A First Approximation Design of the Social Safety Net for a Democratic Cuba

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Executive Summary

This paper quantifies the 1992 social safety net of Cuba as consisting of cash expenditures of 2,396 million pesos and in-kind expenditures and subsidies of 2,162 million pesos. The combined social safety net in 1992 was enormous, comprising 37.0% of the gross domestic product (GDP) of Cuba and 55.4% of all payroll wages. Several reform proposals were analyzed to reduce the burden of the social safety net on a declining economy. These reform proposal were directed mainly at pensions (retirement, disability and survivor's pensions), health insurance and unemployment compensation.

The future burden of pensions is expected to grow appreciably as a result of the aging of the Cuban population and the extravagant retirement promises of the Castro regimen. To ameliorate the burden of the pensions, the reform proposals consisted of delaying the retirement age of the Cuban population to 65 years old for both sexes (up from the current 55 years for women and 60 years for men) and to allow younger workers to opt for privately-managed Individual Retirement Accounts (IRAs) as in the Chilean system. These proposal will have the effect of diminishing the burden of pensions from 20% to less than 15% of payrolls.

The health reform proposals focused on maintaining the previous high health outcomes (i.e. life expectancy, infant mortality etc.) of the Cuban health system in the eighties, while reducing over investment, excess manning and waste. The proposed health reform actions include: i) restricting the family doctors program solely to rural and mountain areas, 2) revising the Cuban ambulatory health standards from the current 9.3 visits person to the 5.6 visits per person characteristic of Western Europe and North America, 3) reducing hospital overhead costs by eliminating excess housekeeping and clerical staff, 4) increasing hospital bed utilization from the current 72% to the 80% utilization rates of the mid-eighties, and 5) reducing the general and administrative costs of the Ministry of Public Health per se, whose overhead costs are the highest in the world. In addition two health financing options were analyzed: a health insurance option with 20% co-payments and an option without co-payments. The combination of health reform actions and financing proposals results in reductions in health costs from the current health system costs of 17.6 % of payroll wages to 8.3 % of payroll wages in the case of the reformed system with co-payment insurance options. Without co-payments, the reformed health system costs would diminish to 10.4 % of payroll wages. Proposals for reform of unemployment compensation restricted the unemployment benefits to 50% of salaries, as in the rest of Latin America.

The reform proposals result in payroll tax rates of 19.63% of wages for the employers and 13.60% of wages for the employee; payroll rates which exceed by a small margin those of Costa Rica. While the proposed employer payroll tax rate is smaller than Mexico's, the Mexican employee payroll tax rate is smaller than the rate proposed for Cuba. The proposed employer payroll tax rate of 19.63% of wages has the following components: 10.7% tax rate for pensions, 2.8% tax rate for health insurance with co-payment provisions, and 6.13% tax rate for unemployment compensation. The employee 13.6% tax rate on wages includes: 8.8% tax rate for pensions, 2.80% tax rate for health insurance with co-payment provisions and 2.0% tax rate for unemployment compensation. The government's share of the reform proposal of the social safety net is 12%, the employer's share is 52% and the employee's share is 36%.

The government's share of the social safety net has therefore been reduced from the current 76% share to the proposed 12% share; the employer's share proposed is more than double the current 24% employer share.

Both the current and the proposed social safety net still result in considerable number of persons in poverty. A one-time increase in minimum wages from the current $ 1.55 US to $ 3.84 US is necessary to allow cuban workers to purchase the food rationing card in the black market, while the increase to $7.89 US will enable the Cuban workers to afford a balanced diet at black market prices. The Cuban minimum wage rates are so small in comparison to Cuba's international competitors, such as Jamaica, the Dominican Republic, Costa Rica and Mexico, that the proposed social safety net can be financed without adversely affecting Cuba's international competitiveness.

Study Objectives and Background

Previously undertaken studies on Cuba's social safety net have shown the effectiveness of the Revolution as provider of universal health coverage and care capable of meeting citizens expectations. Many nations attempted to imitate or adopt Cuba's system as a model-paradigm. Fewer studies discussed the feasibility of Cuba's safety net as a direct result of the generous former Soviet Union financial assistance. Undeniably, the health system of Cuba was remarkable but nevertheless costly in many ways.

Today, without the same level of foreign resources available, the system can no longer provide and maintain an adequate level of services, as expected by the population, despite assurances and commitment by the leadership. As Cuba enters a transitional period towards democracy with reduced levels of economic activity, the social safety net will be further compromised. This presents a challenge for the leadership of the country.

Cuba's current social safety net had a pre-revolutionary predecessor, very developed in some areas while substantially lacking in others. At the onset of the Revolution, 52 social insurance institutions called "cajas", "fondos", "cajas de retiro", "seguros profesionales" and "seguro de los trabajadores", provided coverage pension and survivors benefits only to 50.0 percent of the salaried workers.[2] Of the 28,033 million pesos contributed to these social insurance institutions, 60.3 percent were paid to public sector retirement plans, 20.7 percent were paid to professional sector retirement plans and the remainder 19.0 percent were contributed to labor union retirement funds.[3] In addition, maternity benefits had been provided since 1938. Among these maternity benefits were six weeks pre-and post-maternity salary payments to insured members. While there was no public policy on unemployment compensation, private organizations provided severance payment to its workers mostly under collective bargaining agreements. Social legislation made it almost impossible to dismiss workers, except for theft and other major causes (such as going out of business.)

While there was never a national health insurance, medical assistance in pre-revolutionary Cuba was provided by a mixture of public hospitals, mutualist organizations (which provided pre-paid health services equivalent to our health maintenance organizations(HMO's)) and private clinics. Although there was no universal coverage, this did not prevent pre- 1959 Cuba from achieving the highest health outcome indices (i.e. life expectancy at birth and doctors per 1000 population) of the Americas after the United States and Canada.[4] As Julie Feinsilver indicates:

Cuba's health ideology and organization are not purely the result of the socialist nature of the revolution. Important precursors can be found in pre-revolutionary medical organization and ideology. Perhaps the most important pre-revolutionary organization was mutualism, a prepaid health plan much like the health maintenance organizations that became prevalent in the United States in the 1970's.

These mutual-aid societies in Cuba were established around the turn of the century by Spanish ethnic societies, such as the Asturians and the Galicians, in order to provide comprehensive medical services for their members. In 1938, the Transport Workers Union of Havana founded its own mutualist clinic to serve its members and others willing to pay the low fees. For the first time, blacks were included in a mutualist plan. Mutualist practice later spread to private group practice because of the overabundance of physicians in Havana. Only a few mutualist societies, however, had facilities in some of the provincial capitals. No such services existed in the rural areas.[5]

Clearly, prior to 1960, the innovative system of health financing existing in Cuba was pioneering and advanced. However, the Revolution decided to create a free-of-charge universal safety net for both the rural and urban populations. This was made possible by the trade subsidies and foreign assistance provided by the former Soviet Union. This economic assistance provided needed scarce resources (oil) at subsidized prices and was paid for and financed with Cuba's primary export commodity (sugar) at prices exceeding the world market. This bonanza allowed the government to pursue otherwise unattainable health goals.

An accessible and cost-shared effective social safety net system will be of the utmost consideration in a future democratic Cuba. Cuba now realistically faces shrinking financial conditions due to lack of material resources. For example, the reorganization proposed and partially applied by the National Assembly of the Peoples Power will cause a substantial reduction in food subsidies, income and welfare level of services.

This study proposes to examine two issues. First, if the present system of cash in payments, unemployment compensation and pensions, food subsidies and others can be kept and continued at the same level despite declining revenues on the Nation's budget? or must the social safety net be restructured to insure its viability given the financial reality without obstructing the potential economic recovery and development under free market conditions in a Democratic Cuba?

