CUBAN EXPERIENCE IN CHILD HEALTH CARE 1959-2006

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PROLOGUE

Writing a prologue is not an easy task, especially when it is to a book that bears witness of 50 years of Revolution in the field of child health and whose human significance relates to life, to the health of those who "are hope for the world, those who know how to love" (José Martí).

When analyzing the social situation in Cuba during his trial after the attack on the Moncada Garrison, where he conducted his own defense, Fidel Castro said:

"Society is moved to compassion when it hears of the kidnapping or murder of one child, but it is criminally indifferent to the mass murder of so many thousands of children who die every year from lack of facilities, agonizing with pain. Their innocent eyes, death already shining in them, seem to look into some vague infinity as if entreating forgiveness for human selfishness, as if asking God to stay wrath. And when the head of a family works only four months a year, with what can he purchase clothing and medicine for his children? They will grow up with rickets, with not a single good tooth in their mouths by the time they reach thirty; they will have heard ten million speeches and will finally die of misery and deception."

This book has a special characteristic, for it advances the facts by stages, bearing in mind the dates on which laws and transformations implemented by the Revolution resulted in pediatric actions that have made it possible for the Cuban family not to experience again the social realities under Batista's dictatorship.

Those who read this book will feel their hearts beating with unprecedented intensity and will, without a doubt, understand what the Revolution has done and why it will never stop, even if the empire never lets up in its efforts to destroy it.

This is a way of recognizing those men and women who, in the field of public health, with absolute commitment, with unlimited devotion, with the Revolution in mind, have been able to turn into reality what Fidel promised the victorious Revolution would accomplish.

How many children were saved from death! How many diseases ceased to pose health problems to our children! How "our dreams of justice for Cuba and the world have come true", as Fidel explains in one single paragraph what the Revolution is all about! We bow with respect and admiration to these men and women.

This is a tribute to the one who is the supreme expression of the Cuban Revolution ideology, the one who has led us with his human sensitivity, his revolutionary life, his constant teachings and leadership, along the infinite road to victory, just in front of the most powerful empire that has existed in human history.

How is it possible for a small, poor and blockaded country to exhibit results that can only compare to those in the developed, capitalist, First-World nations? The simple answer is: because this is the “Revolution of the humble, by the humble and for the humble”, the Revolution of Fidel, of Raúl, of the Cuban people, the continuation of the 10 October 1868 War of Independence, the only and perpetual Revolution dreamt of by Martí.

This book is another powerful reason to strengthen our optimism in a future whose greatest strength lies in what we have done.

Dr. José Ramón Balaguer Cabrera.

INTRODUCTION

The United Nations Millennium Summit was held in September 2000 with the participation of Heads of State and Government of 189 countries. They signed the Millennium Declaration and explicitly expressed their commitment to "fostering development, eradicating poverty, promoting human dignity and equality, and achieving peace and environmental sustainability" (1). The Millennium Declaration proclaims eight development goals and 18 specific targets, most of them to be achieved by 2015.

The target in General Development Goal Number 4 states: *Reduce by two thirds, between 1990 and 2015, the under-five mortality rate*. Its indicators are:

- Child Mortality Rate
- Under-five Mortality Rate
- Ratio of under-one children vaccinated against measles.

Estimates of international agencies confirm that, in 2006, approximately 9.7 million boys and girls died before turning 5 (2). In order to achieve the fourth Millennium Development Goal in the world, that figure should be reduced, at least, to five million deaths in this age group. UNICEF estimates are clear: 5.4 million lives will be saved (in 2015 alone) if this goal is achieved. Over 4.3 million under-five children will die in 2015 if current annual rates remain. Most of these deaths will be seen in developing countries. In order to redress this situation, countries are making great efforts to achieve the Millennium Development Goals (2).

Most of these deaths could be prevented by implementing a number of basic health interventions, namely, early and exclusive breastfeeding, national systematic programs for diarrhea and pneumonia control, as well as increased access to health care services.

Despite efforts by governments, international organizations, non-governmental organizations and various social sectors, many countries have not yet made enough progress in child survival.

The identification of models that could help achieve the goal of reducing the mortality rate by two thirds should be given top priority by the health systems in our countries.

Rationale

The results that have been reported by Cuba in the reduction of the Child Mortality Rate, from 35.9 in 1960 to 5.3 per 1,000 born alive in 2006, were obtained despite huge difficulties. Such hardships include those that usually affect developing countries and the specific economic situation Cuba has had to face. Major determinants of its economic problems have to do with the blockade that was imposed by the United States in the 1960s and the collapse of the socialist camp in the 1990s. Other negative events, such as tropical hurricanes and the damage caused by epidemics that have resulted in victims, especially among children (3, 4), have further compounded existing problems.

The experience gained in the implementation of a model that has made it possible to obtain positive, well-recognized results deserves to be studied and taken as an example of a program that can be implemented by other countries to help improve child care.

Notwithstanding the success achieved by some countries, the loss of millions of young lives at a world level is still a source of concern. Studies reveal uncertainty over the possibilities of many countries to achieve the Millennium Development Goals, especially those relating to under-five survival.

The purpose of this research work was to identify lessons learnt that could help other countries achieve the Millennium Development Goals. This paper contains the findings of a study over resource allocations for health and the results obtained in providing quality health care, including the actions taken by Cuba in different periods to attain encouraging child health indicators.

Considering Cuba's significant emphasis on equity, this research implemented a proposal submitted by a group of researchers (5) regarding the potential of the health sector alone and of partnerships with other sectors. This proved to be extremely relevant because all sectors working together can heighten efforts, especially in low- and medium-income countries.

Local studies conducted by Castell (6) describe how the health care system has created the conditions necessary to develop actions known as intersectorial measures, which are implicit in the characteristics of the system itself and are ensured by legal provisions relating to activities by other sectors, social organizations and the community at large.

Some intersectorial (political, social, economic, educational and environmental) measures developed by the Cuban health care sector, by decades, and the progression of a number of indicators in the field of child health appear below.

Situation before 1959

The economic situation in Cuba prior to 1959 was marked by high dependence on the United States, which covered 60 percent of overall exports and up to 80 percent of imports (7, 8). There was also high income polarization: the wealthiest 20 percent of the population took 58 percent of the country's wealth, while the poorest 20 percent got only two percent (9) and was given limited access to educational and medical services. Estimates showed that there were over one million illiterate people (10).

Specialized pediatric care merely covered 10 percent of the child population (11). In 1958, there were three children's hospitals and some private clinics; outpatient care was provided in private doctors' offices and first-aid posts where general practitioners offered free services but no vaccination programs were available (2, 11, 12). The situation was even worse in rural areas. Studies showed how child health condition was significantly poorer among the rural than the urban population (13). Around 60 percent of pregnant women gave birth at health care institutions (14).

There was one doctor every 1,008 inhabitants in the country: one every 248 inhabitants in the capital city and one every 2,608 inhabitants in the eastern provinces (15). This clearly shows how unequal health services were.

There was significant under-registration in health indicators and statistics (16). Estimates reveal that the infant mortality rate stood at approximately 70 every 1,000 born alive. It was even higher in the eastern provinces (17, 18, 19).

EVOLUTION BY STAGES

FIRST YEAR: 1959

INTERSECTORIAL GENERAL MEASURES
• First Agrarian Reform Law. • Rental Reduction Law (No. 125/1959), and Electricity and Telephone Charges laws (No. 502/1959 and No. 122/1959, respectively) • Creation of thousands of jobs. • Declaration on free access to education and health services. • Law granting special credits to the Ministry of Health and Social Welfare to build new hospitals (No. 95/1959).
HEALTH SECTOR MEASURES
• An Integrated Health Care Plan was prepared and implemented. • Law placing all hospitals in the country under the umbrella of the Ministry of Health and Social Welfare (No. 486/ 1959). • Law identifying the Ministry of Health and Social Welfare as the ministry in charge of medical specialties (No. 607/1959). • Presidential Decree establishing the reduction of drug prices (No. 709). • Ministerial Resolution establishing that the Salk polio vaccine was to be provided free throughout the country. • Agreements with PAHO/WHO on the implementation of Malaria Eradication Programs.
CHILD HEALTH INDICATORS
Child mortality rate 34.8 per 1,000 born alive. Differences in child mortality rate by provinces: Higher limit 49.7 per 1,000 born alive. Lower limit 25.1 per 1,000 born alive. Under-one proportionate mortality rate 15.1% Eradicated diseases: None

INTERSECTORIAL GENERAL MEASURES

In 1959, with the triumph of the Cuban Revolution, a new stage of far-reaching political, social and economic changes began and paved the way for the recovery of the country's resources and a transformation process to attain higher levels of human development, despite a negative situation. Transformations included measures for immediate income redistribution to favor workers and marginalized groups (9).

Measures included the First Agrarian Reform Law which, among other benefits, granted land to more than one hundred thousand farmers (9). Other provisions involved the rental and electricity reduction laws (7, 9) and the creation of thousands of new jobs. These laws had an impact on living conditions, especially, on the poorest sectors of the population. The declaration on free access to education and health care (20) laid the foundations for future developments in these areas.

HEALTH SECTOR MEASURES

The provisions adopted by the health sector included basic organizational measures to implement the transformations required in medical care and training of human resources, as well as other provisions that made it possible for the most vulnerable groups to have free or subsidized access to drugs and vaccines. During that year, priority was given to the construction of hospitals.

HEALTH INDICATORS

Child health indicators were consistent with the socio-economic and health situation seen in previous stages. The actions that had just been taken could not generate immediate transformations. The Child Mortality Rate was high, with the eastern provinces doubling the rate in the western provinces (19). Under-one mortality accounted for 15 percent of total deaths in all age groups. Other indicators were not available due to problems with statistical records.

FIRST STAGE: 1960-1969 PERIOD

1960-1969 PERIOD - INTERSECTORIAL GENERAL MEASURES

- Implementation of a State-centralized social policy that promoted equity in access to services and gave priority to the most vulnerable groups.
- Increase in State budget expenditure on health, welfare, social security, and education.
- Planning and equitable distribution of foodstuffs, giving top priority to vulnerable groups, pregnant women, and children.
- Law establishing a rationing system for food and consumer goods (No. 2025/1962).
- Law granting social security benefits to 100 percent of the population and extending coverage to include common and occupational diseases, maternity risks and others (No. 1100/1963).
- Implementation of a National Literacy Campaign.
- Establishment of social organizations.

HEALTH SECTOR MEASURES

- Foundation of the Ministry of Public Health.
- Expansion of health care services to the entire country.
- Establishment of the Rural Medical Service under Ministerial Resolution No. 723/1960.
- Creation of the National Health Care System in 1969.
- Foundation of new health care institutions: rural medical posts, maternal homes, and polyclinics.
- Implementation of health care programs: vaccination campaigns, gastroenteritis control, child mortality reduction, and staff training.
- Implementation of a Mass Vaccination Campaign against Poliomyelitis.
- Organization of health care services for pregnant women and deliveries at medical institutions.
- First international solidarity missions (Chile, 1960 and Algeria, 1963).
- Improvement of statistical health records.

HEALTH INDICATORS.	Beginning	End
Child mortality rate (per 1,000 born alive)	35.9	46.7
Differences in child mortality rate by provinces:		
Higher limit	42.0	51.5
Lower limit	23.9	38.6
Under-five mortality rate (per 1,000 born alive)	*	*
Under-one proportionate mortality rate (%)	17.6	20.7
Main causes of death in under-one children:	Diarrhea, perinatal conditions and sepsis.	
Child mortality due to diarrhea (per 1,000 born alive)	19.6	5.5
Low birth weight index (per 100 born alive)	5.8 **	8.5
Percentage of under-one children vaccinated against measles*		
Eradicated diseases	Poliomyelitis in 1962	

* Not available

** Data reported as of 1963

INTERSECTORIAL GENERAL MEASURES

During this stage, Cuba adopted the socialist system as the driving force for national policy implementation. The State took control of large foreign companies and local private enterprises. These measures benefited most of the population (20, 21, 22). Examples of such benefits include a gradual reduction of the unemployment rate, which had accounted for 12.5 percent of the economically active population in 1958 and dropped to 1.3 percent in 1970, with a significant improvement in women's involvement and household income (9). Likewise, the number of pensioners grew and the minimum retirement pension, which had amounted to 40 pesos a month in 1958, reached 60 pesos in 1960. Social Security Law No. 1,100 extended coverage to all workers in the country (including both common and occupational diseases), as well as maternity risks, accidents, disability, old age, and death. It also set retirement age limits - 55 and 60 years for women and men, respectively (9). Income levels went up when farmers were exempt from land lease payments, and house rental, electricity and telephone charges, and prices for drugs and staples were reduced (7, 9, 10).

