

2.3.3. Cuba

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*“Primary care and family medicine
will be the main health strategies in the XXI century”*
Fidel Castro Ruz

Introduction

Notwithstanding the fact that the Cuban experience has, for some decades, been one of the most efficient models of prevention, control and reduction of disease in one country, the Cuban public health model has largely been ignored and only rarely mentioned in the international scientific literature^{1,2}. Unlike as happened after the publication of the World Bank report “*Investing in Health*” (1993) that shaped health reform in many, not only Latin American countries, leading them to try to contain costs by asking citizens to pay user fees, to separate between supplier and purchaser (beneficiary) functions; and, to privatise health services³, Cuba continued to maintain and implement a public health system based on principles of responsibility, equity and universal health insurance cover^{4,5}.

The uniqueness of the results achieved by the Cuban public health system (**Table 1**) should also be evaluated and compared with those of other nations (**Table 2**), in the light of what has been happening in international politics, especially to Cuba, since the early 1960’s (e.g. the embargo from 1961 on, and the suspension of co-operation with the USSR in the late 1980s).

The Cuban health system

In 1959, the year of the Cuban Revolution, the health sector was heterogeneous and rudimental, based on one University hospital, one Medical School and on primary health care, mainly private, provided by 6,300 doctors, two thirds of whom lived in Havana⁶. Half of these doctors had already abandoned Cuba by the mid 1960’s, moving primarily to the United States as they did not agree with, or accept, the new Cuban Government’s health reforms which had cut their privileges and power by developing a country-wide public health service. The first priorities were to create and implement measures for public hygiene (improving water supply and sewers), prevention of contagious diseases (vaccinations) and development of health services in rural areas⁷. Next, integrated into the 1984 reforms, came the de-

Table 1. Results obtained by public health in Cuba.

- First nation to eliminate poliomyelitis – 1962
- First nation to eliminate measles – 1996
- Nation with the lowest rate of HIV/ AIDS
- The most effective Dengue control programme in the Americas
- Highest level of medical health cover: 1 doctor every 120-160 families
- The highest rates in the world for treatment and control of hypertension
- 45% reduction in the mortality rate for cardiovascular diseases
- Infant mortality rate: 5.8%
- Realisation and implementation of a complete health plan for the Americas
- Free medical training for students from Africa and Latin America
- 34,000 doctors sent to 52 nations with scarce resources
- Creation of a National biomedical informatics network (INFOMED)
- Creation of a biotechnology R&D sector (created the first human polysaccharide vaccine)

Table 2. Health and socio-economic indicators.

<i>Indicators</i>	<i>Cuba</i>	<i>USA</i>	<i>China</i>
Population (million)	11.3	299.0	1.300.0
Life expectancy at birth (years)	77.7	77.9	72.5
Fertility Rate (births per women)	1.5	2.1	1.8
Infant mortality rate (% births)	6.0	6.0	23.0
Prevalence of malnutrition (% children <5anni)	3.9	-	10.0
Prevalence HIV positive patients (% population 15-49 yrs)	0.1	0.6	0.1
Human Development Index HDI [position 177 nations]	0.838 [51]	0.951 [12]	0.777 [81]
Per capita GDP (SPP \$)	6,000	41,890	6,757
Human Poverty Index HPI [position 177 nations]	4.7 [103]	-	11.7 [80]
Probability of not surviving past age 40 (%)	3.1	-	6.8
People without access to an improved water source (%)	9.0	-	23.0
Tertiary level education (%)	61.5	82.7	20.3

Source: The World Bank (<http://devdata.worldbank.org>); Human Development Report 2007/2008 (<http://hdrstats.undp.org>).

velopment of a system of polyclinics and hospitals which focused on primary care, beginning from Family Care⁸. Today there are about 70,000 doctors in Cuba, 31,000 are General Practitioners and each has around 120-160 families (about 600 persons) in their practise^{9,10}.

Each GP is assisted by a nurse, who takes part in all preventive and treatment activities, both ambulatory and home visits. Each has a small residential apartment, rent free, next to the Surgery: usually a small building, separated off from the surrounding buildings. The monthly salary is about 30\$ for the doctor and 25\$ for the

nurse, for five working days (Monday to Friday); Saturday mornings are usually dedicated to refresher or up-date courses organised in polyclinics or hospitals. Each year, both have some weeks off for holidays¹¹. Home visits are part of their routine because the team, doctor and nurse, must know about the state of health of each of their patients in their family, housing and neighbourhood setting.