This paper will explore several options for the design of a social safety net in a democratic Cuba. As a result of the unavailability of Cuban statistics on several of the topics researched in this paper, this exploration and analysis of the social safety net is labelled "a first approximation". In addition, some of the data needed for a complete design of options are not published by the Cuban Government. The methodology pursued in this paper uses on several occasions broad averages which need to be separated into components for the eventual final design of Cuba's social safety net.

Definition and Design Criteria of the Social Safety Net.

The social safety net is defined as "in-kind" and "cash" income transfers provided, for the purpose of maintaining a socially acceptable minimum level of health and welfare, higher or at least equal to the subsistence level provided to those households suffering from either temporary unemployment or from long term poverty. This definition of the social safety net is thereby associated with the definition of poverty and the desire to raise households above the subsistence level.

The focus on "in-kind" and on "cash" benefits assures the ability of the population in distress to rise above the subsistence level. This definition limits the social safety net to specifically include: pension plans, sick pay, unemployment compensation, social assistance payments, health benefits, housing subsidies, student aid and in-kind food distribution benefits (such as food stamps and specific food subsidies). Not included are: educational expenditures such as teacher salaries, books, repairs and depreciation of buildings and equipment. Student cash allowances and in-kind (room and board) aid are included. In addition, excluded in this first approximation are: employment training programs and public works and others, such as investments expenditures, which are sometimes included in some less

restrictive definitions of the social safety net.

Design Principles

The design of the proposed social safety net will abide by the following principles[6]:

a) Poverty Mitigation: the social safety net is designed to minimize the costs of avoiding poverty status by targeting the social transfers solely on the persons suffering from either unemployment and/or poverty. The poverty relief criterion insures that every one receives a level of income equal at least to the subsistence level.

b) International Microeconomic Efficiency: the social safety net is designed so as not to increase production costs for industries and products facing international trade competition.

c) Macroeconomic Efficiency: the social safety net does not contribute to budgetary imbalances.

d) Domestic Microeconomic Efficiency: the social safety net has no adverse effects on incentives to work, save and invest, and does not distort relative prices in the economy.

e) Administrative Ease and Cost: the social safety net is easy to administer, is resistant to fraud, and its cost is as inexpensive as possible.

The social safety net design options are evaluated in terms of the above principles in the last section of this paper.

Section I

An Overview of the Current Cuban Social Safety Net.

A brief overview of the social safety net of Cuba during the period 1980-1992 is presented. Table 1 presents the costs of pensions, unemployment compensation, health, social assistance and housing, food, and educational subsidies.

Pension and Maternity Benefits. These benefits comprise old age pensions, disability and survivor's pensions and maternity benefits. The costs and revenue figures for the selected years 1980-1987 come from Félix Argüelles Varcárcel[7]. The post-1987 figures come from the Comité Estatal de Trabajo y Seguridad Social[8].

Social Assistance Benefits. These benefits, which include some small in-kind components, were taken from Félix Argüelles Varcárcel's study of social security.[9]

Children attending day care facilities, called "Círculos Infantiles," also receive food subsidies. The cost of food per child per year at the Círculos Infantiles runs from 70-75 pesos; the parents pay a portion of these costs, which range from 3 to 40 pesos depending on their incomes. The subsidy hovers around 51 pesos per child assisting the day care facilities.[10]

Unemployment Compensation Benefits. Prior to the economic dislocations that started in 1990, Cuba had an unemployment compensation system based on years of working on the job. The benefits accumulated roughly as one month of unemployment compensation per year on the job, up to a maximum of one year of unemployment compensation.[11] Rodriguez and Carriazo Moreno[12] report that the average unemployment benefit paid in 1981 amounted to 70.0 percent of the average annual salary (i.e. corresponding to 170 pesos per month) and that according to the 1981 Census of Population and Housing

the unemployment rate was 3.4 percent of the economically active population. By November 1990, the unemployment compensation system was changed to adapt it somewhat to the economic dislocation and high unemployment rates which resulted from the loss of the Russian trade subsidies and foreign aid. This current, post-1990 system has been excellently summarized by Carmelo Mesa-Lago[13] and its cost is estimated in this section.

The first analytical step consists of estimating the amount of unemployment in 1989 and in 1992. Estimates and projections of the Cuban labor force are available from the International Labor Organization (ILO)[14], but suffer from discrepancies between the actual population figures and the ILO population projections, as well as between the labor force participation rates projected by the ILO and the actual labor force participation rates of several cohort groups. For example, there are major differences between the 1990 labor force participation rates projected by the ILO for the cohorts in age groups 55-64 and 65+ years old and the actual labor force participation rates experienced by these age cohort groups in 1989 as published in the 1989 Anuario Estadístico de Cuba.[15]

In view of these discrepancies, it was decided to use the ILO labor force participation rates, except for the cohort age groups in question, whose labor force participation rates would be taken from the actual 1989 employment figures. These labor force participation rates were applied to the actual population figures published by the Cuban government.[16] Procedure which resulted in estimates of the economically active population of the order of 4.366 million persons in 1989 and 4.493 million persons in 1992. The 6% unemployment rate typical of 1989 results in an estimate of 247,000 unemployed persons, who were compensated at 70% of average salaries under the old unemployment compensation regime.

An earlier study by the authors[17] estimated the 1992 civilian employment as 3.006 million workers , a significant decrease from the actual 1989 employment level of 3.87 million persons. Assuming a military employment level of 320,000 persons[18] in 1992 (the lowest level possible is 250,000 persons) renders an unemployment level of 1.167 million persons in 1992, more than four times the number of unemployed in 1989. This estimate of the unemployed in 1992 is larger than Mesa-Lago's who assumes a level double our estimate of the size of the armed forces of Cuba.

The rest of this analysis follows Mesa-Lago's cost analysis of unemployment compensation benefits, referred to earlier. The benefits include unemployment compensation for the 143,000 new entrants into the 1992 labor force, 80% of which are assumed not to find jobs and to receive unemployment benefits of 1,220 pesos per year. Of the remaining persons in the unemployment pool, that is, 1,052,600 persons in 1992, 50% are reassigned to other jobs, with the remaining 526,300 persons not reassigned receiving unemployment compensation benefits of 1,383 pesos annually. These employability assumptions and benefit amounts are identical to Mesa-Lago's but result in higher unemployment compensation costs of 867.44 million pesos in 1992 due to differences in the estimates of the persons employed. Mesa-Lago's lower estimates are due to using un-adjusted ILO population projections and labor force participation rates and finally to estimating a larger Cuban armed forces.

Health Benefits. The health benefit figures include both current and capital expenditures on health. The source of these figures is the Cuban Ministry of Health[19].

Housing Subsidies. The housing stock was projected using as a starting point the 1981 estimate of 2,364,778 units.[20] The additions to the housing stock were projected using the rates of net new units presented in Carmelo Mesa-Lago's study of the Cuban social safety net[21]. Eight percent of the number of housing units were assumed to pay subsidized rents amounting to six percent of average incomes, while six percent of the units were assumed to be subsidized but paid no rents. The rest of the eighty-four percent of the housing units were assumed to be privately owned. These proportions come from the

Cuban Census of Population of 1970, as quoted by Mesa-Lago[22], and are used in this first approximation for the lack of better figures. The subsidy per unit was estimated as the difference between rents paid (i.e. at 6% of average incomes) and the cost of repairs, which according to Mesa-Lago[23] was three times the value of subsidized rents in the socialist block countries.

Food Subsidies. As discussed in an earlier paper by some of the authors[24], the Cuban average wage rates comprise only 70 percent of the value of the marginal productivity of labor. Accounting in part for this discrepancy between wages and marginal productivity is the Cuban government policy of subsidizing the retail prices of food, clothing and electricity so as to develop a distribution of consumption expenditures that is more equal than the distribution of wages.

