date was set at the time when a national program began to function either directly sponsored by the government or, if run by a separate agency, facilitated in some way by the government (e.g., through the provision of family planning services in its public health clinics). Countries such as Cuba (Landstreet, 1971:111) which provide services but do not consider themselves to have a specific family planning program, are included.

Whatever may be the ultimate effect of the programs on fertility, all declining fertility countries except Cuba, which was undergoing other more radical changes at the same time (see Landstreet, 1971, and González, 1972 for discussions of fertility increasing and decreasing factors) seem to have started their fertility declines earlier than their family planning programs and those not declining do not yet show an appreciable overall effect using the statistics shown. Naturally, the heated debates in the early half of the 1960s which preceded the institutionalization of the programs in many Latin American countries (see Stycos, 1971) may have had a more important effect initially than the programs themselves. It should be noted that the conclusion concerning the small, if any, direct effects of the programs on the observed declines is not much affected by possible errors in the fixing of dates when the programs achieved "national coverage", since they can be in error by only a year or two. Furthermore, as seen in Column 14 of Table 2, the coverage of women in the reproductive ages, as measured by the sum of "new" acceptors over the period 1965-69, was quite low in most countries.

In Costa Rica and Chile, the percentages of women covered are rather high, but the declines appear to have begun well before the programs began functioning. Gómez notes that the importation of contraceptive pills into Costa Rica increased more than 100-fold, from 2,500 doses in 1961 to 250,000 in 1968, but indicates that a "very numerous" group of couples were obtaining the pills outside the official programs (1970:303).

Social and Economic Change

The tentative conclusions from the above discussion is that up to around 1960-70 family planning programs have not been directly instrumental in creating the fertility declines observed and that, therefore, one should seek to explain the declines in terms of social and economic changes taking place within the countries and external to them. The likely importance of the latter when analyzing Latin American fertility trends may be seen by observing in Graph 1 that there were larger changes in CBR levels around the times of the First World War and the Great Depression in those countries which were more dependent upon foreign markets and the inflow of foreign capital (see Collver, 1968:42 and 1965:33-34 for a discussion and evidence using standardized CBRs).

Given the magnitude of the earlier fertility declines in Cuba and Chile that are evident in the graph it seems probable that various groups in these countries were using some form of volitional fertility control before the present decline. Studies in Chile as far back as 1937 revealed rather high rates of induced abortion which are even higher at present (Raquena and Monreal, 1968). Some forms of fertility control, not health related and perhaps not explicitly volitional (e.g., through prostitution), may have existed earlier in other countries as well; certainly, as noted in the previous paragraph, in many of the countries the CBRs apparently did respond to changing conditions, in the particular instance probably through marriage postponement (Collver, 1965:52-54). One's orientation toward the explanation of the present fertility declines will be different if one assumes that reductions in fertility result primarily from the spread of a new social invention (i.e., the limiting of childbearing) rather than from a shift in social patterns through which the different social groups adjust their fertility, as they did in the past, to the conditions in which they live (for an expanded discussion see Carlsson, 1966).

Furthermore, the way in which the social classes or other groups in the various countries respond to a given change is likely to depend on qualitative differences among the societies as well as on quantitative differences. For example, Cuba, which has undergone vast structural changes since the 1959 Revolution, is unlikely to respond to a per capita income change in the same manner as another Latin American country which may have both the same level of and percentage change in per capita income; the meaning of per capita income and the distribution of income is too different.

Since it was impossible to directly treat these theoretical considerations, which would require special studies of the individual countries, the following should be considered a very preliminary study to see to what extent quantitative levels and changes in various socio-economic factors may be related to the declines. Indicators of the factors selected are shown in Columns 4 through 12 of Table 2. In the analysis that follows it should be

remembered that the indicators are at best representative of the factors and processes taking place and are not
the processes, themselves (see Rosen and Simmons, 1971, for an example of how education indirectly may affect
fertility through the effect it may have on the roles of women). In addition, it must be recognized that the
fertility trends studied here at the national level are weighted averages of the trends in the fertility levels
of the groups constituting the countries (see Mertens,1970,for a review of the literature on differentials).
Obviously the velocity at which the different groups change and the proportion each is of the total population will
affect the overall fertility trend.

