

Aging and Human Development: Asynchronies in the Foretold Age Structure Changes in Latin America (2000-2050)

Laura L. Rodríguez Wong
CEDEPLAR / Federal University of Minas Gerais, Brazil

Morvan de Mello Moreira
Joaquin Nabuco Foundation, Brazil

Abstract

The age structure composition in Latin America is changing due to the dramatic fertility decline in first place and improvements in mortality levels in second place. Both processes have taken place at different time and speed causing asynchronic demographic transitions throughout the countries of the Region. Thus, several of them are now in the later transitional stage.

This paper analyses the consequences of fertility and mortality changes in the age structure over the period 1950-2050 assessing those asynchronies.

Countries are classified according to the UNDP's Human Development Index and some relationships are established considering Dependency Ratios and ageing Indexes. Conditional Survival probabilities for age 55 and higher are estimated in order to evaluate mortality differentials at older ages in the different socioeconomic contexts.

Results indicate that although Latin American countries started demographic transition at different times, differences in the speed of fertility and mortality decline will bring about a relatively homogeneous continent in terms of national age compositions in the medium term. The clearest examples are Cuba, Brazil and Haiti, which are quite different - among others aspects - in size, development, and/or wealth. While fertility transition decline began during 1950, 1965 in the two firsts countries, it has barely started in Haiti. In 2000 all of them have a demographic '*window of opportunity*', and will have a similar age structure by 2025.

Results raise up elements contributing to the discussion about the effect of the ageing process at the level of:

- a) New socioeconomic strategies (macro-level).
- b) Longevity (micro-level)

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Introduction

The population ageing process in Latin America is enough documented by now – when most of the national demographic censuses from the nineties has been thoroughly analyzed. The process is characterized by important decreases in the proportion of children and youngsters and slight increments in the elder population that will become expressive in the near future. These changes leave little doubts about a) the new social challenges that the Latin American countries will add to the current problems in the medium term; and b) the importance of its correct dimension in order to subsidize social policy projects.

The perception of such challenges together with the unique favorable conditions that the current demographic conjuncture offers is a current discussion among demographers and planers. We believe that this *window of opportunity* –as it was denominated by Carvalho and Wong (1998) - for policies addressing better life conditions during the phase that precedes a consolidated old age composition should widely be known and taken into account in the definition and implementation of social policies in Latin America.

This essay aims to subsidize the debate considering that the demographic transition in Latin America quickly accelerated during the period 1950-2050 but began asynchronously among the countries that integrate the Region. The paper associates these different evolutions to the well being of the population, considering the Human Development Index, which, in a way, measures the human capital. It also considers the experience of the countries that are ahead in the demographic transition process and having better life conditions, trying to foresee possible shortcuts to be used by the today poorest countries in order to reach their own development with smaller social costs.

The paper relies on the fact that population demographic dynamics, because of the age structure inertia, allows to estimate with enough reliability future age and sex composition. Analysis of the age distribution over time is based on estimates from international institutions, particularly those elaborated by the Population Division of the United Nations and the Latin American Center of Demography (CELADE).

Given the objectives, the paper presents, in first place, concepts and indexes for measuring ageing. After brief characterization and a social-demographic classification of the Region, it makes a reference to the demographic transition and to the evolution of the large age groups through to Dependence Ratios. For better understanding of the dynamics of the ageing population in the Region, the paper also considers the world context. Finally, to complement the understanding of this process, the survivorship of the elderly is discussed.

On the Concepts and Measures - Longevity and Ageing Population

The literature reviewed by Moreira (1997) makes clear that “old age” is a very relative concept. Generally speaking, however, both Asian and Western schools agree that ageing in modern times is identified with the increasing proportion of less productive population, which becomes economically and socially more dependent with further increase in age (ESCAP, 1994; CEPAL, 1999) The classification of a person or a group of persons as elderly by reasons of age and the extent of ability is determined by such factors as level of socioeconomic development, living conditions, cultural factors and the nature of work.(Afzal,1994). It shall be noticed that this definition implies the individual and collective level.

As an individual, every living being becomes older over time, thus, ageing process has genetic components. Degree of physical decline is influenced by environmental factors, diet, physical exercise, habits –like smoking–, air pollution and occupational conditions. Also, it is clear as pointed out by Gokhale (1994) that the process of continuing physiological, psychological and social change throughout the life span occurs with great variations among individuals.

When an entire population is considered, its ageing process depends on how the demographic characteristics of the population are changing its age structure (ESCAP, 1994 p. 46). The ageing process of a population is thus a continuing process: it is partially determined by past demographic dynamics but speed and direction depend on the current interrelationship of the population components (age structure, fertility, mortality and migration), which on turn, will influence future age composition.

Demographic considerations of the ageing process are mostly limited to definitions of old age, which is determined chronologically. It is conventional to identify the elderly with those aged 65 or more because of their relationship with social security and retirement; commonly accepted limits are either 60, 65 or 70 years. It is around these ages that working capacity begins to be affected by biological, physical and mental conditions. In any case, considering population aged 60 or more as a monolithic group conceals two important factors: the internal age and gender distribution, and the numbers of very old people, defined as those who aged 80 or more. (Gokhale, 1994)

Individuals age as time elapses, thus it is an irreversible process. The population as collective, however, ages as the mean age of its constituents (the individuals) increases. Thus, differently of longevity, the ageing process of a population may reverse if fertility, mortality and migration trends are re-defined.

Measuring the Ageing Population Process

In this paper, three measures are used as indicators of the degree of a population ageing: its medium age, its Dependence Ratio (DR) and its Aged/Child (AC) ratio. The DR is defined conventionally as the relationship between population below age 15 and above age 65 and the population aged 15 to 64 yearsⁱ. When the ageing process is more visible because of the decrement in the proportion of youngsters and rather small increases in proportion of the elderly, the Aged/Child ratio might be a suitable indicator. It takes into account the numbers and changes at both ends of the age distribution simultaneously thus allowing to consider the speed of the ageing process. It is conventionally defined, as the ratio of the number of elderly person to the number of childrenⁱⁱ. Thus:

$$A/C \text{ Ratio} = \frac{\frac{{}_w P_{65}}{P}}{\frac{{}_{15} P_0}{P}} = \frac{{}_w P_{65}}{{}_0 P_{15}} * 100$$

Where: ${}_w P_{65}$ is the 65 year-old population and more; ${}_{15} P_0$ are the under 15 year-old population and P is the total population.

Socio-Demographic Differences: The Human Development Index and the Demographic Transition

The population ageing process in Latin Americaⁱⁱⁱ, began at different periods and different national configurations. Wong et al. (2000) show, with data from the beginning of the century, important differences in the timing and intensity of this phenomenon considering five of the most populous countries of the Region, thus justifying the need of a better and more detailed knowledge of this process^{iv}. With this objective, and before considering the national differences of the ageing process a brief sociodemographic profile of the Region and a classification of the Latin American countries through social well-being indicators is made.

This ageing process is taking place at the moment that conjuncture of regional development has important repercussions in the formulation of policies of social wellbeing and the future quality of life for the elderly. Thus, besides the speed of the process which is, in itself, important, it should be attempted for three equally important aspects: the widespread poverty that proportionally reach more the old people, the urbanization and the feminization of ageing^v. They are important above all to foresee the future situation of this segment of population.

Related to poverty, the ageing process of the Region coincides with a situation marked by high poverty levels. In fact, if the poverty line is established around US\$2 of daily revenues, the number of poor people in the Region, according to World Bank statistics, would reach 183 million, in 1998, or 36,4% of the population and an increment of 10 million related to 1990 (World Bank, 1999). Three additionally elements address serious foretold social problems that, will probably have significant impacts on the well being of the elderly: (a) the no clear indication of reduction of poverty in Latin America; (b) the well known pernicious unequal regional income distribution; and (c) the high unemployment rates that has marked most national economies for relatively long periods.

Related to urbanization and feminization, it is known that these characteristics tend to accentuate in the ageing process in Latin America. As they affect quality of life of elderly people, they should be also considered. Between 1970 and 2025, according to Table 1, the Aged/Child ratio will rise from 9,8 elders for every 100 children to 40,6. Participation of urban population in the composition of this ratio goes from 62,2% to 82,0% during this period and female importance also increases in the total elderly population: women's weight in the A/C ratio varies from 54,1% to 56,9%.