Estimates of the magnitude of the food subsidies vary significantly. Relying on Claes Brundenius figures[25], Medea Benjamin, Joseph Collins, and Michael Scott[26] reported that the food subsidies in 1980, including both retail sales subsidies and subsidized meals at work places, were of the order of 25 pesos per month per person, which results in a high estimate of food subsidies of 2,908.2 million pesos for 1980. A more moderate estimate is presented by Rodriguez and Carriazo Moreno[27], who based on information published in the newspaper Gramma[28], estimated that the differences between retail prices and production costs for key food items were 1,887 million pesos in 1980. According to Rodriguez and Carriazo Moreno, the 1981 price reform reduced these subsidies to 671 million pesos for 1981.

More recent information on food subsidies is presented by Enrique Pérez Marín and Eduardo Muñoz Baños[29], who mention that the Cuban government during the eighties financed nearly three million food rations daily via food and nutrition programs at hospitals, schools and at work places, supplying nearly 20% of the calories and nutrients of the Cuban population during this period. Pérez Marín and Muñoz Baños[30] also mention that by 1987, the Cuban government was financing deficits in agricultural production of the order of 600-800 million pesos annually to subsidize food consumption. These figures appear conservative and do not take into account subsidies in transportation, commercialization and marketing, and industrial processing.

Students' Room and Board Subsidies. The educational subsidies included in the Cuban social safety net include in-kind benefits, such as room, board (food) and clothing given free of charge to boarding students and the board and clothing awarded to semi-boarding (semi-internos). In addition a selected number of students from low income families receive a monthly cash stipend of 10-20 pesos.[31] However, this cash benefit is not estimated in this study because data could not be located on the number of students who received the stipend.

The room and board subsidies were estimated by comparing the costs of elementary, secondary, higher and special education of regular students, boarding students and semi-boarding students. Differences between the costs of regular students and semi-boarding students were estimated as 72 pesos per student, closely corresponding to the costs of feeding children in day care facilities. Differences between the costs of boarding and semi-boarding students were estimated as 60 pesos per student for room and 72 pesos for board (food). These annual cost figures were developed from the information presented by Rodríguez and Carriazo Moreno[32] and are close to the costs presented in Brundenius[33].

Summary of the social safety net

An initial analysis of the social safety net, as portrayed in Table 1 , reveals a structure of benefits that is largely non-targeted, with most of the benefits accruing to the general population, rather than to the poor. Indeed, only the unemployment compensation program, the nutrition program at the day care centers, the social assistance programs, and the housing subsidy program appear targeted on the needy, the poor and the unemployed.

In addition, all the social safety net programs contribute to the macroeconomic budgetary imbalance. Adding housing subsidies, food subsidies, day care subsidies and educational room and board subsidies at their 1989 levels to the 1992 expenses in pensions, unemployment and health care results in an estimate of the 1992 Cuban social safety net of $4,558.3 million pesos, amounting to 37.0 percent of the Gross Domestic Product (GDP) and 55.4 percent of 1992 wage-bill of the Cuban economy. In 1992, cash expenditures amounted to 2,396 million pesos, that is, 52.6 percent of the social safety net. The in-kind transfers were approximately 47.4% of the social safety net. The pension and maternity programs only recovered 55% of their costs in 1987, and the only other program with a user fee or social insurance payment is the day care. Unemployment benefits, health benefits are provided free, without a social insurance copayment, and food price discounts are huge. By their lack of reliance on market mechanisms to finance the social safety net, the Cuban government is seriously affecting its domestic microeconomic performance and incentives to reduce waste in the system.

A first step in the right direction would be to end subsidies to food and other consumption goods, with a concomitant one-time increase in wages and pension payments in order not to reduce the income and well-being of the general population affected. This would mean increasing 1989 wages and pension payments by as much as 800 million pesos, (i.e. increasing total wages paid by 686 million pesos and pension payments by 113 million pesos). Other elements of the social safety net require more complex reforms and redesigns and are discussed next in more detail. These include pension and maternity benefits, health insurance and unemployment compensation.

Section II

HEALTH SYSTEM REFORM OPTIONS

Cuba, a developing country, has been able to achieve significant improvements in health conditions comparable until recently to the health standards of the western democracies in Europe and North America (excluding Mexico). But the costs of achieving these improved health standards have been high, amounting in 1993 to 11.7 percent of the Cuban Gross Domestic Product (GDP).[34] In spite of this large cost, the trend in the health costs is still upwards as the Castro government continues to go forward with ambitious and expensive health programs that involve expanding hospital facilities above the already high levels of service provided[35], achieving rates of doctors per person double that of the United States rates by the year 2000[36], and deploying new doctors in the "Médico de Familia" program, which aspires to place a doctor in every block to serve the Cuban population. Since the cost of the current system, cannot possibly be financed from Cuba's declining economic prospects, this section focuses on costing the options for reforming the current health system. Indeed the task before us is how to maintain the high health outcomes while cutting the waste. The current health system of Cuba includes at least four parallel systems. One system serves foreigners who visit Cuba to receive medical treatment and thus contribute to the local economy as "medical tourists". Treatment for these patients is provided at the 44-bed Cira García hospital in La Habana[37], but this sub-sector is not analyzed here, since the resources spent on it are negligible compared with the overall health budget. Another high quality system serves the "nomenclatura" of government and party officials but, because no data on the hospitals and polyclinics serving this group has ever been published, it is not possible to specifically analyze separately this sub-sector. A third system serves the military and its dependents and is not analyzed in this paper because of the dearth of data on its operations. The fourth system serves the general population and is the subject of this research. Political dissidents are frequently denied medical access and are sometimes tortured at government hospital facilities[38], but there is no separate system serving them.

The national health system of Cuba provides several categories of care at the sector, area, municipality, provincial and national levels. As shown in Figure 1, the family doctors' offices and the rural medical posts provide primary health services at very small population sector levels (comprising 700 persons for

the family doctors). Polyclinics, rural hospitals and maternity homes serve larger areas and municipalities. The polyclinics provide specialized services to patients referred to by family doctors. Hospitals, blood banks and laboratories are under the control of provincial authorities, while at the national level there are national research institutes, such as those for oncology, neurology, tropical medicine and cardiovascular surgery among others, plus the Ministry of Public Health, which administers the overall system.

Background

As shown in Table 2 , the pre-revolutionary health standards of Cuba have been much maligned. At the onset of the revolution in 1959, Cuba's health indices, such as life expectancy at birth, and doctors per 1,000 persons ranked at the top of Latin America and were third, albeit a distant third in the Americas, only exceeded by those of the United States and Canada. Cuba's supply of doctors per person was ranked 11th in the world, above countries like France, the United Kingdom, Japan, Spain, Holland, Uruguay, Chile and Belgium among others.[39] Cuba's infant mortality rate and hospital beds per person were also among the top in Latin America, very close to those of Argentina and Uruguay.[40] Admitting that there was a concentration of health sector resources in La Habana, concentration still remaining in our days, and that the rural sector was unattended, does not detract from the accomplishments of medicine in pre-revolutionary Cuba. Indeed the Cuban life expectancy at birth in 1960 was only slightly less than the United States rate in the same period[41] (i.e. 64 years for Cuba in 1960[42] vs. 68 years for the United States in 1954[43]).

While the pre-revolutionary health system provided a good base from which to refine and improve the health system, the loss of Cuban doctors who emigrated abroad after the revolution threw the health system of Cuba into a tailspin from which it did not recover until the early seventies, but (as shown in Table 2) the improvement in health standards has continued since, with only a slight interruption in the mid-eighties (incident which led to the firing of the Cuban Minister of Public Health at the time). When in 1979 the World Health Organization (WHO) and the Pan American Health Organization (PAHO) began their world wide initiative on Health For All by the Year 2000, Cuba proudly proclaimed that the WHO/PAHO health outcome objectives and goals had already been achieved in Cuba[44]. But as shown in Table 2 , the cost of achieving these improved health outcomes was taking an increasing share of Cuba's resources in a country which had difficulty feeding itself, had a need to ration consumer goods, clothing and shoes due to their scarcity, and was experiencing a significant housing deficit of at least one million dwellings[45].