State budget spending on education, health care, welfare, and social security grew. Per capita health expenditure moved from 7.24 pesos in 1960 to 24.85 pesos in 1969 (10, 23).

A rationing system was established across the country under Law No. 2025/1962, ensuring equitable distribution of foodstuffs and consumer goods (24, 25) and paying special attention to pregnant women, undernourished infants and children suffering from chronic diseases.

The Literacy Campaign eradicated illiteracy and laid the foundations for cultural development of the population. The 1953 National Census had revealed that 23.6 percent of the population was illiterate (41.7 percent of them in rural areas). Under the Campaign, 707,712 people were taught how to read and write in one year and the illiteracy rate declined to 3.9 percent (9. 10).

Social organizations were established to gather women (Federation of Cuban Women) and neighbors (Committees for the Defense of the Revolution) whose members became health promoters in their own communities (26).

HEALTH SECTOR MEASURES

The Ministry of Social Health was replaced with the Ministry of Public Health. This agency was mandated to put into practice the State provision that health care was a right of the people and was to be provided free (3). Under Ministerial Resolution No. 723/1960 (27), the newly-established Rural Health Service sent doctors to remote rural areas. This period saw the inception of primary health care in the country.

The State-financed National Health Care System guarantees free health care and full access by the population to decentralized, comprehensive medical services, with prevention, planning, guidance and the introduction of scientific breakthroughs as its main pillars. It is characterized by the participation of the people in the organization of public health activities and in international assignments, which are in line with the main principles of a socialist society (3, 24).

The new institutions included rural medical posts to provide health care to the population in the countryside, maternal homes to give pregnant women labor ward services, especially in mountain areas of the eastern provinces, and polyclinics to offer primary care all over the country.

The establishment of the Scientific Research Center (CENIC) was based on the principle referred to by Commander in Chief Fidel Castro Ruz that “the future of our country must necessarily be forged by scientists” (3).

The first programs to solve the most pressing health problems were undertaken in 1962 and included vaccination campaigns, gastroenteritis control, and staff training. This year witnessed the first mass vaccination campaign (oral poliomyelitis vaccine) and close surveillance of new acute flaccid paralysis cases. The campaign was conducted every year, along with a surveillance system for reported cases. These measures resulted in the eradication of poliomyelitis as soon as the vaccine was administered in the country (28).

As under-one morbidity and mortality rates went up in 1969, a detailed study was conducted to halve them in the 1970-1980 period. To this end, a Child Mortality Reduction Program was implemented in 1970 (29). Medical services for pregnant women were also organized.

The First National Meeting on Pediatric Standards was held in 1969, when Cuban health records were considered reliable by WHO (25, 30).

The main difficulties in implementing the new provisions derived from underdevelopment in previous years, which further intensified as a result of the U.S. economic blockade banning trade with Cuba in 1962 (9, 22).

HEALTH INDICATORS

The child mortality rate was still high during this period. This was associated with a reduction in death under-registration and the adoption, in 1965, of the new born-alive concept recommended by WHO (25). The increase reported in diarrheal and respiratory diseases, especially in 1969 (29), negatively affected under-one mortality. The number of deaths by acute respiratory diseases grew as a result of the A2 Hong Kong Influenza Virus which caused 11,366 deaths (at a rate of 22 every 1,000 born alive). The Child Mortality Rate reached 47.7 every 1,000 born alive this year (29).

By province, the rate showed slight changes, with the highest number of cases in the eastern provinces. The under-one proportionate mortality rate was still high, accounting for around one fifth of deaths in all age groups. The first cause of child death was infectious intestinal diseases, although the rate decreased to one fourth over this period. By the end of this decade, the low birth weight index remained. Under-five mortality indicators are not available for this period.

SECOND STAGE: 1970-1979 PERIOD

1970-1979 PERIOD - INTERSECTORIAL GENERAL MEASURES		
• Enactment of the Constitution of the Republic of Cuba /February 1976. • Foundation of Central State and Government Agencies. • Establishment of a new political and administrative division in the country. • A 34.5-percent increase in budget allocations to the health sector. • Cuba's incorporation into the Council for Mutual Economic Assistance (CMEA). • Consolidated distribution of the family basket. • Supply of food supplements to pregnant women, undernourished infants and children suffering from chronic diseases in all provinces. • Increased food supplies to children's hospitals and schools. • Maternity Law for Working Women (No. 1263/1974. • Family Code (Law No. 1289/1975). • Children and Youth Code (Law No. 16/1978). • Development of Scholarship Programs.		
HEALTH SECTOR MEASURES		
• Implementation of the National Health Care System. • Three-year social service for new health care professionals in rural areas. • Implementation of a Child Mortality Reduction Program. • Establishment and expansion of a Community-based Health Care Model. • First vaccination campaign against measles for 6-month to 5-year-old children. • Development of a program to build hospitals, polyclinics and medical schools in all provinces. • Development of a staff training program. • Establishment of the so-called accompanying-mother plan. • Implementation of a 0- to 20-year-old population growth and development research, a perinatal research (Cuba, 1973), and WHO's International Perinatal Research. • Development of a Handbook of Pediatric Procedures. • Establishment of the Neonatology Specialty. • Training of social and mass organization members as community-based health promoters. • Improvement in birth and death records.		
HEALTH INDICATORS	Beginning	End
Child mortality rate (per 1,000 born alive)	38.7	19.6
Differences in child mortality rate by provinces:		
Higher limit	45,7	24.2
Lower limit	33.5	14.4
Under-five mortality rate (per 1,000 born alive)	43.7	13.2
Under-one proportionate mortality. (%)	17.1	5.1
Main causes of death in under-one children:	inatal conditions, diarrhea and sis.	
Child mortality due to diarrhea (per 1,000 born alive)	5.5	1.1
Low birth weight index (per 100 born alive)	10.3	10.2
Percentage of under-one children vaccinated against measles		53% *

Eradicated diseases:	**Malaria, poliomyelitis, neonatal tetanus, and diphtheria**

- Data reported in 1979.

INTERSECTORIAL GENERAL MEASURES

In 1976, new central government agencies were created, namely, the National Assembly of People's Power, the Council of State, and the Council of Ministers; and the new Constitution of the Republic came into effect (30). The new political and administrative division of the country (totaling 14 provinces), and the new Economic Planning Management Unit were established. These measures made it possible for the government to better implement social and economic actions for the most vulnerable sectors and areas. Health care allocations under the budget grew. State allocations to public health amounted to 216.4 million pesos in 1970 and reached 409.2 million in 1979 (10).

Under the new leadership structure, the vice-presidents of the municipal and provincial governments are the health-sector directors at such levels. This organization benefits intersectorial actions by grassroots organizations.

The family basket was further supplied to the entire population, and food supplements continued to be provided to pregnant women, children suffering from specific diseases, and children's hospitals and schools in all provinces (31, 4, 32). The legislation in force seeks to foster children, women and family development.

In order to consolidate the results of the Literacy Campaign, scholarship programs were launched in 1962 to guarantee access to intermediate-level and university education, especially by low-income-family children and youngsters in isolated areas (25).

HEALTH SECTOR MEASURES

The National Health Care System (3, 24, 28) and the Child Mortality Reduction Program combined medical, social, preventive, curative, obstetric, perinatological and pediatric aspects in outpatient and hospital care (26, 33, 34, 35).

The three-year Rural Social Health Service (24, 36) benefited medical coverage in remote areas. This stage was characterized by the consolidation of health care services, the construction of new units, namely, polyclinics, rural medical posts and maternal homes (17, 37), and staff training in all provinces. A new primary health care model was developed during this period, known as Community-based Care (38, 39).

Preventive measures were also implemented, including a mass vaccination campaign against measles (since 1971 for 6-month to 5-year-old children), the development of community-based health promoters, improved health care quality (under Pediatric Standards), and the development of the Neonatology Specialty and Advanced Nursing Education (28, 40, 41). The accompanying mother plan (18, 42) sought to further humanize care. Three important national research works on child health were completed, and several research institutes were established (25).

HEALTH INDICATORS

The Child Mortality Rate halved; the under-five rate dropped by two thirds; all provinces reduced the mortality rate; and the proportionate mortality rate in under-one children declined by two thirds. Infectious intestinal diseases dropped from the first to the second main cause of death and the related rate was reduced by one fourth. The low birth weight index remained high.

The percentage of under-one children vaccinated reached 53; the list of diseases eradicated during this period included malaria, diphtheria and neonatal tetanus, thanks to vaccination and hygiene programs under implementation.

THIRD STAGE: 1980-1989 PERIOD

1980-1989 PERIO: GENERAL MEASURES		
• Implementation of a General Wage Reform. Minimum wage grew by 14 percent. • Budget allocations for the health sector jumped by 57.8 percent during this period. • Improvement of a program to fight epidemics. • Development of Scientific Clusters. • Public Health Law (Law 41/1983).		
HEALTH SECTOR MEASURES		
• Establishment of the Family Doctor and Nurse Plan. • Improvement of the Child Mortality Reduction Program which later became the Mother and Child Health Care Program under a more comprehensive approach. • Implementation of a low birth weight index reduction program. • Establishment of the Medical Contingent. • Development of the Turquino Manatí Plan. • Cuba's incorporation into the World Diarrheal Disease Control Program since its inception by UNICEF/WHO. • Establishment of an intensive therapy network for pediatrics, neonatology, and delivery monitoring. • Introduction of prenatal diagnostic technologies: alpha-fetoprotein tests, diagnostic ultrasound, and tests for early detection of congenital hypothyroidism and phenylketonuria. • Opening of the William Soler Cardiology Center and a pediatric cardiology network.		
INDICATORS	Beginning	End
Child mortality rate (per 1,000 born alive)	19.5	10.7
Differences in child mortality rates by provinces:		
Higher limit	24.2	13.6
Lower limit	14.4	7.6
Under-five mortality rate (per 1,000 born alive)	24.2	13.2
Under-one proportionate mortality (%)	4.8	3.0
Main causes of death in under-one children:	Perinatal affections, congenital malformations and diarrheas.	
Child mortality due to diarrhea (per 1,000 born alive)	1.1	0.5
Low birth weight index (per 100 born alive)	9.7	7.3
Percentage of children (one to 14 years old) vaccinated against measles.	97.6 % *	
Eradicated diseases:	Congenital rubella syndrome and parotitis post meningoencephalitis.	

* Data reported in 1987 for one- to 14-year-old children

INTERSECTORIAL GENERAL MEASURES

National development allocations grew. While state budget allocations for education moved from 1.3 billion pesos in 1980 to 1.6 billion in 1989, those for the health sector

moved from 440 million to 1.9 billion in the period. This increased the number of institutions and workers in both sectors (9, 10, 21). Social-security expenditure moved from 311 million pesos in 1971 to over one billion in 1989. Women's involvement in non-domestic tasks and social life also increased. During this period, investments in the educational sector made it possible to take average schooling to sixth grade first and to ninth grade some years later. Between 1980 and 1989, enrolment at all educational levels increased. The figures rose from 92,000 to 149,000 children at day-care centers, from 146,000 to 243,000 students at universities, and from 25,000 to 55,000 in special education (9, 21).

Cuba's incorporation into the CMEA made it boost its foreign economic relations with reliable markets and at fair prices, have access to foreign resources, especially fuel, raw materials, machinery equipment, soft credits, technical advisory services, and joint projects. Domestic production volumes grew in the 1981-1983 period. For example, industrial output increased from 10.5 to 158.2 percent; agriculture, from 128.1 to 215.3 percent; and communications, from 194.1 to 260.9 percent (10).

The social and economic measures that were adopted helped reduce imbalances and gaps. In 1953, 20 percent of the poorest population took only 6.5 percent of total wealth while 20 percent of the wealthiest got 57.9 percent. Thirty years later, the former received 11.3 percent and the latter, 33.8 percent (9, 43).

The economic growth rate stood at four percent, and employment and educational opportunities grew (15, 39). Average wage increased by 14 percent under the General Wage Reform (21). Between 1981 and 1985, the Global Social Product grew by 7.9 percent a year (44). This, along with social development efforts, paved the way for the eradication of poverty in Cuba during the period (22).

HEALTH SECTOR MEASURES

The most decisive transformation in Cuban health history took place in the field of primary care: the launching of the Family Health Care Program in compliance with

the health-for-all objectives that had been set in the year 2000. This model, based on a clinical, epidemiological and social approach to health problems, was rapidly introduced all over the country (38).

The Child Mortality Reduction Program that had been implemented in 1970 for the first time was further developed. It became the National Mother and Child Care Program, one of the most important programs in the local health care system (26, 18, 45, 46). This Program defined the policies to be implemented in order to guarantee mother and child care, and the strategies to be associated with pregnancy, delivery and puerperium care. It helped increase deliveries at health care institutions, further reduce the low birth weight index, and provide better care for newborns and children at hospitals and in communities (26, 45, 46). A low birth weight index reduction program was also implemented during this period (26).

