

Consistent Improvement in the Nutritional Status of Colombian Children between 1965 and 1989¹

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Three national anthropometric surveys carried out in Colombia in 1965–1966, 1977–1980, and 1986–1989 provide a reasonably standardized basis for comparing the nutritional status of infants and young children in those years. That comparison, presented here together with appropriate socioeconomic data, indicates marked reduction of malnutrition paralleling strong socioeconomic gains.

Energy-protein malnutrition of infants and children, commonly reflected in physical growth retardation, is one of the most important public health problems of developing countries—because of its prevalence and because of its functional implications for the individual and society at large. A variety of developing country national nutrition surveys have been performed over the last three decades to assess the magnitude of childhood nutrition problems (1). However, repeated prevalence surveys using similar statistically selected samples representative of the entire population are uncommon, and so comparable data suitable for assessing trends over time and the relationship of such trends to socioeconomic development are not usually available.

An exceptional situation exists in Co-

lombia, where the Ministry of Health has conducted national health surveys covering the periods 1965–1966 (2), 1977–1980 (3), and 1986–1989 (4). These surveys included anthropometric measurements of country-wide samples of infant and young (preschool age) children. The three resulting sets of data, covering similar representative samples of the general population, are comparable enough to permit valid assessment of changes in the nutritional status of Colombian children over the 24-year interval between 1965 and 1989.

This article reports findings obtained by comparing the overall results of the studies' anthropometric evaluations of young children. General demographic, socioeconomic, and health information (obtained from official government statistics and other sources) are also presented in order to show concomitant social and economic development trends throughout the 24-year period. The reason for using a variety of social and economic indicators here is to document parallel trends in these indicators—rather than to relate them to each other, make attributions, or explore causal relationships.

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METHODS

The three country-wide surveys were conducted using samples representing virtually the entire population (nearly 98%), excluding only those people (less than 3% of the total) living in the underpopulated eastern plains and jungle areas. These samples were comprised of the members of randomly selected households from which family and individual data were collected. Anthropometric measurements were taken from all children within specified age ranges. The numbers of children up to five years of age that were included in each survey are shown in Table 1.

Similar data collection methods, measurement techniques, and data quality control procedures were used in each of the three studies. Anthropometric measurements, taken by trained interviewers following standard procedures, included weight to the nearest 0.1 kg and length (up to two years of age) or height (after two years) to the nearest millimeter (5). Birth dates were verified whenever possible.

Similar analytic procedures were applied to the three sets of data. Age in months, weight, and length or height were used to obtain three anthropometric indicators: weight-for-age, length or height-for-age, and weight-for-length or height;

and the observed values were compared to those proposed for international reference by the World Health Organization (6). Prevalences of study subjects with low anthropometric indicator values were estimated according to WHO procedures (7), using a cutoff point two standard deviations (-2.0 Z scores) below the reference mean. The data presented also include demographic, socioeconomic, and health indicators obtained from appropriate sources.

RESULTS

Changing Childhood Malnutrition Prevalences

Tables 2, 3, and 4 show estimated prevalences of malnutrition among the survey subjects 0–59 months of age. These estimates have been derived from the three aforementioned anthropometric indicators, on the basis of which comparisons between the three 1965–1989 surveys can be made. Figures 1 and 2 show trends in malnutrition prevalences among rural and urban subjects.

Global Malnutrition

The figures in Table 2 indicate that the total prevalence of global malnutrition (low weight-for-age) among study children 0–59 months of age declined by about 20% from the first survey to the second and by about 52% from the first survey to the third. The overall reduction in the prevalence of moderate to severe malnutrition (61%) was more marked than the decline in the prevalence of mild malnutrition (49%). As was to have been expected, the shift in the weight-for-age distribution toward the left resulted in less consistent changes in the prevalence of mild global malnutrition across age groups.

Table 1. Sample sizes of children in the three surveys, by age group (Colombia, 1965–1989).

