MORTALITY AND HEALTH POLICY */

1.   It is difficult for the representative of CELADE to prepare an effective and useful contribution that suits the items included in the Annotated Provisional Agenda for the Symposium on Mortality and Health Policy. Those responsible for the elaboration of the Agenda and those responsible for the ECLA-CELADE work programme were obviously pursuing two quite different objectives.

The drafters of the Agenda have in mind interesting and valuable studies which -if it were possible to carry them out- should be taken into account by those who plan socio-economic development policies. For us in ECLA-CELADE who work in developing countries in Latin America, the implementation of such studies is illusory: on the one hand, there is not enough information to carry out sound studies aimed at establishing the interrelationships (or simple associations) included in the Agenda, while on the other hand, in most of our countries no such thing as a realistic socio-economic development policy exists, due mainly to the prevalent politic and economic instability.

We are convinced of the existence of interrelationships between socio-economic development and mortality, but we cannot provide answers, quantified with reliable data, to such questions as: 'What is the role of development in eliciting or retarding mortality reduction?'; 'What are the effects of development-related changes in the environment and in life styles on health and mortality?'; and other questions included in point 4 of this Agenda.

2.   This paper presents what we know about mortality in Latin American countries in terms of present levels, trends and some few differentials.

In some cases the knowledge is reliable, in other cases the estimates are plausible, and in others, though still plausible, they are of dubious value. We believe that this presentation is both basic and useful for studies of inter-relationships such as those mentioned in the Agenda (which, I would like to insist, are very interesting). Those who undertake studies of the nature suggested in the Agenda might benefit from this summary view of where our present knowledge of mortality stands.

We believe it is fundamental to present a panorama on:

a) The quality of information available in most of our countries;
b) The levels of mortality (it is our understanding that we know the level if we are able to determine, through any procedure, a life table);
c) Mortality trends, in terms of selected indicators;
d) Differentials by sex;
e) Other differentials, particularly those related to childhood mortality; and
f) Causes of death, though this matter has not been studied systematically (i.e., for the majority of countries covered by CELADE) as is the case of the other above-mentioned points.

3.   It seems appropriate to make some comments on the extent and depth of this paper:

i) The poor quality of the available data in most Latin American countries seriously limits any sound analysis of mortality, even if restricted to determining some simple indicators.

/ii) Our

ii) Our work programme gives first priority to helping countries to assess their demographic situation. Consequently, we must prepare estimates and projections on levels and trends of mortality, fertility and migration for all the Latin American countries. These tasks imply the evaluation of all sources of information, the testing of different methods, and the analysis of findings, taking into account other social and economic variables, as well as avoiding any inconsistency among demographic variables. This is a permanent activity at CELADE and allows us to keep updated demographic estimates for the countries of the region. It absorbs a large proportion of our resources, however, and has thus prevented us from conducting studies in line with the approaches reflected in the Agenda.

a) Quality of information

We must insist again on the weak statistical base available in developing countries for making reliable estimates on levels, trends and differentials of mortality, because we wish to emphasize how far we are from the possibility of conducting studies on such subjects as "alternatives for health intervention programmes, ranging from selective cause-specific programmes to more comprehensive multi-cause programmes", this being an item in the Agenda (5).

It is worth pointing out, however, that the situation varies among countries and over time. Indeed, paradoxical conditions are shown by some countries. We have improved enormously in the knowledge of mortality in some countries where almost nothing was known until the 1970s, this improvement being due to the application of indirect demographic methods, developed during the last two decades, to data collected in population censuses and surveys (1, 2, 3). On the other hand, countries that traditionally have kept reasonably acceptable registers of births and deaths, and whose censuses have been considered of good quality, have suffered a deterioration on the quality of their statistics during some periods. Cases such as those of Argentina, Mexico and Brazil illustrate this point.

It is difficult to establish uniform criteria for classifying countries according to the reliability of their data. The procedures to evaluate basic data need information from independent sources. They cannot be used in most countries of our region, either because there are no available independent sources of data, or, if they exist, the information they provide is not adequate.

In consequence, direct objective criteria and other kinds of evidences -sometimes of a type which seems rather subjective- will be used to define the reliability of the mortality estimates.

Two factors are taken into account when deciding on the accuracy of an estimate:

i) The methods of estimation, determined by the availability of data in terms of quantity, quality and timeliness. They can be direct, when the available information on births, deaths and population allows this approach, or indirect, using non-traditional information or simple models adopted for a particular situation.

/We strongly

We strongly maintain that no method, with its complex underlying hypotheses, can replace the original data, if available and accurate. Common sense must dictate the selection of the best method to be applied in each case.

ii) Consistency of estimates with other indicators (demographic and socio-economic). It happens sometimes that while mortality estimates may be based on weak information, they are nevertheless able to provide a plausible value, to describe a trend, and even to determine some relevant differentials.

Let us examine how the utilization of the two points above permits the classification of countries into different categories.

As mentioned earlier, it is assumed that the mortality of a country (area, region or subgroup of a population) is known if a life table can be prepared or, what amounts to the same thing, if sufficient indicators or parameters can be derived in order to construct a life table. Traditional data sources for mortality estimates are registers of deaths -as numerators- and the population enumerated in a census -as denominators-, both data being classified by age, and if possible by sex.

The evaluation of methods of registering births and deaths, as well as those applied in population censuses, permits us to conclude that mortality estimates for Argentina, Chile, Uruguay, Venezuela, Costa Rica, Cuba and Mexico (4) are reasonably accurate. According to CELADE's estimates, the population of these seven countries represented 40% of the total of the region in 1980.