This period saw a consolidation of health care services. They were further improved upon the establishment of a pediatric and neonatal intensive care network and women-in-labor monitoring units (33, 47, 48). Both the William Soler Cardiology Center and the pediatric cardiology network were created. The pediatric cardiology network, established in every province, provides local health care for children suffering from cardiopathies and is made up of pediatricians, neonatologists, imaging experts, and other specialists trained in comprehensive health care. Since then, the Cardiology Center in Havana has been a national reference center for children with heart diseases across the country, including diagnosis, medical treatment, surgery and rehabilitation (11, 33). The development of research institutes makes it possible to improve treatment of complex health conditions. They also operate as reference centers for child health care throughout the country.

The experience that had been gained over the last two decades in the implementation of joint actions by central government agencies and mass organizations paved the way for the enactment of Public Health Law No. 41 in July 1983 (25).

The National Center for Medical Genetics, the Immuno-assay Center and the Center for Genetic Engineering and Biotechnology were established to promote the development and consolidation of the Mother and Child Health Care Program, and the production of pharmaceutical drugs, vaccines and diagnostic kits for congenital diseases.

The diagnostic program, known as neonatal screening, began with the alpha-fetoprotein tests, phenylketonuria, sickle-cell-anemia and congenital- hypothiroidism diagnosis, and prenatal ultrasounds (18, 25, 36, 49).

Mass organizations members were trained as health promoters for vaccination campaigns and other activities associated with women and children's health (50, 51).

Cuba joined the World Diarrheal Disease Control Program (18) that had been launched by UNICEF/WHO. In 1987, the Turquino Manatí Plan was developed to improve the quality of life of people living in mountain areas including, among other aspects, health activities mostly intended for women and children. The Family Health Care Program (38) was integrated into this plan.

The epidemics control program was put together when the meningococcal disease and the hemorrhagic dengue hit the country and caused high mortality rates, especially among children (36). The experience gained during this period (52) showed how successful *intersectorial actions* were.

A decisive factor to fight the dengue epidemic was vector eradication through resource allocation and inter-sector coordination.

The meningococcal disease epidemic called for joint research by hospitals and scientific research centers, which came to the conclusion that the best way to control it involved the development of a vaccine against meningococcus B (36). This posed quite a challenge, because this vaccine did not exist in the world (53). In less than five years, the new vaccine was developed, saving the lives of millions of children in Cuba and over 40 countries.

HEALTH INDICATORS

During this decade, the evolution of health indicators was very favorable. The Child Mortality Rate and the Under-five Mortality Rate halved.

By province, the child mortality rate continued to drop while proportionate mortality in under-one children moved from 4.8 to three percent.

Infectious intestinal diseases moved from the second to the third major cause of child mortality, and the rate decreased by one fifth (compared to the 1.1 in the previous decade). The Low Birth Weight Index decreased more rapidly than 10 years earlier.

The percentage of children between one and 14 years of age vaccinated against measles reached 97.6, and the Congenital Rubella Syndrome and the Parotitis Post Meningoencephalitis were eradicated.

FOURTH STAGE: 1990 – 1999 PERIOD

1990-1999 PERIOD - GENERAL MEASURES
• Establishment and development of a Special-Period Plan in Peacetime.
• Legalization of foreign-currency possession.
- Law on Agricultural Production Units (No. 142/ 1993).
- Law on Agricultural Market Operation and Self-employed Workers' Participation (No. 191/1994).
- Law authorizing joint ventures with foreign and domestic capitals (No. 77/1995).
• Priority to special mother-and-child diets.
• Strengthening of research plans by scientific research centers for the development of pharmaceutical drugs, vaccines, and equipment.
• Preparation of a Plan of Action to comply with decisions by the World Summit for Children.
HEALTH SECTOR MEASURES
• Setting of priorities:
- Development of family and primary heath care.
- Strengthening of decentralization, intersectorial actions and community participation.
- Improvement of health care quality at hospitals and institutes.
• Development of a methodological, policy document to:
- Focus the Health Care System on primary care.
- Boost programs at hospitals and research institutes.
- Develop pharmaceutical and natural/traditional medicine production programs.
• Priority to programs, especially the Mother and Child Health Care Program.
• New provisions to deal with increased low birth weight index:
- Review and improvement of the Low Birth Weight Program.
- Construction of new maternal homes and modification of their roles.
- Access by pregnant women to workers' canteens.
• Control programs for diarrheal diseases and acute respiratory infections at a primary health care level.

• Expansion of the Family Doctor and Nurse Plan to achieve 98.3-percent coverage. • Improvement of the methodological work to treat critical patients at pediatric and neonatal intensive care units. • Specialized training in seriously-ill-children care, nutrition and infectious diseases. • Incorporation of the meningococcal B and hepatitis B vaccines into the National Vaccination Program. Administration of the Hemophilus influenzae vaccine to all under-one children. • Increase of the number of social welfare units.		
INDICATORS	**Beginning**	**End**
Child mortality rate (per 1,000 born alive)	10.7	6.5
Differences in child mortality rate by provinces:		
Higher limit	13.6	9.1
Lower limit	7.6	5.0
Under-five mortality rate (per 1,000 born alive)	13.2	8.4
Under-one proportionate mortality. (%)	2.8	1.2
Main causes of death in under-one children:	**erinatal conditions, congenital malformations and diarrhea.**	
Child mortality due to diarrhea (per 1,000 born alive)		**0.1**
0,3		
Low birth weight index (per 100 born alive)		**6.5**
Percentage of children (from 2 to 6 years) vaccinated against measles.		**98% ∗ /1993**
Eradicated diseases:	**Measles in 1993, whooping cough in 1994, and rubella and parotitis in 1995**	

∗ Data reported in 1993 for children from 2 to 6 years of age.

INTERSECTORIAL GENERAL MEASURES

The international crisis hit Cuba, especially after the disintegration of the Eastern European socialist countries and the intensification of the U.S. blockade. The collapse of the socialist camp resulted in the loss of major business partners (over 80 percent of Cuba's trade was conducted with these nations) (9). The blockade was further hardened with the Torricelli and Helms-Burton acts (9).

In 1990, the government launched the Special-Period Plan in Peacetime for the purpose of mitigating the impact of the economic crisis (49). The idea was to re-route international economic and trade relations as soon as possible and restructure the local production and service sectors under the new circumstances, while preserving the main achievements of the Socialist Revolution (54).

A number of reforms were carried out, including organizational changes in the State apparatus, legalization of foreign currency possession, expansion of establishments selling foodstuffs and other products in hard currency, authorization of self-employment, establishment of agricultural markets operating under the law of supply and demand, and the participation of foreign capital in local ventures (18, 36, 49).

The State developed new actions to guarantee the family basket, especially for the risk population (32). The idea was to preserve *equity* as much as possible, despite the crisis.

The original goal under the social process remained: guaranteeing population access to basic services, giving priority to vulnerable groups, promoting equality without any distinction as to race, gender, religion, political affiliation, or area of residence. The people continued to trust its principal leader. Only his wise, fair decisions made it possible to preserve the achievements made in the field of health care, which kept citizens at ease (4, 9, 17, 36, 45, 49).

A UNDP report indicated that Cuba provides an example of a country that has achieved higher human development levels, even without economic growth, because the government has given top priority to well-planned social spending (55).

Most financial resources available at the time were used to protect the most vulnerable groups. This was possible due to the homogeneous distribution of resources in previous years (4, 18, 36, 56).

HEALTH SECTOR MEASURES

Priority was given to the development of primary and family health care. Decentralization, intersectorial actions and community participation were strengthened, and service quality got better. A methodological policy document was developed for health care staff with the aim of identifying priorities, strategies and programs, focusing on primary

health care, strengthening hospital care, introducing advanced technology, boosting research institutes, and implementing pharmaceutical and natural/traditional medicine production plans. Priority programs included Special Mother and Child Health Care (56). Special attention was paid to the Statistical Information System, which was improved during this period (57).

Foreign-currency shortages had a negative impact on environmental hygiene, health care institutions, and medical treatments that required advanced technologies. Equipment, disposable-material and drug imports were reduced. Special plans were developed to produce drugs and manufacture equipment locally, and strengthen organizational measures for distribution (7, 9).

During this period, strategies were established in several sectors, especially, in health care, and professionals from different areas managed to compensate, with intelligence and self-denial, critical shortages. The information system for health records made it possible to detect an increase in the low birth weight index. In order to deal with it, the relevant program was reviewed and the number of maternal homes was increased. They were mandated to guarantee adequate diet for pregnant women (18, 37, 56). In some instances, pregnant women went for lunch at workers' canteens in their area of residence.

The number of new graduates increased and the number of those incorporated into the Family Health Plan in rural and mountain areas almost tripled (58, 59, 60). Care for young children, especially those under one year of age, was given top priority. This made it possible to regularly monitor these children, building upon the Family Health Care potential at a time of economic crisis (58, 61, 62).

HEALTH INDICATORS

The child mortality rate and the under-five mortality rate continued decreasing, though at a pace lower than in the previous decade. By province, the mortality rate and the proportionate rate in under-one children further dropped.

Infectious intestinal diseases were the third main cause of child mortality, though the rate significantly declined. The Low Birth Weight Index increased at the beginning of the decade due to difficulties in food supply. This trend was redressed as a result of some measures taken.

The percentage of under-one children vaccinated against measles stood at 98. Measles, rubella, whooping cough, and parotitis were eradicated.

FIFTH STAGE (2000 - 2006 PERIOD)

GENERAL MEASURES (2000 – 2006 PERIOD)		
• Development of trade relations with Venezuela and China, • Systematic follow-up to plans of action related to the Millennium Development Goals, the World Summit for Children, and the International Conference on Population and Development, • Implementation of programs under the so-called Ideological Battle Initiative, including: - Energy Revolution, - Educational improvement, - Universal access to higher education, - Mass participation in culture and sports, - Gradual introduction of computers into all social sectors, and • Disaster preparedness.		
HEALTH SECTOR MEASURES		
• Development of Health Revolution Programs, • Universal access to primary health care, with polyclinics operating as basic institutions within the national health care system: - Introduction of advanced technology into polyclinics, - Development of Active Screening, - "University training at Polyclinics" Program, • Implementation of programs seeking to prevent obesity and atherosclerosis, • Improving comprehensive care for healthy children, • Development of congenital malformations prevention and diagnosis programs, and • Improvement of care for vulnerable groups: disabled people and natural-disaster victims.		
INDICATORS	Beginning	End
Child mortality rate (per 1,000 born alive)	7.2	5.3
Child mortality rate by provinces:		
Higher limit	9.1	9.0
Lower limit	4.9	3.8
Under-five mortality rate (per 1,000 born alive)	9.1	7.1
Under-one proportionate mortality	1.4	0.7
Main causes of death in children under one:	Perinatal conditions, congenital malformations, sepsis.	
Child mortality due to diarrhea (per 1,000 born alive)	0.3	0.1

Low birth weight index (per 100 born alive)	7.6	6.5
Percentage of under-one children vaccinated against measles	98%	
Diseases no longer posing health problems	Tetanus and *H. influenzae*	
Diseases with morbidity lower than 95%	Meningococcal disease, typhoid fever, and hepatitis B	

INTERSECTORIAL GENERAL MEASURES

Some of the objectives that had been set in previous decades have been met in the 21st century. The country's Gross Domestic Product grew by 3.8% a year in the 1995-2003 period; the socialist system remains; priority is still being given to vulnerable groups; and equity has been preserved, especially in health care and education (4, 9, 18, 63 and 64). Significant economic agreements were reached with the People's Republic of China and Latin American countries, particularly with Venezuela. Cuba and Venezuela signed a Strategic Plan for the Implementation of the Bolivarian Alternative for the Americas (ALBA) Initiative.

Human development continues to be a central goal to the country's leadership (65, 66). In a regional comparison in key areas related to human development and equity, such as population health and resources allocated to education, Cuba ranks on top in Latin America and the Caribbean. It is the country of the region making the largest investments on science and technology, and having a number of researchers that exceeds its economic capability by far (49).

The Cuban social policy grants priority to the supply of free, subsidized goods and services over monetary income and mercantile relations. Even the low-income population groups have access to goods and services that are not within reach of poor people in developing countries, including access to education, health care, culture, sports, and social welfare in natural-disaster situations and disability cases (24, 36).

The government keeps systematic control over the implementation of actions aiming to comply with decisions made at world summits and conferences on population and development (3, 9, 21, and 63). The 2005 Cuban Report on the achievement of the Millennium Development Goals showed a breakdown of indicators by gender and areas, as working for equity is indispensable to reaching the goals agreed upon (67).

Effective national programs in sectors like health care, education, social welfare, and environment are being further implemented (68).