Table 1: Latin America, 1970/2025: Aged/Child ratio for the total population according to their composition by residence and sex (%)

Period	Total A/C ratio	Total		Urban			Rural		
		Male	Female	Total	Male	Female	Total	Male	Female
1970	9,8	45,9	54,1	62,2	26,5	35,7	37,8	19,4	18,4
2000	17,0	44,1	55,9	76,5	31,8	44,1	23,5	12,4	11,8
2025	40,6	43,1	56,9	82,0	34,2	48,0	17,7	8,9	8,9

Source: CELADE (1999)

In the total estimation, growth of the urban female elder population, is the most important component of the variation of the A/C ratio; female's contribution was 35,7%, in 1970 and will

be 48,0%, in 2025.^{vi} Male's over-mortality among the elderly and the very old (thus bringing about feminization of the ageing) together with their differential by residence and social and family composition are the determinants of this new profile.

The Human Development Index (HDI)^{vii} allows classification of the Latin American countries according to their social well being. Use of this classification aims to identify the regional demographic dynamics diversity and their relationship with the social differences inside the continent. In any case, apart from Haiti, national values in Latin America do not show dramatic differences. At the end of the nineties, the HDI oscillates between 0,84, for Chile and 0,65 for Guatemala. There is no country classified among the group of the wealthy nations, neither among the poorest (or least development) part of the world^{viii}.

Table 2: Latin American countries classified according to Human Development Index, (HDI), Demographic Transition Index (DTI) and population proportion in the total population of the Region.

HDI classification	Country	HDI	Demographic Transition Index	Population Proportion (*)
High	Argentina, Chile, Uruguay, Costa Rica, Mexico, Panama, Venezuela, Colombia. (Cuba excluded)	0,84 to 0,76	0.96	25,4
Medium	Peru, Paraguay, Dominican Republic, Ecuador, (Brazil excluded)	0,74 to 0,72	0.93	10,3
Low	El Salvador, Honduras, Bolivia, Nicaragua, Guatemala, Honduras.	0.69 to 0.65	0.74	7,4
Cuba		0,78	1.01	3,1
Brazil		0,75	0.84	34,6
Haiti		0,44	0.49	1,7

Source: 2000 Human Development Report (Index values for 1998) – United Nations Development Program

(*) Related to the total Latin American population in 2000 (per cent)

The available estimates up to 2000, as presented in Figure 1, suggests the existence of three groups of countries in the Region with relatively high, medium and low HDI values. Even in the presence of substantial improvements in the HDI, similar composition is observed for the seventies. I.e., the countries have maintained nearly stable the hierarchy observed since then.

Additionally, an analysis of the HDI components evolution shows that improvements in mortality levels rather than the other ones is the most important factor for rising the HDI in almost all the Region. This is particularly true for the less privileged countries^{ix}. In fact, taken into account the life expectancy at birth (e_0), during the seventies, the extreme mortality levels implied more than 30 years of survivorship for the high HDI countries (Cuba, Costa Rica, and to a lesser extent, Argentina and Uruguay). Almost three decades later, when almost entering the XXIth century, the difference is still significant, but reduced to not more than 20 years favoring Cuba, Chile or Costa Rica – or 14 years, whether Haiti is excluded from the comparison. The major gains were for infant and child mortality (also portrayed in the series of Figures in Annex) reinforce this evidence.

Table 2 details the composition of the three established groups. Because of specific peculiarities three countries are handled separately: 1) Haiti, that is the poorest nation and keeps great distance from the other countries of the Region. 2) Cuba, that has simultaneously low and high economic and social indicators respectively, and it is in the later phase of its demographic transition. 3) Brazil, that has the largest population of Latin America (around 165 million people in year 2000) and plays important economic role in Region. Also, Brazilian fertility decline was one of the sharpest in the Region; considering the period 1970/75 as the beginning of the significant fertility decline, in a 20 year-period, the fertility decreased in almost 50%^x.

The classification using the HDI is quite similar to those based on demographic approaches, specifically when fertility transition or any other index related to demographic transition are considered.

This is the case of the study by Chackiel and Schkolnic (1992), that classify national fertility levels and identify different timings of the on set of demographic transition in Latin America. In general, countries of low HDI (included Haiti) had during the quinquennium 1985-90, the highest fertility levels (above 5 children per woman). In the same situation were, besides Dominican Republic, the Andean countries of Peru and Ecuador.

The group of countries with high HDI is composed, on one side, for the countries geographically located at the north of the sub-continent; they had, according to the authors, medium/low fertility levels. On another side, this group also includes the so-called "*South-cone*" countries (Argentina, Uruguay and Chile). They had quite low fertility levels from before the sixties. Costa Rica is added to this group, since it reached a fertility level below 3,0 children for woman, before the beginning of the nineties.

The demographic transition index (DTI), presented by Kuroda (1994) for measuring stages of demographic transition^{xi}, also shows the direct relationship with the HDI. Set of countries with the better social well being are next to completing their demographic transition as this index is nearer to 1.0. Yet, according to this Index, Cuba has already completed the last stage of the demographic transition.

In short, as fertility is the main determinant of the age structure destabilization after a period of *quasi-stability*, the fact that countries have altered its fertility levels at different periods, implied the age composition change to also begin at different periods. The association of the asynchrony of the population trajectory with differentiated social well-being levels identified by HDI, allows to establish some relationships among demographic indicators and social well being.

The Evolution of the Age Structure

Current changes in the age structure, once most of the countries of the Region have began the fertility transition, determine a quite predictable age pattern in the medium term. It is known that the first and clearer effect of the fertility decline is the decrease in the population growth rate. Latin America's demographic growth as a whole passed from 2,6% per year, in the quinquennium 1965-70, to 1,7% for the period 1995-2000^{xii}. Another demographic phenomenon, still in process, product of the fertility decline, is the generations changing size. In this situation, the age distribution pyramid shows that those born before the fertility transition are followed, when moving forward in time, for generations of relatively smaller size, born while the huge fertility decline is taken place. As result it is observed a growing relative increase of the elder population.

Thus, reminding that reproduction levels decline began at different moments and speeds in the Region, such changes in the age composition are also happening with different timings. This process is better observed in Table 3, for the period 1950/2050, through the variations of the median age of the population (M) and of the dependence ratio.

Table 3: Latin American countries classified according to the Human Development Index (HDI) Median Age and Dependency Ratios - 1950-2050

Median Age of the Population (in years)										
HDI	1950	1975	2000	2025	2050	Variation during the period				
						1950/75	1975/00	2000/25	2025/50	1950/2000
Latin America	20,1	19,1	24,6	32,3	37,5	-1,0	5,5	7,7	5,1	17,4
High	22,3	21,8	25,7	32,3	37,9	-0,5	3,8	6,7	5,6	15,6
Medium	19,4	17,9	22,8	31,0	37,4	-1,5	4,9	8,2	6,4	18,0
Low	18,1	17,1	19,2	25,9	34,4	-1,1	2,1	6,8	8,5	16,3
Cuba	23,3	22,7	32,9	43,3	46,1	-0,6	10,2	10,4	2,8	22,7
Haiti	22,4	19,3	19,2	25,6	33,8	-3,1	-0,1	6,4	8,2	11,4
Brazil	19,2	19,4	25,8	34,3	38,5	0,2	6,4	8,5	4,2	19,3

Dependency Ratios										
HDI	1950	1975	2000	2025	2050	Variation Index (1950=100)				
						1975	2000	2025	2050	
Latin America	78,8	83,8	58,8	49,9	58,6	106,4	74,7	63,3	74,3	
High	71,2	74,3	59,7	51,3	58,4	104,3	83,8	72,1	82,0	
Medium	83,2	90,2	63,0	49,0	56,4	108,5	75,8	58,9	67,8	
Low	87,9	94,4	84,5	55,5	49,5	107,3	96,0	63,1	56,2	
Cuba	68,6	78,6	44,5	49,5	72,4	114,5	64,8	72,1	105,5	
Haiti	72,4	84,2	78,3	55,3	49,7	116,2	108,1	76,3	68,6	
Brazil	80,2	79,2	51,5	48,4	61,3	98,8	64,2	60,3	76,4	

Source: Previous table, CELADE, 1999a and United Nations, 1998.