Age (in months)	Years of survey		
	1965–66	1977–80	1986–89
0–5	102	187	200
6–11	101	216	208
12–23	192	319	392
24–35	196	369	401
36–47	175	338	379
48–59	184	331	393
Total	950	1,760	1,973

Figure 1. Prevalences (%) of global malnutrition (low weight-for-age) among Colombian children 0–59 months of age, grouped according to urban and rural areas of residence, as indicated by data from the national health surveys of 1965–1966, 1977–1980, and 1986–1989.

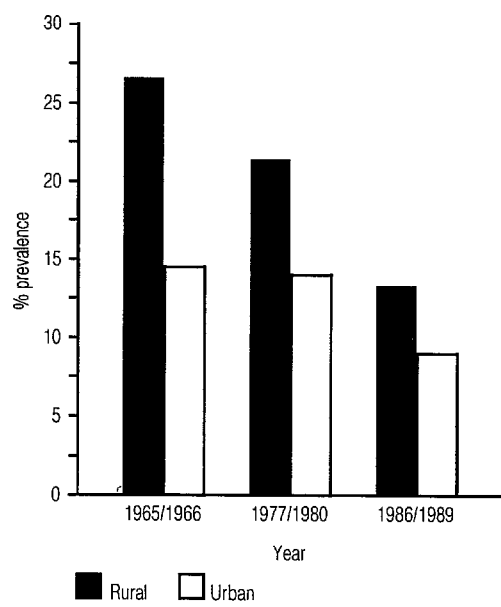


Figure 2. Prevalences (%) of stunting (low length or height-for-age) among Colombian children 0–59 months of age, grouped according to urban and rural areas of residence, as indicated by data from the national health surveys of 1965–1966, 1977–1980, and 1986–1989.

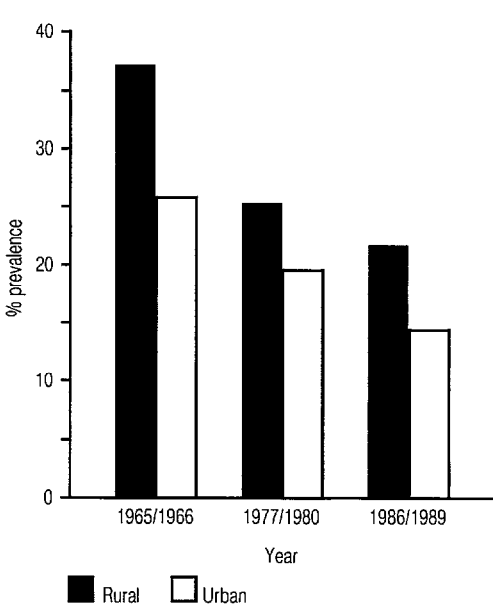


Table 2. Prevalences of global malnutrition (low weight-for-age) detected by the three surveys among the children studied (Colombia, 1965–1989).

Age group (months)	Prevalences of low weight-for-age malnutrition (%) ^a								
	Mild ^b			Moderate/severe ^c			Total		
	1965–66	1977–80	1986–89	1965–66	1977–80	1986–89	1965–66	1977–80	1986–89
0–5	0.6	2.6	0.4	0.8	0.4	0.0	1.4	3.0	0.4
6–11	10.1	12.5	6.3	7.3	1.7	2.6	17.4	14.2	8.9
12–24	17.5	18.1	10.8	7.1	5.8	5.4	24.6	23.9	16.2
25–35	15.8	13.5	8.5	10.4	2.0	2.2	26.2	15.5	10.7
36–47	22.8	16.9	6.1	4.2	1.8	0.4	27.0	18.7	6.5
48–59	16.6	17.7	10.8	2.8	1.4	1.8	19.4	19.1	12.6
0–59	15.5	14.4	7.9	5.6	2.4	2.2	21.1	16.8	10.1

^a2.0 or more Z-scores below the reference mean.
^bBetween 2.0 and 2.9 Z-scores below the reference mean.
^c3.0 or more Z-scores below the reference mean.