HEALTH SECTOR MEASURES

New Revolution Programs were undertaken in 2002, including the so-called Health Revolution Programs.

They could be successfully implemented only after changes were introduced in the organizational structure of the health care system and in the family doctor and nurse system. Primary health care transformations are based on improving population services, adapting them to specific health situations, and further promoting staff training and upgrading. Polyclinics have been refurbished at an accelerated pace and are being equipped with state-of-the-art technology (38). They have actually become basic institutions under the National Health Care System.

These changes have also involved the introduction of *active screening* as a systematic work method to identify and overcome community health problems in a timely manner, with the participation of the local population and institutions in the implementation of actions. Former President Fidel Castro said: “Active screening is the truly reliable diagnosis of the state of health of a population and the greatest leap forward we can conceive of to increase the life expectancy of people today” (69). It should be developed by polyclinics to solve health problems that are a responsibility of the State, using local human and material resources and involving the mass organizations. The idea is to conduct timely, comprehensive screening for any community health conditions (38).

In 2004, polyclinics became university training facilities for specialties such as Medicine, Dentistry, Psychology, Nursing, and all Health Technologies. Building upon work education, they provide comprehensive, community-based training. These facilities do not only include polyclinics but also homes where patients are given hospital care under the program (38).

The Health Revolution Programs also cover refurbishing works at health care institutions, staff upgrading, new equipment at neonatal and pediatric intensive care units, care for genetic conditions, disabilities, child chronic diseases and

ophthalmologic afflictions, imaging, transplantation, rehabilitation and other technologies that help improve health care quality. In 2003, Cuba's international medical cooperation efforts grew and new programs were undertaken to include child health care (70).

Cuban Deputy-minister García Salabarría recently announced that intersectorial work is being introduced into the local health care system. Family medicine objectives and functions are being reformulated, and institutional efforts are being integrated to solve population health problems, he added. We are witnessing changes that will enrich Cuban public health theory and practice, he stressed (71).

Cuba is waging a true revolution in all sectors, especially in health care and education. Political will was ratified by former President Fidel Castro when he said: "Perhaps the most useful contribution to the struggle for a better world that we can make through our modest efforts will be to demonstrate how much can be done with so little, if all of the human and material resources of a society are put at the service of the people" (72).

HEALTH INDICATORS

The child and under-five mortality rates continue to drop and are below 10 every 1,000 born alive. The gap between the higher and lower limits remains small, but slightly widened in the 2000-2006 period. The under-one proportionate mortality (as compared to the number of deaths at all ages) is below 1.5%.

Infectious intestinal diseases are not among the main causes of death and the related annual mortality rate does not exceed 0.1% (10 deaths in children under one).

The low birth weight index is close to 5%; the number of one-year-old children vaccinated against measles stands at 98%; tetanus and *Hemophilus Influenzae* are no longer considered health problems; and meningococcal disease, typhoid fever and hepatitis B morbidity has been reduced by 95%.

These child health indicators have been achieved thanks to the measures that were adopted four decades ago, including access to services and priority to the most vulnerable groups.

A review of the measures under implementation and of these indicators, which are some of the Millennium Development Goals to be achieved by low-income countries like Cuba, serves to reaffirm the principle that certain health care problems should be solved by the health sector alone while others call for the participation of other sectors as well.

The Cuban experience shows how important intersectorial work is, especially the one that is promoted and coordinated by the State at a social level, under specific and particularly difficult social and economic conditions.

Lessons learnt

A review of the Cuban experience in child health care after 1959 makes it possible to identify lessons learnt that can be taken as reference and can be applied by other countries seeking to achieve the Millennium Goal of reducing child mortality:

- The principle of equitable wealth distribution and the measures adopted to guarantee compliance with it have helped improve child health indicators.
- Legal actions were taken for this purpose, establishing the responsibility of the State for the health of the population and the right of all citizens, especially women and children, to quality health care.
- Laws were enacted to this end.
- A health care system based on state provision, social medicine, free access to services, and people's participation in related programs paves the way for good child-health results.
- Increasing the educational and cultural level of the population is indispensable to boosting child health in any country.
- A primary health care program focusing on the main causes of morbidity and mortality and on community participation provides a major strength to any health care system, especially in low-income countries.
- The construction and operation of rural medical posts, polyclinics and maternal homes significantly help improve mother and child health indicators, especially in isolated areas and dysfunctional families.

- Health care programs and plans featuring regularly controlled actions and involving all social sectors help achieve better child-health indicators.
- A Comprehensive Mother and Child Health Care Program is indispensable to improving child health indicators.
- The construction and operation of maternal homes have played a key role in reducing the low-birth-weight index.
- A universal, free vaccination program involving all social organizations has made it possible to reduce immunizable-disease-related morbidity and mortality.
- Control programs for gastroenteritis and acute respiratory diseases have helped reduce morbidity and mortality.
- The Cuban Family Doctor and Nurse Program is the mainstay of the health care system in any low-income country.

- The development of a staff training program under the health care system and of health care units has sought to meet population needs, capitalizing on world scientific breakthroughs, in line with the socio-economic and demographic situation in the country.
- The epidemics coping program has been based on political will, scientific evidence, social participation, surveillance, and unified command.
- The State developed an economic, political and social plan to deal with crisis situations, re-route international trade and economic relations, and re-structure the production and service sectors, preserving the most important achievements that have been made. It intensified decentralization efforts, intersectorial work and community participation.
- The development of statistical health records and their constant review by health care system managers at all levels have made it possible to take timely measures to overcome child health related problems.
- Research centers have developed activities to meet child health organizational needs and services.
- Cuban health professionals have provided child health care in over 100 countries under international solidarity actions. This has favored their comprehensive professional and human development.

Main challenges

The main challenges to be met in child health care in Cuba include:

- Promoting exclusive breastfeeding in children under six months and complementary breastfeeding in up to two-year-old children.
- Improving child care quality.
- Increasing survival and improving quality of life in low birth weight children.
- Reducing accidents.
- Intensifying child nutritional surveillance.
- Furthering actions to improve quality of life in children affected by chronic diseases.
- Implementing special actions for children from dysfunctional families.
- Carrying out local interventions aimed at bridging the infant mortality rate gap between provinces.

Conclusions

The lessons learnt in child health care in Cuba have been mainly based on:

Political will: The country's highest authorities have given top priority to health. The Commander in Chief himself had so anticipated in his self-defense plea known as the Moncada Program, before the triumph of the Revolution in 1959. This determination has been reaffirmed over the years, especially under crisis situations such as aggressions, epidemics, hurricanes, and the so-called Special Period.

Centralized health care management: It provides for strong integration and constant oversight in the implementation of activities under the Mother and Child Health Care Program at all levels. The review of child health statistical data is conducted on a daily basis and involves program managers, local executives, deputy ministers, and even the health minister. Likewise, inspections over mother and child health care throughout the country are carried out on a regular basis.

Intersectorial work: It becomes evident in the integration of local activities seeking to protect mother and child health, involving all sectors, and having health care directors present in municipal and provincial governments.

Equity: Emphasis is placed on universal coverage and access by the entire population. This is critical so as to control and eradicate diseases all over the country. Equity principles benefit mainly low-income people and biologically and socially vulnerable groups, and favor the implementation of health care programs and campaigns.

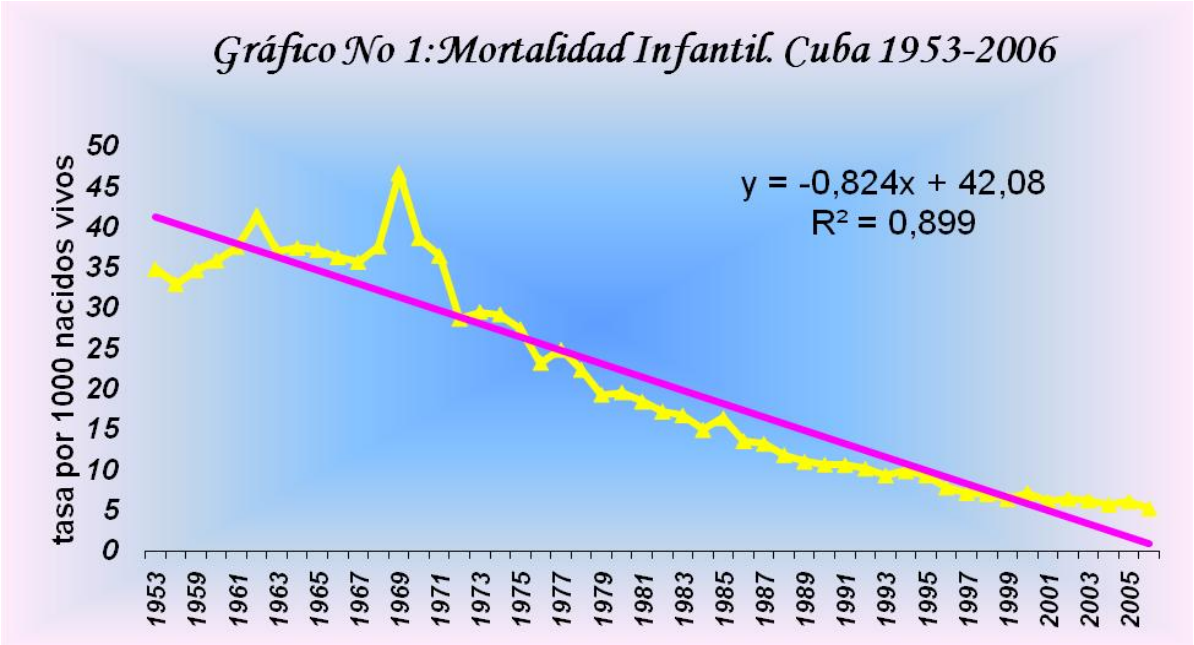
Health surveillance: It makes it possible to identify specific problems in a timely manner and devise the best possible solutions. It has helped detect epidemics, apply the right approach to health problems like diarrheal and respiratory diseases, and deal with low birth weight during the special period and unusual causes of death in some areas.

Scientific evidence: Effective interventions are made to devise new solutions: technologies, pharmaceuticals and vaccines, including the Cuban meningococcal (type B) vaccine.

Social participation: The local population has been actively involved in social processes like the literacy campaign, the mass vaccination campaigns, the identification of cases over epidemics, and child care. Social participation is closely related to political will and has played a vital role under crisis situations.

All these factors have provided for comprehensive, dynamic relations and have made a decisive contribution to child health care in Cuba.

