



**Cuba Transition
Project**

A stylized graphic of the Cuban flag, showing the green, white, and blue stripes and a red star, is partially visible on the left side of the dark green title bar.

**THE FUTURE OF HEALTH CARE
IN A POST-CASTRO CUBA**

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Cuba Transition Project – CTP

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Executive Summary

The health care system in Cuba has long been a focus of the Castro regime. A system that has gone through several significant metamorphoses over the decades, a result of both external and internal factors, it has, nonetheless, been touted as one of the few successes of Castro's 46-year reign.

One future change affecting the system is inevitable and critical: the passage of power out of Fidel Castro's hands. With health care a mainstay of the Castro revolution, it will be critical for the future of Cuba to evaluate how this significant social institution will be affected. A thorough evaluation of Cuba's health care will also provide useful data for policy-makers. In order to understand the future of health care in Cuba and how it may be affected by change, one must examine past trends as well as potential political scenarios that may arise. A number of expected situations and policy implications will arise in a post-Castro Cuba, based on an understanding of historical trends and expected future scenarios. Following are some recommendations for a Cuba in transition:

- For a smooth transition to occur, regardless of the political scenario, it will be imperative for any future leadership to ensure basic health care services for all citizens.
- It will be important to maintain medical services in rural and mountainous areas of the country. As these were the breeding grounds of the Castro revolution, in part due to the lack of adequate health care, to prevent future insurgencies, the current level of services should be made available.
- Cuba has a history of significant exodus of highly trained medical personnel during periods of transition. This again will be a factor, given the very low levels of compensation for physicians, nurses, and allied health professionals and the opportunities that exist in the United States and other countries.
- To forestall a mass exodus and to maintain or improve quality health services in Cuba, one possible scenario is to allow and foster a two-tiered public/private system of health care. As opportunities for certain market forces arise, the desire for health care services beyond a basic system for all may develop. Such a

system would allow medical personnel to work in the public sector and supplement their income through the provision of services in the private sector. The infrastructure underlying a two-tiered methodology already exists in Cuba through the *Hospitales Turísticos* used by tourists and government officials. Further, historically, a two-tiered methodology existed in Cuba before Castro came to power. Such a system, however, can only develop if the basic public health care program is maintained and retains its comprehensiveness.

- Financing would be potentially forthcoming from industry-based or labor union-based managed care organizations. This may be supplemented through the modest development of private health insurance. Not-for-profit provision may be a necessary element of such financing and provision.
- Infrastructure, both basic health care facilities, specifically, as well as housing, water, sewage, and food supplies that impact the health of the population, require considerable upgrading. A potential and important role for nongovernmental organizations (NGOs) exists.
- Vaccination programs and safety of the blood supply will have to be monitored and maintained during transition. Again, there may be opportunities for involvement by NGOs in assuring a smooth transition.
- Countries going through political transition are especially vulnerable to disruption of food and medical supplies. Transition in Eastern Europe following the breakup of the Soviet Union bore this out, and breakdowns in food and medical supplies, illness and epidemics, especially intestinal and respiratory ailments, were serious problems. This may become an issue in a future transition.
- Especially vulnerable populations, such as elderly males, who have been largely ignored by the Castro regime due to limited resources, will have to be monitored and rehabilitated as a result of poor nutrition and limited provision of medical care services during the past decade.
- Cuba has one of the fastest growing aging populations in the Western world. This rate of growth, compounded by a current

mandatory retirement age of 55 years for females and 60 years for males, is expected to place tremendous stress on the socio-economic, infrastructure in Cuba, including health care, in the very near future. A period of transition, especially a tumultuous one, may cause difficulty in sustaining needed services for this population group, resulting in serious consequences.

- Whereas Cuba has one of the lowest reported rates of AIDS in the Western Hemisphere, there is concern that the rise in tourism, especially the increased amount of sex tourism, coupled with the inadequate supply of prophylactics, is leading to growth in the incidence of sexually transmitted diseases (STDs) and AIDS. If a post-Castro era results in an increase in tourism, without appropriate precautions against the spread of STDs, the ramifications for the country, especially for the young population, could be significant.
- Abortion has been a form of birth control, a means to decrease the reported infant mortality rate through the elimination of compromised fetuses, as well as a method for gender specification to increase the birth rates of males. Policy changes impacting women's health in this environment will have to be closely monitored. There is a potential role for religious-based and other NGOs in such a transitional environment.
- One of the few areas of potential opportunity for foreign investment opportunities in Cuba are the fields of pharmaceutical supplies and biomedical engineering, where substantial progress has been made and where well-trained, low-paid personnel exist, but where market limitations exist as well. Fostering this system through partnerships and enhanced compensation of personnel will enable entry into new markets and limit out-migration of scientific brainpower from the country.
- Specific outcomes in medical services and health care will be largely a function of the actual political and social structure that evolves after Fidel Castro's reign has ended.

The Future of Health Care in a Post-Castro Cuba

Health care provision in Cuba has a long history and has been the focus of much international attention, as the system has had to adjust to significant changes over the years. Considered, at times, to be a showcase of the Cuban Revolution, the system nonetheless has gone through a number of revolutions and evolutions itself in the past 50 years. The purpose of this paper is to explore health care in Cuba subsequent to one more inevitable evolutionary or revolutionary change: the health care sector in a post-Castro Cuba environment. In order to gain insight into the future of health care in a post-Castro Cuba, as well as significant implications for policymaking, it is critical first to understand Cuba's history of medical services and health care provision. This is especially important in Cuba, where politics, demographics, and social policy have been intertwined with the provision of health care.

One can separate the modern history of medical care in Cuba into five distinct periods: the pre-revolution era prior to 1959; the post-Castro revolution period, 1960–1982; the stable period from 1983–1989; the “Special Period,” 1990–1994, reflecting the fall of the Soviet Union and the imposition of tighter restrictions on the existing embargo by the United States on Cuba; and the current situation, 1995 to present. Each period reflects both advances and declines in the provision of medical care and in health outcomes, such as infant mortality rates and public health statistics. By examining health care data from the recent past, we can relate this information to aspects of stability and change in a post-Castro Cuba and attempt to offer significant policy recommendations.

The Period Prior to 1959

Prior to Castro's coming to power, Cuba's medical care system was a mixture of public and private provision of care, reflecting a trend that was common in much of the Western Hemisphere. In 1959, approximately 6,600 physicians were practicing medicine in Cuba, and physicians' services were concentrated in the urban areas. Very few doctors provided medical services to people in rural areas (de Gordon 2003). While the overall physician-to-population ratio in Cuba was 92 per 100,000, the ratio in Havana was 238 per 100,000, compared with 40 per 100,000 in

the province of Oriente (de Gordon 2003). Physicians, who were trained in Cuba's one medical school, worked for the state or a province and, beyond that, had the option of providing services privately. A two-tier system arose, along with a strong perception among the populace that quality care was only available in the urban areas and only to those persons with significant financial resources.

Just as physicians were concentrated in the larger cities, so, too, were hospitals. In the province of Havana, there were 12 beds per 1,000 people, while in Pinar del Rio, there was less than one bed per 1,000 (de Gordon 2003). In 1958, only 1,000 trained nurses worked in the country (Thrupkaew 2001). Just as physicians' education was concentrated in one medical school, nursing education and training occurred in one school. Only approximately 80 new nurses per year graduated from this school (MacDonald 1999, 112).

In pre-Castro Cuba, a form of social security dating back to 1902, with coverage that included workmen's compensation and maternity care, financed health care. A form of prepaid medical coverage was also available in the Mutualist Health Associations (Diaz-Briquets 1983). Essentially, this was an early form of prepaid managed care. By prepaying 2 to 5 pesos per month, a member would receive medical services through his or her not-for-profit providers. Community Boards provided governance. The government contributed a partial subsidy for those who could not afford the fee (Diaz-Briquets 1983). Nearly one-half the population belonged to one of these Mutualist Health Associations at their peak (Diaz-Briquets 1983). Members of the military and their families were covered by a separate health care plan. Overall, a significant proportion of the population was covered by some form of health care plan (Diaz-Briquets 1983). As a tangential note, it is not surprising that, as Castro came to power and many Cubans fled to Miami, health care plans reflecting the structure of the Mutualist Health Association plans, providing prepaid managed care, became a prominent growth industry in Miami and provided a model for mainstream managed care growth in the United States during the 1980s and 1990s.

While a significant proportion of the Cuban population had access to some form of health care, the underlying philosophy was that health care was not a primary government responsibility. In Cuba at that time, no coordinated system to fight disease and protect the public's health existed

(OAS 1983), and information to guide decision making was lacking (MacDonald 1999). Ultimately, the budget of 22 million pesos, 3.30 per person, to provide mental and physical health care in 1958 proved to be inadequate (OAS 1983). This was further complicated by an indication of significant corruption in the provision of care. Individuals who were politically connected or financially well off were those who received preferential treatment in the health care system (Diaz-Briquets 1983; MacDonald 1999).