Table 3. Prevalences of stunting (low length or height-for-age) detected by the three surveys among the children studied (Colombia, 1965–1989).

Age group (months)	Prevalences of stunting (low length or height-for-age) (%) ^a								
	Mild ^b			Moderate/severe ^c			Total		
	1965–66	1977–80	1986–89	1965–66	1977–80	1986–89	1965–66	1977–80	1986–89
0–5	2.2	0.8	2.7	1.4	0.6	0.0	3.6	1.4	2.7
6–11	7.5	7.3	6.1	3.1	2.8	0.8	10.6	10.1	6.9
12–23	17.8	18.3	14.0	13.7	8.3	10.0	31.5	26.6	24.0
24–35	16.5	12.8	9.9	16.3	7.2	3.8	32.8	20.0	13.7
36–47	26.9	21.4	12.3	19.6	11.4	5.0	46.5	32.8	17.3
48–59	26.7	23.0	16.7	18.1	8.9	6.8	44.8	31.9	23.5
0–59	18.2	15.1	11.4	13.7	7.3	5.2	31.9	22.4	16.6

^a2.0 or more Z-scores below the reference mean.

^bBetween 2.0 and 2.9 Z-scores below the reference mean.

^c3.0 or more Z-scores below the reference mean.

Stunting

The survey data indicate a drop of about 30% in the prevalence of stunting (low length or height-for-age) among study children 0–59 months old from the first survey to the second, and a drop of about 48% from the first survey to the third (Table 3). As in the case of global malnutrition, moderate to severe stunting dropped to a greater extent (by 62% compared with 37% for mild stunting), and changes in the prevalence of total and severe stunting were more consistent across age groups than those of mild stunting.

Wasting

All three surveys found the prevalence of wasting (acute malnutrition, low weight-for-length or height) to be relatively low among the respective 0–59 month groups (Table 4). The data suggest that this prevalence increased from 3.9% to 4.9% between the first two surveys, when there was a large decline in stunting, but dropped to 2.9% in the third, the percentage of moderate to severe cases found by the latter survey being only 0.5%. When the data are broken down by age group, the highest prevalences of wasting are found in the 12–23 month group;

Table 4. Prevalences of wasting (acute malnutrition, low weight-for-length or height) detected by the three surveys among the children studied (Colombia, 1965–1989).

Age group (months)	Prevalences of acute malnutrition (low weight-for-length or height) (%) ^a								
	Mild ^b			Moderate/severe ^c			Total		
	1965–66	1977–80	1986–89	1965–66	1977–80	1986–89	1965–66	1977–80	1986–89
0–5	1.6	4.0	1.0	1.5	0	0.5	3.1	4.0	1.5
6–11	3.9	5.6	2.4	3.7	3.1	1.0	7.6	8.7	3.4
12–23	6.7	7.9	4.3	0.7	1.9	0.8	7.4	9.8	5.1
24–35	2.8	4.1	3.5	1.0	0	0.2	3.8	4.1	3.7
36–47	1.6	0.8	0.8	0	0	0	1.6	0.8	0.8
48–59	0.6	2.4	2.0	0.3	0	0.3	0.9	2.4	2.3
0–59	3.1	4.1	2.4	0.8	0.8	0.5	3.9	4.9	2.9

^a2.0 or more Z-scores below the reference mean.

^bBetween 2.0 and 2.9 Z-scores below the reference mean.

^c3.0 or more Z-scores below the reference mean.

but these do not exceed 10% for any of the survey periods shown in the table, the prevalence found in the last period (5.1%) being the lowest.

Geographic Patterns

Overall, the data show that malnutrition declined more in the rural areas, thus tending to close the preexisting urban-rural gap, whereas the decline in stunting was proportionally greater in urban areas (Figures 1 and 2).

More generally, the malnutrition picture tended to improve most strongly in the poorest regions of the country, so that former marked regional differences in the prevalence of malnutrition also tended to diminish (4). In 1965–1966 the percentages of study children 0–59 months old who were below the third percentile of the WHO international reference standard of weight-for-age ranged by geographic region from 12.0% to 31.9%, and the percentages below the third percentile of length or height-for-age ranged by geographic region from 17.2% to 39.3%.