The phase-out and eventual elimination of the large Russian trade subsidies and its concomitant impact on reducing the Cuban GDP has had inevitable effects on Cuba's health standards. First, as its economy progressively shrinks, the share of GDP devoted to health has burgeoned to such a high level (i.e. 11.7% of GDP) that is exceeded only by the inefficient U.S. health system currently awaiting reform. Kathleen Barrett[46] reports that as a result of the economic difficulties, Cuba does not have the capability to pay for the raw materials used in the manufacture of 85% of the medicines consumed in Cuba, and this has resulted in the lack of 229 important drugs (i.e. insulin, antibiotics, etc.) as well as basic medical supplies, such as surgical supplies, X-ray plates etc. As a consequence, some important health problems are cropping up[47]. In late 1991, more than 50 thousand persons became affected with optic neuritis (optic myelo neuropathy), a disease due to serious deficiencies of vitamin B and which produces inflammation and damage to the optic nerve. In early 1993 UNICEF[48] reported that 50 % of the infants between six and twelve months showed symptoms of anemia, in addition to the report that 10 % of the children between six and eleven years old suffer from goiter[49]. By mid-1993, according to G. Gunn[50], mortality rates in nursing homes had doubled from those of the previous year. In a recent paper, Ricardo A. Puerta[51] mentions that malaria and tuberculosis, illnesses that had been eradicated have reappeared and that due to the lack of nutrients and vitamins there are numerous cases of skin

infections, lice, pellagra and chicken-pox affecting the population.

Waste, Over-Investment, Coercion and Social Control in the Cuban Health System.

In his insightful analysis of the Cuban health system, David Werner[52] extols its achievements, while criticizing the lack of cost-effectiveness considerations in its design, its not choosing technology more appropriate to a developing country, and the coercion and method of social control inherent in its operations. Werner concludes that the Cuban health system, because of its high costs and its features, criticized above, is not a model for use in other developing countries. This section expands on Werner's ideas. According to Werner, the founding principles of the Cuban health system are officially stated as follows:[53]

1.The health of the people is the full responsibility of the State.

2.Universal health coverage is guaranteed to all persons without discrimination.

3.The people must participate actively to assure and maintain the high health levels.

4.Preventive care is the primary goal of health care.

Except for both the first principle of over-reliance on the State and the Cuban government's use of coercion in the context of the third principle under the ruse of citizen participation, there is no inherent problem with incorporating the other principles in the re-design of options for the Cuban health system. In the options to be analyzed in this paper, the State is not the only health provider, since private health facilities will be available in a free market Cuba. In addition, the individuals, employers and employees will contribute to the financing of health care, thus, the current State control will be broken.

The participation of citizens in the health system of a democratic Cuba will not be coerced. The current policies of compulsory doctors visits for pregnant women and infants will be abolished. Coercive policies in current use include having mothers and pregnant women receive visits from representatives of the Neighborhood Comites for the Defense of the Revolution (comités de barrios) and by representatives of the Federation of Cuban Women whenever they fail to show up for scheduled visits. These "come to the doctor or else" policies contribute to the high rates of use (or abuse) of the health system and should have no place in the future redesign. In Cuba today, pregnant women have become producers of intermediate inputs for the manufacture of biotechnology products.[54] Between the eight and twelfth weeks of their pregnancies, women have to collect daily their urine for the extraction of estrogens and other hormones. The government also has a placenta collection program. Potential mothers involved in complicated pregnancies, which endanger the life of the mother and the child, and those women suffering from high risk conditions, such as those hypertensive or diabetes, are counseled to consider the possibilities of abortion if necessary. This may help to explain the high incidence of abortions in Cuba, where abortion is practiced as a form of population control. In 1986, approximately 49.1 percent of all pregnant women ended their pregnancies with abortions; this rate has since declined to the still large rate of 41.2 per 100 pregnant women in 1992.[55]

The lack of cost-effectiveness considerations in the Cuban health system are indicated in Table 3 , which compares Cuban health statistics with those of other countries. It should be noted from this Table that several countries (i.e. Spain, Greece, Portugal, Costa Rica, Hong Kong, Jamaica and some of the Caribbean Islands) achieve high health outcomes standards (i.e life expectancy at birth and infant mortality rates) comparable to those of Cuba, but at a significantly lower cost, measured in terms of percentage of GDP devoted to health. Another indication of the inefficiency and waste in the Cuban health sector is its requirement for larger rates of input (i.e. doctors, nurses and hospital beds per 1000

persons) than countries with comparable health outcomes status. A final comment derived from the statistics presented in Table 3 concerns the use of appropriate technology. The Cuban health system, with its over-reliance on doctors rather than relying on nurses, on community health workers and on paraprofessionals, has chosen patterns of health operation more akin to those of highly developed countries with their concomitant higher costs. A contrast of Cuba's health input rates and those of the Caribbean Islands presented in Table 3 drives forth this point, also emphasized by David Werner[56].

Other examples of waste and inefficiency in the Cuban health system are the excess labor and the deterioration in the efficient use of hospitals in Cuba. According to the Ministry of Public Health[57], workers such as : day-laborers, (i.e. called "peons" in Cuba), gardeners, cooks, cleaning services, clerical workers and non-professional health care personnel accounted for nearly 51.2 percent of the 274,544 workers employed in the Cuban Health sector in 1987. The Cuban health system has therefore a dimension other than health, namely, it is also an employment program! Efficient utilization of hospital beds has been declining from the high utilization rates of 80 percent of hospital beds of the early and mid-eighties, utilization rates which -as shown in Table 4 were comparable to the best in Western Europe, to the currently lower utilization rates which now have a range in the low seventies (i.e. 72.2 % - 72.6 % in 1992). Worldwide hospital staffing ratios, presented in Table 5 , also show that there is excess labor in Cuban hospitals. The Cuban hospitals have higher rates of usage of doctors than most countries, close to Sweden's 2.45 full-time equivalent employees per patient-day, but below the U.S rate of 3.38 full-time staff per patient-day[58], and have rates of use of nonskilled personnel as high as India[59]. If the proper role of public policy in Cuba is to maintain the high rates of health outcomes, while reducing waste and unnecessary costs to achieve cost levels that can be financed out of domestic resources, then the hospital sector is a good place to begin the cost reduction process.

A final source of inefficiency and waste is the high amount of resources spent on general administration at the Ministry of Public Health level. These costs, which include public health, research and administrative functions are generally between 6.0% and 9.6% of the total health resources.[60] But in Cuba, if defined to include research institutes, the overseas medical program and the Ministry of Public Health general and administrative expenses, (see the section on health costs below) these costs are a staggering 21-24 percent of the total health costs. This is another area that requires adjustments.

There is clearly an over-investment of resources in the Cuban health system. Patterns of use of hospitals and ambulatory care facilities (polyclinics and the family doctors program) reveal that the number of outpatient and ambulatory doctor visits (excluding visits to the dentist) per person in Cuba exceeds the comparable per capita rates of outpatient visits of most developed countries in Western Europe and the Americas[61]. Roemer[62] reveals that in the planning of Cuban ambulatory care facilities (i.e. polyclinics) in the early seventies, Cuba used the medical standard of five annual doctor visits per person derived from the United Kingdom's [63] socialized medicine experience. But the Cuban experience reveals rates of outpatient and ambulatory health visits which exceed even the high standards of the developed countries. In Cuba, the 1992 average number of obstetric doctor visits of pregnant women who give birth is 15.3 visits[64] (assuming 3 obstetric doctor visits for those women that terminate their pregnancies via abortion), and healthy babies less than one year old are required to see the doctor fifteen annual scheduled visits[65]. The number of annual doctor visits per person has been growing in Cuba steadily since the early seventies.