This reasonable accuracy has not necessarily remained the same throughout time. There is evidence, for example, that some deterioration has occurred in both Argentina and Mexico, and for some periods there is no information about the annual number of births and deaths. In other cases, as for example, in Chile and Costa Rica, recent census information is not available (in Costa Rica the population census has not yet been carried out), but registers on annual deaths are available. To solve these problems, we have interpolated the series on deaths for Argentina and Mexico, and extrapolated the population estimates for Chile and Costa Rica. In this way we have produced updated estimates on mortality.

In short, in these seven countries life tables have been constructed following orthodox methods. However, we do not mean that these procedures are the best for all cases and for all types of mortality research. In fact, in the rest of the countries -the majority- indirect techniques are generally employed in the analysis of mortality.

Mortality estimates for Brazil, Ecuador, Peru, Guatemala and Panama, where different procedures have been used, could be accepted as plausible. They represent mortality estimates which are consistent with the fertility estimates and sex-age distribution of the population. When we impose consistency we are introducing, to some extent, arbitrary criteria or subjective judgement, supported by common sense. The population of these five countries was 44% of the total of Latin America.

For the rest of the countries (Bolivia, Colombia, Haiti, El Salvador, Nicaragua, Dominican Republic, Honduras and Paraguay), the mortality estimates are

/uncertain, being

uncertain, being derived from data of poor quality. Among them there is a diversity of situations. When examining each case this circumstance should be borne in mind.

b)   Level of mortality

In table 1 expectation of life at birth ($\overset{o}{e}_o$) and infant mortality rates (IMR) are presented, by countries, for the three groups defined according to the reliability of their estimates. Values of these two indicators are given for quinquenniums between 1950-1955 and 1980-1985 (roughly a documentation of recent past trends) and for 1995-2000 (a set of possible projected values).

Let us concentrate our attention first on the most recent estimates, i.e., those corresponding to 1975-1980.

In the following auxiliary table 1-A, we indicate the years to which the basic data used to derive the most recent estimate correspond, the source of that data, and the method used in each country.

It is no accident that the highest values of $\overset{o}{e}_o$, and the lowest values of IMR, correspond to the first group of countries, i.e., the ones we consider to have reliable information. There is an obvious association between level of mortality and socio-cultural and economic development, and countries of the first group are, in general and relatively, in a better condition than the rest.

The second group is more heterogeneous than the first one. A difference of 12.1 years between the highest and the lowest $\overset{o}{e}_o$ is observed (as opposed to 8.7 years in the first group). It is surprising to see Panama in this group, since it has a relatively high standard of living. The last review of the mortality estimates, however, indicates that a deterioration in the registration of deaths has taken place in recent years.

The uncertainty of the estimates in the last group could explain, partially, the enormous differences between levels of mortality by countries. In the extreme case, Bolivia with 48.6 and Paraguay with 64.1 years illustrate the point (the difference amounts to 15.5 years).

If a weighted average is computed for each group, with population as the weighting factor, we obtain 66.2, 61.1 and 59.0 years, for the first, second and third groups, respectively. These differences between the averages could have been anticipated since, as mentioned above, there is a clear association between reliability of information and economic and socio-cultural development. It should be borne in mind, however, that a larger margin of error affects the average values of the last two groups.

If we carry out the same exercise with the IMR, we obtain weighted averages of 51.3, 80.0 and 80.3 per thousand for the first, second and third groups, respectively.

Since the IMR is a more sensitive demographic indicator of socio-economic conditions than $\overset{o}{e}_o$, the differences between the first and second groups of countries could reflect a true difference. The lack of difference between the second and the third group is most likely spurious and due simply to the fact that the IMR levels, in the latter group, are grossly underestimated.

/Table 1

Table 1

LATIN AMERICA: LEVELS OF MORTALITY IN TERMS OF: a) EXPECTATION
OF LIFE AT BIRTH, IN YEARS (BOTH SEXES), b) INFANT MORTALITY
RATES (IMR) PER THOUSAND (BOTH SEXES), FOR
QUINQUENNIUMS BETWEEN 1950-1955 AND
1980-1985, AND 1995-2000

	1950-1955	1955-1960	1960-1965	1965-1970	1970-1975	1975-1980	1980-1985	1995-2000
a) Expectation of life at birth, in years								
Argentina	62.7	64.7	65.5	66.0	67.3	68.7	69.7	72.0
Chile	54.1	56.1	57.6	60.5	64.2	65.6	67.0	70.6
Uruguay	66.3	67.2	68.4	68.6	68.8	69.6	70.3	72.1
Venezuela	52.3	55.7	58.9	61.8	64.5	66.2	67.8	70.9
Costa Rica	57.3	60.1	63.0	65.6	68.1	71.4	73.0	74.4
Cuba	58.8	61.8	65.1	68.5	70.9	72.7	73.4	74.7
Mexico	50.8	55.4	58.6	60.3	62.2	64.0	65.7	69.6
Brazil	51.0	53.4	55.9	57.9	59.8	61.8	63.4	67.5
Ecuador	46.9	49.6	51.9	54.6	57.1	60.0	62.6	69.0
Peru	43.7	46.2	48.8	51.3	55.0	57.1	59.1	64.3
Guatemala	42.7	45.4	48.2	51.2	54.6	57.8	60.7	68.0
Panama	55.3	59.3	62.0	64.3	66.4	69.2	70.7	73.2
Bolivia	40.4	41.9	43.4	45.1	46.7	48.6	50.7	59.4
Colombia	50.6	53.5	56.2	58.4	60.4	62.2	63.6	66.9
Paraguay	51.9	54.5	56.6	59.6	63.1	64.1	65.1	67.8
El Salvador	45.3	48.8	52.3	55.9	59.1	62.2	64.8	71.3
Haiti	37.6	40.7	43.5	46.2	48.5	50.6	52.7	58.4
Honduras	42.2	45.0	47.9	50.9	54.1	57.1	59.9	67.8
Nicaragua	43.0	45.5	47.9	50.4	52.9	55.2	57.6	64.7
Dominican Republic	45.1	49.1	52.6	55.3	57.9	60.3	62.6	68.1
b) Infant mortality rates (IMR), per thousand								
Argentina	65.9	60.3	59.7	57.4	49.0	40.5	36.0	26.1
Chile	127.2	117.0	107.0	89.8	72.0	62.3	54.0	35.1
Uruguay	57.4	53.6	47.9	47.1	46.3	41.6	37.5	28.9
Venezuela	110.9	92.2	76.9	64.9	52.4	44.8	38.6	27.7
Costa Rica	88.6a/	81.6a/	70.6a/	60.3a/	67.1a/	29.6	20.2	16.3
Cuba	79.0b/	34.0b/	38.7b/	39.2b/	(33.8	22.5	20.4	15.8}c/
Mexico	113.9	97.7	86.3	78.5	69.3	60.5	53.0	36.7

