



Transformations in the health system in Cuba and current strategies for its consolidation and sustainability*

Roberto Morales Ojeda,¹ Pedro Mas Bermejo,² Pastor Castell-Florit Serrate,³ Carmen Arocha Mariño,³ Nelly C. Valdivia Onega,⁴ Dalilis Druyet Castillo¹ and José A. Menéndez Bravo¹

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ABSTRACT

In Cuba, universal access and health coverage rest on three key principles: health as a human right, equity and solidarity. Although many of the Cuban health indicators are among the best in the Region of the Americas, in 2011 it was decided to reorganize health services, in line with the process of updating the Cuban economic and social model that occurred in all sectors. For this purpose, an action-research project was designed, including a situation diagnosis, implementation of changes and evaluation of the results, in several stages. As a result, human resources were rationalized with a reduction of more than 150 000 posts not directly linked to patient care, management structures were reduced in 57 municipalities, 46 polyclinics were compacted, the Family Physician and Nurse Program was optimized with 20 specialties for the community care, teaching was reorganized, and the international medical cooperation programs were revisited. These changes have contributed to improving the sustainability of the National Health System and its performance: increase in the number of consultations at the primary level (19.3%) and oral care visits (56.6%), reduction in the number of visits to emergency rooms (16.1%), increase in the number of patients surgically treated (12.1%), increase in the number of research projects (300%) and increase in the number of medical students (55.7%), among others. In Cuba, transformations in health is an ongoing project.

Keywords

Health systems; sustainability indicators; efficiency; Cuba.

The strategy for universal access to health care and universal health coverage rests on three key principles: health

as a human right, equity and solidarity (1). Worldwide and in the Americas region, universal health is increasingly at the center of all policies, with discussion focused on the paths that will best lead to its full realization. This is not, however, the problem in Cuba, where the State is responsible for a single health system that provides coverage and access without exclusions. Nevertheless, sustainability of this system

—without diminishing quality of care— and reaching ever higher levels of efficiency are pressing problems, augmented by the aggravating factors of climate change and population aging.

As the opening article in the *Pan American Journal of Public Health's* special issue dedicated to health in Cuba, this overview aims to explain, describe and analyze the rationale for the transformations

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¹ Ministerio de Salud Pública, Havana, Cuba.

² Instituto de Medicina Tropical Pedro Kourí, Havana, Cuba. Send correspondence to Pedro Mas Bermejo, pmasbe@infomed.sld.cu

³ Escuela Nacional de Salud Pública, Havana, Cuba.

⁴ Dirección Provincial de Salud, Havana, Cuba.

carried out as part of the strategy for reorganizing and consolidating the Cuban health system toward making it sustainable. With this baseline information, the reader will be better prepared to delve into the accompanying articles covering several intersecting topics: health problems, their conditioning factors, and the health system’s response through diverse programs and strategies; economic factors affecting public health in Cuba and its sustainability; research and the use of new information technologies to improve the quality and efficiency of public health practice in Cuba; among others.

GENERAL CONSIDERATIONS AND BACKGROUND

A key dilemma faced by public health globally is summarized by the following question: should the State take responsibility for health services, privatize them, or apply mixed or intermediate approaches? This quandary became particularly pressing during the 1990s with the application of policies encouraged largely by the World Bank and the International Monetary Fund, which promoted reforms to remodel health systems and reduce State participation (2). More recently, this question has been the subject of continuous debate from diverse standpoints reflecting a broad spectrum of political tendencies and economic approaches (2–6).

From a regionalization and political-administrative organization perspective, two trends characterize Latin American health systems: concentration of public and collective services within a single system, on one hand; and transfer of responsibilities to autonomous subnational units, on the other. The oldest examples of unified health systems are in Chile, Costa Rica and Brazil, in that order. Currently, Argentina and Colombia are moving in a similar direction (7–12).

The Cuban health system is organized by levels of care and provides universal coverage through medical and epidemiological care to the population, irrespective of skin color, religious belief, geographical location, or economic, social or political status (13). Health promotion and disease prevention are top priorities. The National Health System (*Sistema Nacional de Salud*, SNS) operates on the premise that improving population health indicators, quality of medical care, satisfaction with

services, and efficient use of resources is a prerequisite for guaranteeing the system’s sustainability and alignment with universal health (14–16).