Additional factors that negatively affected the health of the population were an illiteracy rate of approximately 23.6 percent of the population 15 years or older (Cuba 1955); a sewer system in Havana, built between 1908 and 1913, to serve 600,000 people (OAS 1983); and, in 1953, water systems that used often polluted water from wells and rivers that served approximately 75 percent of all rural families (OAS 1983). These factors caused significant public health risks, which were partially mitigated by the increased availability of antibiotics and insecticides (Diaz-Briquets 1983).

Health outcome indicators in Cuba prior to 1959 were relatively poor in rural areas. There was a high incidence of infections and parasitic diseases, including gastroenteritis and tuberculosis (OAS 1983). One public health survey in the late 1940s indicated that 86.5 percent of the rural population had intestinal parasites (Diaz-Briquets 1983).

1960–1982: Revolution and Transition

As Castro and his followers took power in Cuba, one of the initial medical care crises that occurred was the unprecedented exodus of physicians from Cuba. It is estimated that one half of the physicians in Cuba at that time, 3,000 of the 6,000, left Cuba for the United States (Claudio 1999). A significant proportion of the professors from the one medical school also left the country. Further, three-quarters of the approximately 1,000 nurses left Cuba (OAS 1983).

The loss of such a significant portion of health care professionals had a devastating effect on the provision of medical care services in Cuba. In post-revolutionary Cuba, establishing a health care infrastructure and providing sufficient medical personnel and medical services to meet the needs of the population became a high priority—not only to ensure the

public's health, but also to sustain the governmental and social structure changes.

In order to accomplish this, programs were set up to train a new cohort of physicians rapidly. These newly trained physicians were required to adopt the communist philosophy, which rejected private medical care (de Gordon 2003). The goal, as stated in the new government's Constitution of Cuba, was to guarantee every individual's "right" to health care regardless of race or ethnicity, through the public provision of comprehensive, free care in all regions of the country and public health campaigns to reduce the threat of disease (OAS 1983). By 1964, the number of physicians had been restored to 6,000, and from that point on, training levels increased significantly. Training initially took place in hospitals, and then medical schools gradually opened throughout the country—four were established by 1975 (MacDonald 1999), and by 1995, a total of 23 medical schools served Cuba (Veeken 1995).

The Ministry of Public Health (MINSAP) took over the role of consolidation of various health care facilities, personnel, and organizations to set up a comprehensive system that would meet the needs of both urban and rural populations. Utilizing a command-type system of resource allocation, MINSAP moved away from a market system toward a central planning approach to determine the five elements of resource allocation: which medical services to provide, how much of each service to make available, the method of production for each service, the means of distribution of services to the population, and methods to increase health care services over time.

Consolidation of health care facilities resulted in the development of the Municipal Polyclinics. This method of providing medical care to the general population came about in 1963, with a focus on health care in the work environment, schools, and child care centers. Municipal polyclinics emphasized curative rather than preventive ambulatory care and served as the bases of the health care system. The concept was to spread medical care service more equally throughout the country (de Gordon 2003; Diaz Novas 1989). Polyclinics began to evolve during the 1960s and 1970s to deal with some of the shortcomings of the centrally controlled health care system. A growing emphasis was placed on primary care through the establishment of teaching polyclinics in 1974. Certain specialty services became available in the polyclinics, such as pediatric services, internal

medicine, and gynecology (MacDonald 1999). The quality of services in the polyclinics was relatively poor, as emphasis was placed on the treatment of symptoms rather than the underlying causes of diseases. Further, patient utilization was extremely high, relative to the availability of physician services, resulting in overburdened physicians, queuing for services, and low quality and quantity of capital, that is, equipment and supplies, in the polyclinics (Diaz Novas 1989). Indeed, given that physician training took place in the hospitals in a capital-intensive environment, physicians were not professionally trained to deal with the primary care (polyclinic) setting, where physical resources were often deficient (Diaz Novas 1989). Due to the low quality of polyclinic services, relationships between physicians and people in the community were, generally, poor. A significant disconnect also occurred between physicians in the hospitals and those in the polyclinics.

Ultimately, patients chose to wait until their symptoms and diseases worsened to the point that they required hospital care. They would go to hospital emergency rooms, avoid the time-consuming queuing inherent in the polyclinic system, and receive better care (Diaz Novas 1989). This is typical human behavior when the quality and quantity of medical care services are limited and rationed through queuing. Hospital accessibility for those who required a great level of care was easier, as the number of hospital beds per 1,000 in Cuba was among the highest in Latin America, with 5.5 beds per 1,000 population in 1964, though the number dropped to 4.2 by 1974 (de Gordon 2003).

Nursing became another area of concern. As 75 percent of the country's nurses left the country after the revolution (OAS 1983), to remedy the situation, the government established emergency training programs (Warman 2001). These programs served a dual role, first to reestablish a population of nurse professionals for the health care system and, second, to provide job opportunities for a hungry population (Warman 2001). Because most nurses had left Cuba, student nurses essentially had to teach themselves and other students. Nurses who would complete their exams in less than one year became the major teachers. Nurse-teacher brigades were formed, wherein nursing students with more training worked alongside those who lacked training (MacDonald 1999).

In order to deal with significant lack of sufficient staff in the rural polyclinics and the hospitals, nurses with only six months of emergency

training were assigned to oversee these facilities. During the emergency training, students spent a half-day on course work and a half-day in a ward with a mentor nurse (MacDonald 1999). For staff nurses, a designation was formed, “emergency nursing trainees.” These individuals took an examination after completing a three-month course; those scoring an A+ were entitled to enroll in a three-year general nurses’ training course without having completed a secondary school education (MacDonald 1999). The Red Cross also intervened and supplied staff nurses to provide training for nurses working in blood banks immediately after the revolution. In 1968, options were provided for individuals who did not receive appropriate scores on their exams. These individuals could become licentiates, or “community health workers,” working in the schools, immunization clinics, or day care centers (MacDonald 1999). By 1971, additional adjustments were undertaken in training and certification processes, so that one could attend a two-year program in a nursing school to become a licentiate. The pool of nurses grew significantly. By 1980, 14,000 registered nurses, who had received additional coursework, were working in Cuba along with an additional 13,000 “state enrolled nurses,” those with two years of training beyond the ninth grade who were employed mainly in nursing homes (MacDonald 1999, 142).

A reflection of the country’s stabilization was growth in nursing professionalism. In 1981, education for registered nurses was a four-year university program (MacDonald 1999). Nursing became an integral part of health care reform, so that the team of family doctor and nurse focused on primary care, home care, and prevention. Family practices were integrated into the community: the office and examining rooms were on the first floor of a building, the physician’s apartment on the second floor, and the nurse’s apartment on the third floor. While the family doctor’s practice was officially limited to daytime hours, it was often a 24-hour job (Thrupkaew 2001; Sturm 2002; Oxfam 1997; Reed 1999).

Técnicos (nurse technicians) receive two years of training subsequent to their completion of secondary education, and professional nurses (registered nurses) earn a four-year university degree (Warman, 2001). Professional nurses undertake additional responsibilities in the health care setting and receive additional compensation. This two-tiered system of nurse education and qualifications continues today (Warman 2001).

The net impact of these adjustments in the delivery of health care

appeared to have significant impacts on the overall health indicators in the country. Whereas reliability of infant mortality rate information has been questioned for the period prior to 1965 (OAS 1983), reported infant mortality dropped from 37.3 per 1,000 live births in 1960 (National Center for Health Statistics Publications 2002, 114) to 34 per 1,000 births in 1970 (UNDP 2002) and 19.6 per 1,000 births in 1980 (National Center for Health Statistics Publications 2002, 114). Further, although infants accounted for 19 percent of all deaths in the early 1960s, this proportion fell to 6 percent by 1978 (OAS 1983). A number of factors played a role in this decline. Between 1966 and 1974, the percent of women giving birth in hospitals grew from 77.1 percent to 98 percent (Diaz-Briquets 1983, 110). There are also indications that abortion was and continues to be used liberally as a means of birth control, and pressure is placed on physicians by the government to use such procedures to prevent problem births (Humanitarian Aid 2004). This issue will be addressed later in the paper.

1983–1989: A Period of Systems Maturation and Adjustment

The Cuban health care system underwent a major transformation in the early 1980s. After utilizing a strong, centrally controlled system that emphasized top-down administration of the system, Cuba evolved into a combination bottom-up and top-down system of provision of care with significant local control of primary medical services. The point of entry into the health care system became the family doctor.

These reforms were a function of the Public Health Law of 1983, which specified “general activities to be carried out by the state to protect the health of Cuban citizens” (PAHO 1998). The law established three levels of provision of care: the national level, the provincial level, and the municipal level (Macintyre and Hadad 2002).

The national level’s main responsibility was collection of information, as well as coordination of medical, pharmaceutical, and biotechnological research. Institutes to oversee these various national functions were established, all under the auspices of the Ministry of Public Health (Macintyre and Hadad 2002).

At the provincial level, under the auspices of the newly created Provincial Administrative Council, responsibilities included oversight of

hospitals, the establishment of systems to monitor epidemiological trends, the management of blood banks, and the training of nurses to work in provincial blood banks. All training was standardized and, as indicated earlier, was meant to follow the communist political philosophy closely (MacDonald 1999). New physicians had to pledge allegiance to Fidel Castro to oppose private practice, defend the communist revolution with their lives, and incorporate the “proletariat philosophy of medical science: for the good of mankind” (Gordon 1983, 1026). In practice, though, Cuba’s health care system may well be more socialist than communist, as it is not as similar to the system that was in place in the former Soviet Union as to those of countries with socialized medicine.