Because of the deficiencies and uncertainties in the fertility decline measurement, only a simple descriptive
approach is taken without statistical analysis. Starting with the working hypothesis that there were fertility
declines in eleven high fertility countries, the eleven highest values on each variable were underlined in Table 2,
excluding Argentina and Uruguay from the total countries oligible.(When a socio-economic indicator was not available for
Cuba, only the ten highest values were underlined). If there is a perfect positive association between the
declines and an indicator, all eleven fertility decline countries should have values of the variable underlined,
that is, they will have the highest values. To check directly the hypothesis that there may be threshold values on
the indicators beyond which declines occur (United Nations,1965:148-150) it would have been desireable to show the
indicators for earlier dates as well, but due to space limitations only the values around 1970 and the change over
a recent time period could be shown; in fact, however, the results are essentially the same when, say, 1960 indi-
cator values are used.

Fertility declines appear to be reasonably correlated with all indicators except change in per capita income
and change in life expectancy; both are uncorrelated with fertility decline. The lack of correlation with
per capita income change is not surprising both because in the short-run per capita income increase may have a
positive effect on fertility, other things being equal (see e.g., Heer,1966), and because income and the gains in
income are distributed regressively in most Latin American countries (United Nations,1971:68-74). The highest
association is between fertility decline and the percentage of population 15-19 years old in secondary school.

Looking at the individual countries it is seen that the two countries with the largest declines each have all
but one of the values of the variables underlined. Excluding changes in life expectancy (since it does not appear
to be correlated with fertility decline), in Costa Rica all the indicators have high values. Of the "probable" and
"possible decline"categories of countries, Brazil and Venezuela have no more than one low value each. However,
Mexico, a very stable fertility country, also has only one low value -- that is, values on all the other indicators
are unexpectedly high. Perhaps it is significant that the stability of the GRR in Mexico results from compensating
changes in the ASFR; while fertility of the youngest age has fallen by 16 percent (the largest fall in all countries
in this age group), the older group (30-49) has gone up. This suggests that the different cohorts are reacting
differentially to the conditions present in Mexico. It will be of the greatest interest to watch the effect of the
family planning program beginning nationally in Mexico in 1973 because all the usual quantitative socio-economic
indicators of a declining fertility country appear to be present.

Not only does Mexico, a stable CBR country, have high values on all but one indicator, but another failure of
the indicators is that two declining fertility countries, El Salvador and Guatemala, have low values on most variables.