Values of M for the high HDI countries were relatively higher during the fifties as a consequence, in most of the cases, of international migration flows and of historical low fertility levels; classic examples are Argentina and Uruguay.

In the period following 1950-75, however the national differences, the whole Region had a *quasi-stable* age structure and slight decrease in M , generally attributed to important epidemiological progresses. The more accentuated reductions in infant and child mortality, certainly, enlarged the pyramid base and made the median age of the population to decrease. It is, only after the seventies – decade that coincides with the beginning of fertility transition in major part of Latin America- that the ageing process began and dramatically accelerates after 2000.

Irreversibly, the Region will tend to age maintaining the differences in the corresponding age structures in the medium term, provoked by the different timing of fertility destabilization. Table 3 shows that countries with low development and a relatively late onset of the fertility

decline, still have, for the year 2000, more than half of its population aged 20 or less. Furthermore, on the assumption that social and economic differences have been approximately similar for the considered period, the association with the variation of HDI, absent in 1950 and 1975, appears in the periods 2000 and 2025. Finally when the generalized low fertility levels and mortality will be reached, which is expected to be the case in approximately 50 years time – in a conservative hypothesis– half of the American Latin population would be a slightly below the age 40.

Summing up, trends in M , indicate that during the first 50 years of the period, when mortality and fertility began to decline, the age structure undertook a slow ageing process (an increment of about 4 years for M). Between 2000–2050, the demographic transformation would imply almost 13 more years of increase in the ageing process of the Latin American population.

The three separate countries show specific trends. Cuba, in first place, that have very low mortality levels since several decades and low and constant fertility levels expected to remain so, presenting below replacement growth rate and completed demographic transition. This country will have half of its population aged more than 46 years and will become one of the most old age structure nations^{xiii}. In second place it is Haiti, that, besides being the poorest country of the Region, will continue to have a very young age structure if, as expected, the replacement level is not reached by 2050^{xiv}. Finally, related to Brazil, the most populated country, given its fast fertility decline, the ageing process will be even more accelerated. Except for Cuba, Brazil is one of the countries, that is experiencing major increments in the median age. It is only after 2025, that Brazil will tend to decelerate the ageing process.

The Dependence Ratio

As a first step to understand the ageing process the dependence ratio (DR) is considered in this item. Although evolution of the total DR indicates the burden of the population in 'active' ages, it is the evolution of its components (youngsters and elders) that determines, demographically speaking, whether there is a *window of opportunity* and how fast the challenges due to the acceleration of the ageing process will come. Evolution of both the total DR and its components are detailed next.

The Total DR

Lower section of Table 3, shows that total DR it is decreasing in the continent, since at least the seventies and it will continue so after the first two decades of the XXIth century. Given its economic connotation, the particular evolution of DR in the Region reflects a positive demographic situation. This conjuncture can stay for several decades depending on the speed of change in the age composition, and it has been widely discussed^{xv}. It is not the case to replicate this debate, being enough to point out, as it was mentioned before, the 'unique opportunity' that, in demographic terms it favors the conditions for fleeing towards better life conditions.

The decrease in the DR took place due to the changes, initially in mortality and then, much more remarkably, in fertility levels in different period and rhythms in the different countries. Thus, the Table 3, shows that, the first group of countries, in which are included those that precociously began the demographic transition. They will first interrupt the DR decrease trend, that should happen about 2020 and even earlier in Chile and Costa Rica –included in this group. It should be mentioned the performance of Cuba here, with expressive increases of DR, already

about 2000. Being countries more privileged economically (or, just, socially, as in the case of Cuba) it is expected that they will have the appropriate conditions for facing the DR trend reversion due to growth of the elderly people.

Symptomatically, low HDI countries (Haiti among them), will have more time to adapt to a situation of an upward DR trend. This will only happen, very probably, in 2050. Related to these countries -as suggested in the study of McNicoll (1999), referring to Africa - the larger available period before facing problems typical from an older age structure, would have, also, the heavy economic and social burden, associated to the delay of the fertility and mortality transition towards low levels.

The Components of the Dependence Ratio: Youngsters and Elders.

Because of its nature, the Young (YDR) and Elderly (EDR) dependence ratios evolve according to the demographic inertia and its increase/decrease trend obeys to the conjunction of both the fertility and, particularly in the case of the elderly people, the mortality. Thus, Figure 2 portrays 100 years-period of past and -likely- future fertility and mortality effects in the age composition of the Region. The sequence of the countries classified according HDI values and the sequence of the three specific countries that include Cuba and Haiti as representative of extreme situations illustrates what we are calling the foretold transition.

During the *quasi-stable* period (1950-75), the DR showed a slow increase trend that will shift afterwards;. In both situations, the main responsible for the DR trend is the young component. The YDR will stabilize, probably, when concluding the first half of the XXIth century. The Figure shows, also, that the elderly component increases and accentuated its participation, still after 2020. By 2050, the DR would continue decreasing in the Region, it will be about 58,6: six out of ten dependents will be aged 65 or more.

The variation in the composition of DR, given the asynchrony of the Latin American demographic transition, as it is expected, it differs due to the different rhythm of the transition. This may be seen in the values of YDR and EDR according to the level of well-being. If the countries of the Region tend to the stage presented by the high HDI set of countries - in a period of time that depends, basically, of the time of the onset and speed of fertility decline - it can be predicted, with virtually no vies, the tendency and composition of the DR. The results of this exercise are plotted in Figure 2: major part of the Latin American countries would have expressive changes in the age pattern during the two following decades.

In synthesis, the forefront countries in the demographic transition will return, in the relatively short term, to increasing DR trends. Several of them are countries of high HDI and have since several decades ago, reasonable proportions of elder people as mentioned before.

They might be reference for the countries with low and medium HDI in the sense of evaluate wrongs and rights related to social needs and ageing process of population thus avoiding mistakes and encouraging the positive experiences.

The group of countries of medium HDI, whose DR is higher at the beginning of the period shows the more accentuated decrease of the ratio due to the relatively sharply fertility decline. It is clear that the reversion of this tendency, on one side, is only due to the elderly component. On the other hand, this will happen after reaching the smallest ratios, including those ones of the high HDI group. Demographically speaking it is a *window of opportunity* for a country entering

the pathway towards ageing after having reached such low Dependence Ratios. This is the case of Latin America, where DR decreases, particularly due to the decrease of children's proportion; this attribute will also relieve pressure for resources intended to them, thus facilitating the search for better alternatives.

Finally, the group of countries with low HDI is in general, at the beginning of the demographic transition with children and youngsters representing important proportions. Again, they may incorporate and adapt in the formulation of its social policies the forefront countries' successful experiences in its search of development alternatives.

The sequence of the three specific countries prefigures the ageing transition in Latin America. Countries that had the current Haiti profile are experiencing now the beginning of the ageing process. The Cuban situation forewarns the speed that the process may have.

The Ageing Process in Latin America

Elements presented here, show that the ageing population is a differentiated process among the countries of the Region. The DR components showed, also that such phenomenon is the result of the interaction among the three large age groups. For better understanding of the ageing process, this item, details interactions among just both children and elders, through evolution of the Aged/Child ratio. Previously, a brief comment of the Latin America situation in the world context is made.

Latin America in the World Context

Data in Table 4, shows the elder population through three figures: (a) absolute values; (b) proportion in the total population; and (c) A/C ratios. They suggest quite different worlds; one of them put together the poor countries, in which the number of elders is high, but its relative weight is low. The other formed by the rich countries, in which the absolute size is small, but the relative participation in the total population is important. In year 2000, the less developed countries (LDC)^{xvi} have approximately 250 million of people aged 65 or more. Global figures (not included here) indicate that they represent 5,1% of their total population. In the developed countries the elders reach 170 million (or 70% of the aged population in the LDC) and represents 14,4% of their total population (proportion 2,8 fold related to the LDC). In 2050 the absolute quantitative differences indicate that the older population in the LDC (1,2 billion) is almost fourfold related to the developed countries (300 million). Asian countries account for the highest volume of aged population.