At the municipal level, oversight was established through a local council, whose responsibilities were to insure that that the community’s needs were assessed and that care was established to meet those needs (Macintyre and Hadad 2002). Community hospitals, called polyclinics, were designed to meet the needs of the local population (Macintyre and Hadad 2002). Included under the jurisdiction of the local councils were specialist hospitals in rural areas, maternity homes, elderly centers, dental care centers, and mental health centers (Macintyre and Hadad 2002). Local involvement was developed through action groups that, in turn, elected local leaders to municipal and national groups. The purpose of these groups was strategic planning with the Ministry of Health and the polyclinics to meet the health needs of the local populations (Iatridis 1990). Wellness became a focus of each community and its health care workers. Health care workers were organized as teams to meet their goals, mutually agreed upon with the local citizens’ action group (Reed 1999; Iatridis 1990). Campaigns associated with immunizations, blood drives, and environmental cleanup became some of the activities adopted by the local communities (Diaz Novas 1989). This system is in line with many of the principles and tenets of modern continuous quality improvement systems, incorporating top-down and bottom-up management concepts. In such systems, those in management and leadership positions team up with and obtain buy-in from those providing direct patient care services. Systems are in place for open communication between service providers and directors of services, and methodologies are established to assure that improvements in processes are implemented to achieve desired outcomes on a continuous basis. In so doing, patient-focused as

well as population-focused care is achieved. Given the methods introduced, either accidentally or consciously by the Cuban government, the Cuban health care system, as constructed, was essentially ahead of its time, as numerous national health care systems currently are attempting to establish such organizational traits.

The government also initiated several public health strategies to reduce the transmission of communicable diseases. There were vaccination campaigns to eradicate polio (1963), malaria (1968), diphtheria (1970), and tetanus (1976) (OAS 1983). Death rates from whooping cough, tuberculosis (OAS 1983), and poliomyelitis (PAHO 1998) dropped significantly. Eventually, the Cuban health care system was successful at eradicating seven significant diseases (Uriarte 2002; PAHO 1998). As infant mortality rates, childhood deaths, and communicable diseases were brought under control, the main causes of death shifted from infectious diseases to noncommunicable chronic diseases, such as heart disease, cancer, and strokes (Diaz Novas 1989; Macintyre and Hadad 2002; PAHO 2002, 199).

In the mid-1980s, one major communicable disease was about to enter Cuban society and would bring about one of the more controversial methods of care: HIV/AIDS. The first case in Cuba was discovered in 1985 (Barry 2000), and the government almost immediately began to screen high-risk groups, namely, prisoners, people in the tourist industry, pregnant women, individuals in the maritime industry, and anyone who had traveled outside Cuba after 1976 (Barry 2000). Those who tested positive were quarantined in facilities where all medical needs were met, residential housing was provided, and sports and recreation facilities were available (Macintyre and Hadad 2002). Quarantining was permanent. With this approach, Cuba was able to get a handle on a potential epidemic that other countries, to this day, are still struggling with. However, as quarantining was essentially perceived to be a prison system, after intense pressure from the international community, mandatory quarantining was adjusted to allow for voluntary stays. After an eight-week stay involving counseling, training and education, and a small stipend, individuals now have the option to choose to remain in the facilities permanently or to leave. A majority of those afflicted with AIDS exercise the option to remain in these facilities (Macintyre and Hadad 2002). In these facilities, their diets are designed to strengthen the body's resistance to infection

(Barry 2000). Further, patients receive AZT and interferon, some of which is imported and some produced locally (Bradley and Kim 1994). A health area that took on cutting edge status during this period of Cuba's maturation was biotechnology, especially relative to the country's size and political situation. In 1985, a Cuban doctor performed the first heart transplant to be undertaken in the country, and in 1989, Cuban doctors successfully developed two models of a mechanical heart (MacDonald 1999). The Genetic Engineering and Biotech Center (GIBC) was established in 1986 by the Cuban government to focus on the cloning and mapping of DNA (MacDonald 1999). The biotechnology industry in later years would become an important source of revenue, which will be discussed later in the paper.

1990–1994: The Darkest Days of the “Special Period” in Cuba

Several major developments began to challenge the underlying ability of the Cuban government and its society to provide for the health care needs of its population: the devastating effects of the fall of the Union of Soviet Socialist Republics (USSR) in 1991 and the tightening of the U.S. embargo in 1992.

The importance of the USSR to the economic and social health of Cuba cannot be overstated. From 1961 until 1991, the Soviet Union provided billions of dollars of subsidies annually to Cuba and accounted for 60 percent to 90 percent of all of Cuba's trade (Sturm 2002). Consequently, Cuba became economically isolated as exports dropped approximately 70 percent and gross domestic product (GDP) fell 35 percent after trade with the Council for Mutual Economic Assistance (COMECON) was lost (Garfield and Santana 1997, 15; PAHO 1998, 206). (COMECON was established to promote trade and economic development in Eastern Bloc countries.) Cuba also began to experience the full impact of its communist economic policies, which had been cushioned in the past by the financial support of the Soviet Union. The immediate outcome was the tremendous loss of hard currency that Cuba needed to purchase supplies and raw materials (Barry 2000). The impact, however, was also felt in terms of the government's ability to provide public health, with spending of hard currency on public health dropping 70 percent during this period (“What Ails” 1998). While these reductions were

extremely significant, it should be noted that health care was actually cut less than other goods and services in the country during this time, from 1990 through 1994, which the Cuban government called the “Special Period,” as food and oil were even more tightly rationed (Sturm 2002).

In an attempt by the United States to speed the collapse of Castro’s regime, already under growing economic distress following the fall of communism elsewhere in the world, Congress passed the Cuban Democracy Act in 1992. This law actually reinstated a ban that had been weakened in 1975. The law increased restrictions on trade between Cuba and foreign subsidiaries of U.S. corporations (Marquis 1992; Barry 2000). Additional prohibitions were placed on trade in 1996, when the Helms-Burton Act (also called the Cuban Liberty and Democratic Solidarity Act) was passed, limiting the ability of non-U.S. companies to undertake trade with Cuba (Barry 2000) and discouraging investment by other countries into Cuba (PAHO 1998). There is much debate over the extent of the impact of the U.S. embargo on the health of the Cuban population. Although some scholars have argued that the embargo curtailed the availability of needed medications and health care supplies, others insist that the weaknesses and shortages of the health care system were manifestations of poor planning and policies instituted by Castro (Barry 2000; Mesa-Lago 2002). Regardless of the causes, policymakers today must pay close attention to the limitations and areas of vulnerability in the Cuban health care system, as many of these weaknesses will present great challenges in future periods of transition.

During the Special Period, resources were scarce and had to be allocated carefully. The government focused on primary health care and provision of quality maternity care and called upon its readily available supply of well-trained medical personnel. Further, as a tactic toward attaining the strategic goal of increasing its political capital internationally, the Cuban government continued to send its doctors and to provide medical assistance to other countries. In 1994, 5.5 percent of the Cuban GDP was being spent on health care (PAHO 2002, 210). With health care spending in 1994 at 1,061.1 million pesos, health care made up over 7 percent of all spending, and 14 percent of public sector spending (PAHO 1998, 218). Sixty percent of all this spending was on personnel, with notable increases in primary care and reductions in spending on hospital care during the Special Period (PAHO 1998, 219).

Whereas the Cuban government and society attempted to provide services while resources were declining, a number of negative health impacts took place relatively quickly. These impacts are important to note, as during future transitions in Cuba, particularly those that occur tumultuously, they may reappear as human issues of great concern. Total mortality rates increased from 6.4 per 1,000 to 7.2 per 1,000 in 1994 (Garfield 2004). Infant mortality rates were especially noteworthy, as they initially spiked to 10.7 per 1,000 in 1990 (National Center for Health Statistics Publications 2002, 114), a direct result of an increase in low birth weight infants (Oxfam 1997). Between 1989 and 1993, the percentage of babies born at under 2,500 grams increased by 23 percent, and the percent of women underweight during pregnancy increased from 7.9 percent to 9.3 percent (Garfield and Santana 1997, 16). More than half of the pregnant women in 1991 were anemic, even though the government actively tried to provide nutritional supplements to all of them (Garfield and Santana 1997, 16).