Over the past 58 years, despite material constraints, the SNS has achieved international renown for continually upgrading its health services and systems, leading to steady improvements in Cuba’s main health indicators. Cuba ranks at the top of several key health indicators in the region (17, 18) (Table 1) and presents relevant outcomes in other sensitive population health indicators, such as birth and mortality rates (Table 2).

At the beginning of the 21st Century, the SNS was engaged in a process of consolidation and renovation. During the first decade, a broad social program was implemented (19) that renovated and modernized health services through the introduction of modern technologies at all levels of care, including primary care. Addressing the National Assembly in late 2009, Cuban President Raúl Castro stated that, “Without affecting the quality of health care provided to all citizens at no cost, and even improving it, expenditures can be substantially reduced” (20). This urgent appeal from the highest level of government was a clear call for efficiency without undermining excellence in service delivery.

The health system responded by developing and implementing an improvement and transformation plan aimed at reorganizing, downsizing, and regionalizing health services in order to consolidate their functions and increase the efficacy and efficiency of plans and programs. It also sought to raise the system’s capacity to meet foreseeable challenges related to population aging and other health contingencies, such as those that might derive from climate change and its impacts (19, 21).

In 2011, Cuba began updating its economic and social model in all sectors (22). The Ministry of Public Health included updating as part of its systematic processes of supervision and control, conducting a critical evaluation that brought to light a set of difficulties related to health service operations in need of transformation. It also identified the need to devise a new strategy and take steps toward reorganizing services in accordance with the country’s economic, social and health context (19, 23).

THE TRANSFORMATION PROJECT

As a result of the grave economic crisis suffered by Cuba in the 1990s with the loss of its traditional markets due to political changes in Eastern Europe and

TABLE 1. Cuba’s ranking in relation to countries in the Americas region, selected indicators, 2015

Indicator	Cuba	Americas region countries (minimum; maximum)	Cuba (regional ranking) ^a
Life expectancy (years)	79.1	63.5; 82.2	5
Under-5 mortality (per 1 000 live births)	5.5	4.9; 69.0	2
Maternal mortality (per 10 000 live births)	39.0	7; 359	10
Health professionals (per 10 000 population)	157.8	7.5; 157.8	1

^a Ranked from best to worst, according to polarity of the indicator

Source: Created by the authors based on reference 17.

TABLE 2. Birth and mortality rate indicators in the world, Latin America and the Caribbean, and Cuba, 2016

Indicator	World	Latin America and the Caribbean	Cuba
Birth			
Crude (per 1 000 population)	19	17	10.4
Total fertility (children per woman)	2.5	2.1	1.6
Mortality			
Crude (per 100 000 population)	8	6	8.8
Under-5 (per 1 000 live births)	43	18	5.5
Infant (per 1 000 live births)	32	15	4.3
Neonatal (per 1 000 live births)	19	9	2.4

Source: Created by the authors based on references 17 and 18.

tightening of the economic, trade and financial embargo imposed on Cuba by the United States since the early 1960s (24), Cuba's healthcare facilities deteriorated physically and shortages of supplies worsened. To a certain degree, the quality of health service management also deteriorated as demand for hospital services increased. A survey conducted by the National Hygiene, Epidemiology and Microbiology Institute during this period evidenced people's dissatisfaction with the health services (25).

In 1997, Suárez (26) demonstrated the magnitude of the challenges Cuba needed to overcome to withstand the effects of the economic crisis and maintain the achievements and high quality of health services in a country with free, universal access and coverage, and a population accustomed to making extensive use of such services, from primary health care (PHC) to specializations equipped with cutting edge technologies.

In response to the difficulties identified and the subsequent need to reorganize Cuba's health services in alignment with national policies and changes in the economic model initiated in 2011 (22), an action research project was designed. This project was led by an expert group of specialists with more than five years experience as heads of health services and academic credentials as professors and researchers in the field of health systems and services. The project had two components: assessment and evaluation; followed by enactment, implementation and concurrent evaluation of outcomes. Throughout the process, the expert group's main role was to analyze and collectively discuss the information, and provide technical assistance to the Ministry of Public Health.