Table 4: Population aged 65 years and more, Proportion of elders and Aged/Child ratio according to Continents and Regions. 1950-2050

Continent and Region	1950	1975	2000	2025	2050
a) Population aged 65 years or more (in millions)					
Europe		44,98	77,13	107,44	146,99 172,98
America do North		14,10	25,23	38,82	68,46 85,99
Asia		57,38	101,65	216,29	485,12 913,91
America Latin & Caribbean		6,18	14,06	28,08	67,47 135,67
Africa		6,98	12,80	24,99	52,87 141,34
b) Elders Proportion (per cent)					
Europe		8,2	11,4	14,7	21,0 27,6
America do North		8,2	10,4	12,5	18,8 21,9
Asia		4,1	4,2	5,9	10,3 17,3
America Latin & Caribbean		3,7	4,4	5,4	9,7 16,8
Africa		3,2	3,1	3,2	4,1 8,0
c) Aged-Child ratio (per cent)					
Europe		31,4	48,5	84,4	143,0 191,3
America do North		30,2	41,4	59,1	104,8 128,5
Asia		11,2	10,9	19,6	46,7 91,9
America Latin & Caribbean		9,2	10,6	17,2	41,1 83,7
Africa		7,4	7,0	7,5	11,9 33,3

Source: Basic data from United Nations (1999).

In the case of Latin America neither the numbers of elders, which is relatively low when compared, to Asian numbers, for instance, nor its relative weight, shows extreme situations. The striking characteristic of the Region is above all, the speed of the ageing process. At the end of the period 1950-2050, Latin American old people will become important, because of both absolute and relative figures. The elders will have increased about 15 times in a 100 year-period, and the A/C ratio being 9,2% at the beginning of the period, will reach 83,7%, in 2050. This means an increment even higher than the corresponding to the Asian continent. In any case, at the end of the period, similar to Asia and opposite to Europe and North America, there will still be less older people (65 and more) than children (0 to 15).

The Ageing Process Among the Latin American Countries

The evolution of the A/C ratio allows identification of the age structure speed of change in the population. At the end of the XXth century, quite a few countries have relatively more elders than youngsters; all of them are in the last stage of the demographic transition (Spain, Italy and Japan among them).

Table 5 presents the ratios and expected variations over the period. Firstly the wide spectrum that A/C assumes in several historical, social and demographic contexts around the world is showed. Secondly, the Latin American situation is detailed. The countries are ranked according to the expected value in 2050, when the ratio could vary between 22,0 and 265,0.

Panel A, shows several European countries: Spain and Italy, now with the higher ratios; as an additional example of developed countries, there is United States, showing that quite different historical evolutions it is not synonym of major differences in the ageing process. South and

North Korea are included for they will have in 2050 a similar and next to 100,0 ratio, despite their ideological points of view; also because they both represent one of the most vertiginous process of population ageing. Thailand and Japan show similar speed. Close to these countries, China is included as an example of a culture, that have elder-related values, different from the West. Also, Iran and India are included given they more relatively traditional characteristics. African countries are considered, showing that, even in 2050 there will be A/C ratios lower than those of the developed countries in the XXth century. Additionally, the ratio for the whole Asian continent is included at the bottom of this panel.

Panel B presents Latin American A/C ratio that is practically tenfold the original value in a 100-year period and clearly indicates the sharp ageing process in the Region. The values replicate the HDI classification, i.e., lower A/C ratios always correspond to lower HDI. Although all groups show a clear ageing process by the end of the period, they differ on the moment when the process consolidates. In the high HDI group, this happens clearly before 2000. In the case of medium HDI, the most accelerated rhythm will take place about 2025. It would follow in the chronological sequence, the group of lower HDI countries.

In the case of the three specific Latin American countries, Cuba is quite singular; the abrupt sociopolitical change that took place during the fifties and sixties provoked equally abrupt demographic changes, what was evident, already in 1975. On that year, still having a typical young age structure, Cuba had a high A/C ratio relative to the rest of the Region. Until the end of the period, as already seen it –and considering the cases in the Panel A– Cuba will become one of the most aged countries of the world, showing a process that is, furthermore, one of the fastest. It shall be noticed that the A/C ratio expected for 2050 is twelve-fold the one registered for 1950.

Table 5 Selected Countries and Countries of Latin America, according to the type of HDI and A/C ratio (1950-2050)

Countries	Period					Index of variation (1950=100)			
	1950	1975	2000	2025	2050	1975	2000	2025	2050
Panel A: Selected countries									
Spain	26,9	37,6	110,1	346,9	265,0	139,8	409,3	1 289,8	985,1
Italy	31,4	51,6	121,2	211,8	248,4	164,5	386,0	674,5	791,1
Japan	13,9	33,9	107,4	180,8	192,4	243,9	772,7	1 301,1	1 384,2
United States	30,2	42,4	57,1	91,2	110,9	140,4	189,1	302,0	367,2
South Korea	7,3	9,5	29,9	73,35	113,6	130,1	409,6	1 004,8	1 556,2
Thailand	7,1	7,65	21,4	52,3	98,6	107,7	301,4	736,6	1 388,7
China	13,4	12,1	26,5	60,6	94,2	90,3	197,8	452,6	703,0
North Korea	7,9	7,6	16,9	47,9	90,4	96,2	213,9	606,3	1 144,3
India	8,6	9,7	14,7	35,9	76,1	113,4	170,9	418,0	884,9
Iran	13,7	6,9	10,1	20,7	54,6	50,4	73,7	151,5	398,5
Kenya	9,9	7,4	6,0	8,9	32,7	75,3	60,6	90,4	330,3
Ethiopia	6,8	5,7	6,1	8,4	22,2	83,8	89,7	124,3	326,5
Panel B : Latin American Countries classified according to HDI									
Latin America	9,2	10,6	17,2	41,1	83,7	115,2	186,7	446,7	909,8
High HDI	14,1	14,0	21,5	44,8	84,2	99,7	152,9	318,6	598,5
Medium HDI	9,9	8,4	13,5	34,4	78,5	84,7	136,0	347,2	792,8
Low HDI	7,9	6,3	8,4	17,0	49,1	79,4	105,8	214,6	620,3
Cuba	13,7	18,0	45,3	106,9	171,0	131,2	330,8	780,8	1 249,1
Haiti	14,1	11,2	9,2	17,9	50,2	79,2	65,1	126,5	355,4
Brazil	7,2	9,7	18,1	46,8	92,9	133,9	249,8	648,0	1 285,0

Source: Panel A: Adapted from Moreira (1997); Panel B: Ratios calculated from: United Nations (1998 e 1999)

Haiti is without doubt a country that has not started the ageing process; on the contrary, up to 2000, the A/C ratio will continue decreasing. Unless its demographic dynamic undergoes huge alterations, the inertia of the age structure will not allow, in the medium run any shifts in the A/C ratio. Even incorporating the expected fertility decline, Haiti will have, up to 2050, an A/C ratio similar to those of some European countries for the fifties.

Lastly, Brazil's performance is very similar to register for Cuba although the former departs later than the latter. They have A/C ratios above and below 10,0 respectively in 1950, but Brazil remained so up to the seventies. In any case, both countries are having one of the most intense ageing processes. Furthermore, the Brazilian ratio to be reached in 2050, will be more than twelve-fold the one in 1950. A relative increases of such magnitude it is only registered for North-South Korea, Thailand and Japan.

The Survival Differentials in Latin America

Some of the current and expected differences at death in the Region, particularly related to the elders are presented in the series of Tables 6.a to 6.c. They include values of the life expectancy (e_x) and conditional survival probabilities for different ages. Among the probabilities, there are those identified with the beginning of retirement and pension benefits (approximately 55 years for women and 65 years for men). The period considered is 1995/2020, from where three moments are selected: 1995/2000, 2005/10 and 2015/20. The indicators were derived from the life-tables published by CELADE (1999)^{xvii}. In this item, the general mortality level is considered in first place, followed by considerations related to survivorship in the adult ages.