However, by 1986–1989 the corresponding ranges had been sharply reduced, the low weight-for-age range being 12.4% to 14.7% and the low length or height-for-age range being 16.9% to 21.8%.

Changes in Social and Economic Indicators

During the 24-year period spanned by the surveys, important positive changes occurred in a broad spectrum of national demographic, socioeconomic, and health indicators (8–15). Table 5 shows demographic and socioeconomic (household) data derived from country-wide population censuses carried out in 1964, 1973, and 1985. While Colombia's total population increased by about 69% between 1964 and 1985 (from 17.5 to 27.9 million), reaching nearly 33 million by 1990, the annual population growth rate declined from 3.2% to 1.7%. The age distribution changed accordingly; the share of the population accounted for by children (people under 15 years old) dropped from nearly 49% to 36%, and the shares ac-

Table 5. Selected demographic indicators and household conditions reported by the last three national censuses in Colombia (1964, 1973, and 1985).

	1964	1973	1985
Total population (millions)	17.5	22.9	27.9
Annual population growth (%)	3.2	3.0	1.7
Age distribution (%):			
<15 years	48.8	44.8	36.1
< 5 years	18.0	15.5	12.1
< 1 year	4.0	3.2	2.2
Urban:rural population	52:48	59:41	67:33
% illiterate (≥ 15 yrs)	27.1	18.8	11.5
% crowded households (≥ 4 persons per room)	—	22	13
% households with protected floors (wood, tile, etc.)	—	65	84
% households with electricity	—	58	78
Urban	—	87	95
Rural	—	15	41
% households with drinking water supply	—	61	70
Urban	—	87	89
Rural	—	24	28

counted for by those under five years old and under one year old fell from 18% to 12% and from 4% to 2%, respectively.

At the same time, the urban:rural ratio changed from 52:48 to 67:33 in two decades (the most recent estimate is 70:30), and the illiteracy rate among people 15 years or older dropped from 27% to less than 12% (see Table 5). Between 1973 and 1985 the percentage of households with four or more people per room declined from 22% to 13%, while the percentage with protected floors (generally wood or tile) rose from 65% to 84% and the percentage with access to electricity increased from 58% to 78%, this latter improvement being especially marked in rural areas. Changes in sanitation were less pronounced, the percentage of households provided with piped water remaining essentially unchanged in the urban areas and increasing only slightly in rural zones.

Significant changes in certain other socioeconomic indicators that occurred between 1950 and 1988 are shown in Table 6. The gross domestic product (GDP) grew at average annual rates of 6.5% between 1967 and 1974, 5.0% between 1974 and 1979, and 3.4% between 1980 and 1988, the average annual GDP growth over the 35-year period 1950–1985 being 4.9% (16). Correspondingly, per capita GDP grew at an annual average rate of 2.1% in 1950–1972, 3.8% in 1972–1979, and 1.2% in 1980–1988, the average annual rate between 1965 and 1988 being 2.4%. The total income share of that half of the urban population with the lowest income increased from 16% in 1970 to 22% in 1985, while the total income share of that 10% of the urban population with the highest income dropped from 43% to 36% in the same period.

Women's participation in the formal la-

Table 6. A variety of socioeconomic indicators in Colombia applying to the period 1964–1989.