Elsewhere in the population, due to a curtailment of food supplies, malnutrition became problematic and triggered an epidemic of neuropathy, which affected overall physical strength and caused blindness. The government attempted to affect this by dispensing vitamin supplements on a large scale (Claudio 1999). Cuba had been importing approximately half of the calorie and protein intake of its population prior to the collapse of the Soviet Union (Garfield 2004). Between 1989 and 1993, the caloric intake decreased on average by one-third, and protein and calorie imports decreased by 50 percent (MacDonald 1999; Garfield and Santana 1997, 16). This affected mostly adult males, whose caloric intake was reduced from an average of 3,100 calories per day in 1989 to 1,863 in 1994 (Garfield and Santana 1997, 16). Indeed, while the government made a conscious attempt to maintain the nutrition and health of women and children and sustain the relatively low infant mortality rate, scarce resource allocation resulted in the fact that it was primarily males and the elderly who were most impacted by the cutbacks in infrastructure, food supply, and the health care system (Garfield 2004). The Cuban government worked with local grassroots organizations to prioritize the allocation of resources. Focus on the most vulnerable populations came out of these discussions (Uriarte 2002). Significant cutbacks in food imports and the negative effects on the population resulted in one of the only

allowances for a market economy in Castro's Cuba. The federal government not only allowed but encouraged private farmers to grow and sell agricultural products and, further, did not place any government controls on these activities (Garfield and Santana 1997). These initiatives have been more tightly controlled and restricted by Castro's government since 2004 (Rodriguez 2004).

A shortage of medical supplies also became an issue for the country. Mammograms, for example, essentially stopped being done in 1994 and 1995, as x-ray film was basically unobtainable and, even if available, could not be developed (Williams 1997). Further, the film that could be obtained required too high a level of radiation and was not recommended for use initially by the World Health Organization (Oxfam 1997; Williams 1997). Access to pacemakers also became more restricted in 1994 after a U.S. firm purchased the sole major non-American producer of the items, making them subject to the restrictions of the Helms-Burton Act (Garfield and Santana 1997). A major American producer of pacemakers considered applying for a special export license, but did not because of the burdensome process (Willon 1998). Since then, the Cuban government has had to change its supplier for pacemakers repeatedly and shortages persist (Acosta 1997; Moore 1998). Consolidations and acquisitions by U.S. firms also cut off previous suppliers of medical supplies, diagnostic equipment, and pharmaceuticals (Oxfam 1997; American Association for World Health 1997). Whereas licensing of pharmaceuticals and medical equipment was theoretically possible, the procedures were extremely complicated and time consuming (American Association for World Health 1997). One indicator of the negative impact of the Special Period was that the number of surgical procedures in Cuba dropped from 777,737 annual procedures in 1990 to 598,329 in 1995. This was prompted, in part, by the closing of 100 operating rooms in the country (PAHO 1998, 217).

Other chains of events associated with the faltering economy also caused difficulty for the Cuban people and, ultimately, impacted the health of the population. Housing stats came to a virtual standstill (Garfield 2004; Possehl 1998). The water system in Cuba had used U.S. pipes, and the embargo limited access to American parts, such as pumps (Oxfam 1997). European supplies, when tried, did not work properly (Williams 1997; Macintyre and Hadad 2002). As a result, the percentage

of the population with running water dropped from 83 percent to 81 percent in urban areas and from 30 percent to 24 percent in rural areas between 1990 and 1994 (Garfield 2004). It was estimated that only 13 percent of municipal water systems were treated with chlorine by mid-1994 (Garfield 2004). The net effect was an increase in such diseases as Guillain-Barre Syndrome, due to contaminated water supplies (Barry 2000). Donations of chlorine from nongovernmental organizations (NGOs) resulted in greater access to chlorinated water, increasing the chlorination of water supplies to 87 percent (Garfield 2004). NGOs also were involved in other aspects of the provision of supplies. Significantly, relatives outside the country provided crucial aid to their family members by sending needed supplies of all kinds (American Association for World Health 1997).

The net effect of the Special Period and its resultant shortages of food, deterioration of the water supply, lack of medicine and medical supplies, and insufficient medical management information systems was that the medical and health infrastructure of the country was seriously weakened (American Association for World Health 1997). Malnutrition, infectious diseases, accidents, and the lack of resources for adequate diagnosis and treatment of diseases all became significant issues. The ultimate impact was an increase in morbidity (the incidence of disease) and mortality (death) rates in the country.

An additional consequence of the more stringent embargo and the loss of hard currency was a cutback on pharmaceutical imports. This forced Cuba to look to other alternatives in accessing pharmaceutical supplies. Herbal medicines supplanted as much as 80 percent of prescription drugs in Cuba (“What Ails” 1998). Cuba began to establish its own industries, developing production capabilities in the area of pharmaceuticals, specifically generic drugs. Little central government regulation of the pharmaceutical industry existed. Oftentimes, development and production of these pharmaceuticals were in violation of international patent laws (Sturm 2002; Adams 2002). Pharmaceutical production served not only to meet the needs of the domestic population, but also became an important source of hard foreign currency as pharmaceuticals produced in Cuba were sold overseas, frequently to less developed countries (PAHO 1998; Bradley and Kim 1994).

Cuba’s biotechnology industry also developed during this period,

gaining a reputation for being quite innovative and path-breaking. Innovations included treatments for Parkinson's patients (Robinson 1997), anticholesterol drugs (Possehl 1998), interferon, cancer drugs, and work on vaccines against Type-B meningococcal meningitis and Type B hepatitis (Bradley and Kim 1994). Some of the growth in biotechnology has been spurred on to meet the demands for treatments of diseases prevalent in the Latin American marketplace (Bradley and Kim 1994) to generate hard currency for the country.

The Cuban government has seen potential marketability of some of these medical advances but needed to partner with foreign pharmaceutical companies and foreign governments to facilitate these activities (Possehl 1998). The focus was on regional areas in secondary markets where pharmaceutical markets were still open. The targeted markets were various areas of the Caribbean; a number of Latin American countries, including Argentina, Colombia, and Brazil; and the Chinese government, in partnership with biotechnology and pharmaceutical companies in China (Bradley and Kim 1994). There also have been some relatively recent developments in relations with pharmaceutical companies in Canada (Possehl 1998). In 2003, Cuba exported approximately \$100 million in pharmaceuticals, which have become one of the country's main exports (CTP June 2004).

The Situation in Cuba: Today and in a Post-Castro Cuba

The provision of medical care and the ultimate health of the population in a post-Castro Cuba will be a reflection, in part, of the current situation in the country. The population in Cuba is currently estimated at approximately 11.3 million (CTP June 2004). Over three-quarters of the population live in urban settings (Macintyre and Hadad 2002).

Cuba continues to expend a significant amount of its resources on health care. According to the Human Development Index in 2000, health care expenditures amounted to \$193 per person or 6.1 percent of GDP (UNDP 2003). Ninety percent of these funds were allocated for use at the local level (Macintyre and Hadad 2002). The Cuban government reported that its total health care budget in 2002 was 1,923,032,100 Cuban pesos or 170.92 Cuban pesos per capita (Anuario Estadístico 2002).

The Cuban people enjoy one of the highest life expectancies in the

Caribbean, at 75 years for males and 79.3 years for women (World Health Organization 2004). Infant mortality rates are approximately 7 per 1,000 births (UNICEF 2002), after spiking to 10.2 per 1,000 in 1992 (PAHO 1998, 207). These laudable results, comparable to those found in the industrialized world, have reflected a campaign to reduce the incidence of low birth weight infants by focusing resources on maternal care and continued support of the family doctor system. The average number of prenatal visits was 17.2 in 1992 and reached 23.6 in 1996. Babies were seen by physicians an average of 35 times in the first year of life (PAHO 1998, 208). The low infant mortality rate may also reflect indications that at-risk pregnancies and/or nonviable fetuses are aborted with significant frequency, as physicians are held accountable for increases in infant mortality rates (Humanitarian Aid 2004). Abortions are legal and free in Cuba (Hemmes 1994). Further, Cuba has one of the highest documented rates of abortion among developing countries (Henshaw et al. 1999). In 2001, the abortion rate in Cuba sat at just under 50 per 100 live births (CTP March 2004). Evidence suggests that abortion is also used as a method of gender selection. Whereas the typical gender ratio at birth is 105 to 107 boys per 100 girls (Hudson and Den Boer 2004), the sex ratio among newborns in Cuba is 118 males to 100 females (CTP March 2004), well above the 105–107:100 ratio. The role of Catholicism and its influence on current liberal attitudes toward abortion will be important to monitor in a post-Castro Cuba. Pope John Paul II's visit to Cuba in 1998 brought Catholicism more into the open after its suppression since the 1960s. It is estimated that 4.5 million Cubans, or 40 percent of the population, are Catholic. The numbers of baptized Cubans and new priests have been growing significantly in recent years ("Cuba's Second" 1997). If Catholicism becomes a more prominent force and if religious faith continues to be encouraged by activist religious-based NGOs that work with young women of childbearing age, a decline in Cuba's abortion rate is possible.