The second level of health care is 436 polyclinics. These polyfunctional centres provide day hospital type services for the surrounding area and are where GPs send, and accompany, patients who need specialist diagnostic, treatment or rehabilitative services.

The third level is 279 highly specialised hospitals, some of which are considered of international excellence (e.g. cardiology, dialysis, immunology, transplants). As well as these structures, scattered all over the island are: 197 residential care homes for the elderly, 227 maternity clinics for deliveries, various structures for the disabled and one “sanatorium” for HIV positive patients¹². Cuba spends about 16% of its GDP on health care, in other words about 320\$ per capita per year⁴.

INFOMED the Cuban National Health Care Network

Since 1992 a network, a national information portal has been being developed so as to improve coordination and information within the Cuban university health system¹³. The informatics and telecommunications system was developed with financial support from United Nations Development Programme (UNDP), the World and Pan-American Health Organisations and UNICEF. The network links all provincial information centres, research institutes, hospitals and Universities in the country to each other¹⁴.

The INFOMED portal was mainly developed using an open source software and includes a virtual library which allows consultation of biomedical journals and international bibliographic databases. Since 1999, a distance learning university course in Epidemiology and Public Health has been set up. The portal also offers numerous other sources of information and educational resources in different areas of medicine (e.g. surgery and paediatrics). Each Cuban health institution has an area dedicated to training and formation, research or management. All health workers, even primary care doctors and nurses have free access¹⁵.

The US embargo and the “suspension of co-operation” from the USSR

The ongoing US embargo and the break up of the USSR with the resultant suspension of aid, subsidies and trade led to the “special period”, 1991 to 1994, when there was a profound economic crisis in Cuba and much of the population found it hard to survive¹⁶. The Cuban economy contracted by 30%, foreign supplies of drugs, food products, products for industry and agriculture and the health of the Cuban population in general deteriorated¹⁷. Even distributing essential foodstuffs through rationing, which favoured pregnant women, children and the elderly, was

unable to stop vitamin, protein and micronutrient deficiency diseases appearing in more than 50,000 Cubans. The average daily consumption of calories was 3100 Kcal in 1979; by 1994 it had fallen to 1863 Kcal. In this period there was an epidemic of peripheral and ocular neuropathies and the proportion of children born underweight rose by 23% passing from 7.3% in 1989 to 9.0 in 1993¹⁶.

In 1991, 50% of pregnant women and one year old children were found to be anaemic¹⁸. The population's state of health had gone backwards by a decade and it was some years before they returned to the quality of life they had enjoyed previously. As has happened and been documented in other nations (e.g. Iraq, Haiti and Palestine)^{19,20}, economic sanctions have serious repercussions on the state of health of the populations affected, and especially on weaker, more disadvantaged sections²¹, but continue to be used notwithstanding this and the doubtful political efficacy of the "embargo strategy"²².

Mother and child health

After Canada, Cuba is the country with the lowest infant mortality rate in the Americas, and is among the lowest in the World (**Table 3**)²³. This is the result of a long strategy, begun immediately after the revolution, which has placed mother and child health firmly at the top of national health priorities.

In 1959, infant mortality stood at 60 deaths per 1,000, while the maternal mortality rate was 137.8 deaths per 100,000 deliveries²⁴: today, the figures are 5.8 and 39.5 respectively. The main contribution to this improvement in mother and child health has been made by the *Programa Nacional de Atencion Materno-Infantil* (PAMI) National Programme for Mother and Child Health), launched in 1970, which over a thirty year period, notwithstanding the serious economic crisis of the early 1990s and some natural disasters, has more than halved the negative rate of a series of public health indicators⁴.

However, maternal mortality is still high when compared with other countries which would suggest that obstetric care needs to be improved as does access to the technology for monitoring and treating high-risk-pregnancies (**Table 4**)²⁵.

Table 3. Changes in the infant mortality rate (per 1000 births), children aged <5, in the period 1960-2005.

<i>Year</i>	<i>Cuba</i>	<i>USA</i>	<i>China</i>	<i>Brazil</i>
1960	54	30	-	176
1970	43	26	118	136
1980	22	15	60	91
1990	13	12	45	57
2000	9	9	37	30
2005	7	7	25	21

Source: <http://childinfo.org>

Table 4. Indicators of health care for deliveries in the period (2000-2006).

