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LIFE EXPECTANCY TRENDS IN COSTA RICA[1]

Hugo Villegas[2] and Carlos A. Valverde[3]

This article presents an analysis of life expectancy trends in Costa Rica from the early 1970s to 1976. The methodology employed was developed with the help of the Latin American Center for Demography (CELADE). The findings obtained reveal that the average Costa Rican life span grew very rapidly in this period—a time when major efforts were being made to extend health services to underserved population groups.

One goal of Costa Rica's 1971-1980 National Health Plan was "to increase life expectancy at birth between 2.87 and 2.92 years by 1980, which would yield a life expectancy between 71.02 and 71.07 years for those born in that year" (*1*).

For the purpose of working toward this goal, an exhaustive analysis of mortality trends, by age group, and the possibilities for reducing them in the specified time was carried out in 1973 with the help of the Latin American Center for Demography (CELADE). The study gave due consideration to the development of health service programs and to the level and structure of mortality in 1972 (*2*). On this basis, from among a total of 21 initial alternatives for reducing mortality, a selection was made of intermediate objectives deemed feasible within the context of the National Health Plan. These were:

1) To reduce mortality among infants (subjects under 1 year of age) by 30 per cent.

2) To reduce mortality among children 1 to 4 years of age between 50 and 55 per cent.

3) To reduce mortality among children over 5 years of age and among adults in accord with the reductions possible under "normal" conditions as set forth in model United Nations tables (*2, 3*).

General mortality declined markedly in Costa Rica from 1950 to 1973. Over this 23-year period life expectancy at birth for both sexes rose from 55.7 to 68.3 years, registering an average annual gain of slightly more than half a year of life expectancy for each calendar year.

On the basis of the life tables constructed for 1950, 1963, and 1973, life expectancy estimates were drawn up for the period 1950-2000. These estimates singled out 1970-1975 as the five-year period of greatest estimated gain—this gain corresponding to 2.77 years overall or an average increase of 0.55 years in each calendar year. Estimated gains for subsequent periods were progressively smaller, because of the progressively higher base levels of life expectancy achieved. The various estimated gains and base levels are shown in Table 1 (*4-6*).

In order to evaluate the extent to which National Health Plan activities were harmonizing with the aim of raising life expectancy, and also to assess the effectiveness of the plan's principal strategy (extension of health service coverage to rural communities), comparisons were drawn between mortality data for 1970-1972 (before the rural health program began) and 1974-1976 (when the program was in full swing). The activities of the rural health program included control of communicable diseases

[1] Also appearing in Spanish in the *Boletín de la Oficina Sanitaria Panamericana*, 1979.

[2] PAHO/WHO Consultant in Health Services Development, Costa Rica.

[3] Assistant Director of Rural Health, Ministry of Health, Costa Rica.

Table 1. Past and projected Costa Rican life expectancy at birth, 1950-2000.

Period	Life expectancy at birth (both sexes)	Total gain	Average gain per calendar year
1950-1955	58.24 years		
1955-1960	60.50 "	2.26 years	0.45 years
1960-1965	62.81 "	2.31 "	0.46 "
1965-1970	65.41 "	2.60 "	0.52 "
1970-1975	68.18 "	2.77 "	0.55 "
1975-1980	70.23 "	2.05 "	0.41 "
1980-1985	71.79 "	1.56 "	0.31 "
1985-1990	72.82 "	1.03 "	0.21 "
1990-1995	73.37 "	0.55 "	0.11 "
1995-2000	73.78 "	0.41 "	0.08 "

Sources: References (*5*) and (*6*).

(malaria, intestinal parasitic diseases, and diseases preventable by vaccination), basic environmental sanitation, and timely maternal and child care (encompassing nutrition work, periodic monitoring, first aid, and health education).

This CELADE-Ministry of Health study (*7*) revealed significant changes. The extent of these changes, in turn, was found to vary in accord with two factors: the degree of health coverage in individual communities and the time elapsed since these coverage activities began. Tables derived from these data showed life expectancy at birth for each respective period to be 67.71 and 71.15 years. In other words, there had been an apparent gain of 3.44 years overall, equivalent to 0.86 years in each calendar year. This increase is remarkable—not only because of the unprecedented size of the average yearly gain, but also because life expectancy in Costa Rica was high to begin with, and so the possibilities for gain were relatively small.

Pursuing the matter further, 20 life tables were constructed. These included:

- Two tables for the country as a whole (1970-1972 and 1974-1976).
- Ten tables for groups of cantons[4] classified according to the degree of coverage afforded the population by the rural health program. (For each period, five groups of cantons were considered—those not covered by the program; those receiving less than 25 per cent coverage; and those receiving coverages of 25 to 50 per cent, 51 to 75 per cent, and over 75 per cent.)
- Eight tables for groups of cantons classified according to the time elapsed since the start of the rural health program. (For each period, the four groups of cantons considered were those where the program was in its first, second, third, and fourth years.)

The calculations made were based on uncorrected registered deaths in order to facilitate comparability. This was considered reasonable in view of the relative completeness of death statistics in Costa Rica (underregistration was less than 8 per cent in the period 1963-1973) (*4*). The results showed that the gains made were associated with both the degree of coverage provided and the time elapsed since the rural health program began. Particularly marked gains were seen where coverage exceeded 50 per cent and also where the program had been underway for three or more years. When either of these conditions applied, average life expectancy at birth was found to have

[4]The geographic subdivision below the province level. (Costa Rica is organized successively into provinces, cantons, and districts.)

posted sharp gains averaging *over* one year of increased life expectancy per calendar year. Table 2 provides a sampling of the observed gains.