Assessment and evaluation

The first phase, devoted to assessment and evaluation, was based on the application of a set of 147 indicators that measure structure, process and outcomes, and satisfaction with the health services provided. Results were entered into an *ad hoc* health information system by category (27). Institutions included in the assessment and evaluation phase were hospitals, polyclinics (health facilities serving the population of several neighborhoods; these polyclinics are linked to hospitals), Family Doctor and Nurse Program offices (located in every neighborhood to serve the surrounding population; affiliated

with polyclinics), maternity homes (centers providing care for pregnant women facing some type of risk or who live in remote locations), oral health centers and services, and institutions providing care for elderly or disabled persons.

For each indicator, the frequency or periodicity of collection was defined (one time only, monthly, quarterly, twice-annually or annually), as were flow or levels of circulation (institutional, local or national) and sources (continuous statistics, surveys, interviews and monitoring actions or audits). The components, description and simple algorithm for calculating each indicator were also specified. Depending on their characteristics, indicators could be structural (need for PHC clinics and demand for human resources), process (general indicators of resources and productivity), outcome (coverage and availability of services) or satisfaction of the population with services received.

For purposes of the evaluation, the following definitions of three of the key concepts in the transformation process were applied (28):

- **Reorganization:** Process by which the distribution of organizational structures for health service delivery is modified, as well as corresponding resources, in order to meet the health demands of the population in accordance with changing circumstances, and individual and collective goals.
- **Downsizing:** Process by which two or more departments or services of the same specialty or activity are merged or unified in order to guarantee optimal functioning through the most rational use of time and available human and material resources.
- **Regionalization:** Process by which the services provided by health institutions are made available and organized in an accessible and equitable manner in order to guarantee the coverage required by the population, supported by the referral/counter-referral system that allows the family doctor to be in charge of their patient's routing through the system until the patient's health needs are resolved.

Enactment, implementation and evaluation of outcomes

The principal outcome of the assessment and evaluation component was the

creation of the operational bases for modifying the distribution of organizational structures and for rationalizing institutional resources and increasing efficiency in service provision without diminishing quality of care in meeting the population's needs. Subsequently, a timeline was created for the enactment, implementation and evaluation of the results of the transformation. Three stages were defined, each with specific purposes and actions, as described below (21). The entire process was led by teams of professionals selected for their experience and specific skills in health service management and administration, in regular consultation with the entities involved and the community, aiming toward appropriate decision making.

First stage. Carried out in 2011–2012, actions in this stage were aimed at redefining strictly necessary staffing needs in human resources, streamlining management structures, determining need for Family Doctor and Nurse Program offices, applying a new structure in small municipalities with a single health area, reorganizing teaching processes and re-arranging international medical cooperation programs.

This stage of the transformation process determined that municipal health departments and polyclinics had a similar structure, regardless of their level of complexity. Cases of duplicate functions were identified, as teams and working groups had been created to provide specialized care for specific diseases. This meant that patients were seen outside their clinics, causing a breakdown in the concept of responsibility and continuity of care. This organizational model of care affected fulfillment of a foundational objective of the Family Doctor and Nurse Program: to turn the polyclinic and its affiliated clinics into sites for patient care, teaching and research by means of a process of consultations with specialists who would transfer technology to the family doctor.

During this stage of the transformation process, health actions that had been "verticalized" returned to the clinics, the number of clinics was increased, and the foundation of the system—the doctors and nurses providing care to families—was expanded. This guaranteed coverage to the population and reinforced the principle that the primary level of care is the point of entry into the system.

Second stage. Evaluation of first stage outcomes laid the foundation for a

second stage of deeper transformations (2013–2014), in which the same goals were maintained and new actions were included, based on the experience acquired. New actions included promoting development of workers’ job skills, as well as their ethical and social competencies, using the most advanced medical science and technology. In addition, organization of different services and levels of care, and their integration, was strengthened, and the family medicine model was consolidated.

Third stage. In this stage (2015–2016), actions were carried out to preserve the foundational concepts of the Family Doctor and Nurse Program and the quality of services in polyclinics. The goal was to satisfy between 70% and 80% of the population’s health needs at the primary care level; reorganize health promotion and prevention, epidemiology and microbiology services, in accordance with the national and international situation; maintain the principle of education at work during the teaching, service provision and research processes in Cuban medical schools; increase the number of operational research projects to optimize decision-making; increase the export of medical services; and diversify sources of income.