The original Cuban standard of five doctor visits per person had already been achieved by 1981, but kept growing throughout the eighties. In 1983, previous to the start of the family doctors program, 5.2 outpatient and ambulatory doctors visits per capita were experienced. But the growth of the family doctors program has led to significant further growth in visits to doctors. In 1987 visits to doctors at polyclinics and outpatient services at hospitals were 6.4 per person, which added to the per capita visits to family doctors resulted in a grand total of 7.3 doctor visits per person. Even further growth was

achieved by 1992, where visits to doctors at polyclinics and at hospital outpatient services were 6.3 per person while visits to family doctors were 2.9 per person, for a grand total of 9.3 doctor visits per person, that is, a virtual doubling of the ambulatory standard for doctor visits in spite of the economic difficulties experienced by Cuba.

The Cuban ambulatory usage rates are higher than those of the United States[66], which were 5.6 doctor contacts (including contacts over the telephone) and 4.9 doctor visits per capita in 1991, higher than those of Canada, which experienced rates of 5.5 doctor visits per person in 1983[67], and even higher than the rates for Sweden, which are 88.7 percent of the British rates.[68]. The Cuban rates of medical visits are also much higher than those of Latin American and Caribbean countries with high health outcomes status, that is, higher than the rates of 3.5 visits in Uruguay (1983), 3.02 in Costa Rica(1988), 3.00 in Barbados (1983), 2.63 in Panama (1988), and the per capita rates of 2.10 in Jamaica (1982) and Bahamas (1988)[69]. In fact, the high Cuban rates of doctors visits per person are comparable only to those of the USSR in pre-perestroika days[70], which were 8.9 visits per person and which have declined ever since after perestroika eliminated the coercion and social control inherent in the prescribed required scheduled visits which used to characterize the health systems of countries in the socialist camp.

The problem of over-design and over-investment have been compounded by the design and expansion of the Cuban family doctor program[71] begun in 1984, at the height of the subsidies received from the USSR. The program consists of training and deploying one family doctor and one family nurse for every 120-140 families (600-700 persons). The family doctors provide primary health care at residences, work places, schools, day care centers, homes for the aged etc. The program was started with 237 family doctors in 1984, by 1987 the number of family doctors had reached 4,021 doctors, by 1989 there were 6,211 doctors, by 1990 there were 11,901 family doctors in the field and 22,021 family doctors by October 1993. By the end of 1990 nearly 57 percent of the population of Cuba was served by family doctors, figure that increased to 90.1 percent by the end of 1993.[72] The family doctors program is expected to be continued until the year 2000 and will bring nearly all the population of Cuba to be served by the family doctors. While the family doctors are less expensive to train and deploy, it is difficult to find justification for this program, begun when Cuba had already achieved its health outcomes status much admired throughout the world. In all probability, this program brings decreasing returns to investments in the Cuban health system. Even supporters of the family doctor program signal caution on its expansion. The UNICEF[73] program plan, referred to earlier, cautions that the magnitude of the growing expense of the family doctor program signals the convenience of reexamining the expansion and functioning of this program so as to consider the possibility of making more intensive use of the polyclinics and of existing installations and equipment for the doctors' offices and of introducing more flexibility in the expansion of the program by changing the deployment planning ratio of doctors per person or per family.

If Cuba is to conserve and maintain its high health status achieved during the revolution, it will need to rationalize its health delivery system by cutting the instances of waste, inefficiency and over-investment noted above. Proposals for improving the cost-effectiveness of the Cuban health system while not affecting its outstanding health outcomes are presented in a later section, but first, the demand and cost models used in the redesign of the Cuban health sector are described next.

A First Approximation Model of the Cuban Health System.

A simple model of the Cuban health system is presented below. It includes a demand model to project the use of ambulatory and hospital facilities and a cost model. The cost model uses a parametric building-block design and traces the costs of labor, materials, food, medicines and depreciation for ambulatory services, hospitals and general overhead costs (such as research facilities and the general Ministry of Public Health administration costs).

Demand Model for Health Care.

A simple demand model traces the demand for outpatient and ambulatory visits and the demand for hospital inpatient services as functions of

the age composition of the Cuban population[74], incomes, and prices/fees charged.

Demand for Ambulatory Care: Doctors Visits. The demand model for outpatient and ambulatory visits was specified as a parametric demand model combining actual Cuban data on doctors visits for each age group with income and price elasticities from the literature on health in developing countries. The nine cohort age groups specified are presented in Tables 6a and Table 6b. Unfortunately, the Cuban health data is not reported in enough detail that would allow distinguishing those persons older than 75 years old. The 1992 rates of doctors visits for each of the above cohort groups is presented in Table 6a , which was estimated largely from the annual reports ("Informes Anuales") of the Cuban Ministry of Health combined with some information from the Cuban health literature.

The number of doctors visits per person in 1992 is the largest for infants less than one year old (at 40.7 annual visits per child) and begins to decline by age. Children between 1-4 years old have rates of 12.1 annual visits, and the rate is 10.7 annual visits per child aged 5-14. After the age of 14 years, women show higher rates of doctors visits than men. Women older than 65 years old exhibit the highest rates (at 10.8 annual visits) among adult women, and the same is true of the men older than 65 years old (at 10.5 annual visits) . Using the same methodology presented in Table 6a , the per capita rates of doctors visits were estimated for 1987, a year when the family doctors program was still getting off the ground. The results, presented in Table 6b, reveal smaller rates of demand, specially for the infants less than one year old. These infants have 1987 usage rates of 23.5 annual visits per capita, that is, almost half of the 1992 rates, but the increases in visits per person for all the other cohort groups are very moderate. In 1987, children 1-4 years old had rates of 9.9 annual visits per child, children aged 5-14 had per capita rates of 8.1 annual visits. Males aged 15-49 visited doctors 7.7 annually, while females of the same age went 9.4 times annually.In the age group 50-65, males went to the doctor 7.7 times and females went 8.3 times annually; and for the oldest group with more than 65 years of age, males visited the doctor 9.5 and females 10.0 times annually. In view of these figures one cannot help but conclude that the whole thrust of the family doctors program is to reduce further the already small infant mortality rate of Cuba, with all the political propaganda benefits that flow from the reduction.

The 1991 rates of doctors contacts per person for comparable age cohort groups in the United States are smaller. Children aged 5-14 had 3.4 contacts, adults aged 15-44 had 4.7 contacts, adults aged 45-64 experienced 6.6 contacts, with only those 65 years old and over having comparable levels of doctors contacts to the Cubans, in this case 10.4 doctors contacts per person[75]. Again, this discussion brings forth the over-design and over-investment features of the Cuban health system and the probability of decreasing returns to the family doctors program.

More insights on the inefficient overuse of Cuban ambulatory health services is provided by a comparison of Cuban and U.S. standards of number of doctors' visits for infants and pregnant women. Regarding uncomplicated pregnancies, the U.S. standard is: doctors' visits "every 4 weeks for the first 28 weeks of pregnancy, every 2-3 weeks until 36 weeks of gestation and weekly thereafter."[76], that is, a total of 12 visits during a 37-week uncomplicated pregnancy. The Cuban standard for a normal pregnancy is once a month visits during the first 32-34 weeks, and thereafter once per week until up to 37 weeks, that is, a total of 12-13 doctors' visits during a 37 week uncomplicated pregnancy[77]. Thus differences in the usage rates of ambulatory facilities by pregnant women in both countries are due mainly to the family doctors program and perhaps to a higher incidence of complicated pregnancies in Cuba.

However, the situation is different for infants. The Cuban standard for doctors' visits of healthy babies is every 15 days for the first three months and once a month thereafter, that is , a total of 16 annual visits (including the new born visit) per healthy baby; after the first birthday, the child visits the family doctor once per month.[78] The equivalent U.S. standard for healthy children comes from the American Academy of Pediatrics[79] and consists of 22 patient visits from pre-natal to age 20. Specific visit rates by age group are: eight visits for children under one year of age, including the pre-natal visit, the new born visit, and visits at 2-4 weeks, at 2 months, at 4 months, at 6 months, at 9 months and at 12 months; children 1-4 years old are prescribed five visits, including visits at 15 months, 18 months, 24 months, 3 years and 4 years; children 5-14 years old have six prescribed visits, including visits at 5 years, 6 years, 8 years, 10 years, 12 years and 14 years. The standard for doctors' visits by young adults aged 15-20 years old includes visits at 16 years, 18 years and 20 years. In the case of children the Cuban standard for doctors' visits, which is double the U.S. standard, is clearly excessive.