Comparing the 1980 target established by the National Health Plan with these results—obtained five years after initiation of the health service extension program at the national level[5]—supports the conclusion that the 1980 target has been surpassed and that the country has broken through the 70-year life expectancy barrier. This event had not been expected until about the end of the decade.

All in all, the data (see Table 3) show that as of 1976 the following progress had been made toward the reduced mortality goals set in 1973—intermediate goals deemed essential, in terms of available alternatives and estimates, for achieving the increased life expectancy desired.

1) Infant mortality fell 38.8 per cent between 1972 and 1976.

2) Mortality among children 1 to 4 years of age declined by 57.5 per cent.

3) Mortality among people over 5 years of age was reduced by more than the projected amounts in most cases—except for groups in the 10 to 29 age range. (One principal reason for this exception, at least in the upper part of the age range, was that traffic accident rates rose in this period.)

In general, these results closely follow the pattern of the three alternatives selected when the 1980 life expectancy target was established in 1972. This indicates that the methodology employed is a useful one, and that making periodic estimates (with such adjustments as the annual data may suggest) could prove a valuable tool in setting goals for health service programs designed to reduce mortality and alter its composition.

The results also confirmed an assumption used in the rural health program. This assumption was that the greatest changes would occur in places where the program had been active for two years, in areas where coverage was provided to at least 50 per cent of the population, and in areas where the full range of program activities were underway. A prime reason for making the assumption was that in these areas community participation occurs within a framework of concerted activity directed at overall development, thereby providing the driving force behind the health improvement effort.

[5]Activities at the local level began in 1973.

Table 2. Gains in life expectancy at birth in the cantons of Costa Rica, grouped by degrees of coverage of the rural health program,* in the years 1970-1972 and 1974-1976.

Population groups	Life expectancy at birth (in years)		Gains from the first period to the second	Average gain per calendar year
	1970-1972	1974-1976		
Whole population	67.71	71.15	3.44 years	0.86 years
Urban dwellers	68.76	71.16	2.40 "	0.60 "
Rural dwellers in cantons receiving:				
Coverage of less than 25% of the population	68.73	71.13	2.40 "	0.60 "
25-50% coverage	63.94	67.44	3.50 "	0.87 "
51-75% coverage	67.26	71.30	4.04 "	1.01 "
76-100% coverage	67.89	72.96	5.07 "	1.27 "

Source: Reference (7)

*Local activities related to this program for extension of health service coverage first began in 1973.

Table 3. Costa Rican mortality and life expectancy, by age group, in 1972: reductions in mortality projected for 1980, and reduction observed in 1976.

Age group (years)	1972 mortality (deaths per 1,000 inhabitants)	1970-1972 life expectancy, in years	1980 mortality projected by the National Health Plan		Mortality observed in 1976		1974-1976 life expectancy, in years
			Mortality (deaths per 1,000 inhabitants)	% Reduction	Mortality deaths per 1,000 inhabitants)	% Reduction	
Under 1	54.4	67.71	38.08	30	33.3	38.8	71 15
1-4	4.0	71.46	2.00	50	1 7	57.5	73 02
5-9	1.0	68.81	0.70	30	0.5	50.0	69.56
10-14	0.5	64.12	0.38	25	0 4	20.0	64 74
15-19	1.1	59.29	0.84	24	0.9	18.2	59.90
20-24	1.6	54.56	1.22	24	1.4	12.5	55 17
25-29	1.5	49.93	1.14	24	1 4	6.7	50.56
30-34	2.2	45.31	1.75	20	1.7	22.7	45 94
35-39	2.6	40.76	2.15	17	2.0	23 1	41 35
40-44	3.1	36.25	2.69	13	3 0	3.2	36.79
45-49	5.2	31.78	4.60	12	4.2	19.2	32.33
50-54	6.7	27.48	6.07	9	6.2	7.5	28 00
55-59	11.6	23.34	10.72	8	8.7	25 0	23 83
60-64	15.7	19.53	14.76	6	15.4	1.9	19.88
65-69	28.7	15.85	27.29	5	25.4	11.5	16.16
70-74	43.2	12.80	41.56	4	35.3	18.3	13.08
75-79	68.5	10.08	66.03	4	66.5	2.9	10 18
Over 79	184.2	8.25	182.36	1	169.0	8.3	8.23

Sources. Dirección General de Estadística, *Estadística vital,* 1972, 1976, and CELADE, *Estudio sobre esperanza de vida en Costa Rica,* 1972.

SUMMARY

A fundamental goal of Costa Rica's 1971-1980 National Health Plan was to boost average life expectancy at birth by roughly six months in each calendar year, so as to push average life expectancy above 71 years in 1980. This was to be accomplished principally through special programs for extending health services to underserved parts of the population.

To help assess the effectiveness of this health coverage effort, the Latin American Center for Demography and Costa Rica's Ministry of Health conducted a joint study comparing mortality data for 1970-1972 and 1974-1976. Among other things, the study indicated that life expectancy at birth rose from 67.71 years in 1970-1972 to 71.15 years in 1974-1976. Moreover, the gains made in particular regions tended to rise as health coverage became complete and after the coverage program had been underway for some time. The study thus revealed achievement of greater gains than those expected.

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