Annex

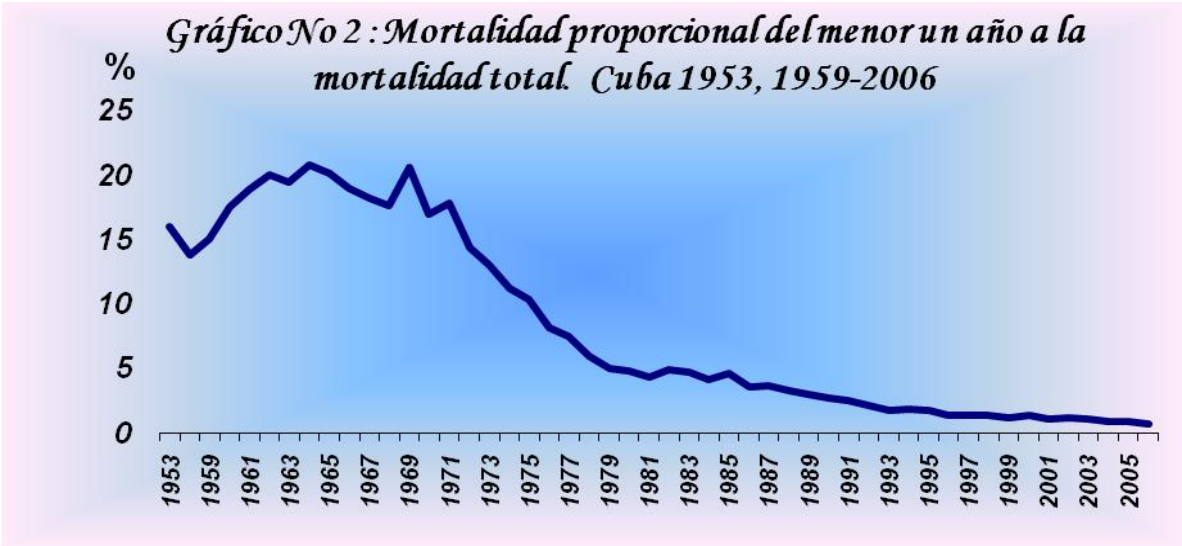


Graphic 1

Graphic No. 1: Child mortality, Cuba, 1953-2006 period

Rate per 1,000 born alive

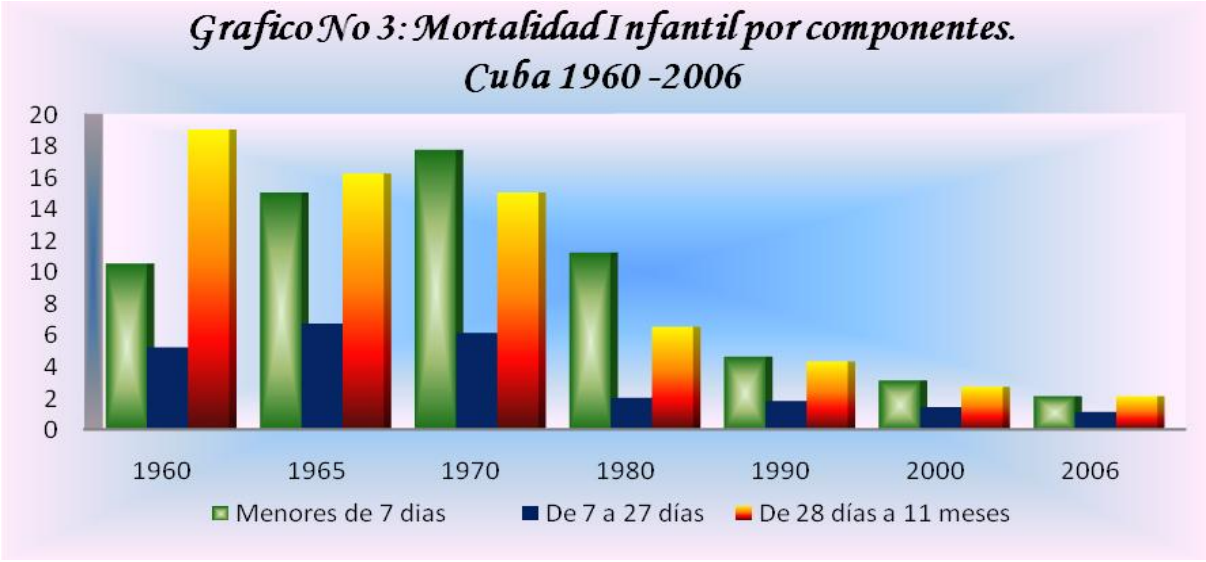
Graphic 1 shows a dropping trend in infant mortality rate since 1970, with a linear adjustment (R^2 =0.89) in this indicator (Graphic No. 1), despite a certain increase in the first 10 years of the period under study.



Graphic No. 2: Under-one proportionate mortality rate to total mortality, Cuba, 1959-2006 period

Graphic No. 2

Under-one mortality accounted for up to 20% of total mortality in the first few decades and has steadily dropped to values below 1%.



Graphic No. 3: Infant mortality rate by components, Cuba, 1960-2006 period

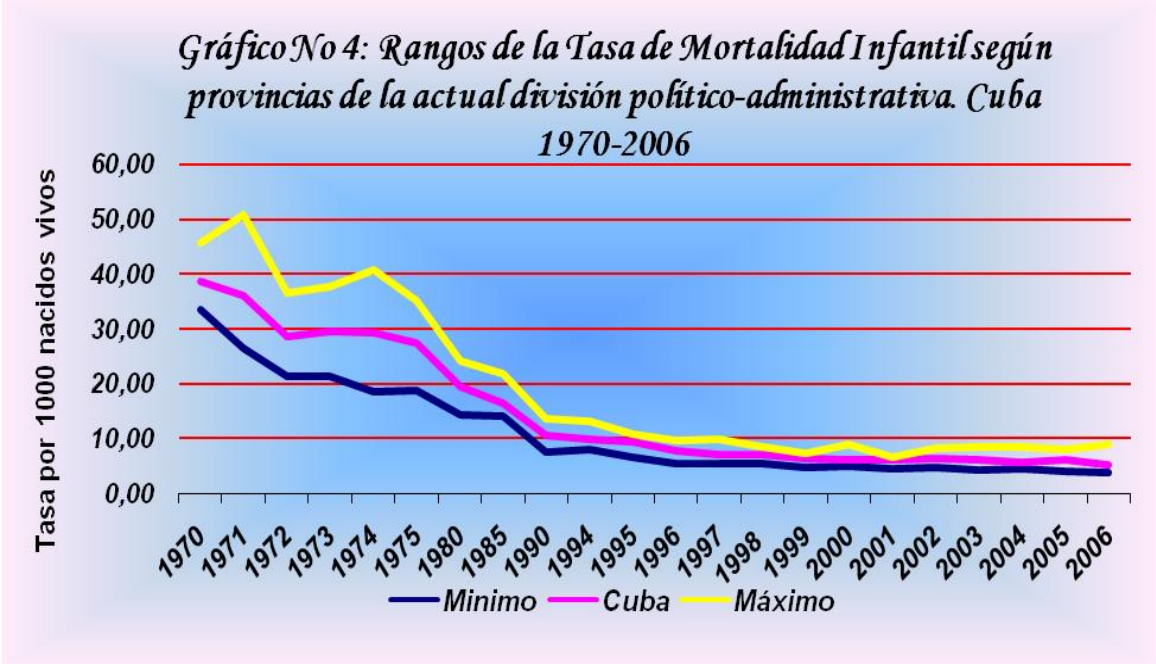
Under 7 days old

From 7 to 27 days old

From 28 days to 11 months old

Graphic No. 3

Infant mortality has been dropping since the 1960s, with a marked difference between the initial and final periods. A higher death rate in the first decade of the period under study was due mainly to higher early neonatal death rates and, to a lesser degree, due to higher late neonatal death rates. The post neonatal death rate has been dropping ever since, with the sharpest decline in the 1970s.

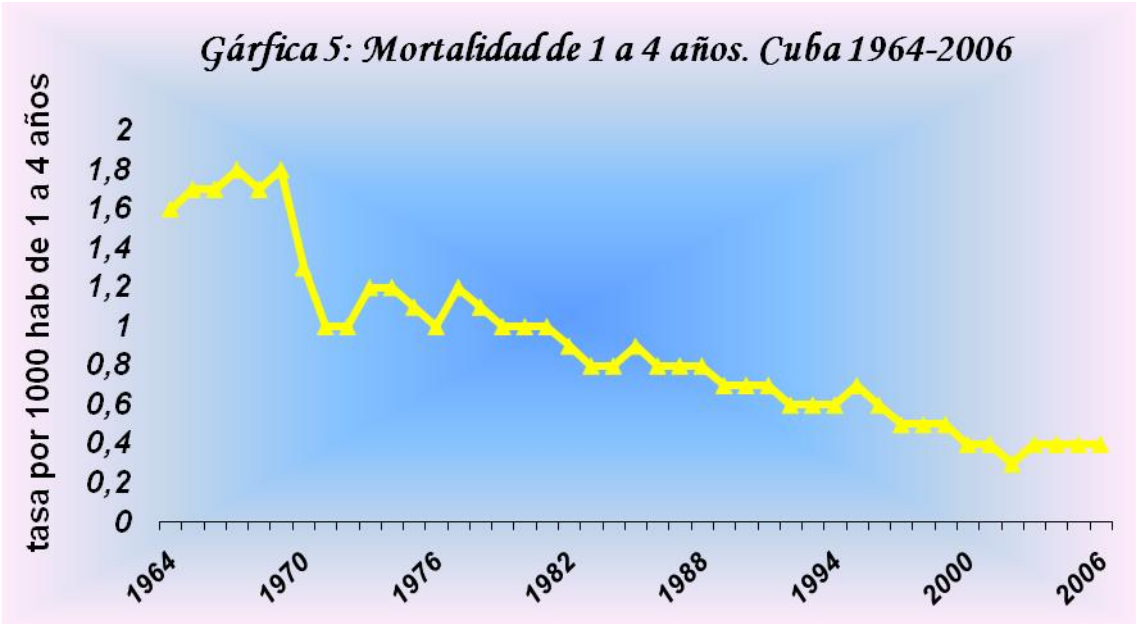


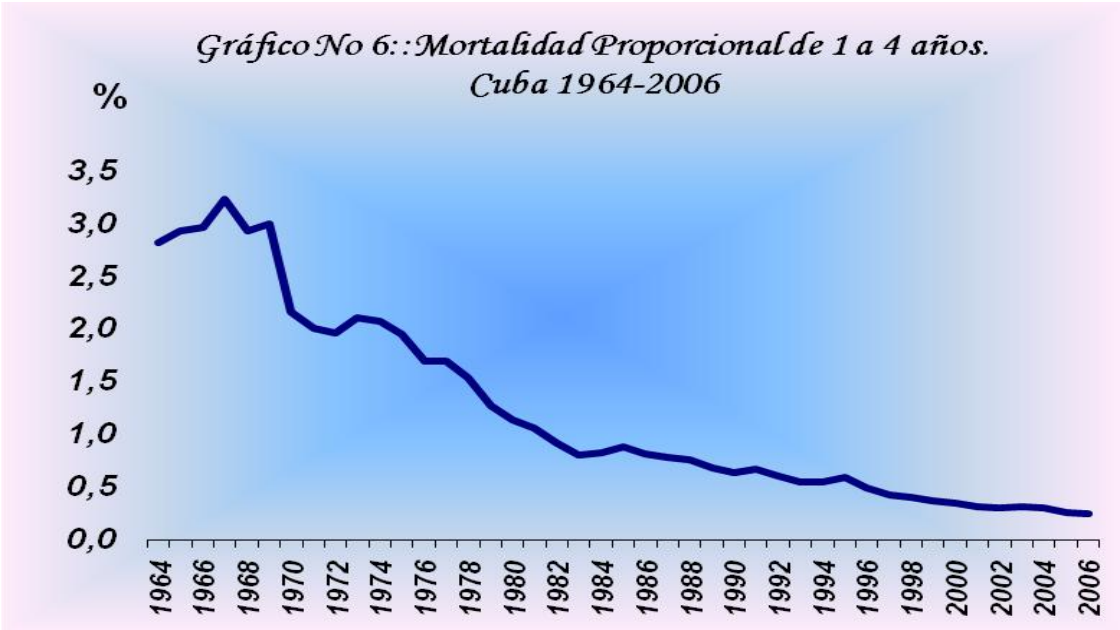
Graphic No. 4: Child mortality rate by provinces under the current political and administrative division, Cuba, 1970-2006 period

Rate per 1,000 born alive

Graphic No. 4

The difference between higher and lower limits in the infant death rate gradually dropped, as seen in the graphic.





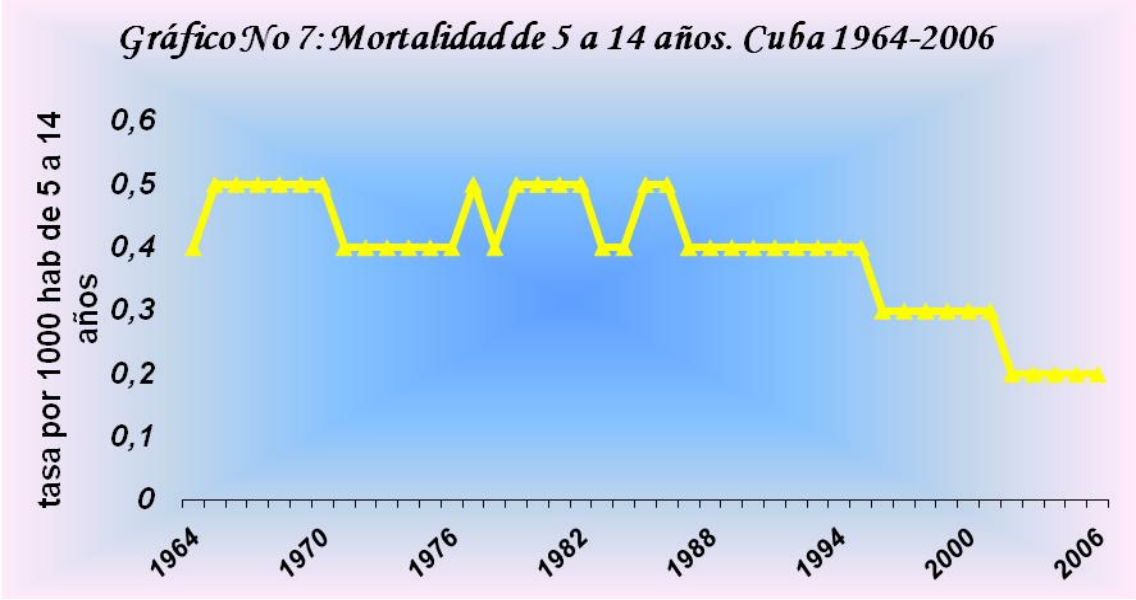
Graphic No. 5: One-to-four- year- old mortality, Cuba, 1964-2006 period