Considering that one of the HDI components is mortality, classification of countries using this Index, is expected to be and almost direct relationship between the Index and mortality levels. Thus it is more important, to emphasize the differences and/or similarities among the elders rather than the ranking among them, once the HDI as noticed, has improved in Latin America, due primarily to evolution of mortality levels rather than the other HDI's components (education and economic productivity). I.e, survivorship have increased proportionally less than other well being aspects.

Perspectives About General Mortality

Related to the current situation (1995-2000), and for the youngest ages, important differences in mortality levels are expected. In the high HDI countries, life expectancy at birth (e_o) for both sexes, is 8 years higher than in the medium or low HDI countries^{xviii}. Looking at the tree separate countries, there is an extreme difference higher than 18 years for e_o . Differences of similar magnitude appear in the probability of completing the first decade of life.

The implicit hypotheses in the Latin American countries population projections is that mortality differences will tend to narrow; consequently, the available values for 2015-2020 assume a smaller medium difference among the extreme cases. For both sexes, it is expected a difference, still important of 4 years, approximately. Again, the average values conceal expressive inequalities: the forecasted e_o establishes a difference between Cuba and Haiti of nearly 13 years. It is expected for these countries to increment their corresponding e_o in around 4 and 10 years, respectively, between 1995-2000 and the following 25 years.

Despite the expected improvements in the mortality and the convergence at low levels, it is also expected to maintain some disparities. It shall be pointed out that the pursued goals imply for the LDC an infant mortality for 2020, similar to that of the high HDI countries presented in the quinquennium 1995/2000. That is, perspectives about child and infant mortality have implicit, a 20 year-time gap, among the levels of the high and low HDI countries^{xix}.

Expected Survivorship Among the Elders

Having emphasized the unequal mortality at birth, it is important to remind that the Latin American mortality is located in the intermediate values at world level. In this situation, variations in the infant and child mortality are the main determinants in the variations in the general mortality with relatively less variation in adult ages and among the elderly.

In the men's case, in the quinquennium 1995/2000, at age 65 (in general, the male age entrance at retirement) it is expected them to survive for more 14 years on average, regardless of the HDI value. The variation interval is, certainly, smaller than in the case of the infant and child mortality; for Cuba and Haiti, e_{65} oscillates between 16 and 12 years respectively. It shall be noted the value of Brazil, where e_{65} is lower than the average value corresponding to the lowest HDI countries. This is an indicator that Brazilian mortality is proportionally higher among the elder people when compared to the rest of Latin American countries. The probability of Brazilian survivors at the age 80 follows similar pattern: for those men reaching retirement age, 40% will not survive until the age 80 in Brazil; in low HDI countries nearly 45% will do it.

In the women's case, mortality among the elders, if maintained current life conditions, will keep, relatively to men, clearer association with HDI. Age 55, associated to the beginning of the female retirement may illustrate this: e_{55} equals 23-25 years, depending on the classification of the countries. Again, with little diversification, two thirds of these women would survive the 75th birthday. As before, it shall be pointed out the higher Brazilian mortality in the advanced ages. The 65 year-old Brazilian woman's probability to survive up to the age 80 (51,7%) is practically equal to the registered for the low HDI countries (52,0%).

**Table 6a: Latin American countries classified according to HDI and selected countries:
Life expectancy and conditional survival probabilities for selected ages
Period: 1995-2000**

Indicator	HDI Level			Cuba	Brazil	Haiti
	High	Medium	Low			
Male						
Life Expectancy (in years)*						
e_0	68,7	65,6	61,5	73,5	62,7	55,0
e_{55}	21,3	21,5	20,6	23,8	19,4	17,9
e_{65}	14,3	14,4	13,9	16,3	13,1	11,9
e_{70}	11,4	11,3	10,9	13,0	10,3	9,3
Conditional Probabilities for selected ages *						
0 - 10	96,5	92,0	91,5	98,3	93,6	85,7
15 - 65	72,4	72,7	63,9	78,9	62,2	56,3
55 - 75	56,4	57,1	49,6	65,8	48,8	42,3
55 - 80	39,0	39,2	36,8	50,2	31,5	24,8
60 - 80	41,8	41,9	39,9	52,8	34,7	27,7
65 - 80	46,4	46,3	44,7	57,1	39,7	32,5
Female						
Life Expectancy (in years)*						
e_0	75,1	70,3	66,8	77,3	70,4	58,3
e_{55}	25,0	23,9	23,1	26,2	22,9	18,6
e_{65}	17,1	16,1	15,3	18,2	15,5	12,3
e_{70}	13,6	12,8	12,0	14,6	12,2	9,7
Conditional Probabilities for selected ages *						
0 - 10	97,2	93,5	92,6	98,8	95,1	88,7
15 - 65	83,2	80,5	74,0	84,6	77,7	61,3
55 - 75	69,6	66,1	62,1	74,7	62,8	45,3
55 - 80	53,5	49,4	45,0	60,8	45,1	27,3
60 - 80	55,8	50,2	47,7	63,0	47,6	30,1
65 - 80	59,4	55,4	52,0	66,5	51,7	34,2

Source: Estimated from CELADE, 1999

(*) Estimated as the weighted sum considering the total population of each country .

Around 2015/20, at age 65 (the retirement age mark), it is expected the men to increase their survivorship slightly more than two years related previous two decades: e_{65} will be approximately of 16,5 years, against 14 years at the end of the XXth century. In the case of women, the age 55 presents an additional gain of 3 to 4 years related to the same past. When approaching retirement, e_{55} , would be superior to 27 years in 2015/20. Also, it is worth to notice, that at the end of the XXth century, it is expected two thirds of women reaching age 55 to survive until the age 75. In the period 2015/20, two thirds would survive until the age 80.

**Table 6b: Latin American countries classified according to HDI and selected countries:
Life expectancy and conditional survival probabilities for selected ages
Period: 2005-2010**

Indicator	HDI Level			Cuba	Brazil	Haiti
	High	Medium	Low			
Male						
Life Expectancy (in years)*						
e_0	71,6	69,3	66,6	75,4	66,9	60,0
e_{55}	22,9	22,8	22,4	24,8	21,3	18,7
e_{65}	15,5	15,5	15,3	17,1	14,5	12,4
e_{70}	12,4	12,3	12,1	13,7	11,6	9,8
Conditional Probabilities for selected ages *						
0 - 10	97,4	94,5	94,1	98,7	95,4	90,1
15 - 65	76,6	76,4	70,6	81,5	68,8	61,5
55 - 75	61,6	61,8	60,6	68,8	55,9	45,6
55 - 80	45,0	44,7	43,8	53,8	39,1	27,7
60 - 80	47,7	47,3	46,7	56,3	42,2	30,6
65 - 80	52,0	51,5	51,3	60,3	47,0	35,4
Female						
Life Expectancy (in years)*						
e_0	77,7	74,4	71,7	79,4	74,7	63,9
e_{55}	26,7	25,9	24,9	27,7	25,4	19,7
e_{65}	18,5	17,8	17,2	19,4	17,6	13,1
e_{70}	14,9	14,3	14,2	15,6	14,0	10,3
Conditional Probabilities for selected ages *						
0 - 10	98,0	95,6	94,9	99,1	96,6	93,0
15 - 65	86,5	84,2	79,6	87,1	82,9	66,5
55 - 75	75,0	71,9	69,3	78,3	70,6	49,8
55 - 80	60,8	57,0	54,0	65,7	55,3	31,5
60 - 80	62,9	59,1	56,4	67,7	57,6	34,3
65 - 80	66,0	62,5	60,3	70,9	61,3	39,0

Source: Estimated from CELADE, 1999

(*)Estimated as the weighted sum considering the total population of each country .

For the specific three countries it is expected, however, a persistent inequality among the two ends. That is, there are not, even at the hypotheses level, perspectives of intervention to balance this situation. In fact, when reaching the retirement age, in Cuba a man would survive 5 years more than in Haiti. For women, when reaching the 55 years, the Cubans will survive eight years more than the Haitians will do it. In the case of the Latin American giant, the projections indicate, equally, minimum perspectives of modification; the Brazilian pattern identified at the beginning of the period would remain almost invariable. Despite the relatively medium HDI that Brazil has, the elders' mortality, since the beginning of the period, as already mentioned is closer to the corresponding to the less privileged countries.