/Table 1 (conclusion)

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	1950-1955	1955-1960	1960-1965	1965-1970	1970-1975	1975-1980	1980-1985	1995-2000
Brazil	134.7	121.9	109.4	100.1	90.5	78.7	70.6	50.6
Ecuador	167.7	147.6	132.3	114.5	100.0	83.2	68.8	38.5
Peru	195.1	173.4	152.2	132.7	106.5	93.4	81.9	71.7
Guatemala	131.0a/	130.7a/	128.1a/	115.3a/	90.2	79.0	67.7	40.4 ⎫
Panama	70.2a/	61.3a/	55.5a/	46.7a/	43.8	36.2	32.5	25.3 ⎬c/
Bolivia	175.7	169.7	163.6	157.5	151.3	138.2	124.4	74.4
Colombia	123.2	102.2	84.5	74.2	66.9	59.4	53.3	40.5
Paraguay	105.7	91.2	80.6	66.9	52.6	48.6	45.0	35.7
El Salvador	-	-	-	-	101.0	84.8	71.0	42.2c/
Haiti	219.6	193.4	170.5	150.3	134.9	120.9	108.1	76.8
Honduras	-	-	-	-	110.7	95.4	81.5	46.3 ⎫
Nicaragua	-	-	-	-	108.9	96.5	84.5	51.4 ⎬c/
Dominican Republic	-	-	-	-	83.6	73.1	63.5	41.8 ⎭

a/ G. Feeney, J. Chackiel and E. Taucher, Mortalidad al comienzo de la vida. Paper presented to the Latin American Panel. Unpublished.

b/ IMIAL, Cuba.

c/ The values $\overset{o}{e}$ and q_0 come from the estimates prepared by CELADE, except those marked c/, whose values correspond to a work entitled Infant mortality rates: estimates and projections by country and region, 1970-2000, prepared by the United Nations Population Division.

Table 1-A

Countries	Years to which the most recent information on deaths from the vital statistics corresponds	Census base of the estimate of population by age	Methods used
Group 1			
Argentina	1976-1979	1980	Direct
Chile	1971-1974	1970	Direct
Uruguay	1974-1976	1975	Direct
Venezuela	1969-1971	1971	Direct
Costa Rica	1979-1981	1973	Direct
Cuba	1977-1978	1980	Direct
Mexico	1969-1970	1970	Direct
Group 2			
Brazil	1976-1980	1980	Growth Balance Equation (GBE) for adult mortality. Proportion of dead children for child mortality
Ecuador	1970-1975	1972	GBE for adult mortality. Proportion of dead children for child mortality
Peru	1970-1975	1972	GBE, proportion of dead children and other indirect procedures applied to results of the National Demographic Survey (Prospective and Retrospective), 1974-1976 and the National Fertility Survey, 1977-1978
Guatemala	1972-1973	1973	GBE for adult mortality. Proportion of dead children for child mortality
Panama	1975-1980	1980	Direct

Group 3

In the rest of the countries indirect procedures were applied to different information provided by censuses and some surveys.

/c) Mortality

c)   Mortality trends

Table 1 above shows the mortality trends in terms of $\overset{o}{e}_o$ and IMR, for both sexes. The values are self-explanatory.

A glance at figures 1, 2 and 3 gives an overall picture of mortality trends. They show the expectation of life at birth, for both sexes, separately for each of the three groups of countries.

We can see that the historical trend in the first group of countries is more irregular than in the others. This can be easily explained because in these countries the estimates, being closer to reality than in the others, reflect patterns that are probably true. In the countries in group 2, the trends reflect the adjustments imposed on defective data rather than the real historical trend. This same reason explains the extraordinary regularity presented by the countries included in the third group.

What can we expect about mortality levels by the end of the century in the Latin American countries? The projections must be taken with caution, particularly those for countries where present mortality levels are uncertain.

In order to project the mortality it is assumed that:

- countries with a moderate level of mortality at present will continue the declining trend at a slower rate than in the past;
- countries with a high or moderately high current level of mortality will experience a more rapid decrease than those of the other group.

Consequently, we anticipate that by the end of this century the expectation of life at birth will show lower dispersion among countries. For example, 58.4 years is the lowest value, estimated for Haiti, and 74.7, the highest, for Cuba. That means a difference of 16.3 years instead of the 24.1 years estimated for the quinquennium 1975-1980, between these two same countries.

Regarding IMR, the projected values for the quinquennium 1995-2000 reflect substantial declines, particularly in countries like Ecuador (54% of the present value), Honduras (51%) and El Salvador (50%). However, basic data for these countries are rather weak, and so are the projected values.