Rate per 1,000 one-to-four-year-old children

Graphic No. 6: One-to-four-year-old proportionate mortality, Cuba, 1964-2006 period

Graphics 5 and 6

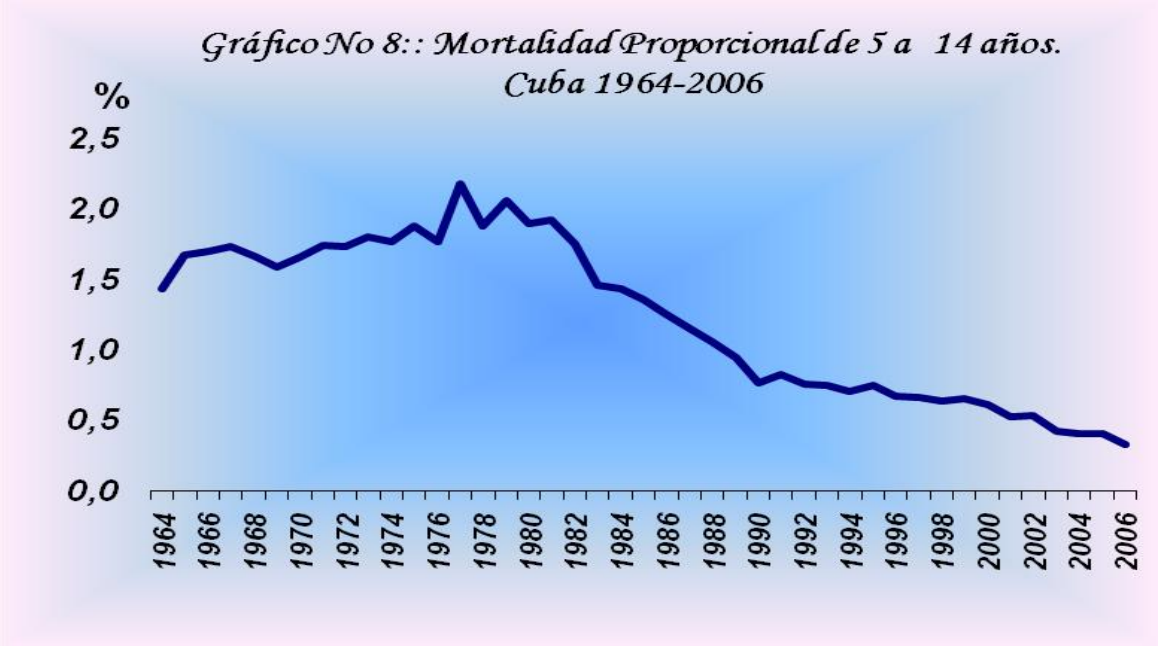
These two graphics show the pre-school death rate and its contribution to total mortality (proportionate mortality). The death rate in the period under review has been steadily declining and has led to stability in this indicator. Proportionate mortality has been reduced, reaching 0.2% in 2006.



Graphic No. 7: 5-to-14-year-old mortality, Cuba, 1964-2006 period

Rate per 1,000 five-to-14-year-old children

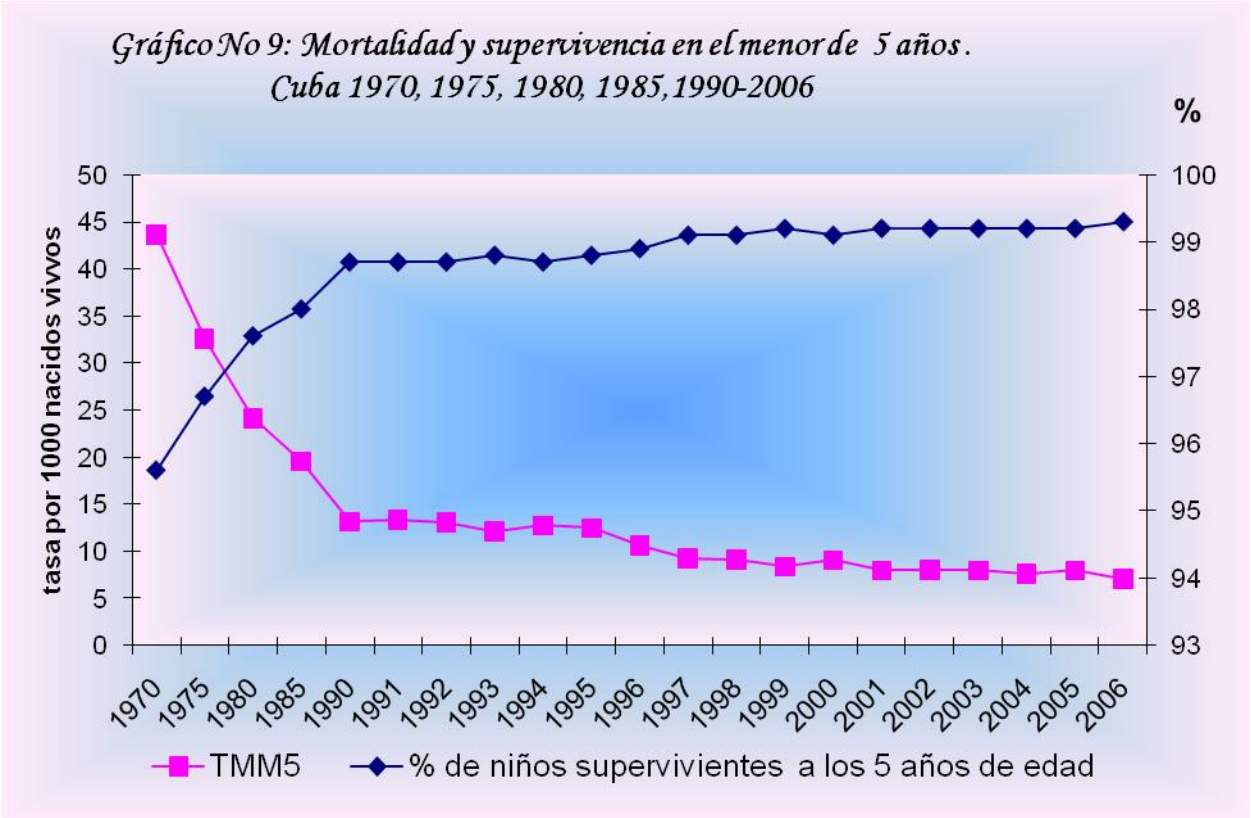
Graphic 7 shows the death rate in 5-to-14-year-old children. While the decline here is not as sharp as in the previous groups, a dropping trend has been seen.



Graphic No. 8: 5-to-14-year-old proportionate mortality, Cuba, 1964-2006 period

Graphic 8:

School-age mortality has been dropping, especially after 1980. As a result of an increased birth rate in the 1960s, this age group significantly grew in the previous period and proportionate mortality rose.



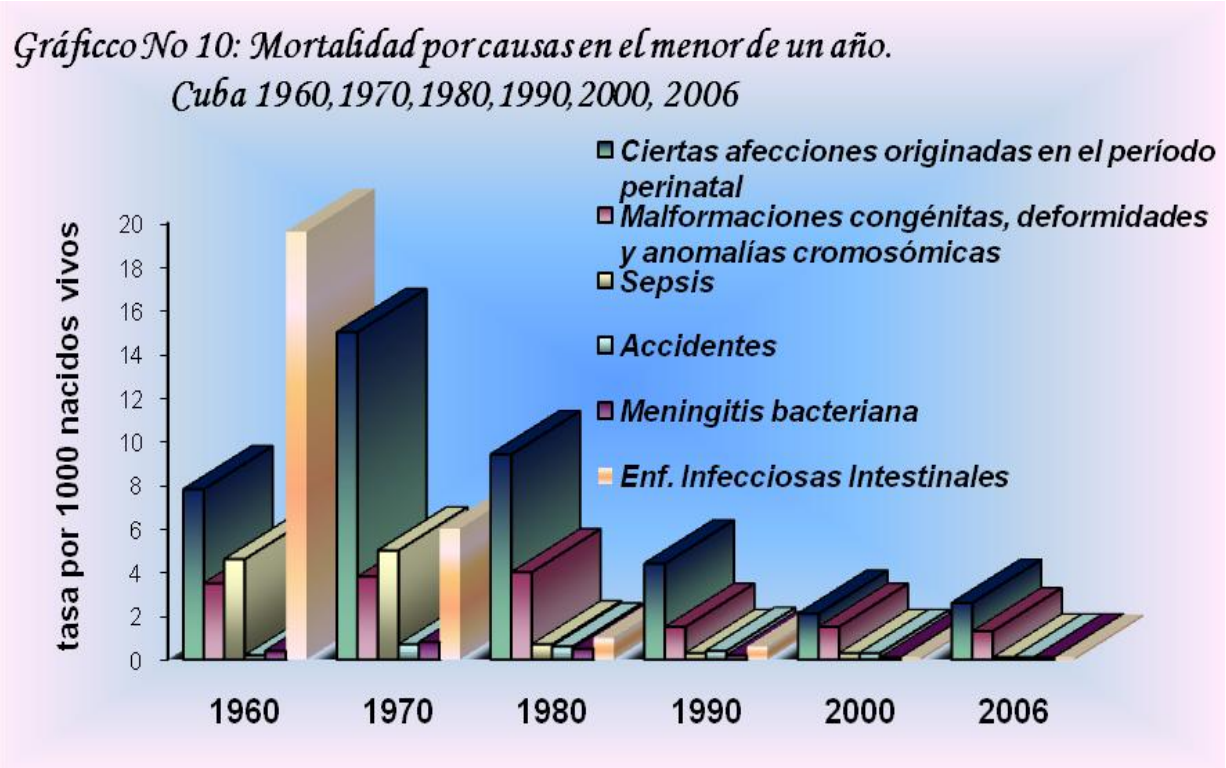
Graphic No. 9: Under-five mortality and survival rates, Cuba, 1970, 1975, 1980, 1985, and 1990-2006 period

Rate per 1,000 born alive

TMM5: Under-five mortality rate

Percentage of children surviving at five

Graphic 9 shows the under-five mortality and survival rates. There is a marked decrease in mortality, especially in the first two decades, and a consistent increase in survival, reaching over 99%.



Graphic No. 10: Causes of death in under-one children, Cuba, 1960, 1970, 1980, 1990, 2000 and 2006

Rate per 1,000 born alive

Certain perinatal conditions

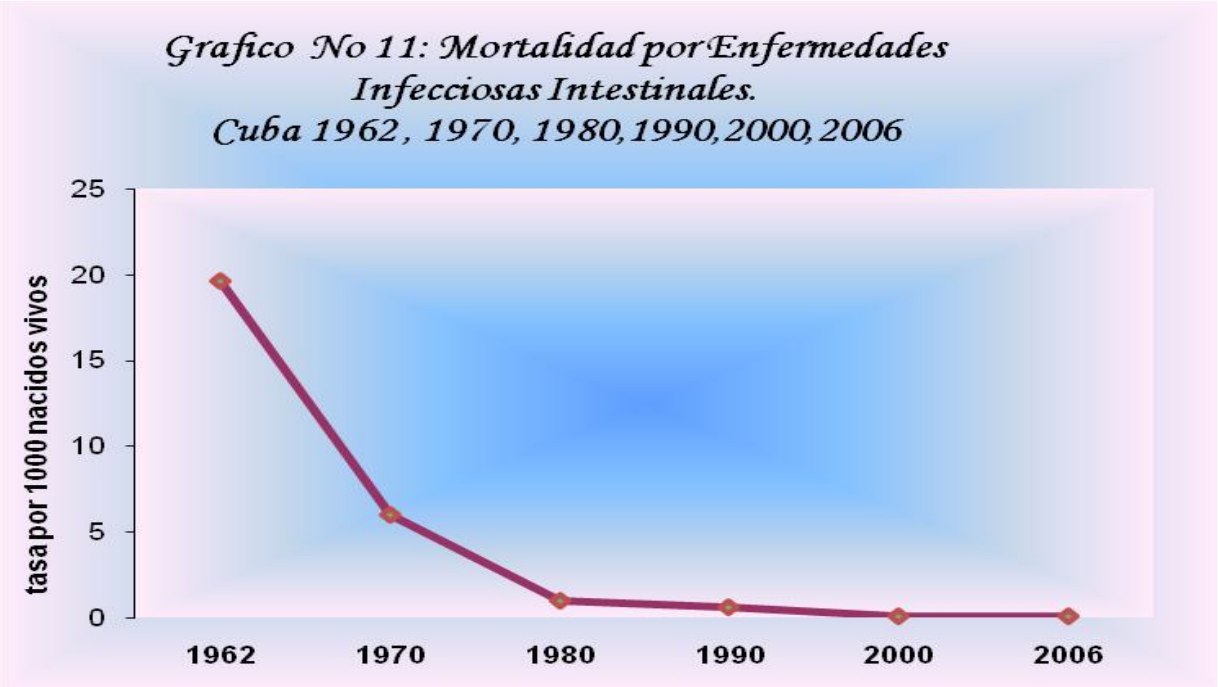
Congenital malformations, chromosomal abnormalities and deformities