Indicator	Applicable period, except where indicated otherwise		
	1965–66	1977–80	1986–89
Gross domestic product (% annual growth)	6.5 (1967–74)	5.0 (1974–79)	3.4 (1980–88)
Per capita GDP (% annual growth)	2.1 (1950–72)	3.8 (1972–79)	1.2 (1980–88)
Income share (%) of 50% of the population with lowest income	15.9 (1970)	—	21.8 (1985)
Income share (%) of 10% of the population with highest income	43.4 (1970)	—	36.4 (1985)
Adult women with salaried jobs (%)	17.3 (1964)	26.1	45.0 (1985)
Net primary school enrollment (%)	57 (1965)	80	93 (1985)
Primary school completion rate (%)	15	36	57
% urban completion	41	53	62
% rural completion	3	11	18
Secondary school enrollment (%)	17 (1965)	31	55 (1985)
University enrollment (%)	3	7	14

Sources: References 11, 15–17.

bor force also increased, from 17% in 1964 to 26% in 1977–1980 and 45% in 1985. Net primary school enrollment rose from 57% in 1965 to 93% in 1985 (virtually 100% in the urban areas), and secondary school enrollment increased from 17% to 55% in the same period. Female enrollment rates in both primary and secondary school more than doubled, and completion rates improved significantly in both urban and rural areas. The male:female ratio of primary and secondary school students reached 50:50 in 1986–1988, while that of university students changed from 65:35 in 1975 to 52:48 in 1985.

The Demographic and Health Surveys of 1978, 1986, and 1990 showed a signif-

icant increase in the educational level attained by women of reproductive age: Illiteracy among such women declined from 13.3% to 4.2%, while the percentage of women with at least secondary education rose from 33.7% to 54.5% (17).

Changes in general health indicators are shown in Table 7. Life expectancy at birth rose from 55 years in 1965–1966 to 69 years in 1989. The total fertility rate (live births per woman) declined progressively from 7.0 in 1965 to 2.9 in 1989. The crude birth rate dropped from 45 per thousand population in 1964 to 26 in 1988, while the crude death rate fell from 14.0 per thousand in 1965 to 5.2 in 1988. Infant mortality declined steadily—from 86

Table 7. Selected health indicators obtained during the period 1960–89 in Colombia.

Indicator	Applicable period, except where indicated otherwise		
	1965–66	1977–80	1986–89
Life expectancy at birth (years)	55	62	69 (1989)
Crude birth rate per thousand population	45 (1964)	30	26 (1988)
Crude death rate per thousand population	14.0 (1965)	6.4	5.2 (1988)
Total fertility per woman	7.0 (1965)	4.3	2.9 (1989)
Infant mortality (deaths per thousand live births)	86	64	39 (1989)
Mortality (deaths per thousand) among children 1–4 years of age	14.5 (1965)	7.0	3.0 (1988)
Mortality (deaths per thousand live births) among children <5 years of age	148 (1960)	78	50 (1989)
Mortality (deaths per thousand) among children 5–14 years of age	—	1.1 (1970)	0.5 (1988)
Maternal mortality (deaths per 100,000 deliveries)	254 (1965)	160	110 (1987)
Diarrheal disease mortality as:			
% of infant mortality	—	24.0 (1977)	11.4 (1988)
% of 1–4 year mortality	—	23.2	16.6 (1988)
Acute respiratory disease mortality as:			
% of infant mortality	—	15.2	11.2 (1988)
% of 1–4 year mortality	—	15.0	12.1 (1988)

Sources: References 8, 13–17.

deaths per thousand live births in 1965–1966 to 39 in 1989. (The most recent infant mortality estimate is as low as 27 deaths per thousand live births—17.) In general, regional and urban-rural differences in rates of infant mortality have substantially diminished, while those associated with maternal education, maternal age, birth order, and birth spacing have persisted.

The percentage of infant mortality attributed to diarrheal diseases fell from 24% in 1977 to 11.4% in 1988, while that attributed to acute respiratory infections dropped less sharply. The two-week prevalence of diarrhea among children 0–5 years old dropped from 19% in 1986 to 12% in 1990, and the share of cases treated with oral rehydration therapy reached 49% (31% being treated with pre-packaged ORS mixtures and 18% with mixtures made at home) (17). Maternal mortality also dropped, from 254 deaths per 100,000 deliveries in 1965 to 110 in 1987, as did overall mortality among women of reproductive age (from 2.6 to 1.2 per thousand women).