The demand equations for outpatient and ambulatory doctors visits are of the following form:

(1) Vit = Vi,t+0 Ytey Ptep

where:

Vit =Doctors visits in ambulatory and outpatient settings (including visits under the family doctor program) by cohort group i during time t.

Vi,t+0 =Doctor visits in ambulatory and outpatients settings (including visits under the family doctors program) by cohort group i during the baseline period or time t+0.

Yt =Average Wage rate during year t.

Pt =Price Index of health care costs during time t (Pt+0 =0 during time t+0).

ey and eprepresent the income and price elasticities of demand respectively.

While the time t+0 or baseline doctors visits rates are those derived from Table 6, the demand elasticities are imputed from the literature. Thus, the income elasticity of demand is assumed to be + 0.3 as estimated by Birdsall et all[80] in Mali, while the price elasticity is assumed to be 20, that is, within the range of price elasticities estimated for Peru (-0.46) in 1985, for the Ivory Coast (-0.32) in 1985, for Kenya (-0.20) in 1984, for Malaysia (-0.15) in 1975, and for Sudan (-0.37) in 1986.[81]

The average wage rates, defined in terms of constant 1992 pesos in the full privatization scenario, come from an earlier study[82] of the authors and the wage levels are: 2,737 pesos in year t+0, 2,737 pesos in year t+5, 2,834 pesos in year t+10,, 3,176 pesos in year t+15 under the CBI scenario and 3,473 pesos in year t+15 in the NAFTA scenario. Following the Cuban experience, outlined in the Ministry of Public Health's 1992 Informe Anual, it is assumed that 81.1 % of external health visits take place at the polyclinics, while 32.2 % of outpatient visits to emergency rooms also take place at polyclinics.

Because there is no charge for health services in Cuba to speak of, the price variable cannot be used the way it is represented in equation 1, that is with a point elasticity. Instead, the price portion of equation 1 is re-interpreted as a mid-point elasticity of the following functional form[83], which tends to minimize the analytical complications that arinse due to the problem of zero prices:

$$(2)\ evp = \frac{(Vit - Vi,t+0)(Pit - Pi,t+0)}{\qquad\qquad}$$

(Vit + Vi,t+0)/2 (Pit + Pi,t+0)/2

whose terms have been defined above in equation (1).

Demand for Hospital Inpatient Care. - The demand for hospital care considers both per capita admissions to hospitals and per capita hospital patient-days, this last concept being of greater importance because of its direct link with hospital costs. Using the same procedure used above in the analysis of doctors visits, the usage rates of inpatient hospital services were allocated to the same cohort age and sex groups . The usage rates are presented in Table 7 for hospital admissions, and in Table 8 for hospital inpatient days . As shown in Table 7, infants have the highest admissions rates (at 35.5 admissions per 100 infants in 1992), followed by females and males older than 65 years old (at 21.1 and 18.3 admissions per 100 persons respectively), but that is not the case of the patient-days, which are presented in Table 8. Except for in year 1992, persons aged 65 and over show the highest rates of patient-days per person (at 299-311 patient-days per 100 persons in 1990), followed by the infants less than one year old (at 282.7 patient days per 100 babies).

The demand function for inpatient hospital service is given by:

(3) Hit = Hi,t+0 Ytey Ptep

whose terms are identical to the specification in equation (1) except for the substitution of the variable H (patient-days of hospitalization) for the previous variable V (doctors visits). The specification of the price elasticity as a mid-point elasticity as in equation (2) applies as well to the hospital equation. The income elasticity of demand is assumed to be +0.30 as specified for outpatient and ambulatory services, while the price elasticity of demand is set at -0.20, that is, lower than the average between the price elasticity of inpatient hospital services in Peru (-0.41) in 1985, and the Ivory Coast (-0.38) in 1985.[84]

Cuban health authorities[85] have been claiming that cost savings have been effected by reductions in hospital admissions and costs as the result of the increased number of doctors visits in the family doctors program. The UNICEF[86] document on the family doctors program echoes this asseveration when claiming that the growth of the family program in Pinar del Rio province has led to reductions in hospital admissions from 1985 to 1990. Several important authors[87] have accepted the Cuban governments claims at face value. While a thorough research of the issue of the substitutability of family doctors visits for hospital admission is beyond the scope of this first approximation model, some thoughts on this important issue are presented next.

To research the issue of the substitutability of family doctors visits for hospital admissions a data base was assembled on hospital admissions by age and sex cohorts for selected years 1980-1992. This data is presented in Table 7. Earlier we presented data on visits to family doctors by age group which showed that the greatest impact of the family doctors were on infants under one year of age and to a lesser extent the children aged 1-4 and 5-14, with the other age cohort groups largely unaffected. However a look at the time series of hospital admissions by cohort groups reveals that children aged 0-14 years old experience large drops in hospital admissions rates from the start of the family doctors program to the intermediate year 1987, as should be expected according to the thrust of the family doctors program on these age groups. But that for all the other age and sex cohorts there is an increase in hospital admission rates up to 1987, since the family doctors program has less of an incidence on these groups. However all the cohort groups--those affected and those unaffected by the family doctors program--experience large drops in hospital admission rates by 1992. This leads us to believe that there is another force at work affecting the large declines in hospital admissions in 1992, that is intimately connected to the economic crisis and the unavailability of the medicines and pharmaceutical drug products previously available free-of-charge at hospitals (but they were not free-of-charge at the polyclinics, which provided an economic

incentive to go to the hospital to receive health services).

Cost Model of Health Care

A simple cost model of the Cuban health care system is presented in this section. The model structure is parametric, this means that costs are computed by simple multiplication of wages times work force in each occupational category, with other parameters for food, medicines, supplies, repairs and depreciation imputed from the Cuban data and from the experience of other developing countries.

Cost data from the Cuban health system is hard to come by and in the few cases when published it is published at high levels of aggregation, so that no information appears on cost elements or cost components. For many years, the 1979 hospital operating cost figure of 19.81 pesos per bed per day has been used for analytical purposes in several Cuban medical journals[88], cost figures verified by other investigators. Alemán and his associates estimated hospital operating costs per bed per day of 19.80 pesos in the period 1981-86 and 19.25 pesos per bed per day in 1986.[89] These cost figures have been updated in a more recent article, quoted earlier, in which Osvaldo Castro[90] estimated hospital operating costs of 25.49 pesos per bed per day in 1990, 25.46 pesos per bed-day in 1989, 26.44 pesos per bed-day in 1987, 25.21 pesos per bed-day in 1985, 22.97 pesos per bed-day in 1983 and 20.28 pesos per bed-day in 1981. In his article, O. Castro presents slightly detailed costs by type of care: hospitals and ambulatory care services, and within these categories a further separation into two cost elements: labor and all other costs.

While certainly an improvement over the previous cost analysis, O. Castro's methodology still suffers from two problems. One problem concerns the fact that his cost figures are much smaller than the Ministry of Public Health operating budget (excluding capital investments). Thus, O. Castro's cost data excludes overhead functions such as research and development and the general administrative functions performed at the national level by the Ministry personnel in La Habana. This problem in Castro's cost analysis is confirmed by the health-related cost data presented in the Anuario Estadístico de Cuba and in the Ministry of Public Health's Informes Anuales. The Informes Anuales present data on total employees working in the health sector and the Anuarios present the average salaries paid to them. Multiplication of these two items results in personnel costs which exceed the labor costs presented by Castro. A second problem concerns the level of aggregation in Castro's cost figures and its inability to distinguish between: intermediate costs(i.e. the costs of X-rays, laboratories, physiotherapy etc.), final costs (i.e. outpatient and inpatient hospital services in Medicine, Surgery, Pediatrics and Obstetrics-Gynecology, among others) and overhead costs (administration, housekeeping, maintenance and utilities). Because of these problems, it was decided to build upon Castro's methodology by further separating into components and detailing his cost structure using data from Cuba's manning standards.