An additional concern for females of childbearing age in Cuba is the growing risk of sexually transmitted diseases (STDs), HIV/AIDS, and the resultant impact on abortion, infertility, birth rates, and health care costs. Whereas the incidence of AIDS is significantly lower than in other countries in the Western Hemisphere, for example, fewer than 4,000 total reported cases out of 11 million people in Cuba, compared with 200,000

cases out of 7 million people in Haiti (Adams 2002), there has been an increase in rates of infection due, in large part, to the growth of sex tourism (Barry 2000; Macintyre and Hadad 2002). The rate of reported HIV cases doubled from 1996 to 1997 (International Planned Parenthood Federation 2004). STDs have increased as a result of sex tourism from 86.1 per 100,000 in 1990 to 143.3 per 100,000 in 1997 (Macintyre and Hadad 2002). This problem is compounded by the lack of an adequate supply of prophylactics, as only 5 percent of the population in 2000 reported using condoms. Although a much larger portion of the population has access to modern methods of contraception (72.1 percent of the population in 2000), these may not be as effective as condoms at preventing STDs (United Nations Department of Economic and Social Affairs Population Division 2003). As Cuba has attempted to increase the inflow of foreign currencies—and nurtured its tourism industry as a means of accomplishing this—a consequence has been a notable increase in diseases that will have long-term negative impacts on the health of the younger, primarily female population. Revenue generation in the short run may lead to larger increases in health care costs in the long run, and there will be significant impacts on the rate of abortion, infertility, and birth rates. If barriers to tourism continue to come down in a post-Castro Cuba and if the sex tourism trade explodes further, these long-term negative health effects will be magnified.

Vaccination programs continue to be a priority and cover more than 95 percent of all children under age 2 years in the country (PAHO 2002). The focus on vaccination programs covers such diseases as pertussis (whooping cough), diphtheria, tuberculosis, tetanus, measles, mumps, rubella, and meningitis (Garfield and Santana 1997). Children of mothers with hepatitis B are also vaccinated (MacDonald 1999). In a transitional post-Castro period, as the potential for political and/or social instability occurs, it is critical that comprehensive vaccination programs be maintained to prevent an increase in disease processes. Drawing from the experiences of other countries, political and social transition may cause rates of immunization to drop precipitously (Falkingham 2000). NGOs may play a pivotal role in tracking provision and maintenance of vaccination programs during such a period of transition, as they have in other countries. The role of NGOs will be discussed later in this section.

Cuba currently is experiencing the economic and political effects of

an aging population, which greatly impact the health care system. The elderly population in Cuba includes those individuals who were most active during the revolution but now find themselves having the least access to social services and social structures that were envisioned by the revolution. As health care resource availability has declined, allocation of such resources has been focused primarily on women of childbearing age and children, at the expense of adult males and the elderly (Garfield 2004). The elderly have had difficulty accessing basic health care services and proper nutrition. Until the early 1990s, milk rations were provided each day to children under the age of 13 and adults over the age of 65. During the Special Period, only children under 7 years were eligible for these rations (Garfield and Santana 1997, 16). Shortages of eyeglasses, hearing aids (Gondar and Negrin 2000), and necessary medications, often only available in the former dollar stores, also have affected the ability of the elderly to acquire adequate medical treatment and have had considerable negative impacts on their quality of life (Garfield and Santana 1997). Tuberculosis (TB) serves as an example of the vulnerability of the elderly population to disease processes. The TB rate in Cuba is highest among those aged 60 years and over, with 38.9 per 100,000 population affected in 1996 (PAHO 1998, 209). This is especially noteworthy for Cuba as it approaches a period of transition, with lessons again learned from other regions that have gone through similar transitions. After the fall of the Soviet Union, 29,000 people died from TB in Eastern Europe in 1993, and the incidence of TB infection doubled in Moscow from 1992 to 1994. Explanations for this included not following the World Health Organization's guidelines, lack of health care funding and lack of access to appropriate drugs, older people being more susceptible to the disease, and the growing incidence of more drug resistant strains of TB ("TB Deaths" 1994).

The elderly are more susceptible to pneumonia, influenza, TB, diarrhea, heart disease, and asthma and more likely to have accidents and commit suicide. Between 1989 and 1994, mortality rates associated with each of these processes increased more than 10 percent among the elderly. Heart disease and its mortality risk were brought back under control, as the risk of death from heart disease for older adults decreased by 16 percent between 1996 and 2000 (PAHO 2002, 202). Higher mortality levels associated with diarrhea and asthma are especially

noteworthy, as they are functions of deteriorating basic infrastructure (water, sewage, food supply, housing, and so on). Among older adults in the year 2000, there were 56.7 per 1,000 visits to physicians or health care facilities for acute diarrheal diseases and 296.2 per 1,000 visits for acute respiratory infections (PAHO 2002, 202). The increased suicide rate among the elderly is also of great concern, as it reflects worsening psychosocial conditions in the country and insufficient support systems in place. As Cuba adjusts to potentially historic political and social change, disease processes affecting vulnerable populations will have to be closely monitored because their effects, already serious, may become more problematic.

Issues associated with the aging population are expected to increase with time. Cuba is currently ranked in the top category of countries in terms of the size of their elderly populations, with over 14 percent of Cuba's population aged 60 and over (CTP June 2004). The rate of growth of Cuba's elderly population far exceeds the average aging process of the population in Europe (Gondar and Negrin 2000). The Pan American Health Organization, realizing the scope of the problem, brought together the health ministers and their experts on aging from around the Americas and the Caribbean to discuss the impacts of the region's growing elderly population on their economic, social, and health care systems (PAHO 2003). Older people place more demands on limited social and health care resources, which is a particularly serious concern in Cuba at this time, as resources are scarce. This factor, coupled with a significant drop in the birth rate, underlie trends noted in a report recently released by Merck and PAHO, indicating that by the year 2025, Cuba will have more people over 60 years of age than under 15 years of age (Merck 2004). In 1997, the median age in Cuba was 31. By the year 2025, the median age is expected to be 43, with 24.3 percent of the population expected to be 60 years and older and 7.6 percent 75 years and older (U.S. Census Bureau 2000). Further, Cuba has a mandatory retirement age of 55 years of age for females and 60 years for males (Perez 1998, 521). Given the large decline in the birth rate, from 27.7 births per 1,000 in 1970 to 12.8 per 1,000 today (United Nations Department of Economic and Social Affairs Population Division 2003), a small working population will be burdened with supporting a large, rapidly retiring, aged population. This will place significant cross-generational stresses on the Cuban

population, with resultant negative impacts on political, social, and health care systems in the near future.

The major support systems available to the elderly in Cuba are their families. Currently, 90 percent of the elderly live with their children, grandchildren, or extended families, due partially to a lack of housing (Gondar and Negrin 2000) and to the inability of the elderly population to support themselves financially. The government provides basic financial benefits for the elderly. The average pension is one-half of an individual's salary, which covers only the most basic needs. In the mid-1990s, the average pension was approximately \$7 per month (Perez 1998, 526; Gonzalez 2001). A further indication of the lack of focus on the elderly is the minimal level of gerontological care available. Of the 68,155 physicians in Cuba, only 313 are trained geriatricians (CTP March 2004). Although the government offers nursing home services and senior activities in centers and parks, supplemented by assistance provided by the labor unions, few seniors can take advantage of and participate in these activities. As of 1997, fewer than 12,500 of the elderly population (Gondar and Negrin 2000) lived in Cuba's 196 nursing homes (Macintyre and Hadad 2002, 458), with reported statistics indicating that 5,000 were on a waiting list (Gondar and Negrin 2000). The implication is that there are a large number of individuals who would wish to access such services but may not even list themselves, due to the long length of the queue and a shortage of nursing home facilities. The nursing homes in Cuba do not appear to have the wealth and diversity of services required for a heterogeneous elderly population with vast medical and activities of daily living (ADL) needs. Assisted living facilities are also not part of the long-term care environment. A lack of appropriate supported living facilities may help to explain the increased suicide and mortality rates for the elderly population, as many elderly people perceive themselves to be a burden on their families and, at least implicitly, the Cuban government perceives them as a burden on the state.

Future stresses on the health care system, the social services system, and, ultimately, the economic system will be significant. These trends will stress any new political system and, therefore, issues associated with the elderly must be part and parcel of any health care policy instituted by a new government in Cuba. In the absence of a clear policy, the current serious situation could become catastrophic. The aged population in Cuba

is already marginalized. During transitions, with resources transferred to higher priority needs, health care and social supports for the elderly population are at risk of further deterioration. In addition, as pointed out by the Commission for Assistance to a Free Cuba in its *Report to the President* (Powell 2004), NGOs often ignore the needs of the elderly population in terms of proper food, nutrition, and access to health care. The report stresses the importance of not ignoring this population during a period of transition. Such a focus will be critical to assure that mortality rates do not increase. As Cuba struggles with the impacts of the growing elderly population, it will be important for the country to rethink its retirement and support system policies. Permitting people to work longer will keep the aging population more active and will place fewer demands on public support systems. Further, as demographics change, the younger workforce will be declining in numbers, and more workers will be sought. Keeping the elderly population as active as possible in post-Castro Cuba will be important, not only in terms of economic production, but also for the personal, psycho-social, financial, and medical well-being of older citizens themselves. A new government must reassess the role of the aging population, minimize demands on social structures, and provide more in the way of social support where needs are evident.

For the population as a whole in Cuba, 60 percent of deaths are a result of heart disease, cancer, and strokes (PAHO 2002, 1999). While death rates from stroke, heart disease and suicide appear to be on the decline in the aggregate population, death rates from accidents, diabetes, and cancer have remained constant. Rates of cirrhosis of the liver, asthma, and homicide have been on the rise (Macintyre and Hadad 2002, 451). Again, this may be a reflection of socioeconomic stress. The urban death rate is 6.3 per 1,000, and the rural death rate is 5.5 per 1,000 (PAHO 2002, 1999). Higher death rates in the urban areas may be a result of higher rates of pollution, additional declines in the environment, and growing stress. It should be noted that according to UNICEF, 95 percent of the urban population, but only 77 percent of the rural population, had access to safe water (2002).