The conclusion that one may draw from this brief consideration of the indicators and from an examination of the
individual variable values is that while the apparent fertility declines may be somewhat associated with the factors
and processes discussed, declines may occur in the absence of high values, stability may exist in their presence and
that there are no clearly defined threshold values. The lack of threshold values is not unexpected, since the single
variable threshold theory ignores the other conditions in the countries and the likelihood of multiple causation;
it appears no more likely to hold in Latin America than it appears to have in the case of the European fertility
declines (see Van de Walle and Knodel, 1967). Hence, although the declines seem dependent upon social-economic
changes, the nature of these changes and their relationship to fertility within given contexts remains to be
determined.
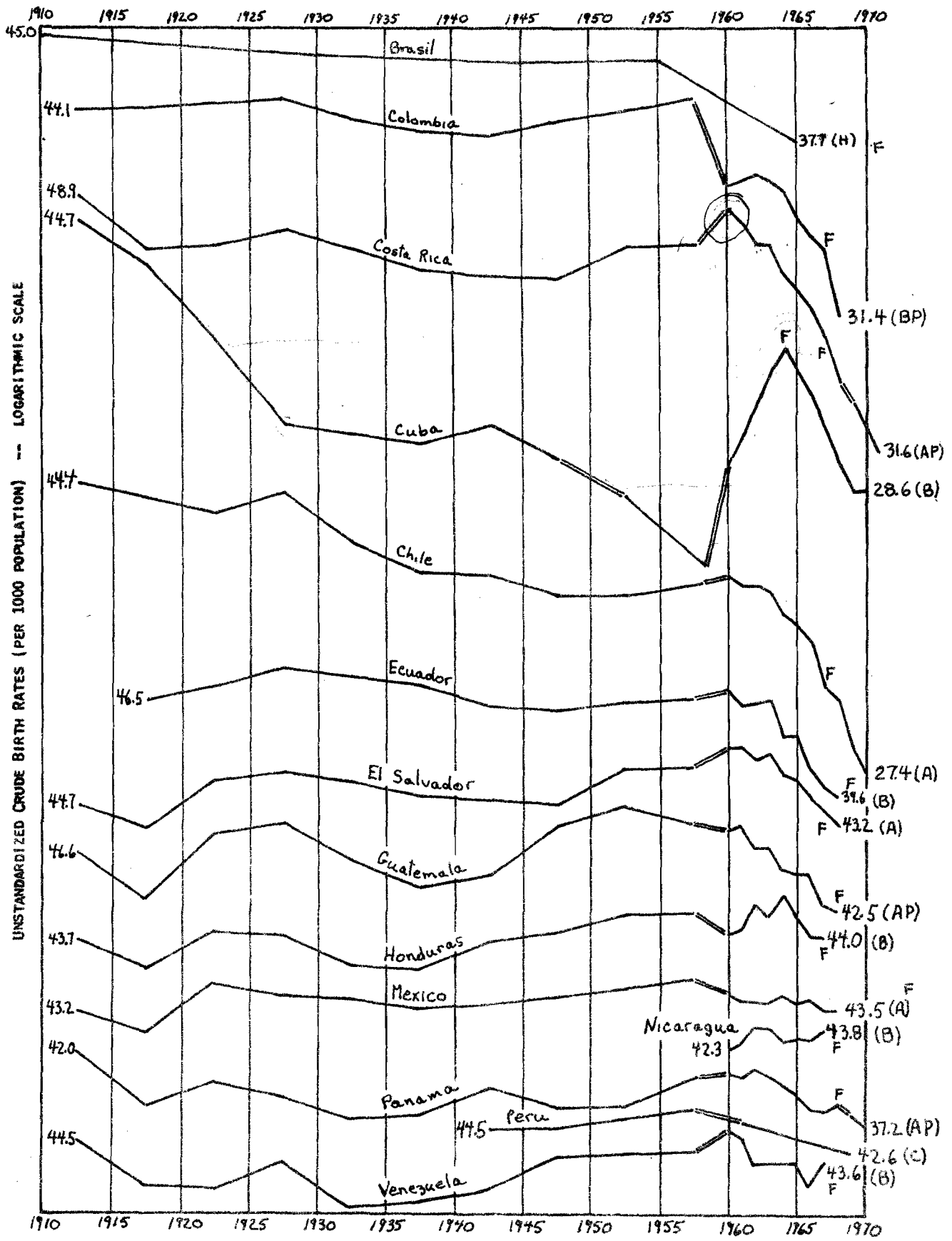
GRAPH 1. UNSTANDARDIZED CRUDE BIRTH RATE TRENDS IN SELECTED LATIN AMERICAN COUNTRIES, 1910-1970
THE CBRS ARE SHOWN FOR THE FIRST AND LAST POINT ON EACH CURVE; THE SYMBOLS IN PARETHESIS
REFER TO THE 1960-70 DATA QUALITY. P = LAST CBR IS PROVISIONAL. F = APPROX. DATE WHEN NATION-
AL FAMILY PLANNING PROGRAM BEGAN. EXPLANATORY NOTES AND SOURCES ARE LOCATED AFTER TABLE 2.