**Table 6c: Latin American countries classified according to HDI and selected countries:
Life expectancy and conditional survival probabilities for selected ages
Period: 2015-2020**

Indicator	HDI Level			Cuba	Brazil	Haiti
	High	Medium	Low			
Male						
Life Expectancy (in years)*						
e_0	74.0	72.4	70.6	76.8	70.3	63.8
e_{55}	24.0	24.1	23.9	25.6	22.7	19.5
e_{65}	16.5	16.5	16.4	17.7	15.7	13.0
e_{70}	13.2	13.2	13.2	14.3	12.5	10.2
Conditional Probabilities for selected ages *						
0 - 10	98.1	96.2	96.0	99.0	96.9	92.9
15 - 65	79.9	79.6	75.8	83.4	73.6	66.2
55 - 75	65.8	65.9	65.5	71.2	61.1	49.0
55 - 80	49.9	49.7	49.6	56.7	44.9	30.8
60 - 80	52.4	52.2	52.3	59.0	47.8	33.7
65 - 80	56.5	56.2	56.5	62.8	52.4	38.4
Female						
Life Expectancy (in years)*						
e_0	80.2	77.7	75.8	81.2	78.2	68.4
e_{55}	28.3	27.7	27.1	28.9	27.6	21.0
e_{65}	19.9	19.4	19.0	20.5	19.4	14.0
e_{70}	16.1	15.7	15.3	16.6	15.6	11.0
Conditional Probabilities for selected ages *						
0 - 10	98.5	96.9	96.6	99.3	97.7	95.7
15 - 65	89.0	87.2	84.1	89.1	86.8	72.6
55 - 75	79.1	76.8	75.2	81.1	77.5	55.0
55 - 80	66.7	63.8	61.9	69.8	63.5	36.7
60 - 80	68.5	65.7	64.0	71.6	65.5	39.4
65 - 80	71.3	68.7	67.4	74.4	68.6	43.8

Source: Estimated from CELADE, 1999

* Estimated as the weighted sum considering the total population of each country .

Some Concluding Remarks

The elements showed in this essay demonstrate that there will be a general process of ageing of population, tending, in the long term to level out the countries of the continent. On one side, the onset of fertility decline that took place at different times among the Latin American countries brought about asynchronously destabilization of the age structure and therefore countries –or set of countries– with different age structures and different socioeconomic age–related needs. Different timing in ageing has been, also, one of the consequences.

On the other side, change in mortality, has also contributed to the ageing process by increasing individual longevity. Besides, as improvements in adult mortality levels are expected to reach all countries, it would contribute to eliminate differences in the age structure caused by the national asynchronous fertility decline. Thus, in a relatively shorter period of time, differences in the age structure would be smaller.

While majority of the Latin American countries will have for the period 2000-2010 the most favorable scenario from the standpoint of the age composition, as concluded by Carvalho and

Wong (1998) on the Brazilian situation, the current differences in the available population projections, indicate clear association between stage of demographic transition and social well-being. In this way, the countries whose changes in the age composition were delayed will experience a demographic transition already accomplished –or in process of being– by its predecessors. This *foresight* would facilitate them an evaluation of the positive and negative experiences linked to the demographic conjunctures of the countries that are both more privileged and at the forefront of the transition. The best use of those experiences, once longevity tends to be similar in the whole Region will avoid '*surprised survivors*'. In other words, there will be countries, that after reaching the smallest dependence ratios will support in the medium term, higher dependencies as a consequence of both the increase of the elder population and increasing longevity.

The countries of high and medium HDI in Latin America are currently having a costly process of ageing for being pioneers. That experience includes attempts of solving educational, health economic, social and cultural problems that should be considered and evaluated. Chilean government policy about private initiatives for supporting retirement and pensions during the late eighties that had been relatively successful is an example: Will a similar policy be suitable – *ceteris paribus*– for countries like Bolivia or Peru?

Some aspects –several of them mentioned, for instance, in Carvalho and Wong (1998)– are raised here, they should be assessed in view of the foretold and differentiated demographic transition:

- **Control of the infant and child mortality levels.** It is known that countries as Cuba, Costa Rica or Chile, have low and sustainable levels, similar to minimum averages reached by developed countries. Gains in mortality in this group have been the major responsible for the current increments in the life expectancy at born. Thus, success prophylactic programs replicated and adapted in the poorest countries will tend to narrow the difference in the life expectancy promised by the population projections.

- **Optimization of resources allocated to childhood due to the decreasing number of births.** Reliable vital statistics of several countries and other correlated indicators point out the continuous decline in the absolute number of births. These generations, smaller in size, but with demographic conditions that facilitate the educational qualification –if taken due advantage of the opportunities – will be in charge of, with relatively easiness, the future and inevitable onerous social welfare that approaches. Thus, countries, '*delayed*' in the demographic transition, should be more cautious when designing policies for these population segment. Targets shall be qualitative rather than quantitative when children are considered.

- **Pressure for investments in training of youths entering the labor market.** There is increasing employment demand in the Third world due to the still high growth rates among the population aged 15-64 (generally speaking, the labor force). The experience of the "*South Cone*" (Argentina, Uruguay, etc.) for facing this pressure signals the (an)avoidable road to be thrashed. Also, it should be remembered that, according to the mortality projections, elderly population will survive –at least chronologically speaking–almost homogeneously among the countries, despite of the current level of the nationals well being. Furthermore, this will take place without evidence of significant improvements, as pointed for the numbers of the World Bank (World Bank, 1999).

- **Higher coverage of adult prophylactic medicine.** This action aims the reduction of deaths for avoidable causes. In this way, it is highly desirable to give priority to prophylactic medicine.

Resources of the health system are currently and basically remedial rather than preventive. It is evident that, by increasing life expectancy among the elderly, avoidable diseases – as skin cancer, today, still numerically irrelevant—and those associate to the reproductive tract will tend to increase in areas that are shifting their age composition towards ageing. In this case, preventive attitudes shall strongly be stimulated. That is, current deaths due to avoidable diseases could be postponed through generalization of preventive practices as changes in diet habits, smoking, sedentariness, etc. Some results from private initiative have shown a positive economic balance; it serves as example, the campaign of anti-flu vaccination for elders, in Brazil, initially covered by private medical care plans that is now assumed by the public sphere.

- **Policies for inhibition of earlier retirement.** This would include, as Moraes suggests (1999), modifications in the labor laws in order to stimulate and to re-assure the activity of the elderly and to facilitate the interface between oldest and youngsters in the labor market. Some Asian governments, like Singapore, undergoing sharp ageing process, are encouraging employers to raise their customary retirement age and if necessary, it is prepared to legislate the retirement age. Public policy has actively supported the retraining and reskilling of older workers. (Cheung, 1994).

- **Strategies for recuperation of elderliness as a socio-cultural value.** Moraes, above mentioned, documents Brazilian relatively isolated experiences, in employing people aged 50 or more. *“They would carry ‘a valuable professional experience that can be transferred to the youths, improving their employability... .. transmitting (to the youngsters) the values, of zeal, honesty, cordiality, disciplines and the several qualities that are essential in the current world’”*.

- **Alternative systems to traditional family arrangements, offering social and, psychological protection.** This urgency is brought about because of the smaller number children that couples intend to have. Once these reproductive preferences are implemented, the future elderly population will have an extremely few children that look after them. Necessarily, therefore, alternative systems of coexistence with the elders must be considered. Again, it shall take as ‘pilot tests’ programs implemented in the Regions/areas/countries where demographic transition is practically over.

- **Major gains in female survivorship in the ‘delayed’ countries.** This will end up with important numerically female old population among the low and medium HDI countries. On the average they will be less skilled, and, in general, having experienced rather poor life conditions *vis a vis* the countries of high HDI. The chances of this population to improve the education level or qualification –particularly in the poorest countries– are known to be quite low. Therefore, it should be defined, prophylactic and social security standards different to the registered in the current developed and aged Regions. These differences – added to the equally different cultural and generational patterns shall be considered. Otherwise, successful strategies implemented in the more developed countries, noticeably, Costa Rica, Argentina, Uruguay or even Cuba, would be useless for them.