Indicators	Cuba	USA	China	Brazil
Antenatal care coverage (%)	100	-	90	97
Skilled attendant at deliveries (%)	100	99	98	88
Institutional deliveries (%)	-	-	83	97
Maternal Mortality Rate (per 100,000 deliveries)	37	8	17	76

Source: The State of the World's Children 2008: Child Survival (<http://www.unicef.org>)

Cardiovascular diseases and tumours

Since 1970, cardiovascular diseases (especially hypertension and myocardial infarction) have been the main cause of death in Cuba²⁶.

A series of preventive interventions and organising health services throughout the country have managed over a thirty year period to halve the mortality rate for cardiovascular disease bringing it down to values that are very close to those in Western Europe and North America (**Figure 1**)^{4,27,28}.

Essential anti-hypertensive drugs and recombinant streptokinase are produced in Cuba and are made available to the entire population²⁹. More than 60% of pa-

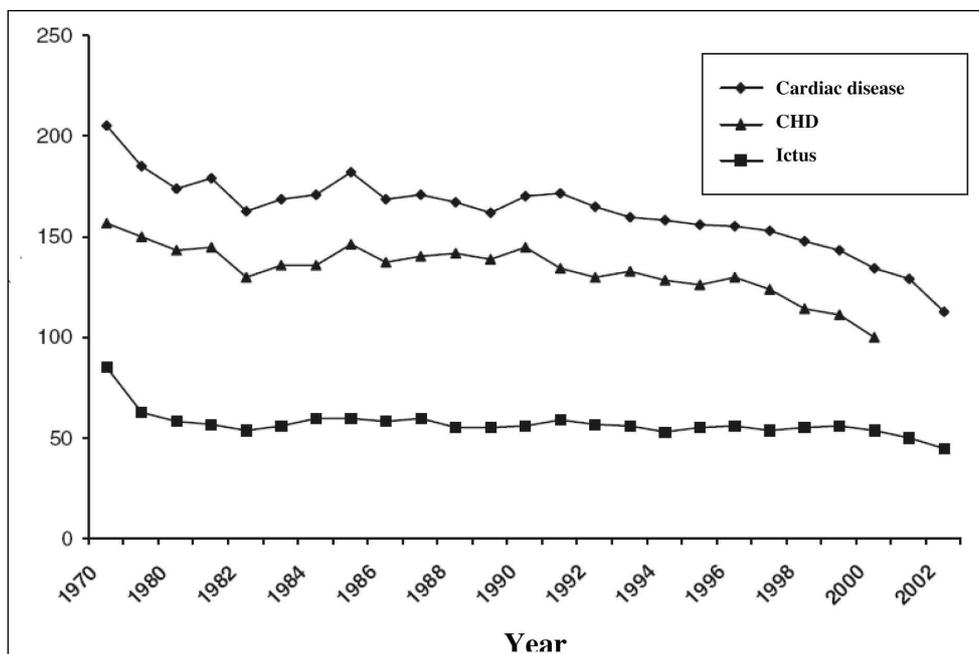


Figure 1. Changes in the mortality rate, adjusted for age, for cardiovascular diseases in Cuba in the period 1970-2002 (4).

tients with myocardial infarction receive antithrombotic treatment within 30 minutes of the acute event³⁰.

The results obtained in oncology are less positive. The mortality rate for tumours has risen from 115.9 per 100,000 in 1988 to 125.6 in 2003²⁴. The most commonly occurring tumours are pulmonary carcinoma and prostate cancer, followed by breast and colon-rectal cancers³¹. Anti smoking campaigns in this country, which produces tobacco and where smoking has long been part of the culture, have had little impact so far.

Infectious diseases

In 1962, "Vaccination Days" were first declared throughout the country, and have proved to be a very efficacious strategy for raising people's awareness and for reaching the target populations very quickly. The model was soon copied in many other countries. The WHO has officially recognised that, in Cuba, the last recorded case of measles was in 1995 and that since 2005, there have been no cases of Diphtheria, Polio, Tetanus, German Measles or Yellow Fever³².

The Cuban Government's investment in developing excellent immunological research with a bias towards Public Health has allowed it to develop a solid biotechnology industry, especially in the vaccine sectors³³. This is a an important, indeed, remarkable achievement, given the difficulties Cuba has had to face, because of the ongoing US embargo, when trying to obtain a supply of reagents.