TABLE 1. TRENDS IN AGE SPECIFIC BIRTH AND GROSS REPRODUCTION RATES (GRR)
IN LATIN AMERICAN COUNTRIES (1950-1970)
(NOTES ARE LOCATED FOLLOWING TABLE 2)

AGE SPECIFIC RATES (PER 1.000 WOMEN IN AGE GROUP)

COUNTRY	YEAR	BASIS	GRR	15-19	20-24	25-29	30-34	35-39	40-44	45-49	SOURCE
ARGENTINA..1955	1955	AGM	1.54	60.0	161.3	175.4	119.4	78.1	30.3	7.4	CAMISA, 1965: 31
	1960	AGM	1.46	56.5	158.0	167.9	116.0	67.8	26.3	6.5	IBID
	1965	AG .	1.50	59.1	161.5	170.1	124.5	70.1	25.3	5.8	CERISOLA, N.D.; HENRIQUES, 1969
BOLIVIA....1960	1960	DH	2.98	77.0	234.0	276.0	259.0	220.0	117.0	40.0	SOMOZA, N.D.; MACCIÓ, 1969
BRAZIL.....1945	1945	HGN	2.81	95.4	242.4	279.8	242.7	173.4	90.7	28.9	ARRETX, 1972
	1955	HGN	2.75	94.0	245.7	276.6	237.5	163.1	86.6	25.2	IBID
	1965	HGN	2.63	90.4	243.7	274.5	226.3	148.3	72.3	21.0	IBID
COLOMBIA...1951	1951	DJL	2.88	102.9	305.4	332.4	212.6	161.4	60.2	7.7	ARÉVALO, N.D.; MACCIÓ, 1969
	1965	BJL	3.20	97.1	291.3	249.9	257.5	212.4	76.4	27.3	ECLA, 1960; HENRIQUES, 1969
COSTA RICA.1950	1950	AGL	3.16	101.0	306.9	331.6	254.8	201.5	82.9	15.1	GÓMEZ, 1964: P.20
	1958	AGL	3.46	118.0	353.0	361.0	275.0	209.0	87.0	16.0	GÓMEZ, 1970: 295
	1960	AGL	3.59	115.0	354.0	373.0	305.0	218.0	90.0	16.0	IBID
	1961	AGL	3.53	115.0	340.0	359.0	300.0	220.0	99.0	16.0	IBID
	1962	AGL	3.42	112.0	326.0	349.0	291.0	215.0	95.0	16.0	IBID
	1963	AGL	3.41	116.0	325.0	344.0	284.0	221.0	94.0	16.0	IBID
	1964	AGL	3.25	112.0	308.0	326.0	268.0	214.0	89.0	16.0	IBID
	1965	AGL	3.17	111.0	299.0	317.0	256.0	211.0	88.0	16.0	IBID
	1966	AGL	3.05	110.0	288.0	299.0	243.0	209.0	86.0	15.0	IBID
	1967	AGL	2.88	109.0	275.0	278.0	228.0	193.0	85.0	14.0	IBID
	1968	AGL	2.65	105.0	257.0	251.0	212.0	171.0	78.0	12.0	IBID
	1969	AGLP	2.53	106.0	251.0	240.0	196.0	160.0	72.0	12.0	JIMÉNEZ, 1972
	1970	AGLP	2.41	105.0	242.0	229.0	188.0	145.0	68.0	13.0	IBID
	1971	AGLP	2.24	101.0	231.0	211.0	172.0	130.0	65.0	10.0	IBID
CHILE......1952	1952	AG	2.20	73.4	213.2	218.2	179.3	135.0	65.9	17.8	ZUBICUETA, 1971: TABLE 34
	1955	AG	2.38	78.1	215.4	260.2	195.2	137.8	72.4	17.7	IBID
	1960	AG	2.51	84.4	229.5	261.9	227.4	145.8	64.7	15.4	IBID
	1961	AG	2.53	86.8	226.6	264.1	235.5	146.9	61.5	13.7	IBID
	1962	AG	2.52	84.9	230.5	257.1	236.5	147.0	64.7	13.1	IBID
	1963	AG	2.48	86.5	238.9	242.3	222.4	149.7	64.4	11.6	IBID
	1964	AG	2.39	84.2	234.5	236.5	205.7	147.2	61.3	10.8	IBID
	1965	AG	2.33	84.9	228.6	231.9	191.3	148.8	60.0	10.9	IBID
	1966	AG	2.15	85.4	226.4	229.7	128.2	143.8	58.9	10.1	IBID
	1967	AG	2.10	82.9	216.1	211.2	159.8	127.5	53.9	9.3	IBID
	1968	AG	1.97	78.9	207.8	201.7	146.3	112.9	52.8	8.4	IBID
	1969	AG	1.89	78.8	199.8	193.9	139.9	103.9	49.4	8.2	IBID
	1970	AG	1.78	77.5	191.5	187.6	131.2	89.2	45.7	7.9	IBID
CUBA.......1953	1953	BGHL	2.06	104.0	166.0	160.0	141.0	117.0	95.0	62.0	MEZQUITA, N.D.; HENRIQUES, 1969
	1965	BL	2.22	146.1	264.9	212.1	147.7	99.1	31.5	7.2	UNITED NATIONS, 1972: 73
DOMIN..REP.1950	1950	BGIL	3.39	118.2	319.6	309.2	265.9	208.9	109.6	59.1	MELLON, 1966
	1960	BGI	3.51	126.5	330.2	366.9	295.8	209.1	93.0	18.8	RAMÍREZ, 1969
	1970	BGL	3.46	127.8	305.3	330.9	301.0	227.1	102.2	25.6	GARCÍA, A, 1972