Comparing some indicators of growth and quality⁵ of service outcomes before and after application of the transformations, considerable improvement in the volume of the services provided was observed, with an increase in the number of primary care (19.3%) and oral care (56.6%) consultations, and the number of patients who underwent surgery (12.1%), among others (Table 3), although this cannot be solely attributed to the transformations. Hospital emergency room visits decreased by 16.1%, very possibly due to a greater capacity for resolution at the primary care level. Similarly, the proportion of first-time cesareans decreased slightly and surgical efficiency increased markedly. Notable increases were also observed in the important areas of research and teaching.

Future steps. The transformation project—with its components of assessment, enactment, implementation and evaluation—has not concluded, since its outcomes are being used to monitor system performance through the use of

⁵ In Cuba, the increase in polyclinic consultations is also an indicator of patient adherence to PHC as the entry point into the system, resulting in fewer hospital emergency room visits, thereby enabling provision of higher quality hospital care.

resources and analytical tools designed for the three stages of the project.

It should be noted that the entire process of health sector transformation has been characterized by the enactment of comprehensive intersectoral actions at all levels—local, intermediate (provincial or regional) and national—which has served to advance consolidation of the presence of priority health issues in all national and sectoral policies adopted in Cuba (28).

Other important project milestones linked to the transformations

Major milestones of the transformation project aimed at improving sustainability of the system without affecting the health budget include the following:

- In the last decade, the State has maintained a high fiscal priority with percentages that, in general, exceed 25% of the total expenditure of budgeted activity (16). For example, in 2012–2015, health spending remained below 10.4% of the annual per capita Gross Domestic Product (Table 4).
- The number of health system workers was reduced by more than 150 000

positions in the first and second stages of the transformation. Most of those were administrative positions and jobs not involved in providing services to patients. In Cuba, there is not now, nor will there ever be, a surplus of Doctors, dentists, nurses and health technicians, according to projected coverage of domestic services and international commitments.

- Management structures were streamlined in 57 municipalities, and 46 polyclinics serving populations of fewer than 5000 inhabitants were downsized through redistribution in nearby health areas, so coverage was not affected. The basic health team, integrated into Family Doctor and Nurse Program offices, was assigned a maximum population size, which expands the team’s performance and accountability for the health of the population under its care. This concept is reinforced through activities related to elder care, genetic counseling and care of specific population groups. It is complemented, additionally, by the participation of specialists in internal medicine, obstetrics and

TABLE 3. Cuban health system performance before and after application of transformations, selected indicators

Indicator	Before (2010)	After (2016)	Degree of change (%)
Primary care visits (patients served)	64 907 659	77 449 154	19.3
Hospital emergency room visits (patients served)	21 788 808	18 286 319	-16.1
Surgeries (patients served)	948 694	1 063 184	12.1
First-time caesarians (percentage of total patients served)	30.5	28.3	-7.2
Oral health consultations (patients served)	18 649 854	29 213 718	56.6
Research projects	1 183	4 863	311.1
Medical school enrollment (number of undergraduate students in Medicine, Nursing and Health Technologies)	32 848	51 152	55.7

Source: Created by the authors based on reference 17.

TABLE 4. Gross Domestic Product (GDP) per capita, and health and social welfare spending. Cuba, 2011–2015

Year	GDP per capita (in Cuban pesos) ^a	Total health expenditure	
		Millions of Cuban pesos ^a	Percentage of GDP (%)
2011	4 367.4	5 587	11.5
2012	4 498.0	4 568	9.1
2013	4 614.4	5 026	9.7
2014	4 649.2	5 405	10.4
2015	4 849.3	5 641	10.4

^aExchange rate: CU\$1.00 = US\$1.00, at constant 1997 prices.

Source: Created by the authors based on reference 30. All primary data used to create this table come from the 1985–2015 statistical series, available on the Cuban National Statistics Bureau website <http://www.one.cu/series2015.htm>

gynecology, pediatrics and a psychologist, who make up the basic clinic staff, along with community outreach in 20 specialties, 14 in polyclinics and six in the municipality, whose frequency will depend on territorial needs, based on health conditions.

- The Medical Cooperation Program was restructured into three modalities: in the first, Cuba covers expenditures (20 countries); in the second, expenditures are shared between Cuba and the recipient country (17 countries); and in the third, Cuba receives income (30 countries). In all cases, the principle of solidarity is emphasized, since Cuban professionals generally provide services in areas not covered by professionals in the beneficiary countries, because they are remote, difficult to access or pose a health risk. Between 2011 and 2016, during the transformation

process, 140758 health professionals provided services in 67 countries.