Nowadays Cuban children, unlike any others in the World, are vaccinated against 13 infectious diseases, when even the WHO calendar provides for only 7. And today, Cuba also produces the only vaccine available which has proven effective against a strain of bacterial meningitis B and exports it to 30 other countries^{34,35}.

Interferon, monoclonal antibodies, immunoglobulins and cytokines are just some of the immunological products developed and distributed in Cuba. As regards HIV/AIDS, there is low prevalence of the disease on the island (<0.1% of the population aged 15-49), and as well as adopting conventional antiretroviral treatments, Cuban researchers have developed new drugs which are now in an advanced phase of testing³⁶.

Since the first epidemic in 1981, Cuba has been successful in combating Dengue, which is endemic in equatorial regions, and is currently developing a vaccine³⁷.

Oral health

There are 4 Schools of Dentistry in Cuba, about 9,800 dentists and 9300 dental technicians who work in the 464 Dental Clinics. A special model of intervention, based on dividing the Cuban population into 8 cohorts, guarantees Dental care and education for all³⁸.

Each year one cohort receives total, specific, dental treatment, while the 7 other

cohorts are guaranteed a check-up and ordinary primary dental care. The 8 cohorts are: pregnant women; mothers with children under 1 year; children aged 4 years; children aged 5-11; children 12-14 years; adolescents 15-18 years; the disabled; adults >60 years of age. Each cohort receives information on correct oral hygiene, orthodontic check-ups and any treatment necessary. This model has proved to be very effective in reducing orthodontic pathologies, especially in children (4.4% in 1984, 1.3% in 2002)³⁹.

Cuban international cooperation in health care

Cuba has two main lines of International cooperation: training foreign doctors in Cuba (doctors from countries with few resources) and, sending Cuban doctors to other countries where there is urgent need of health care.

The Latin American School of Medicine (ELAM) was opened in Havana in 1999⁴⁰ to provide free medical training to students from more than 30 countries. Around 22,000 foreign students receive study grants to study medicine in the 28 medical schools in Cuba.

The ELAM study programme begins with a one year course for “levelling”, which allows students to acquire the necessary mathematical and scientific knowledge, and learn Spanish well enough to begin their medical studies. At the end of their studies, which may last for 8 years, these students return to their own countries to work.

Cuban doctors are currently working in 52 countries, but especially in Africa, Asia and Latin America⁴¹. At the moment there are about 20,000 Cuban doctors working in Venezuela as part of a barter agreement, which exchanges doctors for petroleum and economic Aid. The Health programme (*Misión Barrio Adentro*) provides primary health care in both rural areas and in poor urban areas in Venezuela⁴². Notwithstanding the need for and efficacy of the work done by the Cuban doctors, there have recently been some protests from Venezuelan doctors against this externalisation of health care⁴³. In the meantime, even though it is still a minor problem, some Cuban doctors are not returning to Cuba at the end of their mission abroad but are emigrating to other countries^{44,45}.

The significance / meaning of the Cuban experience

Political and cultural prejudices have certainly conditioned analysis and evaluation of the organisational model and the results obtained by the Cuban Public Health System. Indeed the Cuban model, despite the fact that the improvement in health of the entire population has been recognised by various International Agencies, is still largely unknown by the international scientific world^{1,2}. The scepticism of the Northern countries regarding the Cuban model could, in part, be attributed to the contradiction between the restrictions on civil rights on the Island and the Government's clear successes in carrying out structural health and education pro-

grammes based on the principles of equality and participation^{46,47}.

The success of the multidimensional approach to Public Health that Cuba has been developing over the past 50 years cannot be denied. The efficacy of prevention initiatives, the development of a whole national sector of biotechnology, the production of diagnostic tools/aids and advanced preventive treatment regulations are just some of goals Cuba has realised at a level achieved by few other countries or, more accurately by no other countries, if one considers the economic conditions created by the US embargo and the speed with which all the projects have been carried out. The Cuban model illustrates precisely those principles promulgated by the WHO in 1978, at Alma Ata, for setting up Public Health systems based on Primary Care. Some countries have, in part, realised these principles, (e.g. Italy and the UK), Cuba however has been a pioneer.

The Cuban model is today being studied favourably and with attention by many countries with few resources (and has even already been exported to some): careful evaluation of the model and bi-lateral opening of the whole scientific community would certainly contribute to achieving that "health for all" which still has not arrived.