If we limit our attention to the first group of countries, the decrease in IMR will range between 30% (for Cuba) and 45 (for Costa Rica). In this same group of countries the greatest difference will be between Mexico (36.7 per thousand) and Cuba (15.8 per thousand), that is to say, almost 21 per thousand. At present (say 1975-1980) the difference between them is about 38.
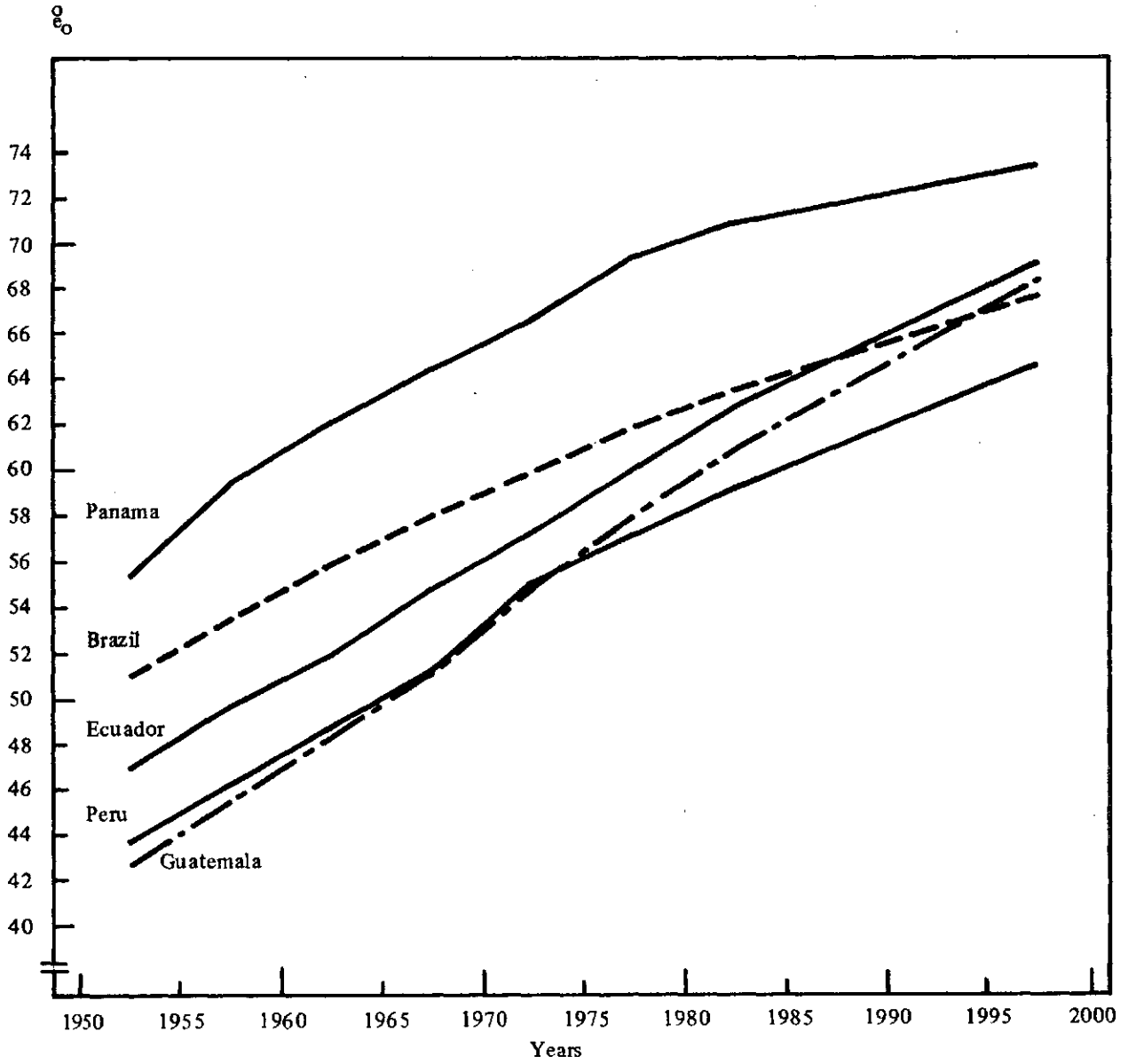
In short, we assume that by the end of this century the differences in mortality levels among Latin American countries will be smaller, though considerable disparities between countries will continue.