- Restructuring of the medical cooperation program produced an annual income growth rate exceeding 200%, in addition to overall savings from more rational use of resources in service provision. This has made funds available to guarantee the sustainability and development of the SNS, acquisition of supplies such as medicines and reagents, investment programs, institutional repair and maintenance, and introduction of medical technologies, as well as computerization upgrades in the health system and improved training of health personnel in the use of advanced technologies.

Despite new sources of financing from adjustments to the medical cooperation program and increased efficiency in health services, the costs of chronic disease care, dynamism of technological

development, prevention and care of emerging and reemerging diseases, population aging, and the impact of the United States' economic, commercial and financial embargo against Cuba, present a huge challenge to sustainability of the SNS. These challenges must be confronted with the dedication of professionals, technicians and workers; community integration; application of interwoven processes, innovations and strategies in managing health systems and services; capitalization of human resources; and greater use of information and knowledge management.

The greatest dividend of the transformation project transcends the outcomes mentioned here, some of which stem directly from the transformations, while others are trends already underway that coincide with the transformations. These benefits materialized throughout the process as valuable learning experiences (Table 5).

TABLE 5. Lessons learned during the Cuban health sector transformation process

Dimensions	Difficulties	Actions
1. Structure	It was found that administrative structures did not provide greater links between health system managers and health services, nor with patients, and that capacity building was needed to identify and resolve problems at the primary care level.	Structures were adjusted based on fulfillment of the functions inherent to each position, personnel competencies and public health collaboration.
2. Competencies of health administrators, professionals and technicians	The decision-making capacity of administrative, scientific and health care sectors—essential to gaining a better appreciation of the utility of research (especially operations research using action-research and evaluation methods) as a resource for SNS development—had been reduced.	Spaces for continuing education, training, and professional development were rehabilitated, contributing to increased professional and research competencies, among them: specialization in health administration other pre- and postgraduate teaching models for the technical and scientific qualification of health professionals
3. SNS efficiency	Specific possibilities for increasing health system sustainability in the work environment had not been directly identified, which would require efficient processes and increased services, technologies and professional skills.	Professional competencies and performance were increased. The Efficiency Program was implemented. Use of technologies was rationalized through more consistent application of the clinical-epidemiological approach, which improved the doctor-patient relationship and service quality. Health service and teaching site accreditation processes were instituted.
4. Primary level of health care	The process of improving PHC was not continuous, and guaranteeing the resolution and efficiency of more than 70% of primary care problems was required. This was reflected at all other levels of care.	Comprehensive development of the Family Doctor and Nurse Program was increased as the key element of this process. Advanced technologies were introduced that helped bring specialized services closer to PHC. A computerization strategy was initiated to sustain designated eHealth areas.
5. Secondary level of health care	Problems with infrastructure and equipment in hospital services that required continuous improvement to increase their capacity for resolution in controlling the principal causes of death and other health problems, complementing actions at the primary care level	Medical technologies were introduced in secondary services in accordance with the health situation. The referral and counter-referral system between primary and secondary care was improved.
6. Demographic and climate changes in Cuba	The SNS was not fully prepared to confront: <ul style="list-style-type: none"> • low fertility and birth rates • population aging • impacts of climate change 	Attention to demographic changes related to preconception risks and care for infertile couples was increased. New aspects in elder care were included to improve quality of life through application of new and methods and models of care, according to the culture and needs of this population. Collaboration with other institutions on projects for confronting climate change and its consequences

Note: SNS: National Health Service; PHC: primary health care.

Source: Created by the authors.

CONCLUSIONS

In accordance with the updating of the Cuban economic model, transformation of the health sector has made it possible to re-define functions and reclassify different health system structures and units at all three levels of care, as well as adjust human resource staffing needs, all of which constitute an important organizational step.

The proposals for reorganizing, regionalizing and downsizing services were applied nationwide once institutions were certified. This led to continued improvement in Cuban population health indicators, as health care activity expanded, from service provision to promotion and prevention, including treatment and rehabilitation. The entire transformation process occurred simultaneously and at lower cost. Its objectives have been met with improved process and outcome indicators and high quality of care indexes that must be maintained. The system generates more income and

continues to develop, since everything must contribute to the sustainability of the SNS. As a result, efficiency in service provision has increased and professional performance has improved.