References

- ¹ H. Waitzkin, C. Iriart, A. Estrada, S. Lamadrid, *Social medicine in Latin America: productivity and dangers facing the major national groups*, «Lancet» 2001, 358, pp. 315-323.
- ² J. Westberg, *An Interview of Cosme Ordóñez Carceller*, «Education for Health» 2006, 19, pp. 390-397.
- ³ F. Mullan, *Affirmative Action, Cuban Style*, «N Engl J Med» 2008, 351, pp. 2680-2682.
- ⁴ R.S. Cooper, J.F. Kennelly, P. Orduñez-García, *Health in Cuba*, «Int J Epidemiol» 2006, 35, pp. 817-824.
- ⁵ M. Franco, J.F. Kennelly, R.S. Cooper, P. Orduñez-García, *La salud en Cuba y los objetivos de desarrollo del milenio*, «Rev Panam Salud Publica» 2007, 21, pp. 239-250.
- ⁶ E.L. Baker, *Cuba Study Group. The Cuban Health Care System and its achievements. Cuba's health system: an alternative approach to health delivery*, University of Texas Health Science Center at Houston, Houston (TX) 1975.
- ⁷ J.M. Feinsilver, *Healing the Masses. Cuban Health Policies at Home and Abroad*, University of California Press, Berkeley (CA) 1993.
- ⁸ E. De la Torre Montejo, C.M. López Pardo, M. Márquez, J.A. Gutiérrez Muñiz, O.F. Rojas, *Salud para todos si es posible*, Mercie Group-ENPSES, CUJAE, Ciudad de La Habana 2005.
- ⁹ MINSAP (Ministerio de Salud Pública), *Anuario Estadístico 2006*, La Habana, Cuba.
- ¹⁰ PAHO, *Cuba*, In Health in the Americas Panamerican Health Organization (PAHO), Washington 2007, pp. 262-279.
- ¹¹ S.E. Birch, L. Norlander, *The Cuban paradox*, «AJN» 2007, 107, pp. 75-79.
- ¹² MINSAP (Ministerio de Salud Pública), *Estadísticas de salud de Cuba*, 2008 http://www.dne.sld.cu/minsap/undades_según_subordinación.htm.
- ¹³ INFOMED, Website, Available from: <http://www.sld.cu> (Accessed February 10, 2009).
- ¹⁴ A.C. Séror, *A case analysis of INFOMED: the Cuban national telecommunications network and portal*, «J Med Internet Res» 2006; 8, e1.
- ¹⁵ A.C. Séror, *Unique lessons from the Cuban National Health Care Network and Portal - INFOMED*, «Health Information and Libraries Journal» 2007, 24, pp. 216-221.
- ¹⁶ R. Garfield, S. Santana, *The impact of the economic crisis and the US embargo on health in Cuba*, «Am J Public Health» 1997, 87, pp. 15-20.
- ¹⁷ M. Barry, *Effect of the U.S. embargo and economic decline of health in Cuba*, «Ann Intern Med» 2000, 132, pp. 151-154.