Table 1. Trends in Age Specific Birth and Gross Reproduction Rates (GRR)
in Latin American Countries (1950-1970) (Continued)
(Notes are located following Table 2)

COUNTRY	YEAR	BASIS	GRR	\multicolumn{7}{c}{Age Specific Rates (per 1.000 women in Age Group)}	SOURCE

COUNTRY	YEAR	BASIS	GRR	15-19	20-24	25-29	30-34	35-39	40-41	45-49	SOURCE
ECUADOR....1955		BGL	3.10	112.3	326.6	313.5	248.7	183.6	70.3	16.0	NIETO, 1964
	1960	BG	3.35	106.0	300.0	337.3	279.9	229.8	90.2	28.5	MERLO, 1969 : 23
	1965	BG	3.26	100.9	307.8	331.2	258.1	225.5	86.8	27.5	MERLO, 1969 : 23
ELSALVADOR.1950		AG	2.97	135.0	296.0	320.1	249.3	145.9	58.4	14.1	ARRETX,1967A: 7
	1961	AG	3.35	146.2	335.4	326.6	272.9	200.3	74.4	17.0	IBID
	1966	A	3.19	144.3	330.3	288.5	238.7	204.4	65.2	34.5	UNITED NATIONS, 1972: 73
GUATEMALA..1950		AG	3.23	164.4	285.7	298.1	258.6	197.1	86.9	35.8	CELADE, (A/72); HENRIQUES, 1969
	1964	AGI	3.19	150.3	308.9	301.0	257.9	185.3	82.7	22.9	IBID
HAITÍ......1960		D	3.00	113.0	274.0	294.0	259.0	187.0	89.0	14.0	MORALES, N.D.; MACCIÓ, 1969
HONDURAS...1951		DGL	3.39	166.2	333.4	335.7	284.0	166.0	82.5	22.9	ARRETX, 1967B:11
	1961	BGL	3.52	167.1	324.5	350.8	279.0	204.7	94.5	24.1	IBID
	1966	BGL	3.45	155.6	321.1	345.1	274.4	203.3	91.9	24.1	CELADE
MEXICO.....1939		AGLM	3.10	122.5	317.6	319.5	237.1	155.7	\multicolumn{2}{c}{58.9Q}	CEED, 1970: 54
	1953	AGLM	3.13	120.0	302.0	313.5	258.6	162.5	\multicolumn{2}{c}{63.7Q}	IBID
	1960	AGLM	3.16	104.8	299.3	317.5	269.3	200.8	\multicolumn{2}{c}{51.6Q}	IBID
	1965	AGLM	3.23	100.2	303.9	324.0	251.1	211.2	\multicolumn{2}{c}{67.9Q}	IBID
	1967	AGL	3.19	96.3	301.0	318.0	245.6	207.3	\multicolumn{2}{c}{69.7Q}	IBID