Sepsis

Accidents

Bacterial meningitis

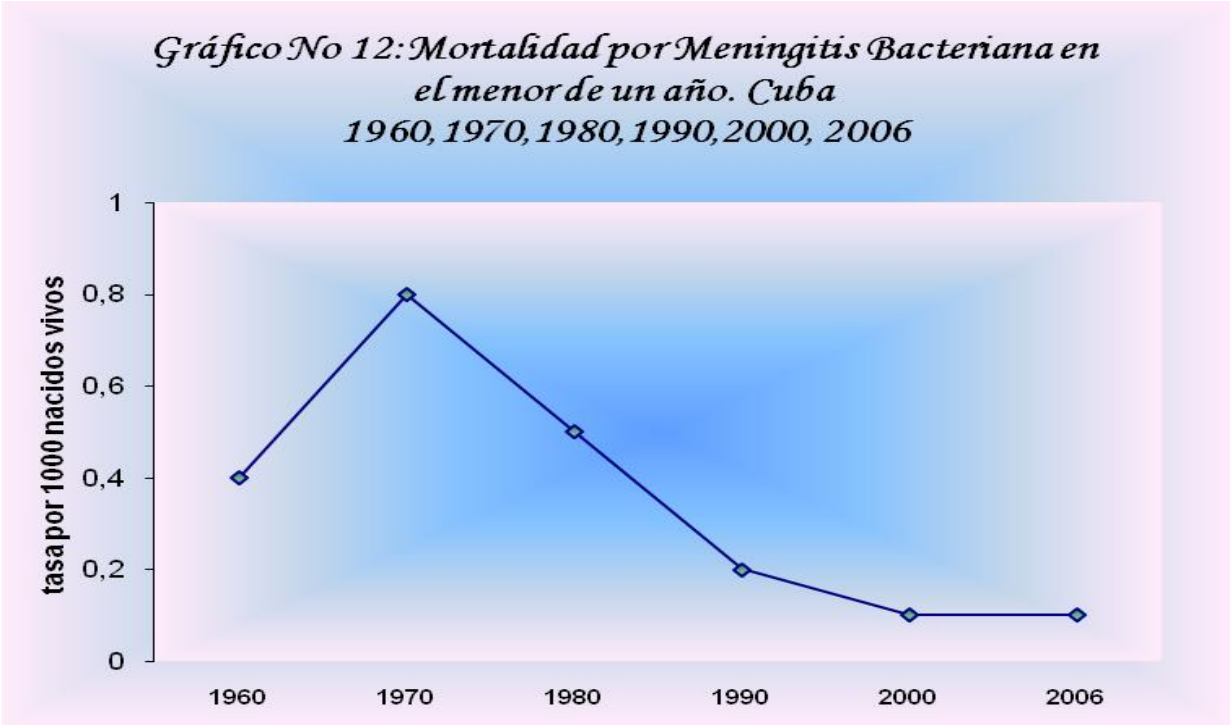
Infectious intestinal diseases



Graphic No. 11: Mortality due to infectious intestinal diseases, Cuba, 1962, 1970, 1980, 1990, 2000 and 2006

Rate per 1,000 born alive

Graphics 10 and 11 show the main causes of death in under-one children. In general, all causes followed a dropping trend since 1970, except mortality by accidents. Infectious intestinal diseases began to decline in the very first decade of the period under study.

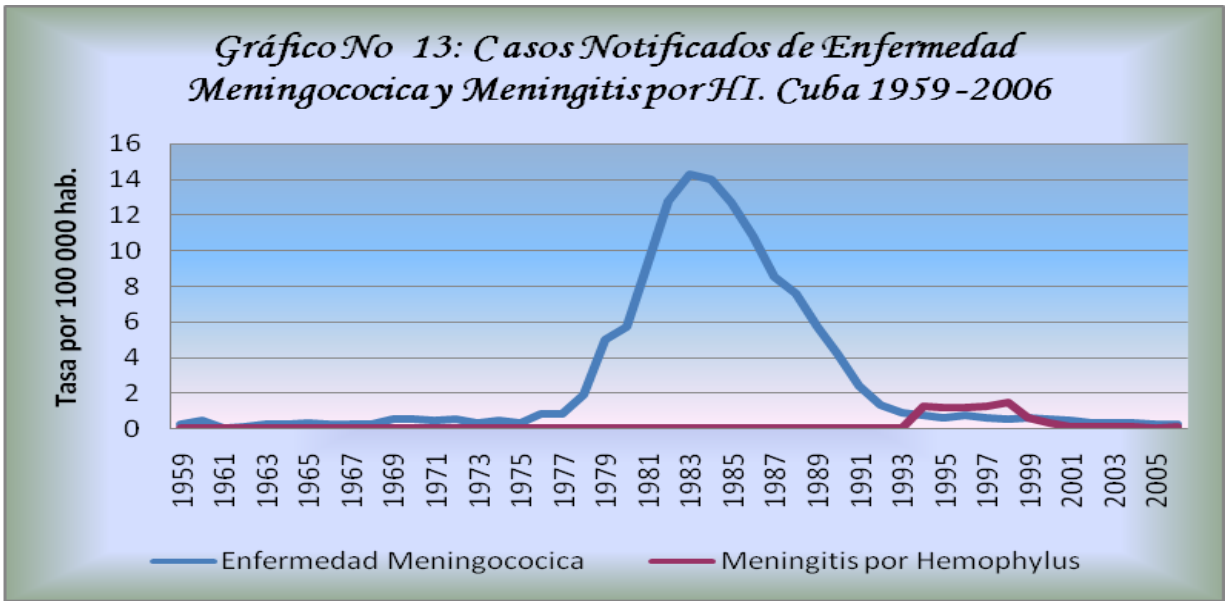


Graphic No. 12: Mortality due to bacterial meningitis in under-one children, Cuba, 1960, 1970, 1980, 1990, 2000 and 2006

Rate per 1,000 born alive

Graphic 12:

The under-one bacterial meningitis mortality rate grew in the 1960s and started to drop in the 1970s. The number of deaths went up in the 1980s, but declined by the end of the decade, upon the introduction of the Cuban meningococcal (type B) vaccine. The death rate further dropped in the 1990s, following the incorporation of the *Hemophilus influenzae* vaccine into the child vaccination scheme.

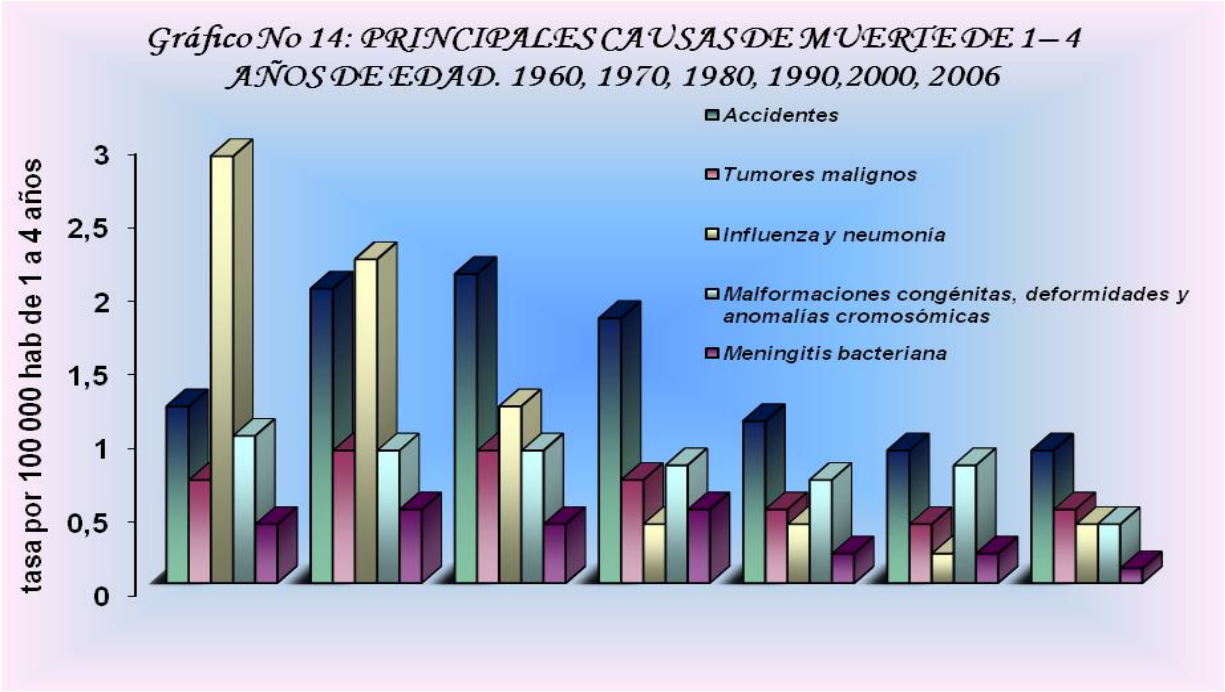


Graphic No. 13: Cases of HI meningitis and meningococcal disease, Cuba, 1959-2006 period

Rate per 100,000 inhabitants

Graphic 13:

The number of meningococcal disease cases grew in the 1980s, as did that of HI meningitis in the 1990s. Effective coping strategies made it possible to keep mortality rates down.



Graphic No. 14: Main causes of death in children aged one to four, Cuba, 1960, 1970, 1980, 1990, 2000 and 2006

Accidents

Malignant tumors

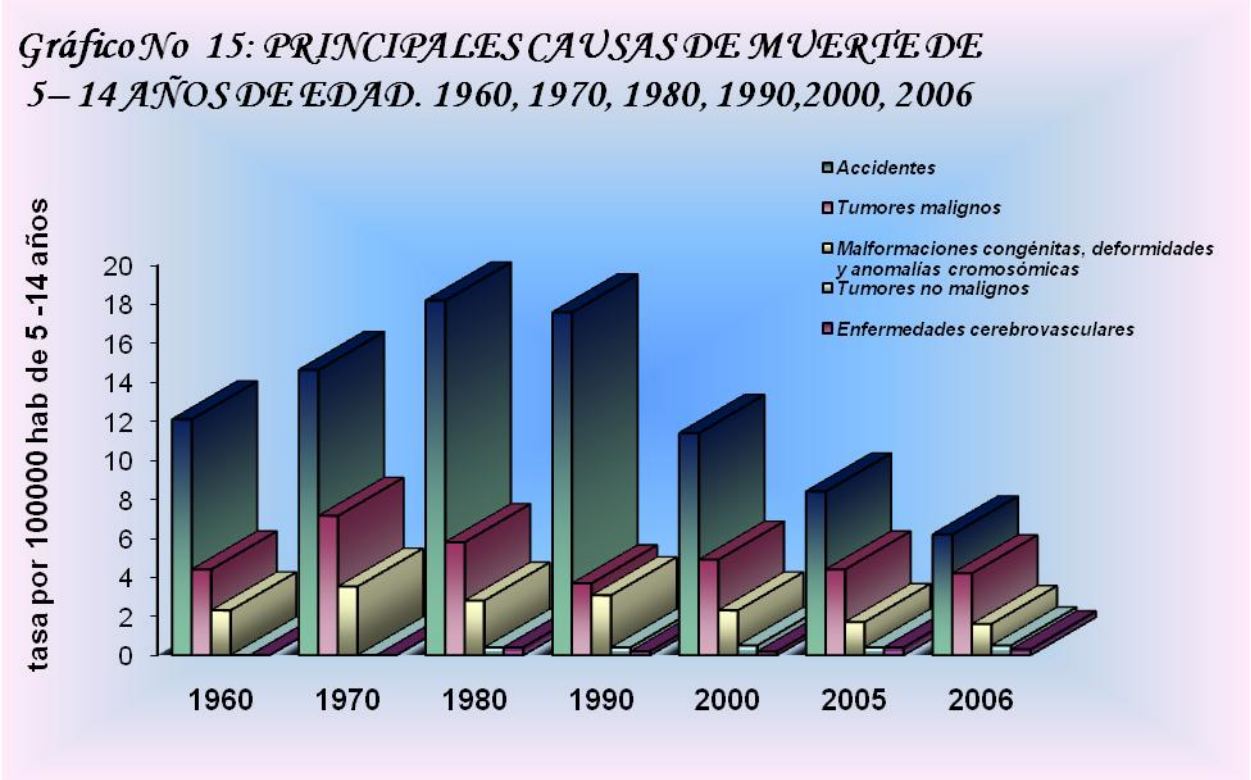
Influenza and pneumonia

Congenital malformations, chromosomal abnormalities and deformities

Bacterial meningitis

Rate per 100,000 one-to-four-year-old children

Graphic 14 shows the main causes of death in children aged one to four. Accident mortality followed a rising trend in the 1960-1980 period, but has been dropping ever since. It is still the first cause of death in this age group. There was a sharp decrease in influenza and pneumonia mortality, especially in the first decade of the study. A decline in bacterial meningitis and congenital malformation deaths has been seen after 2000. In general, the number of causes of death in 2006 was smaller than in the first decades.