- ¹⁸ R. Ubell, *High-tech medicine in the Caribbean. 25 years of Cuban health care*, «N Engl J Med» 1983, 309, pp. 1468-1472.
- ¹⁹ M. Bonati, *Le sanzioni sulla salute*, in L. Bimbi (a cura di), *Not in my name. Guerra e Diritto*, Editori Riuniti, Roma 2003, pp. 27-35.
- ²⁰ M.K. Albright, *Economic sanctions and public health: a view from the department of State*, «Ann Intern Med» 2000, 132, pp. 155-157.
- ²¹ K. Morin, S.H. Miles for the Ethics and Human Rights Committee, *The health effects of economic sanctions and embargoes: the role of health professionals*, «Ann Intern Med» 2000, 132, pp. 158-161.
- ²² S.P. Marks, *Economic sanctions as human rights violations: reconciling political and public health imperatives*, «Am J Public Health» 1999, 89, pp. 1509-1513.
- ²³ F. Varona Rodriguez, N. Bonet Lopez, I. Choonara, *Child health in Cuba*, «Arch Dis Child» 2008, 93, pp. 991-993.
- ²⁴ Ministry of Public Health, *Annual Statistical Report on Health*, Havana, Cuba (Ministerio de Salud Publica. Anuario Estadístico de Salud. Republica de Cuba, La Habana, Cuba). Available at: <http://www.infomed.sld.cu/servicios/estadisticas/> (Accessed February 10, 2009).
- ²⁵ E. Cabezas Cruz, *Evolución de la mortalidad materna en Cuba*, «Rev Cubana Salud Pública» 2006, 32, pp. 1-9.
- ²⁶ R.M. Torres Vidal, M.A. Gran Alvarez, *Panorama de la salud del adulto mayor en Cuba*, «Rev Cubana Salud Pública» 2005, 31, pp. 109-118.
- ²⁷ R.S. Cooper, P. Ordunez, M.D.I. Ferrer, J.L.B. Munoz, A. Espinosa-Brito, *Cardiovascular disease and associated risk factors in Cuba: prospects for prevention and control*, «Am J Public Health» 2006, 96, pp. 94-101.
- ²⁸ P. Ordunez, J.L.B. Munoz, A. Espinosa-Brito, L.C. Silva, R.S. Cooper, *Ethnicity, education and blood pressure in Cuba*, «Am J Epidemiol» 2005, 162, pp. 49-56.
- ²⁹ E. Diogene, P.J. Perez, A. Figueras, J.A. Furones, F. Debesa, J.R. Laporte, *National Pharmacoepidemiology Network. The Cuban experience in focusing pharmaceuticals policy to health population needs: initial results of the National Pharmacoepidemiology Network (1996-2001)*, «Pharmacoepidemiol Drug Saf» 2003, 12, pp. 405-407.
- ³⁰ P. Ordúñez-García, M. Iraola-Ferrer, Y. La Rosa-Linares, *Reducing mortality in myocardial infarction. Experience in Cuba shows optimizing thrombolysis may reduce death rates in poor countries*, «BMJ» 2005, 330, pp. 1271-1272.
- ³¹ C. Bosetti, M. Malvezzi, L. Chatenoud, E. Negri, F. Levi, C. La Vecchia, *Trends in cancer mortality in the Americas, 1970-2000*, «Ann Oncol» 2005, 16, pp. 489-511.
- ³² C. Sansom, *Tackling infectious disease in Cuba*, <http://infection.thelancet.com> 2007; 7: 376 (accessed February 10, 2009).
- ³³ A. Lage, *Connecting immunology research to public health: Cuban biotechnology*, «Nat Immunol» 2008, 9, pp. 109-112.
- ³⁴ G.V.G. Sierra, H.C. Campa, N.M. Varcacel et al., *Vaccine against group B neisseria meningitidis: protection trial and mass vaccination results in Cuba*, «NIPH Ann» 1991, 14, pp. 195-210.
- ³⁵ C.J. de Morales, B.A. Perkins, M.C. Camargo et al., *Protective efficacy of a serogroup B meningococcal vaccine in Sao Paulo, Brazil*, «Lancet» 1992, 340, pp. 1074-1078.
- ³⁶ C. Sansom, *Tackling infectious disease in Cuba*, «Lancet» 2007, 7, p. 376.
- ³⁷ M.G. Guzmán, *Deciphering Dengue: The Cuban Experience*, «Science» 2005, 309, pp. 1495-1497.
- ³⁸ Pan America Health Organization, *Health in the Americas*, Vol. 1, Washington DC 2002.
- ³⁹ A.I. Hazlewood, *Oral Health in Cuba*, «NYSJDJ» 2007, pp. 48-50.
- ⁴⁰ Latin American Medical School - ELAM, <http://www.medicc.org/ns/index.php?s=10&p=0> (accessed February 10, 2009).
- ⁴¹ P. De Vos, P. Van der Stuyft, *Cuba's international cooperative efforts in health*, «BMJ» 2006, 333, p. 603.
- ⁴² S. Carrello de Albornoz, *On a mission: how Cuba uses its doctors abroad*, «BMJ» 2006, 333, p. 464.
- ⁴³ T. Villanueva, S. Carrello de Albornoz, *Venezuelan doctors resent their government's importation of Cuban doctors*, «BMJ» 2008, 336, pp. 578-579.
- ⁴⁴ M. Ceaser, *Cuban doctors working abroad defect to the USA*, «Lancet» 2007, 369, pp. 1247-1248.
- ⁴⁵ P. Van der Stuyft, P. De Vos, *The USA and "Cuban doctors working abroad"*, «Lancet» 2007, 369, p. 2160.
- ⁴⁶ A. Aitsiselm, *An analysis of the Cuban Health system*, «Public Health» 2004, 118, pp. 599-601.
- ⁴⁷ F. Mullan, *The metrics of the physician brain drain*, «N Engl J Med» 2005, 353, pp. 1810-1818.