Figure 1
Group 1
EXPECTATION OF LIFE AT BIRTH ($\overset{o}{e}_0$)(BOTH SEXES)
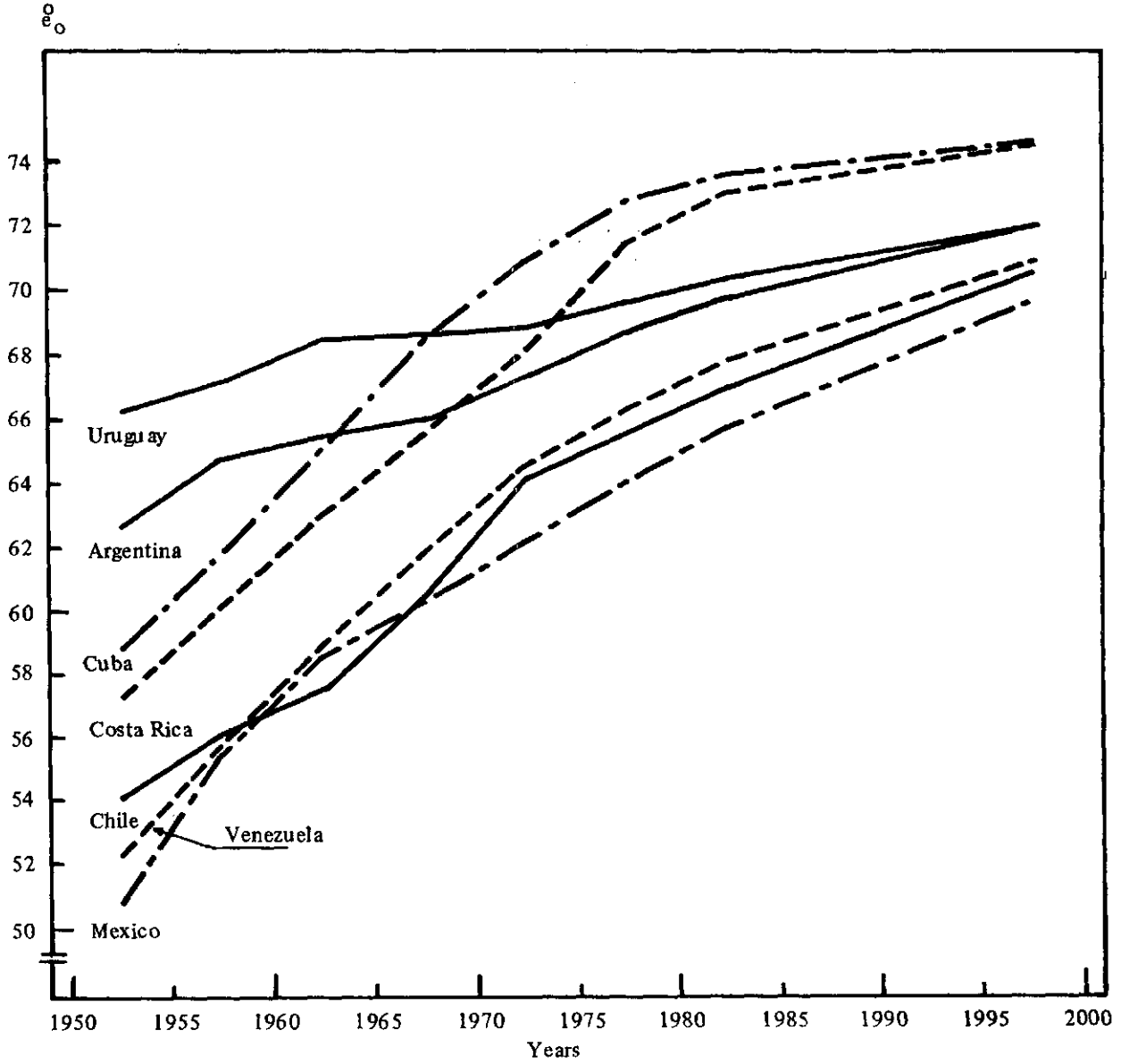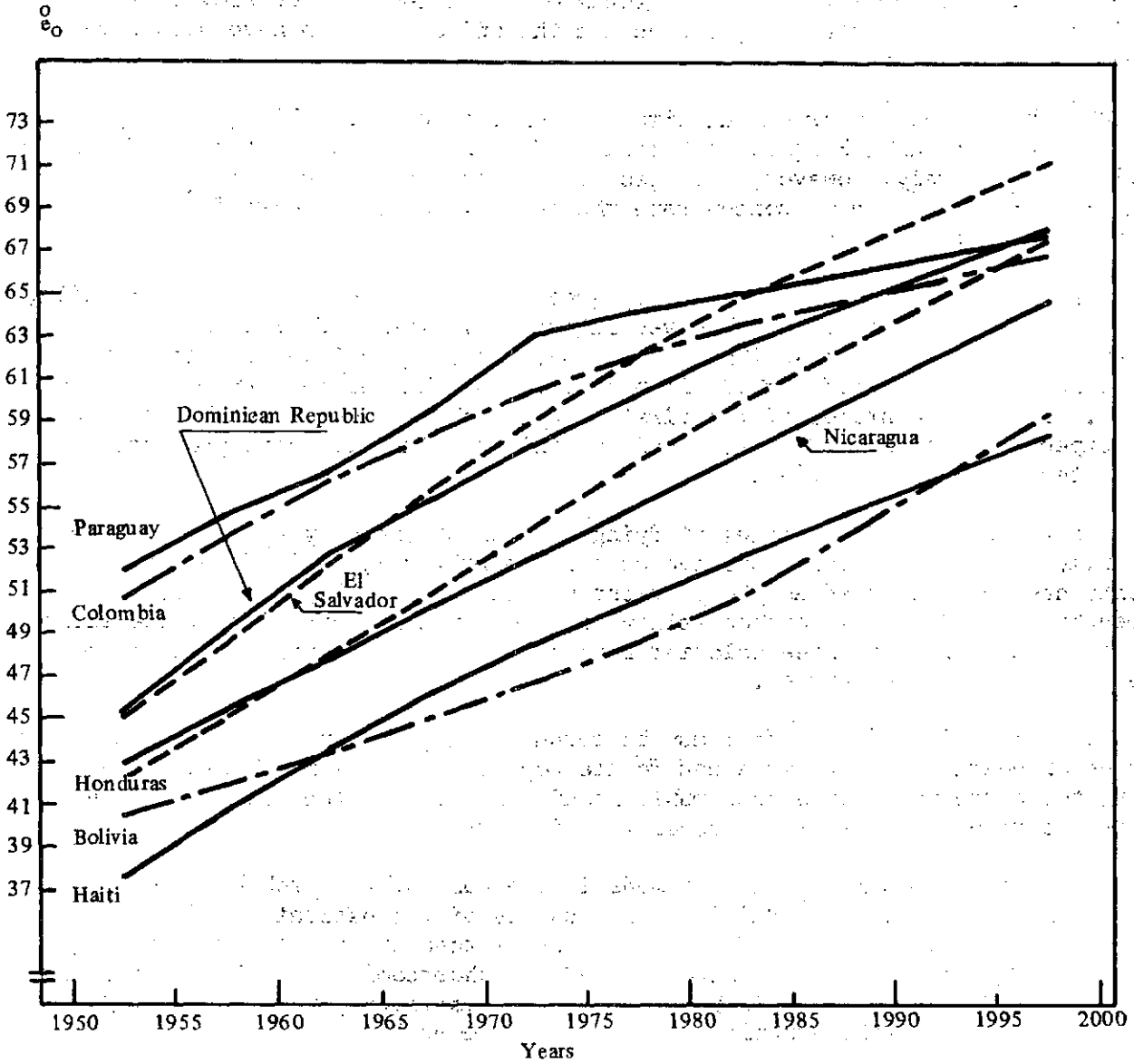