	1970	AGL	3.20	88.9	278.8	318.6	269.5	201.4	\multicolumn{2}{c}{77.6Q}	BENÍTEZ, 1972
NICARAGUA..1950		DIL	3.02	149.0	304.0	308.0	223.0	169.0	77.0	10.0	MACCIÓ, 1969: 14
	1963	BGL	3.28	147.8	349.3	356.2	238.1	165.5	75.2	12.3	MACCIÓ, 1967: 17
	1970	BGPL	3.46	129.0	300.5	335.4	290.0	207.6	118.3	39.2	GARCÍA,A;1972
PANAMA.....1957		A	2.59	145.0	298.0	277.0	174.0	124.0	33.0	9.0	MASCARÍN, 1972
	1960	A	2.66	143.0	296.0	279.0	193.0	127.0	42.0	9.0	IBID
	1962	A	2.73	152.0	304.0	285.0	198.0	131.0	42.0	8.0	IBID
	1965	A	2.63	142.0	296.0	272.0	187.0	131.0	41.0	8.0	IBID
	1967	A	2.58	140.0	290.0	264.0	189.0	127.0	41.0	8.0	IBID
	1968	A	2.60	137.0	291.0	260.0	193.0	131.0	45.0	9.0	IBID
	1969	A	2.52	135.0	281.0	255.0	189.0	126.0	40.0	9.0	IBID
	1970	AP	2.47	134.0	274.0	246.0	183.0	123.0	44.0	9.0	IBID
PARAGUAY...1960		DGHL	3.20	128.7	279.8	346.6	263.8	161.8	93.5	37.6	VIDAL, 1969: 10
PERU.......1940		DGL	2.93	85.0	281.0	292.0	246.0	179.0	90.0	27.0	CEPD, 1972A: 145
	1961	BGL	3.11	101.0	298.0	314.0	255.0	193.0	87.0	28.0	CEPD, 1972B: 148
	1969	CG	3.01	87.0	255.0	324.0	273.0	176.0	76.0	45.0	CEPD, 1972B
URUGUAY ...1950		DGIL	1.24	46.8	132.0	135.2	100.5	66.3	25.5	3.3	CATALDI,1964: 19
	1963	BGL	1.42	60.4	167.0	161.6	104.9	58.5	26.0	3.9	GARCÍA,A,N.D.
VENEZUELA..1950		DL	2.54	53.8	276.4	277.5	217.3	144.7	52.4	20.1	MACCIÓ, 1969: 20
	1960	BGL	2.95	124.7	308.5	303.6	223.9	173.5	59.5	13.9	MORALES,1969: 23
	1965	BL	2.98	125.9	296.6	303.6	228.6	186.4	64.0	17.6	UNITED NATIONS, 1972: 74

TABLE 2. LATIN AMERICAN COUNTRIES BY FERTILITY TREND AND BY SOCIO-ECONOMIC INDICATORS
(THE UNDERLINING OF THE INDICATOR VALUES IS EXPLAINED IN THE TABLE NOTES ON NEXT PAGE AND TEXT; ARGENTINA AND URUGUAY ARE EXCLUDED FROM THIS ANALYSIS)