Mortality among preschoolers in the 1–4 year age group was 14.5 deaths per thousand in 1965, 7.0 in 1977–1980, and 3.0 in 1988; in a similar fashion, mortality among school-age children dropped from 1.1 per thousand in 1977 to 0.6 in 1984. Overall mortality (including infant mortality) among children under 5 declined from 148 deaths per thousand in 1960 to 50 in 1989 (8). In 1964, children under age 5 represented 17.6% of the population and accounted for nearly 50% of all deaths, while in 1985 they represented only 12% of the population and accounted for only 27% of all deaths.

There was also a large increase in both the availability of health personnel and the coverage provided by health services (Table 8). More specifically, there were significant improvements in the availability of physicians, dentists, nurses, auxiliary nurses, and community health workers. Although the average number of hospital beds per thousand inhabitants declined, their utilization (as indicated by the number of patients discharged per bed per year) improved significantly. The

Table 8. Indicators of health resource availability, health care provided, and immunization coverage in Colombia, 1970–88.

	1970	1980	1988
Health personnel per 10,000 population:			
Physicians	4.4	6.2	9.7
Dentists	1.6	2.2	4.6
Nurses	0.9	1.5	2.5
Auxiliary nurses	3.6	8.0	10.3
Community health workers	0.7	1.6	2.4
Hospital beds per thousand population	2.2	1.7	1.5
Patients discharged per bed/year	22.9	33.7	40.7
Prenatal care coverage (%)	—	38.0	80.0
Immunization coverage (%) against:			
Tuberculosis	—	57	90
Diphtheria, pertussis, tetanus	—	20	75
Polio	—	22	92
Measles	—	26	73
Tetanus (pregnant women)	—	6	40

Sources: References 8, 15–17.

proportion of pregnancies receiving prenatal care from trained personnel increased from 38% in 1970 to 80% in 1990 (17). Regarding deliveries, the 1990 Demographic and Health Survey (17) found that about 80% of the last deliveries reported by mothers in the national survey sample were attended by formally trained health personnel (71% by physicians) and that 76% of these deliveries occurred at health institutions.

DISCUSSION

As in other developing countries, childhood malnutrition has long been a major public health problem in Colombia. Partial studies carried out in the 1960s reported prevalences above 60% among children under five years of age; these estimates were based on the Gómez classification, which takes 90% of the standard weight-for-age as a cutoff. The national prevalence reported in 1965–1966 using this criterion was 55.8%, with moderate to severe malnutrition cases (those under 75% of the standard weight-for-age) reaching 15.7% (3).

When a more accepted and statistically meaningful cutoff point, established at two standard deviations below the mean of the reference population, was applied to the first national survey of 1965–1966, the prevalence of global malnutrition (low weight-for-age) among children under five years old was 21.1%, and the prevalence of stunting (low length or height-for-age indicating retarded linear growth) was an even higher 31.9% (3). On the average, between two and three out of every 10 children were clearly undernourished. As in most Latin American countries, acute malnutrition or wasting (as indicated by low weight-for-length or height) was relatively less common (18), its general prevalence being 3.9%, and it affected mostly children in the 6–23 month age

group, its prevalence among them being approximately 7.5%.

By 1977–1980, as indicated in Tables 2 and 3, the prevalences of global malnutrition and stunting had declined by about 20% and 30%, respectively (3). The results of the 1977–1980 survey indicate that one out of every six children under five years of age was generally malnourished (having low weight-for-age), and that one out of five was stunted (with low height or length-for-age). This declining trend in the prevalences of these forms of malnutrition continued after 1980. By 1989, only one out of 10 children exhibited global malnutrition, and only one out of six was stunted.

Overall, the prevalences of both global malnutrition and stunting were cut in half during the 1965–1989 period. This contrasted with the prevalence of wasting (low weight-for-height or length), which was found by all three surveys to be relatively low. Despite changes in the overall rates of malnutrition over time, the first two years of life remained the most critical period, one that carried the highest risk of physical growth retardation (see Tables 2–4).