The success rate that the forefront countries have facing ageing-related demands will facilitate, to the ‘delayed’ countries the application - or not - of similar policies, allowing, in this way, to successfully surpass their corresponding foretold transitions and to find a short-cut towards social development. The ageing of Latin American population is inevitable unless suddenly and huge shifts take place in the current low trend of fertility levels or intercontinental low immigration flows. As none of these are expected to happen in the short or medium term, let’s not forget about it.

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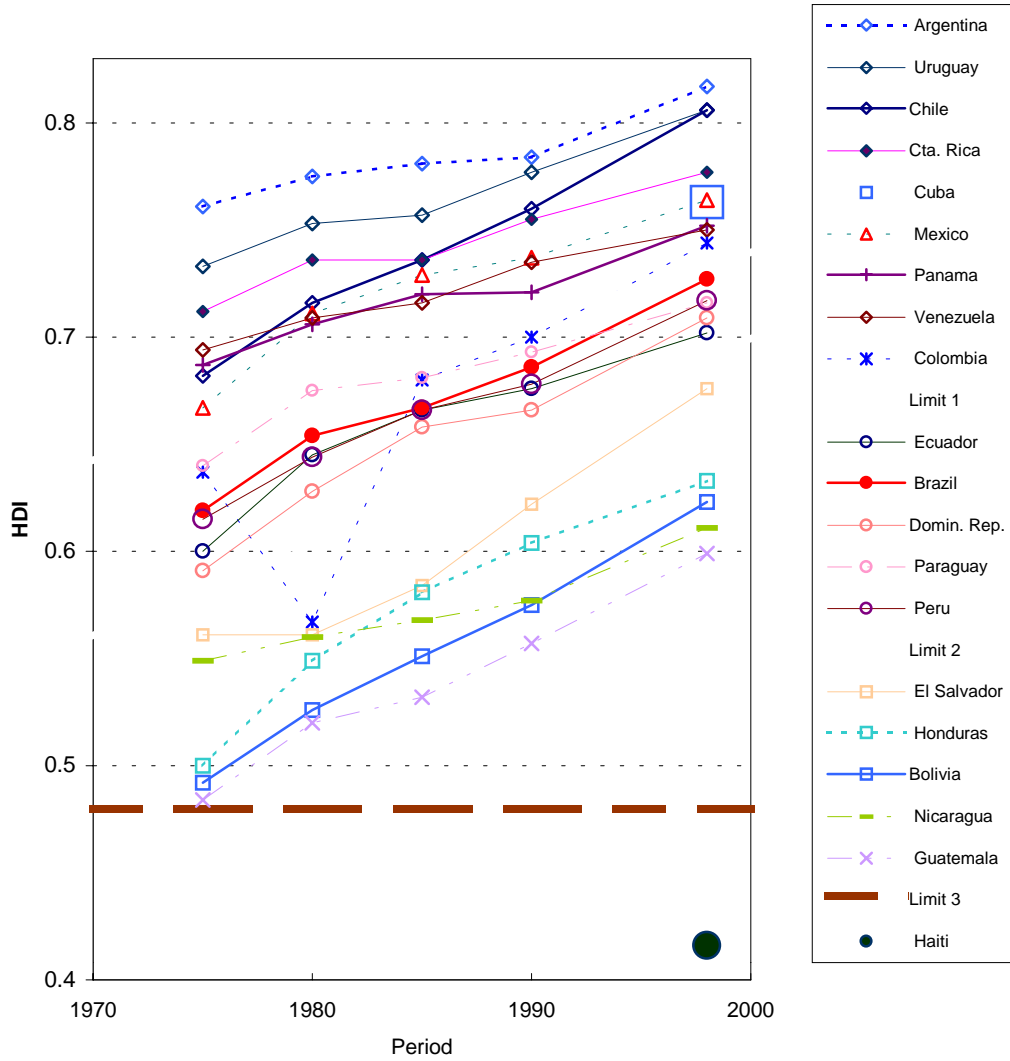
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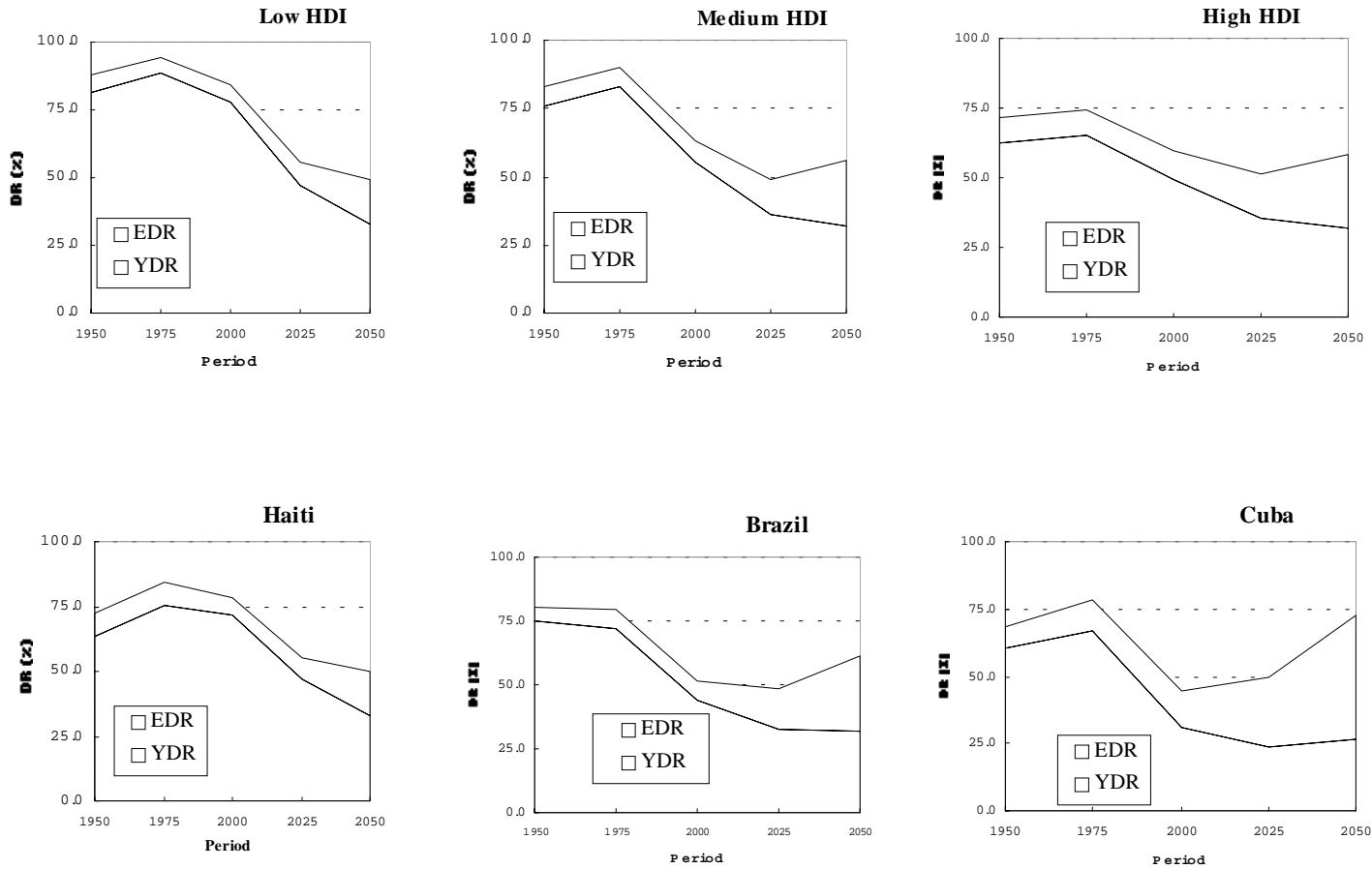
World Bank (1999): Notes from the 1999 World Bank Report. (<http://www.worldbank.org>).