PRESENCE OR ABSENCE OF CBR DECLINE DURING 1960-1970 (1)	CBR LATEST c.1968 (2)	TOT. POP. (EST.) 1970 (000) (3)	LIFE EXP FROM BIRTH Eo c.1965-69 (4)	% CHANGE 1950-67 (5)	URBANIZATION % POP IN CITIES 20000+ EST. 1970 (6)	ABS. DIFF. 1950-70 (7)	% PEA NOT IN AGRIC. c.1960 (8)	EDUCATION % LITERATE OF POP 14+ c.1968 (9)	% IN SEC.SCH. OF POP 15-19 c.1965 (10)	PER CAPITA INCOME (1960 US$) US$ 1970 (11)	ANNUAL % CHANGE 1960-70 (12)	FAMILY PLANNING PROGRAM DATE NATIONAL LEVEL BEGAN (13)	% WFA ATTENDED 1965-69 (14)
1. DECLINE 10% OR MORE													
A. CLEAR DECLINE													
COSTA RICA	31.6 AZP	1736	65.1	13.2	32.3	11.1	42.2	85.8	31.3	612	3.3	1967	9.8
CHILE	27.4 AY	9717	60.9	11.3	57.0	18.3	65.6	89.6	36.3	667	1.9	1967	15.7
B. PROBABLE DECLINE													
COLOMBIA	31.4 BJP	22160	58.5	10.8	43.0	22.0	43.7	72.9U	23.8	396	1.8	1967	1.6
CUBA	28.6 BY	8341	66.8	....	47.5	12.3	57.8	....	29.7	....	....	1964	0.4
ECUADOR	39.6 B	6028	57.2	12.8	32.9	15.2	36.9	72.0	20.0	343	1.8	1969	0.1
GUATEMALA	42.5 AP	5282	50.9	14.3	17.7	7.4	26.9	37.9T	9.8	358	2.2	1968	1.7
EL SALVADOR	43.2 A	3441	54.9	6.4	19.5	7.0	28.9	50.8	18.8	354	2.5	1967	5.3
BRAZIL	37.7 HTN	93245	60.3	29.9	39.3	18.2	49.6	69.6	25.9	419	3.0	1971	0.3
PANAMA	37.2 AYP	1406	63.4	1.9	39.5	16.0	43.1	78.3	45.1	735	4.5	1968	3.5
2. POSSIBLE DECLINE 5-10%													
VENEZUELA	43.6 BV	10755	63.7	8.9	56.4	25.5	62.0	85.0	31.0	891	2.1	1968	0.7
PERU	42.6 CX	13586	58.0	1.0	32.5	14.3	45.2	67.0	25.9	402	1.8	NONE	0.3
3. NO APPARENT DECLINE													
A. PROBABLE STABILITY													
DOMINICAN REPUBLIC	46.3 BYP	4348	52.1	17.5	27.6	17.3	32.4	53.1	16.2	246	0.4	1968	1.7
HONDURAS	44.0 BV	2583	48.9	24.5	15.4	8.6	24.1	47.0R	8.6	240	2.0	1967	4.0
MEXICO	43.5 A	50718	62.4	21.8	40.5	15.6	41.1	77.5	17.9	716	3.5	1973	0.2
NICARAGUA	47.1 BYP	2021	49.9	26.6	24.6	10.4	29.1	49.8T	12.9	388	4.1	1968	2.0
B. POSSIBLE STABILITY													
BOLIVIA	43-45 DS	4658	45.3	9.9	23.3	3.6	47.2Q	39.8	22.5	212	3.1	NONE	0.2
HAITI	45-50 DS	5229	44.5	26.7	6.9	2.2	13.4Q	18.8	5.7	89	-1.7	1970	1.3
PARAGUAY	42-45 DS	2419	59.3	8.3	20.9	5.4	38.7	69.0	16.8	299	1.4	1970	0.4
4. LOW FERTILITY													
ARGENTINA	22.3 AVP	24352	67.4	10.1	66.8	15.1	77.2	91.4R	51.4	1109	2.5	NONE	0.5
URUGUAY	21.7 B	2889	69.2	0.4	70.1	24.6	77.0	89.4T	53.7	743	-0.1	1962	1.0

SEE EXPLANATORY NOTES AND SOURCES ON NEXT PAGE.