As the data indicate, major improvements in the childhood nutrition picture have accompanied a relatively rapid process of social and economic development. Among the developing countries, Colombia has been one of the most successful in raising its people's standard of living. The economy has grown steadily and has become increasingly diversified over the past three decades, and the country has made the transition from a predominantly agricultural society to one that is highly urbanized.

Throughout the 1960s and 1970s, and to a lesser extent in the 1980s, economic growth was accompanied by substantial improvements in public expenditures for the social sector (19). Despite the economic crisis, public social expenditures

throughout the 1980s represented about 8% of the total gross national product, and expenditures for education, health, and social security maintained their shares (38%, 14%, and 39%, respectively) of total public social expenditures (16).

Sizeable investments have been made in the nation's infrastructure—especially in electric power, communications (the number of telephone lines grew from 68,000 in 1965 to 3 million in 1985), and roads (the road network quadrupled in the same period)—and social services were developed throughout the country.

The number of homes and their physical condition also improved. The number of dwelling units increased from 1.6 million in 1950 (making an average of 6.6 persons per unit) to 6.4 million in 1985 (bringing the average to 4.2 persons per unit). By 1985–1987 about 92% of the population (all urban residents and 76% of the rural dwellers) had access to safe water (8). The 1990 Demographic and Health Survey (17) found that 99% of the urban households had electricity, 95% had a piped water supply, and 89% were connected to a sewage system; the respective proportions for rural households were 71%, 43%, and 17%.

Significant changes in income distribution also occurred. Colombia is one of the few Latin American countries that has managed to improve an initially very unequal distribution of income. The GINI coefficient, a measure of inequality which in theory may range from 0 (perfect equality) to 1 (complete inequality), fell steadily from 0.57 in 1964 to 0.45 in 1988 (20). The incidence of poverty fell by 2.9 percentage points a year between 1971 and 1978 (9), a period when the real wages of unskilled workers rose at an average of 6.6% per year, considerably faster than GNP per capita (3.9% per year). This shifted the distribution of income in favor of the poor (9).

As already noted, Colombia has also

experienced a rapid demographic transition (13–14), with dramatic declines in rates of fertility and population growth. The fertility decline has been attributed to substantial improvement in women's education and access to the labor force, increased urbanization, improved income, delayed marriage, and increased availability and use of birth spacing methods (the prevalence of contraceptive use reached 66% in 1990) (17). As a consequence, the population's age structure changed dramatically as the relative size of younger age groups shrank.

Levels of education, especially of women, also registered substantial gains (15). Since 1960, primary school enrollment has more than doubled, secondary school enrollment has sextupled, and university enrollment has increased fifteen-fold. The illiteracy rate has fallen more than 55%, and previous gender differences regarding literacy have disappeared. Not only has female access to the educational system increased, but women's formal participation in the labor force has risen by nearly 50% (11).

Food production and availability have usually been sufficient to meet estimated needs (12). Indeed, annual increases in food production have surpassed declining rates of population growth, registering average rates of 4.5% in 1965–1980 and 2.4% in 1980–1988. This has produced a steady increase in per capita food availability (9), with the per capita dietary energy and protein supplies rising from 2,174 calories and 52 grams of protein per day in 1965 to 2,561 calories and 57 grams of protein in 1988 (at which point the daily calorie supply was at 110% of that required) (8).

Concomitant improvements in health indicators have included substantial increases in both life expectancy at birth and coverage by primary health care services, as well as marked reductions in morbidity from infectious diseases, age-

specific mortality, and the role of infectious diseases in childhood morbidity and mortality (8, 11, 15). Today far more Colombians have access to health services, safe drinking water, and other basic services than was the case previously.