/Figure 2

Figure 2
Group 2
EXPECTATION OF LIFE AT BIRTH ($\overset{o}{e}_0$) (BOTH SEXES)

Figure 3
Group 3
EXPECTATION OF LIFE AT BIRTH ($\overset{o}{e}_0$) (BOTH SEXES)

d)   Mortality by sex

In table 2, expectation of life at birth and probabilities of dying between 35 and 40 years, and between 60 and 65 years, by sex, are presented for the quinquennium 1975-1980, for the three groups of countries defined above. Values of similar indicators for France, Sweden and the United Kingdom have also been included for comparison.

When this paper was prepared, life tables were not available for the period 1975-1980 for Guatemala, Panama, El Salvador, Honduras, Nicaragua and the Dominican Republic. Fortunately, however, all these countries are included either in the second or third group and we concentrate the analysis of differential by sex on the first group of countries.

In general, high values of $\overset{o}{e}_{0}$ imply greater differences by sex in mortality, and this is in fact what can be observed in table 2. The exceptionally low difference observed in Cuba -which has the lowest mortality level in Latin America- can be related to the rapid decline in mortality and changes in patterns of causes of death. In most countries of the first group, the differences between male and female expectation of life at birth achieve similar values to those presented by the selected European countries.

With regard to probabilities of dying between 35 and 40 years (an age span arbitrarily selected as representative of adult mortality), an index of male over-mortality has been computed as the quotient between male and female $_5q_{35}$. Greater differences, with more male overmortality, are observed in countries of the first group (as well as in the three selected European ones), as compared with the rest of the Latin American countries.

The explanation of this fact may be found, perhaps, in the different patterns of causes of death affecting male and female populations. As mentioned above, however, there are not enough comparable studies in most of the Latin American countries to give a satisfactory answer to this matter.

Analogous observations could be made in the case of the probabilities of dying between 60 and 65 years. In addition, the quality of the estimation of this indicator is probably less reliable: larger errors than in younger ages, affecting both deaths and population, may introduce serious shortcomings. Age misreporting, both in the case of deaths and in population, and possibly with different magnitude and direction, could yield erratic measurements of mortality.

What can we expect in the future in connection with mortality by sex? In general, we can assume increasing differences in projecting mortality by sex. For the whole region, a difference of around six years on average is estimated by the end of the century.

e)   Other differentials in mortality

It has always been believed, sometimes on the basis of fragmentary information but in other cases on the basis of relatively reliable sources, that IMR has been and is still very high in the Latin American countries, and that enormous differences prevail among subgroups of population defined according to geographical areas and/or socio-economic variables.

/Table 2

Table 2

LATIN AMERICA: MORTALITY BY SEX, 1975-1980, IN TERMS OF: i) EXPECTATION OF LIFE AT BIRTH; ii) PROBABILITY OF DYING BETWEEN 30 AND 40 YEARS (5^q35); iii) PROBABILITY OF DYING BETWEEN 60 AND 65 YEARS (5^q60)

	$\overset{o}{e}_o$ (years)		Δ'	5^q35 (o/oo)		M/F	5^q60 (o/oo)		M/F
	Males	Females		Males	Females		Males	Females	
Argentina	65.4	72.1	6.7	17.4	10.9	1.6	121.6	58.6	2.1
Chile	62.4	69.0	6.6	23.0	12.8	1.8	126.2	77.3	1.6
Uruguay	66.4	73.0	6.6	13.4	8.5	1.6	118.9	63.7	1.9
Venezuela	63.6	69.0	5.4	19.0	13.1	1.5	138.2	98.8	1.4
Costa Rica	69.0	74.0	5.0	13.1	7.3	1.8	86.3	57.4	1.5
Cuba	71.1	74.4	3.3	10.9	7.9	1.4	81.4	61.9	1.3
Mexico	61.9	66.3	4.4	25.2	18.0	1.4	109.2	82.8	1.3
Brazil	59.5	64.2	4.7	26.9	21.2	1.3	102.7	89.9	1.1
Ecuador	58.0	62.0	4.0	25.8	21.3	1.2	108.7	94.5	1.2
Peru	55.7	58.6	2.9	24.9	22.0	1.1	121.4	111.5	1.1
Guatemala	56.8	58.8	2.0	-	-		-	-	
Panama	67.5	71.0	3.5	-	-		-	-	
Bolivia	46.5	50.9	4.4	37.5	30.7	1.2	150.7	126.5	1.2
Colombia	60.0	64.5	4.5	22.0	18.0	1.2	113.5	81.8	1.4
Paraguay	61.9	66.4	4.5	23.0	18.4	1.3	110.8	84.5	1.3
El Salvador	60.0	64.5	4.5	-	-		-	-	
Haiti	49.1	52.2	3.1	40.7	36.5	1.1	159.3	148.6	1.1
Honduras	55.3	58.9	3.6	-	-		-	-	
Nicaragua	53.5	57.0	3.5	-	-		-	-	
Dominican Republic	58.4	62.2	3.8	-	-		-	-	
France (1977-1979)a/	69.9	78.0	8.1	11.8	5.9	2.0	104.0	42.6	2.4
Sweden (1979)a/	72.5	78.7	6.2	9.7	4.6	2.1	83.4	46.4	1.8
United Kingdom (1976-1978)a/	70.0	76.2	6.2	7.6	5.3	1.4	114.2	59.4	1.9

a/ Demographic Yearbook, 1980.