Graphic No. 15: Main causes of death in children aged 5 to 14, Cuba, 1960, 1970, 1980, 1990, 2000 and 2006

Accidents

Malignant tumors

Congenital malformations, chromosomal abnormalities and deformities

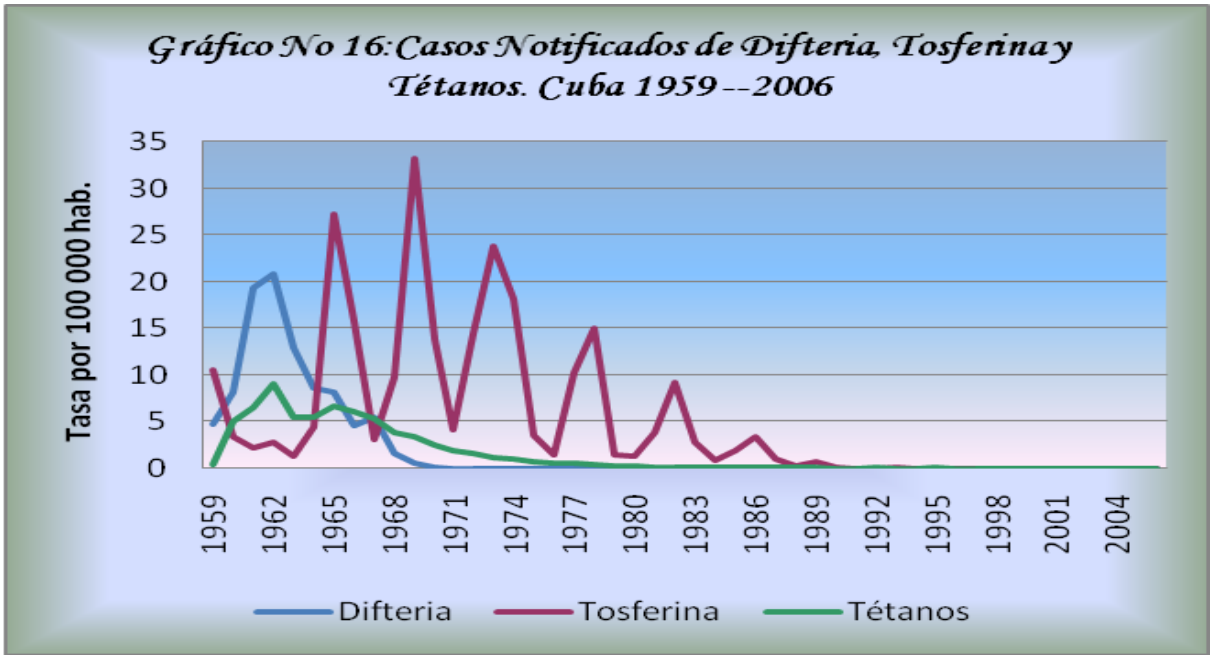
Non-malignant tumors

Cerebro-vascular diseases

Rate per 100,000 children aged five to 14

Graphic 15 shows the mortality rate in children aged five to 14. Accident mortality followed a dropping trend until 1980 and remained practically unchanged in the 1990s, when it continued to be the main cause of death for this age group. In general, the other causes of death have declined and the same cause structure has been seen in the last few decades.

PROGRESSION OF CERTAIN IMMUNIZABLE DISEASES



Graphic No. 16: Notified cases of diphtheria, whooping cough and tetanus, Cuba, 1959-2006 period

Rate per 100,000 inhabitants

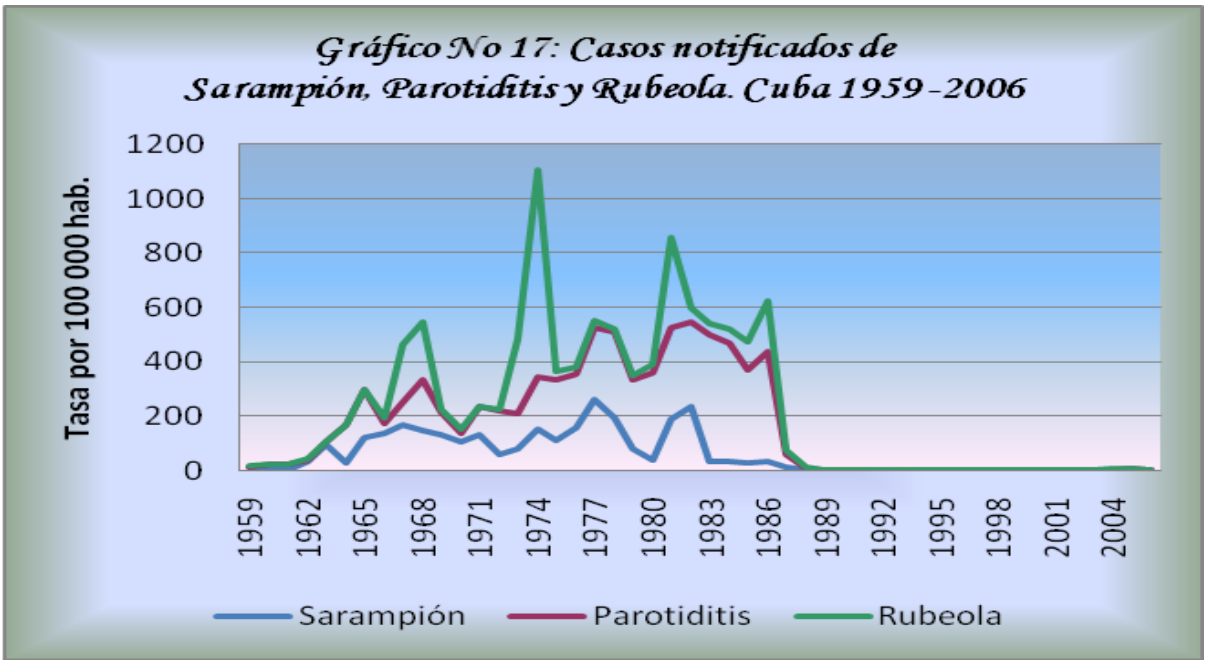
Diphtheria

Whooping cough

Tetanus

Graphic 16:

The number of notified cases of diphtheria, whooping cough and tetanus steadily dropped in the first few decades. Diphtheria was first eradicated and was followed by tetanus and whooping cough. The latter exhibited the highest morbidity.



Graphic No. 17: Notified cases of measles, parotitis and rubella, Cuba, 1959-2006 period

Rate per 100,000 inhabitants

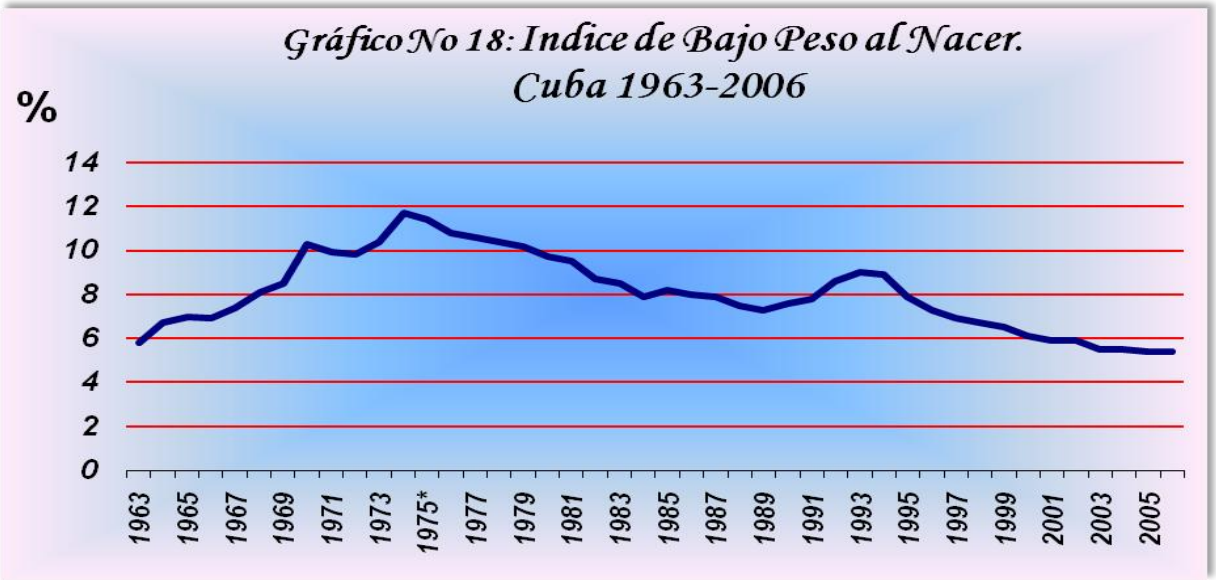
Measles

Parotitis

Rubella

Graphic 17:

Measles, parotitis and rubella exhibited considerably high morbidity rates in the first few decades, but declined and posed no health problems after the introduction of relevant vaccines.

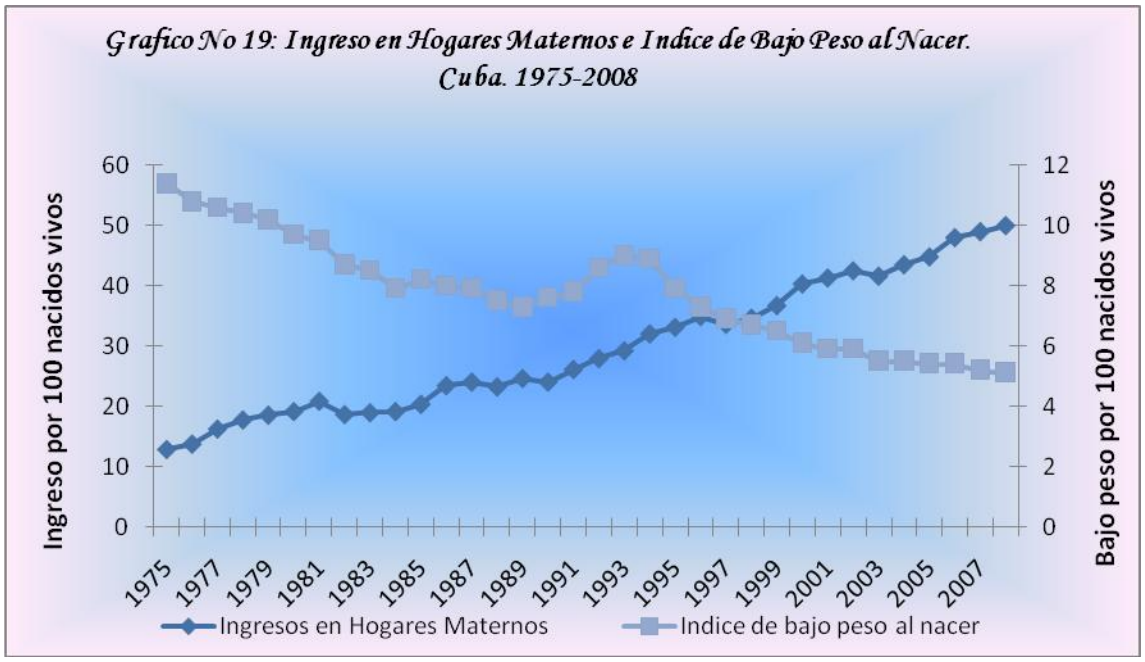


**Cambia la nomenclatura de Prematuro a Bajo Peso manteniendo el mismo criterio (menor de 2500 gramos).*

Graphic No. 18: Low birth weight index, Cuba, 1963-2006 period

**The term premature was replaced with low birth weight, but the same criterion applied (lower than 2,500 grams)*

Graphic 18 shows the progression of the low birth weight index. It continued to grow until the early 1970s, when it started to drop. It stood below 6% in 2000. As a slight increase was seen in the early 1990s, measures were adopted to keep the indicator down.



Graphic No. 19: Maternal home admission and low birth weight index, Cuba, 1975-2008 period

Admission per 100 born alive

Low birth weight per 100 born alive

Graphic 19 shows a decrease in the low birth weight index and an increase in maternal home admission. This move had a positive impact on the first indicator mentioned above.

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