It is well known that improvements in education, health, and nutrition tend to reinforce each other. However, the social changes that have occurred in Colombian society over the last few decades are not merely the consequence of a relatively fast rate of economic growth. Successive governments have given relatively high priority to social improvements, as demonstrated by substantial budgetary allocations to education, training, health, housing construction, and recreation. The social sector's proportional share of the total national budget rose from 31% around 1965 to nearly 50% by 1980. Despite current economic adjustment policies, at present some 26.8% of all public investments are devoted to the social infrastructure—9.9% to water and sewerage, 7.0% to education, and 9.9% to health and nutrition (11). It should be noted, however, that the health sector's share of national budgetary resources decreased from 10% in the 1970s to only 4.4% in 1987 (10), and that overall per capita health expenditures declined from about 8% of GNP to about 7% in the period from the 1970s to the late 1980s.

Colombia created a national health system in 1975. Since then the coverage provided by primary health care services has increased steadily, as has the number of physical facilities (rural health centers and posts). By 1980, 87% of the population had access to a health center or post and 71% had access to a hospital—access to these facilities being defined as having them reachable from home in two hours using the normal mode of transportation. Recent estimates indicate that public health services are readily available to about 60% of the population, with an ad-

ditional 30% of the population being served by the Social Security System and private health care services. It is also worth noting that unprecedented levels of vaccination have been attained: 90% against tuberculosis; 75% against diphtheria, pertussis, and tetanus; 92% against polio; and 73% against measles. In addition, 40% of all pregnant women are being vaccinated against tetanus (8).

Regarding nutrition, Colombia has a long tradition of nutrition and primary health care development, and increasing priority and resources have been allocated to nutrition-related programs. A number of nutrition improvement initiatives have been implemented—including the integrated applied nutrition programs in the 1960s and early 1970s that later evolved toward a National Food and Nutrition Plan (21), the Integrated Rural Development Program that has always enjoyed sustained political backing and central government support, and the functional surveillance system set up in the late 1980s to monitor the country's food and nutrition situation and to guide development of policies and programs.

CONCLUDING REMARKS

The foregoing account has sought to show the consistent improvement in the nutritional status of Colombian children over the past three decades that has paralleled positive changes in social and economic development indicators. It is not possible, within the scope of this presentation, to attribute these positive trends to particular global or sectoral factors, policies, or programs. Additional time series studies may shed some light on this matter. Meanwhile, it should be noted that the consistently positive general trend appears to have slowed down during the first half of the 1980s, over the course of the economic crisis affecting most developing countries, particularly in Latin

America. Fortunately, however, Colombia has been less affected than many Latin American countries, and economic indicators have recently shown some recuperation. Overall, the country's economic growth during the 1980s reached 24.7%, the highest in the region, as compared to an overall regional average of 10.7%.

It should also be noted that despite significant improvement in children's nutritional status, various types of malnutrition (including protein-energy malnutrition, iron deficiency anemia, and marginal vitamin A deficiency in some areas) still pose serious nutrition problems affecting important segments of the Colombian population (3, 22, 23). As of 1989, it was estimated that over 400,000 children under five years old were suffering from protein-energy malnutrition (as indicated by low weight-for-age), about 681,000 were stunted (most likely as a result of chronic deprivation and malnutrition), and close to 120,000 were wasted (acutely malnourished). Therefore, despite the progress to date, it seems apparent that only the ongoing concern and political commitment of governments, political leaders, policy makers, and the public at large regarding equitable social and economic development, promotion and acceleration of required concurrent changes to the social structure, and improved public access to education, health care, nutrition, and social services can ensure that sustained economic growth will be accompanied by a continued nutritional improvement ultimately leading to the virtual eradication of malnutrition.

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Child Health Phase II

In July 1991, the Pan American Health Organization, in partnership with the United States Agency for International Development (USAID), launched Child Health Phase II, an accelerated immunization program in the Americas for the period 1991–1995, with the signing of a US\$20 million agreement with USAID. The purpose of the program is to complete the eradication of polio in the Western Hemisphere, to eliminate measles in the Caribbean, to make substantial progress toward the elimination of both measles and neonatal tetanus throughout the Americas, and to increase coverage with the other three EPI vaccines. The expected cost of the effort over five years is some US\$100 million, to be contributed by donor countries, development agencies, and international and private organizations.