Calibrating Personnel Costs. The first step in the development of separate disjoined cost figures is the calibration of the personnel costs. To that effect the number of persons in the health work force (274,544 persons in 1987, and 290,799 persons in 1989) were collected from the Informes Anuales[91] and multiplied times the annual average salaries for the health sector (i.e. 2,256 pesos in 1987, and 2,341 pesos in 1988) from the Anuarios Estadísticos[92]. This is the same procedure used above to evaluate the reasonability of Castro's cost data. The personnel costs estimated by this procedure were: 619.37 million pesos in 1987 and 680.76 million pesos in 1989. Next, through contacts with recently arrived doctors from Cuba, salary ranges were ascertained for a variety of health personnel such as doctors, dentists, pharmacists, nurses and nurse aids, technicians (such as X-ray technicians, laboratory analysts dental technicians, pharmacy aides etc.), unskilled workers, workers in services (such as those in cleaning and food etc.), clerical and managerial staff, and other unspecified university graduates. These salary ranges were used to calibrate the personnel cost components, insuring that by selection of salaries within the given salary ranges the personnel costs estimated would approximate the personnel costs estimated using

the aggregate average salary in the health sector. This calibration and approximation is presented in Table 9. The calibrated wages and salaries resulted in an estimate of personnel costs of 760.83 million pesos in 1992, salary costs corresponding to a total 310,726 health sector personnel for that year.

Allocating Health Personnel by Service Type. The Cuban government does not publish any data on the allocation of personnel by staff categories between hospitals, polyclinics, research centers, and Ministry of Public Health overhead. In view of this lack of pertinent data, manning standards at hospitals and polyclinics were used to allocate staff between the different services and to calibrate the personnel costs in order to add them to the comparable levels shown by Osvaldo Castro, as referenced above. The following allocation rules based on manning standards were followed:

Family Doctors:

the number of family doctors published in the Ministry of Public Health's Informes Anuales and an identical number of nurses (one nurse per doctor) were allocated to this program.

Polyclinics:

the number of doctors assigned to polyclinics was estimated assuming 4.5 consultations per hour (that is 8,100 consultations per doctor per year). The Cuban manning standard for polyclinics is five consultations per hour[93], but only half of the polyclinics seem to achieve this rate[94], which is lower than the 7.5 rates of consultation per hour achieved elsewhere in the Caribbean.[95] Nurses were allocated to polyclinics assuming rates of 2.85 consultations per nurse-hour, which is lower than the productivity rate of 3.135 consultations per nurse-hour achieved in 1980, according to statistics published by PAHO[96]. Deviations from the 1980 productivity rate were necessary to calibrate the costs of polyclinics. Dentists and pharmacists were imputed to polyclinics at the rate of one each per polyclinic facility. Allied- health technicians (x-rays, lab assistants etc.) were assigned at the rate of 35 technicians per facility, an average between large and small polyclinics. The staffing rates per polyclinic used for allocating the other personnel were developed from interviews with recently arrived doctors and included: five day-laborers ("peons" in Spanish), five service workers, 1.5 managers, and nine clerical workers per polyclinic.

Hospitals:

doctors were assigned to hospitals at the rate of 0.30 doctors per bed, rate which characterizes the Hermanos Almejeiras hospital (excluding the interns)[97]. Nurses were allocated at the rate of 0.62 nurses per hospital bed, again the source for this rate are the staffing standards of the Hermanos Almejeiras hospital, which we are forced to use for the lack of better data. Pharmacists and dentists were assigned as one per hospital. Technicians were assigned as 0.28 per hospital bed, in accordance with the previously presented data on hospital international staffing patterns. Day-laborers and hospital service workers were allocated at the combined rate of one per bed, clerical workers as 0.21 per bed, while managers were assigned as six per hospital facility. All these rates are within the international experience presented earlier, and their use allow us to approximate Osvaldo Castro's hospital cost figures.

Dental Clinics:

the remainder of the dentists and all the dental assistants were assigned to the dental clinics, which also included two day-laborers, two service workers, one manager and four clerical workers per clinic.

Overseas Medical Program:

the 1989 and 1992 allocations to this program come from Julie M.

Feinsilver[98] and include: 1,500 doctors, 1,500 nurses and

1,000 technicians in 1987-89, and 1,000 doctors and 1,000 nurses in 1991-92.

Research Institutes:

doctors were assigned to the research institutes on the basis of 0.66 doctors per bed, which is the rate for the Hermanos Almejeiras hospital counting interns and residents. All the rest of the personnel were assigned using the same rates as for hospitals, with the exception of other university-trained professionals. Twenty five percent of all the other University-trained professional working in the health sector were assigned to the research institutes.

Health Tourism:

staffing rates for the Cira Garcia hospital (44 beds) were assumed to be identical to the Hermanos Almejeiras hospital, which appears to be the jewel of the Cuban hospital system.

Other Health Facilities:

these facilities include the "balnearios" (mineral health spas), hogares maternos etc. amounting to 1008 institutions with 4,574 beds in 1989. The following manpower allocations were imputed: doctors at the rate of 0.1 per bed, nurses at the rate of 0.62 per bed, day laborers as 0.4 per bed, service workers as 0.60 per bed, managers and clerical workers as one per institution respectively.

Ministry of Public Health Overhead:

All the remainder personnel were allocated to the Ministry.

Application of these allocation rules result in the personnel costs presented in Table 10a which are in correspondence with the scant 1989 cost information presented by Osvaldo Castro, as referenced above. For example O. Castro estimates 1989 hospital costs as 310.48 million pesos, which closely correspond to the 1989 total hospital cost figure of 310.39 million pesos estimated in Table 10a using the manning standards. In addition O. Castro's 1989 ambulatory cost estimate of 190.04 million pesos is identical to the sum of the costs of the polyclinics, family doctors program, and dental clinics estimated in Table 10a using the manning standards. No similar comparison is possible for 1992 (see

Table 10b) because O. Castro's cost estimates do not include this latter year.

Allocation of Non-Personnel costs. There are also scant data available for the analysis of non-personnel costs. Willy de Geyndt[99] recorded the following components of hospital costs in the early seventies: wages and salaries (50%), food (10%), drugs, pharmaceutical and curative materials (25%), and hospital general administrative overhead (15%). Pedro Alemán and his associates[100] estimated the cost of drugs, pharmaceutical and curative materials to comprise 17.3%- 24.6 % of the costs of maternity and gynecological hospitals in 1981-82. With drugs and pharmaceutical comprising the bulk (82.4%-82.9%) of these expenses on drugs and materials. Alemán and his research group also reported that indirect costs, as a percent of total costs, at the Mariana Grajales gineco-obstetric provincial hospital in Santa Clara, amounted to 61.7 % in 1981 and 70.3% in 1982[101]. Furthermore, these researchers quote the cost analysis conducted using V. Y. Shilinskas's[102] costing methodology, which estimated that personnel costs were 56.2 percent of total health costs, with food accounting for 10.3 percent, 8.4 percent for drugs and materials, plus 4.9 percent for tools and equipment, among other basic costs in the overall health budget. UNICEF's[103] family doctor program plan specifies 1989 investment costs of doctors' offices of 35,000 pesos for construction and 10,400 pesos for equipment per office, and current costs of 6,528

pesos for covering doctor's and nurse's salaries plus supplies. By 1989[104] according to UNICEF the current costs of the family doctors program (including supplies and pharmaceutical) were 38.96 million pesos, that is 4.3 % of the Ministry of Public Health's budget, but even this UNICEF cost figure appears on the low side given the high proportion of family doctors out of the total stock of physicians.