The inclusion in census questionnaires (mainly as from 1970) of questions on children ever born and on children surviving (and/or dead) permitted the utilization of a procedure, originally developed by William Brass (5), that led to estimates of child mortality which have documented, in many instances for the first time, what had previously been only suspected or guessed. Child mortality is indeed very high in the region (we are referring mostly to periods before the 1970s round of censuses), and there are tremendous differences in the incidence of mortality within each country.

More than 15 country studies have been conducted under the 'IMIAL' (3) project directed by Dr. Hugo Behm.

The indirect methods used to estimate child mortality provide values that refer rather to the age span 0-2 or 0-3, etc., than to 0-1, i.e. the infant mortality rate (IMR). For this reason, in the tables below estimates of the risk of a newborn dying, before attaining age 2 are presented.

Two tables have been selected from a summary published in Notas de Población No. 16.

The values presented in tables 3 and 4 are self-explanatory. The provide useful information that should be taken into account by public health planners and policy-makers.

f)   Causes of death

The study of child mortality, considered in the preceding section provides a good example of work conducted on a comparative basis in a high proportion of Latin American countries. In all cases the information collected was the same, though probably of different quality; in all cases the methodology employed was the same.

In contrast to that situation, nothing similar has been done with regard to causes of death, though more than 20 studies on the general subject of causes of death have been carried out in CELADE or under the supervision of CELADE.

The quality of the basic data, which is quite dissimilar among countries, is probably the first reason for the lack of such a systematic study. Another is that there is not a widely accepted methodology for studying mortality by causes of death. Some authors have followed one approach; other demographers another. CELADE has not itself developed a method to recommend, as is the case in other fields.

Some recent studies have been carried out in Chile (6) and Uruguay (7) where reliable data from vital registers are available. However, we cannot repeat this kind of study in a typical Latin American country since, as already mentioned in this paper, poor quality of information is an obstacle even for simple studies, such as those aimed at establishing estimates on levels and trends of mortality.

It is necessary, in consequence, to develop a new approach to solve the problem by using sources of data other than the traditional registers of deaths. Improvements in death registration to furnish good information are almost impossible to attain in the short term.

Table 3

SELECTED LATIN AMERICAN COUNTRIES: PROBABILITY OF DYING FROM BIRTH TO
EXACT AGE 2, IN URBAN AND RURAL POPULATIONS, 1965-1970

Country	Probability of dying (per thousand)		Percentage of:		Percentage of illiteracy	
	Urban	Rural	Rural over-mortality	Rural population	Urban	Rural
Bolivia, 1971-1972	166	224	34.9	62	-	-
Peru, 1967-1966	132	213	61.4	40	16.8	50.7
Nicaragua, 1966-1967	143	152	6.3	65	24.1	69.7
Guatemala, 1968-1969	119	161	35.3	64	52.8	63.6
El Salvador, 1966-1967	139	148	6.5	60.5	29.0	58.6
Honduras, 1969-1970	113	150	32.7	69	19.7	51.7
Ecuador, 1969-1970	98	145	48.0	58.7	9.3	36.3
Dominican Republic, 1970-1971	115	130	13.0	60	27.9	41.1
Chile, 1965-1966	84	112	33.3	24.9	7.4	27.0
Colombia, 1968-1969	75	109	45.3	36.4	18.2	42.2
Costa Rica, 1968-1969	60	92	53.3	59.4	7.5	18.0
Paraguay, 1967-1968	69	77	11.6	62.6	11.2	25.2

Source: Dr. Behm and collaborators, Mortalidad en los primeros años de vida en
países de la América Latina, San José, Costa Rica, CELADE, Serie A,
No. 1024 to 1032, 1036 and 1037. Data on rurality and illiteracy were
taken from the respective population censuses.

Table 4

SELECTED LATIN AMERICAN COUNTRIES: PROBABILITY OF DYING FROM BIRTH TO
EXACT AGE 2, ACCORDING TO EDUCATIONAL LEVEL OF MOTHERS,
1966-1970

Country	Probability of dying (per thousand)						Mortality group "none"/"10 or more"
	Total	Level of education of mother					
		None	1-3	4-6	7-9	10+	
Cuba a/	41	46	45	34	29	-	-
Paraguay	75	104	80	61	45	27	3.9
Costa Rica	81	125	98	70	51	33	3.8
Colombia b/	88	126	95	63	42	32	3.9
Chile	91	131	108	92	66	46	2.0
Dominican Republic	123	172	130	106	81	54	3.2
Ecuador	127	176	134	101	61	46	3.8
Honduras	140	171	129	99	60	35	4.9
El Salvador	145	158	142	111	58	30	5.3
Guatemala	149	169	135	85	58	44	3.8
Nicaragua	149	168	142	115	73	48	3.5
Peru c/	169	207	136	102	77	70	-
Bolivia	202	245	209	176	110d/	-	-

a/ Based on provisional data of a preliminary study carried out with the 'Encuesta
Nacional de Ingresos y Egresos de la Población, 1974'. The educational groups
are: 0, 1-5, 6 and 7 years or more of schooling.

b/ The educational groups are: 0, 1-3, 4-5, 6-8, 9 years or more of schooling.

c/ The educational groups are: 0-2, 3-4, 5, 6-9, 10 years or more of schooling.

d/ Corresponds to 7 years or more of schooling.