Notes and Sources for Graph 1 and Tables 1 and 2

The symbols have the same meaning on the graph and in both tables.

A. "Complete" birth registration (UN,1972;Camisa,1968).
B. "Incomplete" birth registration but not so deficient as to be useless for identifying trends (UN, 1972; Camisa, 1968).
C. National fertility survey in Peru (N=3300).
D. Birth registration unsuited for trend determination.
F. Date national family planning program began.
G. Corrections made in data when necessary.
H. Only census data used; Brazil calculated without assuming constant fertility.
I. Distribution of births by age of mother unavailable; used data from closest date.
J. Based on Baptisms recorded in Catholic registers.
L. Births tabulated by year of registration rather

than occurrence.
M. Three-year average centered on date shown.
N. Ten-year average centered on date shown.
P. Provisional
Q. 40-49
R. 1960
S. 1962
T. 1963
U. 1964
V. 1967
W. 1968
X. 1969
Y. 1970
Z. 1971

Graph 1.

Sources. A change in the source of data for the CBR curve of a country is shown by a double line (═). For national level family planning program dates see Table 2.

1905-59: five year averages for all countries (Cuba 1905-49) from Collver (1965:27-28), except Brazil and Nicaragua.

1960-latest: single year for all countries, Panama (1960-68) from United Nations (1972:70), except Brazil, Costa Rica, Cuba, Chile and Peru.

Brazil: averages for 1900-19, 1920-39, 1940-49, 1950-59, 1960-69 from CEBRAP (1972, Table 1).

Costa Rica: single year 1960-68 from Gómez (1970:295) and 1969-71 from Jiménez (1972).

Cuba : 1950-59 five year averages from Miró (1968:7) and single year 1960-70 from Cuba (1972).

Chile: single year 1960-70 from Zubicueta (1971: Table 34).

Panama: single year 1969-70 calculated from ASFR (Mascarín, 1972) and provisional results of 1970 Census.

Countries excluded from the graph: see text for explanations.

Table 1. The crude birth rate (CBR) is the number of live births occuring during a given year per 1000 total population at the midyear. The age specific fertility rates (ASFR) are the number of live births to women in ages x to (x+5) in a given year per 1000 mid-year number of women of the same age group. The gross reproduction rate (GRR) is the average number of female live births that would be born to a birth cohort of women all surviving to age 50 and having their births according to the ASFR prevailing in a given year.

Table 2.

Underlining: To study the relations of the indicators to fertility decline, the eleven highest values of each indicator are underlined, since eleven countries were presumed to have had declines during the 1960's. When missing a value for Cuba only ten countries are underlined. The two low fertility countries, Argentina and Uruguay, were excluded.

Sources. See the original sources for additional details.

Cols.
1. Countries organized according to the observed percentage CBR change during the 1960's and the certainty of a fertility decline or of stability. See text for category definitions.
2. Crude Birth Rate: as shown on Graph 1 except where note indicates a later date.
3. Estimated 1970 total population: CELADE (1972b).
4,5. Life expectancy from birth: 1950 data (ECLA,1971:75) of variable quality; 1965-69 (CELADE,1971:47-48).
6,7. Urbanization: ECLA (1972a:28).
8. Percent of Population Economically Active not in Agriculture: OIT (1965).
9,10. Education: ECLA (1971:76); ECLA (1969:34).
11,12. Per Capita Gross Internal Product in 1960 U.S. dollars at market prices: ECLA (1972b: Table 3). Col. 12 is the exponential annual percent change.
13,14. Family Planning Programs: Dates of institutionalized national level programs (see text for definition) from discussions with M.L. García of CELADE. The percentage attended of women aged 15-49 based on the sum of "new" acceptors in private and governmental family planning clinics, 1965-69 (García, 1970:397).

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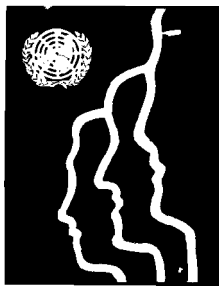
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