Recent increases in the incidence of asthma, cholera, diarrhea, hepatitis, TB, and certain vector-borne diseases are additional possible reflections of socioeconomic stress and environmental factors, as well as the weakening of the public health infrastructure. The increase in the

incidence of asthma in the population has been of special concern and appears to be a direct result of a decline in housing conditions in the country, increased pollution, and a lack of pharmaceuticals to treat the associated ailments (Macintyre and Hadad 2002). The incidence of tuberculosis, which was 5.1 per 100,000 in 1990, peaked at 14.2 per 100,000 in 1995 before dropping to 10.1 per 100,000 in 2000 (PAHO 1998, 209; PAHO 2002, 212). Further, there is a certain level of anxiety regarding reports of outbreaks of dengue fever and malaria, vector-borne diseases spread by mosquitoes. Increases in these disease processes are important issues and carry long-term consequences, particularly among vulnerable groups in the population (Macintyre and Hadad 2002). Again, monitoring and control will be especially important during a period of transition.

Access to pharmaceuticals is important to the health of any population. In examining the pharmaceutical sector, although some of the most severe effects of the economic downturn and the tightened embargo have been mitigated by the increase in domestic production capabilities, impacts, nonetheless, are still felt. This is, in large part, due to lingering effects of the embargo, complicated by the fact that there have been a number of mergers between European and U.S. pharmaceutical companies (Barry 2000), which have further foreclosed Cuba from accessing certain essential pharmaceutical drugs. Since 1959, half of all patented pharmaceuticals in the world have been developed by U.S. companies (Barry 2000). Whereas the Trade Sanction Reform and Export Enhancement Act of 2000, passed during the Clinton administration, permitted the sale of food, medicine, and medical devices to Cuba, the Act did not provide significant relief because financial restrictions prohibited U.S. banks and companies from offering credit to Cuban purchasers. As such, transactions were required to be on a cash basis. The law further prohibits any future president from lifting financing restrictions on sales to Cuba. It is interesting to note that such restrictions may, according to the Act, be lifted with respect to Iran, North Korea, Syria, and Libya (DePalma 2001; Cohen 2003). Further, the Torricelli Law requires that ships going to Cuban ports cannot return to a U.S. port within a six-month period unless they receive a waiver from the U.S. Secretary of the Treasury (Hensel 2001; DePalma 2001). As a result of this law, Cuba has spent an additional \$130 million in transportation costs and \$200 million in import

costs on American products (Hensel 2001). Canada, which opposes the American embargo on Cuba, remains one of Cuba's primary trade partners. In 2004, over \$1.5 million in pharmaceutical and \$500,000 in medical equipment and supplies produced in Canada were exported to Cuba (Peterson 2004; Statistics Canada 2005).

Cuba's development of the biotechnology industry has offered the government a means to earn hard foreign currency (Bradley and Kim 1994). In the biotechnology industry, the central government has allowed a significant degree of autonomy in research and development, though marketing continues to be controlled centrally by the government. There are approximately 40 biotechnology and pharmaceutical companies operating in Cuba, with physicians primarily responsible for technology and oversight. One of the effects of an industry that has been regulated to a lesser extent than its counterpart in the United States is that pharmaceuticals come to market much faster (Bradley and Kim 1994). Of course, this is true of many pharmaceutical developments outside the United States. Cuba, however, is still striving to attain acceptability and credibility in the international arena. A recent example of its success is the determination by the Centers for Disease Control and the World Health Organization that the hepatitis and meningitis vaccines developed in Cuba are safe (Bradley and Kim 1994). In fact, GlaxoSmithKline acquired the rights to market Cuba's Hepatitis-B vaccine, the first such vaccine in the world. Further, an assessment of the pharmaceutical, PPG, by the University of Geneva indicated that this medication was the most effective anticholesterol drug on the market at that time (Bradley and Kim 1994). Evaluations such as these have gone a long way in helping the biotechnology and pharmaceutical industries in Cuba attain a level of confidence and credibility.

The biotechnology sector has also played a role in Cuba's foreign policy as an area of professional cooperation to further political and diplomatic ties. For instance, countries such as Yemen, Algeria, India, Iran, and China have all agreed to biotechnological transfer and cooperation with Cuba. In 2001, China had 38 joint scientific or technical projects with Cuba, including vaccine and biotech research (*Granma*, October 3, 2001).

Perhaps the most interesting relationship borne of scientific cooperation is the deepening relationship between Cuba and Iran. Cuba

was the driving force behind the biotechnology facility built in Tehran, offering scores of Cuban scientists as technical advisors. Cash-strapped Cuba has recently been granted a 20 million euro credit by Iran, as well as Iranian claims to aid Cuba's oil production, in the wake of a discovery of reserves in Cuban territorial waters (*Granma* January 17, 2005). Iran's extremely close ties with Cuba in the biotech sector have raised some concerns, according to José de la Fuente, the former director of research and development at Cuba's premier biotechnology research institute, as Iran has pursued information regarding recombinant proteins and other substances that can be used for biological weapons (2001).

The problem Cuba faces is that it still has difficulty accessing primary or "first world" markets, and, yet, drugs produced by Cuba are often too expensive for the health care markets of less developed countries (Bradley and Kim 1994). Policy implications and opportunities for growth in this sector will be addressed later in this paper.

Turning to the hospital sector, expenditures on hospitals dominate health care expenditures in Cuba, as in most countries. Of the total expenditures on health care in Cuba, estimates are that 45 to 70 percent are allocated to the hospital sector (PAHO 1998, 219; Veekens 1995). The system today and the interactions between physicians and hospitals have essentially remained unchanged over the last 20 years, even though there have been considerable financial challenges for the country. Each family physician, as primary caretaker, serves a population of 600 to 800 people (PAHO 2002, 208). A health team, also providing primary care, serves a population of 4,000 individuals (Iatridis 1990, 31). Area polyclinics, similarly considered part of the primary health care system, serve 25,000 individuals (Iatridis 1990, 31). To provide secondary care, municipal hospitals are set up to serve the needs of approximately 250,000 people (Iatridis 1990, 31). Most child births take place in municipal hospitals, where staffing levels are generally higher than in the polyclinics. Currently, less than 1 percent of all births take place outside the hospital setting (Macintyre and Hadad 2002). Provincial hospitals focus on tertiary care and provide specialized care to approximately 1 million individuals (Bosely 2000).

Several national hospitals that offer more specialized services have established strong ties with research institutions in the country. The largest of the national hospitals is the Hermanos Ameijeiras Hospital in

Havana with over 30 specialties represented (Macintyre and Hadad 2002, 459). Currently, the total bed census in the country is 80,528 beds distributed over 265 hospitals, including Cuba's 62 rural hospitals (CTP March 2004). The hospital infrastructure remains deteriorated, which has had a negative impact on health care outcomes. As the economy has undergone a partial recovery, emphasis has been placed on the reopening and refurbishing of hospital operating rooms (PAHO 1998).

Cuba's rates of accidents, accidental deaths, and suicides are higher than those in most other countries (WHO 2003). A factor that appears to play a role is the lack of emergency and ambulance services. Since 1996, the government has focused on improvement and reorganization of the emergency care system through consolidation of services to improve responsiveness (PAHO 2002). However, with only an estimated 100 ambulances in all of Cuba and only 85 ambulance centers, a reflection of the shortage of automobiles, automobile parts, and gasoline, progress has been limited (CTP March 2004). One hundred twenty-two of 169 municipalities offer emergency services, but only 30 are accredited (CTP March 2004). It is widely recognized that speed of response and availability of life-support systems are critical to the reduction of morbidity and mortality associated with accidents and trauma. In post-Castro Cuba, one of the most cost-effective measures to reduce morbidity and mortality in the country, especially in the short-term, will be to increase the number of supported ambulances and emergency facilities and services in the country. This would require freer trade and/or a role for NGOs. If transition involves violence, the need for and value of ambulances and ambulance services will be that much more important for the country and its population.

As has been observed, politics and health care have been intertwined in Cuba for the last 45 years. The culture of health care will be a critical aspect of evolution and restructuring during a period of transition. As such, different political situations and their effects on the health care system and its various components must be examined. There are, however, elements and aspects of the health care system that one can anticipate, independent of any specific political and social scenarios in Cuba post-Castro.

Cuba's comprehensive health care system serves the entire population; putting aside some of its significant shortcomings discussed in

earlier sections, health care is a major accomplishment of the Castro revolution. A government-provided public health care system that offers basic care for the broad population has actually been a mainstay of nearly every country in the Americas—except for the United States, where an employer-based health care system is dominant.