Some ideas have been put forward for gathering information on causes of death from laymen. Our position is rather sceptical, however, and we have more confidence in other approaches to the matter. If a demographic survey is carried out and a question on deaths that occurred during, say, the last 24 months is included, it would be possible to investigate in depth the circumstances and specifically, though possibly only roughly, the cause of each death. This operation can be viewed as a joint venture of demographers and public health worker. The former would provide information on a national representative sample of annual deaths which would include the name of the deceased, his address at the time of death, and other personal characteristics such as sex, age, marital status, etc.

As pointed out above, in some countries child mortality is still very high. Deaths of children account for approximately one-third of the total. Consequently, what CELADE is testing, as a pilot study, on recent child mortality in Paraguay (8) could represent a promising method for investigating at least causes of death among children. In this study each mother, when registering a recently born child, is asked about the survival of her preceding child. If it has died, a question aimed at investigating the cause of death is included in the questionnaire. This section of the form is completed by a physician. This pilot research is being carried out with the Ministry of Health of Paraguay.

To sum up, as regards the study of causes of death it is necessary to encourage the development of simple methods to be used in a typical underdeveloped country, where information from registers of deaths is defective. In our present circumstances case studies by countries, such as those mentioned for Chile and Uruguay, are not the ideal solution for clarifying the situation concerning causes of death in Latin America.

REFERENCES

1. and   Indirect methods have been applied to estimate mortality in retrospective
2.   national demographic surveys carried out for example in:

   - Honduras: CELADE, Serie A, No. 129, Fascículo 7, *Análisis de preguntas retrospectivas* (1976).

   - Bolivia: Instituto Nacional de Estadística and CELADE, see for example *La situación de la mortalidad de Bolivia* (1975).

   - Peru: Instituto Nacional de Estadística, Encuesta Nacional del Perú (1974-1976); see Fascículo 2: *La mortalidad en el Perú: Diferenciales, niveles y aspectos metodológicos para su medición.*

   - Panama: Dirección de Estadística y Censos and CELADE, *Encuesta Nacional Demográfica*: see for example Capítulo III, Mortalidad. See also *Panamá: La mortalidad y la fecundidad en el período 1950-1976*, Dirección de Estadística y Censos, CELADE, Committee on Population and Demography of the National Academy of Sciences of the United States, June 1981.

   - Paraguay: Secretaría Técnica de Planificación, Dirección General de Estadística y Censos, CELADE: *Informe general sobre aspectos demográficos, 1978.*

   - Haiti: CELADE, Serie D, No. 96, *The demographic situation in Haiti*, by John Hobcraft.

3.   *IMIAL* (Investigación de la Mortalidad Infantil en América Latina): Series of studies conducted by Dr. Hugo Behm on childhood mortality, levels and differentials for Argentina, Bolivia, Colombia, Chile, Ecuador, Paraguay, Peru, Costa Rica, Nicaragua, Guatemala, El Salvador, Honduras, Dominican Republic and Cuba.

          IFHIPAL (Investigación de la Fecundidad mediante el Método de los Hijos Propios en países de América Latina): Series of studies on levels, trends and socio-economic differentials of fertility in Latin American countries; reports on Argentina, Costa Rica and Cuba have already been published.

4.   Methods used to evaluate basic censal information on vital registration are presented for example in the following publications:

          Costa Rica: Dirección General de Estadística y Censos and CELADE, *Evaluación del censo de 1973 y proyección de la población por sexo y grupos de edades 1950-2000*, June 1976.

          Guatemala: CELADE, *Las estadísticas demográficas y la mortalidad en Guatemala hacia 1950-1964*, Serie AS No. 2, 1969.

Guatemala: Dirección General de Estadística y Censos and CELADE, Evaluación del registro de defunciones y tablas de mortalidad, 1972-1973 (February 1978).

Chile: CELADE, Tablas abreviadas de mortalidad a nivel nacional y regional, 1969-1970, Serie A, No. 141.

Cuba: Comité Estatal de Estadística, Dirección de Demografía and CELADE, Proyección de la población cubana 1950-2000, nivel nacional, metodología y resultados (updated in June 1980).

Argentina: Instituto Nacional de Estadística y Censos and CELADE, Estimaciones y proyecciones de población 1950-2025, Buenos Aires, November 1982.

Mexico: Consejo Nacional de Población (CONAPO), Programación y Presupuesto (SPP) and CELADE, Proyecciones de población 1950-2000, Fascículo F/Mex 1, September 1982.

Brazil: CELADE and IBGE (unpublished), "Proyección de la población de Brasil por sexo y grupos quinquenales de edad 1950-2150" (a methodological report).

5. CELADE, Métodos para estimar la fecundidad y la mortalidad en poblaciones con datos limitados. Selección de trabajos, de William Brass, Serie E, No. 14.

6. CELADE, Chile: Mortalidad desde 1955 a 1975. Tendencias y causas, by Erica Taucher, Serie A, No. 162, Santiago, 1978.

7. Ana María Damonte: "Uruguay: La mortalidad por causas en 1975 y sus perspectivas futuras", report on research carried out as a student of the Advanced Demographic Course of CELADE, 1980-1981.

8. Jorge Somoza: Some notes on "Un procedimiento sencillo para estimar la mortalidad al comienzo de la vida" (CELADE, unpublished).