After implementation of these transformations, it became clear that sustainability of the SNS could be increased, while still taking into consideration the socioeconomic, cultural and environmental factors that pose real challenges to development, such as the high rate of population aging, low birth rate, and impact of climate change.

RECOMMENDATIONS

Health system transformations should be streamlined to respond to socio-demographic changes in Cuba. The cost-cutting process must be maintained in order to increase the system's sustainability, and the introduction and widespread use of technology sustaining eHealth, training and development

of human capital must continue. The capacity of systems that capture, process, analyze and efficiently disseminate information in order to monitor, evaluate and, eventually, measure the impact of these transformations, needs improvement.

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RESUMEN

Transformaciones en el sistema de salud en Cuba y estrategias actuales para su consolidación y sostenibilidad

En Cuba, el acceso y la cobertura universales de salud descansan sobre tres principios clave: la salud como derecho humano, la equidad y la solidaridad. Aunque muchos de los indicadores de salud cubanos están entre los mejores de la Región de las Américas, en el 2011 se decidió reorganizar los servicios de salud, a tono con el proceso de actualización del modelo económico y social cubano que transcurría en todos los sectores del país. Para ello, se diseñó un proyecto de investigación-acción que abarcó el diagnóstico de la situación, la implementación de los cambios y la evaluación de los resultados, en varias etapas. Como resultado, se racionalizaron los recursos humanos con una reducción de más de 150 000 plazas no vinculadas directamente a la atención del paciente, se aligeraron las estructuras de dirección en 57 municipios, se compactaron 46 policlínicos, se optimizó el Programa del Médico y la Enfermera de la Familia con la proyección comunitaria de 20 especialidades, se reorganizó la docencia y se reordenaron los programas de cooperación médica internacional. Estos cambios han contribuido a mejorar la sostenibilidad del Sistema Nacional de Salud y su desempeño: aumento en el número de consultas en el nivel primario (19,3%) y estomatológicas (56,6%), reducción del número de consultas en cuerpo de guardia (16,1%), aumento del número de pacientes intervenidos quirúrgicamente (12,1%), incremento del número de proyectos de investigación (300%) y crecimiento en el número de estudiantes de Medicina (55,7%), entre otros. El proyecto de transformaciones en la salud emprendido en Cuba continúa.

Palabras clave

Sistemas de salud; indicadores de sostenibilidad; eficiencia; Cuba.

Transformações no sistema de saúde em Cuba e estratégias atuais para sua consolidação e sustentabilidade**RESUMO**

Em Cuba, o acesso universal e a cobertura de saúde dependem de três princípios fundamentais: a saúde como direito humano, equidade e solidariedade. Embora muitos dos indicadores de saúde cubanos estejam entre os melhores da Região das Américas, em 2011 foi decidido reorganizar os serviços de saúde, de acordo com o processo de atualização do modelo econômico e social cubano ocorrido em todos os setores do país. Para o efeito, foi elaborado um projeto de pesquisa-ação, que incluiu o diagnóstico da situação, a implementação das mudanças e a avaliação dos resultados, em várias etapas. Como resultado, os recursos humanos foram racionalizados com uma redução de mais de 150 000 postos não diretamente ligados ao atendimento ao paciente, as estruturas de manejo foram reduzidas em 57 municípios, 46 policlínicas foram compactadas, o Programa Médico e Enfermeiro da Família foi otimizado com a projeção para a comunidade de 20 especialidades, o ensino foi reorganizado, e os programas internacionais de cooperação médica foram reordenados. Essas mudanças contribuíram para melhorar a sustentabilidade do Sistema Nacional de Saúde e seu desempenho: aumento do número de consultas no nível primário (19,3%) e odontologia (56,6%), redução do número de consultas na emergência (16,1%), aumento do número de pacientes tratados cirurgicamente (12,1%), aumento do número de projetos de pesquisa (300%) e crescimento do número de estudantes de medicina (55,7%), entre outros. O projeto de transformação em saúde realizado em Cuba continua.

Palavras-chave

Sistemas de saúde; indicadores de sustentabilidade; eficiência; Cuba.