Currently, the privatization of health care is being touted and has been introduced by many countries, including countries in the Western Hemisphere. Often, these systems are implemented to take financial pressure off the central government. This is a theme and policy issue that we will return to. However, it must be understood that in countries where privatization of health care has occurred, a basic government-provided health care system is still offered and should be offered as an option to the population as a whole. It will be essential to any smooth transition in Cuba that the basic health care system be maintained. To dismantle this basic global coverage would cause significant disruption and foster distrust for any new regime, because Cuba's public health care structures are quite extensive and integrated into the daily lives of individuals.

Cuba's basic system of primary health care has been held up as a model of efficient, relatively effective care. The system utilizes a simultaneous top-down control model and bottom-up community-based methodology. Associated with this is the assurance that care is provided in both urban and rural settings. One of the areas where Castro was able to establish a strong base was in the rural regions, where provision of most public health services was minimal prior to his coming to power. Castro and his followers garnered much support for the revolution from people in poor rural areas. During any period of transition, it would be critical to maintain the current level of medical services to rural as well as to urban communities.

Assuming that trade and immigration restrictions are lowered after Castro is no longer in power, a brain drain from the health care industry could occur. Movement of health care professionals has been closely monitored and restricted by the Castro regime over the decades. As health care professionals are government employees, incomes have also been tightly controlled. As such, there is vulnerability at all levels.

Nursing is an area of vulnerability. University trained nurses in Cuba earn approximately \$15 per month (Canter 2001). In the United States, an ongoing shortage of nurses is predicted, with vacancies estimated to be on

the order of 13 percent (Barney 2002). Recruiters travel throughout the world to recruit nurses partially to alleviate the crisis that plagues health care facilities and, ultimately, the provision of quality health care in the United States. With 82,000 trained nurses (a ratio of 73.7 nurses per 10,000 population) in Cuba, who have been trained in a highly regarded educational and medical care system, there will be a move to recruit from Cuba's nursing pool during a transition (Macintyre and Hadad 2002, 457). Whereas language differences may be perceived to be a potential barrier initially, though U.S. nurse recruiters are currently recruiting as far away as China (Yu Xu 2003), these concerns would be overcome through intensive English programs as well as the realization that there are a number of geographic regions of the United States where Spanish language skills and Hispanic backgrounds are seen as especially positive attributes. Even at the lowest level of nursing skill requirements in the United States, the salaries would be a seventy-fold increase over what the most highly trained nurses currently earn in Cuba. This potential pool of nurse recruits will be targeted for health care facilities in the United States, and U.S. salaries will be extremely attractive to Cuban nurses and their families.

Similarly, the physician marketplace in Cuba is at substantial risk for brain drain. Physicians work in conditions that allow them little control over their work environment. Hospitals and clinics, as indicated earlier, have deteriorated significantly and offer little in the way of technology. Shortages of necessary pharmaceutical supplies, medical supplies, and even basic sanitation and cleaning supplies have caused multiple problems in the provision of primary care. In this environment, nearly all of Cuba's highly trained physicians are unable to practice their profession as they were trained; therefore, they are understandably frustrated. Coupled with the extraordinarily low compensation for physicians, approximately \$26 per month (Canter 2001) and \$50 per month for those who serve in other countries under contract with the Cuban government (Driggs 2003), there is a great likelihood that talented physicians will leave the country as soon as they can. Cuba has the highest physician-to-population ratio in the Western Hemisphere, estimated to be approximately 59 per 10,000 (UNDP 2003). By comparison, Canada's ratio of physicians to 10,000 population is 22.9; Mexico's is 15.6; Brazil's, 14.4; Dominican Republic's, 19; and Uruguay's, 37 (PAHO 2002, 381). The United States

currently maintains a ratio of 27.6 physicians per 10,000 individuals (UNDP 2003). More than 68,000 physicians (CTP March 2004) currently provide care in Cuba; because many of them could earn much more driving taxis to serve the tourist trade, there is a strong incentive for physicians to emigrate to other countries, including the United States. Whereas barriers do exist for foreign-trained physicians to practice medicine in the United States, there are, nonetheless, opportunities to practice as a physician. Foreign graduates must first receive certification by the Educational Commission for Foreign Medical Graduates in a multi-step process before they can be licensed to practice in a state. Individuals must be able to present their transcripts from a medical school included in the International Medical Education Directory from the approved graduation years. Sixteen medical schools in Cuba are currently listed in this directory, though approved graduation years vary (FAIMER 2004). For those who meet these eligibility requirements, three exams must be taken that test skills, knowledge, and language proficiency. Individuals must participate in a medical residency program for two years in the United States before receiving a license from their state (ECFMG 2004). Specific rules and regulations for Foreign Medical Graduates to be licensed as physicians vary from state to state in the United States. In the state of Florida, for example, laws indicate that in addition to the requirements listed above, a number of criteria must be met, including passing a criminal background check, meeting the minimum age, and being of good moral character (Florida Statutes 2003).

The medical care sector in the United States is rich and diverse, and many areas may allow physicians from Cuba to work in the medical care setting, though not directly as physicians. Such professional positions include high-level medical technicians, physician assistants, and nurses, all areas that are experiencing significant shortages (Florida Hospital Association 2000). For example, there are programs in the United States designed to provide efficient training of foreign medical graduates to practice nursing in the United States (Brecher 2003). Physicians trained in Cuba will have opportunities to move quickly into highly paid, skilled areas of nursing and the allied health professions. Some may also, over time, be able to convert to physician status, especially in underserved areas. Again, given language and cultural sensitivity, there will be great potential for Cuba-trained physicians to meet a need in the various

shortage sectors of health care in the United States, especially in such states as Florida, Texas, California, and New Jersey, where there are special needs for health care professionals of Hispanic background.

Recall that an exodus similar to the one being predicted in this paper occurred once before in the history of Cuba, when half of all physicians, three quarters of all nurses, and the majority of medical professors left the country as Castro took power. The initial impact was disastrous for Cuba (Claudio 1999). In order to assure that history does not repeat itself, in terms of another mass exodus of medical care professionals, with resultant compounded negative impacts on the country's already compromised ability to provide medical care, medical personnel issues must be a major policy focus. Physician brain drain exoduses have been recorded in other countries when doctors sense a lack of support after having invested major amounts of their own time and energy into training (Pang, Lansang, and Haines 2002). These exoduses have generally occurred for economic reasons, independent of political climates within the countries, with similar important, negative consequences. Perhaps by focusing on this issue, we can determine whether a potential opportunity exists to reach several goals simultaneously.

Specifically, in a post-Castro Cuba, if barriers are reduced and private foreign capital and modified market-based approaches are allowed to develop, segments of the population, as well as foreign nationals working in the country, may wish to pay for private health care. Private medical services could be much more extensive than current levels of service, in terms of infrastructure, privacy, availability and choice of services available, coupled with shorter waiting times. Further, these services could be offered to those who live outside the country as well. The basis for such a system already exists in the form of the well-established *Hospitales Turísticos* which serve foreigners in Cuba. Under the current system, foreign capital earned from the *Hospitales Turísticos* accrues to the Cuban government (Bradley and Kim 1994). If a private system were established that allowed for partial or full retention of revenues, nurses, physicians, and ancillary service personnel could be paid more than under the public system. Arrangements could be made with the government for health professionals to work a certain number of hours in the public health service, while allowing them to supplement their incomes in the private sector. Given the large, perhaps oversupply of well-trained physi-

cians in Cuba's health care industry, professional health care coverage of the free clinics and public hospital facilities would not be an issue. If health care providers could supplement their government salaries with privately generated funds, the financial incentive for leaving the country would not be as great.

This system of dual employment has served a large number of countries well, in that basic services are provided and safeguarded by the government through a strong basic health care system, while more extensive services are offered through the private marketplace. Financing of a second level of private health care also has historical roots in terms of the established, prepaid, managed care type financing that was a part of the Cuban health care culture pre-Castro. As mentioned earlier, Mutualist Health Associations played a major role in health care in Cuba from 1902 until 1959 (Diaz-Briquets 1983). Managed care still performs an important function in the Cuban exile community and continues to be influential as a system of financing health care in many countries in Latin America. Many of these managed care programs in Latin America are industry based or labor union based. Their aim is to manage the health of the defined population by focusing on cost-effective prevention.

These financing systems can be supplemented initially by limited private health insurance offered to the population and foreign nationals by private providers. Access to the private system would be one of the major elements of the insurance providers' benefit packages. Private health care systems can be provided and financed in a not-for-profit setting, possibly coordinated by NGOs. A thesis by Sokolowski (2001) states that not-for-profit provision may be a more palatable way to introduce professionalism in a country without it, as provision of services by for-profit firms might be seen as threatening. Medical care, hospital care, and blood bank services are natural areas for not-for-profit provision of care. Such services and facilities can be linked specifically to industry based or labor union based managed care providers, as well as not-for-profit health care insurance providers.

Would a dual system of care be morally tolerated by the Cuban people in a post-Castro Cuba? Does a dual system fly in the face of some of the perceived accomplishments of Castro's Cuba, in that the regime publicly prided itself on pursuing the distributional concept of egalitarianism? In fact, the underlying model for health care delivery in Cuba

today is based on the principles and methodology of a dual level of care. Currently, the dual system provides equal services to the population as a whole, based on egalitarian precepts, with the option of additional services available to tourists as well as to those who have political and/or economic power in the country. The system's *Hospitales Turísticos* provide the second tier of care available in Cuba today. The difference is that the opportunities for access to this higher tier in a post-Castro Cuba would be expanded to the entire Cuban population and, further, the medical care professionals in such a dual system would be able to share in a portion of the financial benefits. This could potentially stem the tide of exodus of medical professionals, thereby assuring that the health care needs of the Cuban population would be satisfied as well.