Figure 1: Selected Latin American Countries according to HDI values (1975 - 1998)



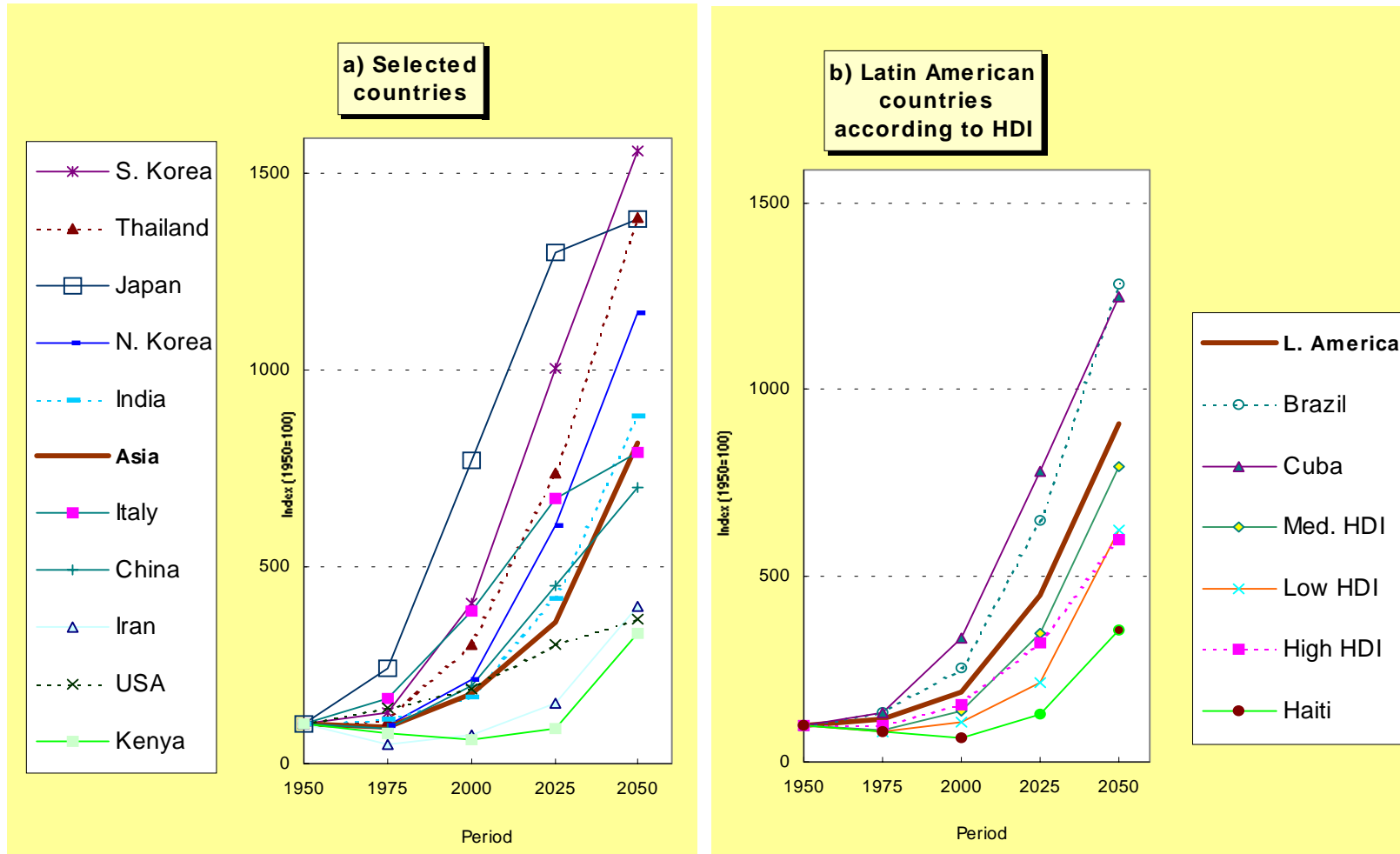
Source: UNDP, 2000

**Figure 2: Latin American Countries according to HDI and Dependency Ratios:
Young and Older Components**



Source: United Nations, 1999NDP, and UNDP, 2000

Aged / Child Ratio (1950 – 2050) – Variation Index (1950 = 100,0)



Source: Wong and Moreira, 2000

Endnotes

ⁱ The DR has two components: (a) The Young Dependence Ratio (YDR) if only population under 15 is included; and (b) the Elderly Dependence Ratio (EDR) if only population aged 64 or more is included.

ⁱⁱ See, for instance, Sryock and Siegel, (1973) p.235.

ⁱⁱⁱ The term Latin America used in this paper also includes the Caribbean countries; small territories are excluded

^{iv} The countries are: Argentina, Brazil, Colombia, Mexico and Peru, accounting for about 60% of the total population of the Region.

^v There are other multiple socioeconomic and demographic aspects to be aware of, not detailed here. Among them, the changes in the family structure and the challenges that the state –and also the family –should face for caring the elderly people.

^{vi} CELADE's numbers for the Latin American population aged 65 and over, by area and sex, for the years 1970 and 2025 are (in thousands):

Area:		Male	Female		Male	Female
Urban	1970:	3.084	4.075	2025:	22.472	31.525
Rural		2.225	2.119		5.910	5.817

Source: CELADE, 1999b.

^{vii} The HDI is elaborated by the UNDP and it is a relative measure for international comparison of welfare. It considers social (education level), economic (GNP *per capita*) and demographic (mortality levels) indicators.

^{viii} Extreme values for the HDI in 1998 were 0,92 (Canada) and 0,25 (Sierra Leone). See UNDP, 2000.

^{ix} Figures A-1 to A-3, in Annex, demonstrate how the evolution of the mortality contributed to reduce the socio-demographic gaps among the countries of the Region.

^x See, for instance, Carvalho and Wong (1998), among others.

^{xi} The DTI is calculated as follows:

$$DTI = 0,5 [7,6 - TFR] / 5,5 + [1 - (79 - e_0) / 36]$$

Where TFR is the total Fertility Rate and e_0 is the life expectancy at birth. The TFR is assumed to decline from an current world maximum average of 7,6 toward the replacement level of 2,1. The e_0 is assumed to increase from an equally current world minimum average 43 years to a maximum of 79 years. For more details, see Kuroda (1994) pgs. 92-95.

^{xii} If the rate of growth population had not varied, the esteemed 283 million population of Latin America in 1970, would have increased to more than 580 million, in 30 years. Comparison with estimates for 2000, results in a difference of approximately 65 million (not born) youths and children.

^{xiii} For comparison purposes, notice that European countries, had, during the fifties, a median age of approximately 29 years. For the nineties, this value is around 36, and it is expected to reach 45 by 2050. Japan, frequently mentioned as example of sharp ageing process of its population, has similar values. Out of this profile are Italy and Spain where median ages would be above 50 during 2050. (United Nations, 1999)

^{xiv} It is estimated that the Haitian TFR would average 5 children by the end of the nineties.

^{xv} As a reference for Latin America and some countries of the Region, see, for example, Carvalho, 1988; Stern e Tuirán, 1993; Carvalho and Wong, 1998; Moreira, 1997; United Nations, 1998.

^{xvi} LDC are those from Africa, Latin America and the Caribbean, Asia (without Japan) and Melanesia, Micronesia and Polinesia.

^{xvii} It is worth to note that they reflect, indeed the experience and specific conditions of the corresponding countries. These life-tables, as it can be deduced from the methodological notes in the CELADE's Demographic Bulletin (1999), scarcely reflects theoretical/empirical survivorship from model life-tables. This comment is also supported by a personal communication from the responsible CELADE's team (Chackiel, 1999).

^{xviii} It is assumed a sex ratio at birth equals to 1.05

^{xix} Infant Mortality for high HDI countries is 23,5 per thousand approximately, for the period 1995-2000. For low HDI countries, for the period 2015-2020, the IM would be 23,9 per thousand. Cuba and Haiti, for this latter period are expected to have IM about 40,0 and 5,0 respectively. (Estimated from the life-tables published by CELADE, 1999).