Independent of any political change in the country, an additional incontrovertible situation in Cuba is the significant decline of the overall infrastructure, exacerbated by the fall of the Soviet Union and the strengthening of enforcement of the embargo. As noted earlier, housing, water systems, sewer systems, and so on are all in disrepair. This has led to the recent increase in the incidence of chronic communicable and non-communicable diseases, especially intestinal and respiratory illnesses (Macintyre and Hadad 2002). Shortages in food supplies and compromised caloric and nutritional intake have contributed to this problem. Delivery of health care has also been impacted, as shortages of medical equipment, medical and pharmaceutical supplies, and even sanitation supplies have increased risk levels associated with the provision of care. Altogether, the decline and disrepair of infrastructure and the shortages of food and medical supplies are negatively impacting the historical quality of the medical care system in the country (Garfield 2004).

As a transition occurs, further deterioration of medical care services and, in turn, the public's health is likely to take place. Indeed, often during transitions, a reallocation of funds occurs to meet other needs of the changing state. Health care services are at risk under such a reallocation. This is what countries in Eastern Europe experienced subsequent to the collapse of the Soviet Union (WHO Regional Office 1998). Further, when changes occur in economic, political, and/or social conditions, there appear to be greater incidences of heart disease and suicide due to stress, especially among the young and middle-aged male population ("UNICEF Warns" 1994). When socioeconomic pressures

manifest themselves in these ways, they add further strains on an already overburdened health care system.

Transition may open up additional important roles for NGOs. The influence of NGOs to date has been limited in Cuba, due to distrust regarding their political motivations (Gonzalez and Coll 1997) and the role of a centralized government in making services available independently of NGOs. In other countries during transitions, NGOs have had a strong track record of providing assistance to restore infrastructure and provide basic food, shelter, and health care needs. Their role may be of great importance in Cuba's transition. One area of focus would be in rural regions, where indications are that infrastructure has deteriorated and health problems have been even more prominent than in urban areas.

NGOs may also be involved in assessing the continued provision of basic medical services and blood bank services, as they did once before when Castro first came to power and a health care personnel exodus caused a crisis (Claudio 1999). Indeed, one of the many functions that NGOs can have during a period of transition is the tracking of medical data. Even if a transition is smooth with insignificant changes in political processes, blood supply and vaccination programs nonetheless will be put at risk. NGOs can help to ensure the continuation of global immunizations and the safety of the blood supply. These programs will have to be monitored closely, as a breakdown would be very problematic for the country. Depending upon the openness of the new regime, NGOs will have a strong or a minimal role. The needs, however, that could be served by NGOs will be diverse and significant.

The nature of regime change will be instrumental in determining the future focus of Cuban society as well as the level of openness to the growth of NGO involvement, private sector participation, and the provision of health care. With all that could potentially occur, there are certain indications that opportunities for development of a private sector, including the medical private sector, may be limited, even though there is so much potential. The actual outcome is a function of the type of political system that emerges after Castro is no longer on the scene. Several writers have been developing theories relating to democratization and emergence of a market-based economy. Edward Gonzalez of the RAND Corporation argues that a number of potential scenarios exist in a post-Castro Cuba (Gonzalez and Coll 1997). These scenarios would, in

turn, impact the health care delivery system in the country. Gonzalez argues that the probability of a reformist or a coalition government, focused on democratic reform and the development of market systems, is quite limited. He indicates that as Castro passes on, a strong possibility is that the military, under the direction of Raúl Castro, Fidel's brother, would retain power with a possible allowance for minimal market opportunities. A second scenario reflects the establishment of a coalition government, although Gonzalez claims that the possibility of an open coalition is not great. Gonzalez suggests that there is so much invested in the underlying concepts of the Fidelistas and so much distrust of any reform movement, either from within or from outside the country by the Cuban exile community, that this is not a viable option. As such, the opportunities for a market-based health care system layered upon the current public health care system may also be limited in scope.

As Alberto Coll indicates in his paper, *The Future of US-Cuban Relations*, the importance of social security cannot be overestimated (Gonzalez and Coll 1997). Fear of the impact of market reform on distribution of wealth is of great concern. Further, the advent of capitalism is not without consequences. Full employment, zero inflation, and perceived egalitarianism have been mainstays of the Castro communist system (putting aside the strong black market that exists in the country). Fears of loss of jobs, security, and homes, and reduced access to a perceived high-quality health care system are some of the concerns that would accompany any market reforms. Policy changes will have to be introduced very carefully, smoothly, and incrementally in a post-Castro Cuba, even though, as indicated, elements of it already exist. The implication, however, from these studies is that there may be only limited prospects for real market-based health care reform in the near term. More widespread reforms may only be forthcoming over time.

With the end of the Fidel Castro regime, negligible changes in the politics within Cuba and in foreign relations and trade between Cuba and the United States are indeed a possibility. Recent moves to strengthen the military infrastructure within the country seem to indicate this. If little political change occurs after a regime change, U.S. frustration will cause, if anything, increased U.S. restraints on trade with Cuba. If this scenario occurs, then it is quite possible that there will be more of the same, namely, continued deterioration of the economic situation within Cuba

with carryover to the health care sector. One can assume that the medical infrastructure, operating under compromised conditions within hospitals and clinics, would continue to deteriorate, with even more constraints on technology and equipment and fewer basic sanitary supplies. Housing and food shortages and current nutritional concerns would not be alleviated; vulnerable populations would continue to be at risk, and their health care problems would become worse. This would put increased strains on the already stressed medical care system. It is reasonable to expect that aggregate mental health would also continue to decline with resultant increases in murder and suicide rates. The government of Cuba would attempt to counter this situation by generating revenues with increased tourism, a factor already discussed as one of the major causes of an increased incidence of STDs and AIDS and a variable affecting the high rate of abortion in the country. More efforts to trade doctors and medications for oil will result from continued political processes, as Cuba will seek markets that are not foreclosed to trade. With this situation, however, will come continued frustration on the part of medical professionals. A combination of an oversupply of medical personnel, poor working conditions, and very poor remuneration will only reduce the morale of the medical care workforce even further. Ultimately, all these stresses will have consequences in terms of stress on the political system. The period of transition post-Castro will be an extremely critical period in the lives of Cubans.

So far, we have discussed issues associated with changes inside the country. What about the potential for investment of foreign capital in medical and health care from external sources? Again, concerns relate to the concept of significant market opportunities in Cuba after the fall of Castro. These opportunities may actually be more limited than has been anticipated by the exile community, not only for political reasons but also for economic reasons. Pointing out the large amount of foreign debt Cuba owes to numerous Western and Eastern Bloc countries and the fact that the economy has been handicapped over the last 10 to 15 years, Jaime Suchlicki indicates that these circumstances reinforce the concept that Cuba is now a poor country without the near-term resources to rebuild (1997). Until the economy improves and at least some of the debt is repaid or resolved, there may be fewer opportunities for investment in Cuba than many anticipate.

If there are to be any major opportunities for investment and potential growth, they may be found in the health care industry. As discussed, Cuba has developed its own pharmaceutical and biotechnology industries out of necessity. The country has highly trained scientific and medical talent and has invested in an infrastructure to meet domestic needs. Further, Cuba has sold pharmaceutical supplies and biotechnology in foreign markets, but it has been essentially foreclosed from selling to less developed countries, as they do not necessarily have the financial resources to afford products produced by Cuban firms.

Given that Cuba's talented and experienced professionals are paid minimally and that the appropriate infrastructures for production, research, and development are in place, partnerships with U.S. and other foreign-based pharmaceutical and biotechnology firms may present worthwhile opportunities for all parties. Foreign pharmaceutical and biotechnology firms would have access to relatively inexpensive professional labor and capital. The potential for scientists' brain drain, just as for medical personnel, could be lowered by offering professionals financial incentives to remain in the country. Partnerships like these would stimulate an infusion of new capital into Cuba, and the participation of foreign firms would allow for the expansion of output into the international marketplace, currently foreclosed to Cuban producers. With an infusion of capital, additional technology, necessary inputs, and know-how, these firms will be able to meet the pharmaceutical needs of the domestic economy as well. Such partnerships will also encourage imports of other necessary pharmaceuticals; hence, a wide selection of medications would be available. Such opportunities hinge upon the post-Castro administration's degree of openness and disposition toward the rest of the world. Transition, by its very nature, brings about instability. This is especially true when transitions rarely occur, offering few patterns associated with change. As Fidel Castro leaves power, whether voluntarily, by force, or by death, there will be many unknowns. This monograph has attempted to provide insights into how health care systems may react and adjust to change. Ultimately, we will not know the outcome until a change actually occurs. What is certain, however, is the fact that the health care system in Cuba will be an extremely important component of any political, economic, and social transition in the country as well as in this active region of the world.

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