To separate the hospital costs between in-patient and out-patient services, the unit cost relationship between them is assummed to be for 4:1, that is, in-patient cost per bed-day which are four times greater than the cost of out-patient visits.[105] The international experience on health costs that can be used to support our cost imputations. The costs of drugs and pharmaceuticals in developed countries range from 8.3% of total health costs in the United States to 21.0% in France. In between are Switzerland (8.5%), Sweden (9.0%), Canada (10.4%), United Kingdom (12.7%), Australia (13.3%), West Germany (17.9%),and Italy (20.0%)[106] The experience other Central American countries has been reported by Phillip Musgrove[107], who presents data on the composition of public expenditures in health in several countries. According to Musgrove, 1984 expenditures on materials, drugs and supplies as percentages of total health costs range from 29.4% in Nicaragua to 16.1% in Panama. In between were Costa Rica at 19.9%, Guatemala at 21.9% and Honduras at 25.6%. Comparable figures for health expenditures on machinery and equipment, as percentages of public health costs, were: 0.66% in Panama, 0.85% in Honduras, 1.17% in Costa Rica, 1.41% in Guatemala and at the peak was Nicaragua with 2.22% of public expenditure in health devoted to machinery and equipment. As the reader can note the Cuban cost estimates are in the general ballpark of the Central American experience.

Using other international hospital costs standards to estimate the missing cost elements, the total capital costs for hospitals have been estimated to range from three to five times (three is used as the capital costs multiple in this paper) the annual recurrent costs, while the total capital costs of polyclinics is estimated as twice their annual recurrent costs. For the Ministry of Public Health's general administration and overhead functions the capital costs are imputed as 1.5 times the corresponding annual recurrent costs. The capital costs of equipment are set at 30 percent of total capital costs (or 40 percent of the costs of the buildings) in accordance with international hospital costing conventions[108]. Capital costs data from developed countries show the capital costs of ambulatory services as comprising 2.3%-3.5% of total ambulatory costs in the United Kingdom and Australia respectively; whereas in hospital services the capital costs range from 7.5% of total costs in the United States to 15.6% in Switzerland, but in most of the developed nations (i.e. Sweden, West Germany and Australia), the capital costs of hospitals hover around 10.0% of total hospital costs.[109] Maintenance costs are imputed as two percent of the costs of the building per se plus seven percent of the equipment costs. The maintenance costs of buildings hovers between 7.0% and 7.5% of total health expenditures in several countries, such as in the Netherlands, United Kingdom, Australia, Sweden and Switzerland[110]. Annual depreciation costs are imputed by estimating payments for interest and capital amortization using capital recovery factors[111] of 10% annually during depreciation periods of 30 years for buildings and 15 years for equipment.

Projecting Real Price Inflation in Health Services. Since health price indexes generally rise faster than the GDP price deflator and other indexes of general price inflation, adjustments are needed to estimate the expected real rate of inflation in the health sector. Because of the excess supply of both professional and non-professional health personnel in the Cuban health system, the rate of price inflation for personnel costs can safely be projected at the same rate as the general rate of price inflation in Cuba. The same is true of the rate of price inflation in food costs which can be expected to correspond closely to the general rate of price inflation. No adjustments are therefore needed to correct for deviations in food and personnel prices from the general rate of price inflation.

However, price inflation adjustments are needed for two components: medicines and equipment, whose rate of inflation can be expected to exceed the national average of price inflation. From health cost data presented by P. Musgrove[112], the annual rates of price inflation for Costa Rica's health expenditures on

medicines and supplies and on equipment was estimated as exceeding the overall rate of inflation in the medical sector by 9.4% for the period 1980-83. Similarly derived figures for other Central American countries were 9.6% annually for medicines and supplies in Guatemala in 1980-84, and 4.2% for medicines and supplies in Honduras from 1980 to 1984. In the United States, the excess rate of price inflation (in excess of the overall rate of price inflation measured by the GDP price deflator) for medicines was estimated as 4.5% in the period 1980-92, while electrical equipment prices grew 1.5% faster than the GDP price deflator in the period 1974-1981.[113] Based on the above estimates, the high inflation rates characteristic of Costa Rica were used for projecting the Cuban price inflation in medicines and equipment. No other price inflation adjustments are deemed necessary. Weighing the 1992 cost components presented in Table 10b by the 9.4% annual excess rate of price inflation in medicines and equipment results in the real price inflation rates for each of the health services presented in Table 11.

Structure of the Health Cost Model. The structure of the parametric health cost model used for projecting the costs of the existing Cuban health system is as follows:

(4) Ct = (1+ Oo) (1+ po)t {[[Sigma]]i [(CCit) (1+pci)t (1+Oi)] [[[Sigma]]j(Sijt)(POPjt)]+

+ [(KCit) (1+ pki)t] [[[Sigma]]j (Sijt) (POPj)]}

whose terms are defined below . The health cost model used for projecting the costs of the health system reform options is almost identical to (4) except for the substitution of the overhead ceiling variable OCot for the product (1+O0) (1+po)t. The overhead ceiling is added to the other health services costs estimated in equation (4). The following variable definitions are used:

Ct = Total health costs in constant 1992 pesos during year t.

Oo =overall general and administrative expense overhead rate,which includes the expenses of the Ministry of Public Health, the research institutes, the overseas medical program, health tourism and other health facilities.

OCot =overhead costs ceiling during time t, which includes the overall general and administrative expenses , such as the expenses of the Ministry of Public Health, the research institutes, the overseas medical program, health tourism, and other health facilities.

CCit = current unit costs in 1992 dollars of health service type i during time t.

pci =annual real rate of price inflation, in excess of the overall rate of price

inflation, of current costs type c of health service type i.

Oi = overhead rate representative of general and administrative expenses of health service type i.

Sijt =number health service units of type i delivered to population cohort type j during time t.

POPjt =population in cohort type j during time t.

KCit = capital unit costs in 1992 dollars of health service type i during time t.

pki = annual real rate of price inflation, in excess of the overall rate of price inflation, of capital costs type k of health service type i.

The cost model formulated above is of the "pay-as-you-go" type; it is not estimated through actuarial methods, and thus results in intergenerational transfers which are usually corrected for in costing systems based on actuarial estimation methods. Perhaps the actuarial model will be developed in the second approximation health model contemplated for the future.

The structure of the cost model used in the cost projections is also presented in Table 12. The cost model was calibrated using 1992 costs, 1990 hospital utilization rates and 1992 ambulatory activity levels. All the costs are expressed in 1992 pesos. A projection of costs (in constant 1992 pesos) for the current unreformed and wasteful health system is presented in Tables 13 and 14 for year t+0 (1995). The projections use 1992 usage rates of ambulatory facilities and 1990 rates of hospital use, that is, before the recent crisis affecting the availability of medicines at hospitals. The projections use the population projections developed by Ricardo A. Donate-Armada[114] and the income elasticities presented earlier.

ANALYSIS OF HEALTH REFORM OPTIONS.

This section analyzes several options for reforming the Cuban health system so as to improve its efficiency and its financing system, but without imposing an undue burden on the employers and without reducing the quality of care available to the Cuban population. The reforms focus on reducing unnecessary waste without affecting the basic quality of health care in Cuba. First, the costs and demands of the current system are projected for the system as it is organized now, that is, with all the inefficiencies noted above. Two other general options are also analyzed which include private sector participation in both hospital and ambulatory services, including HMOs and private insurance systems. The first option undertakes the reform of the system so as to cut its level of waste and introduces health financing via payroll deductions (without co-payment provisions) from employers and employees, with the state financing only the heath care expenses of the unemployed and the physically- and mentally-handicapped. This first reform option has many elements similar to the health care financing system of Costa Rica. A second option also includes the cut in wasteful practices but adds a health financing system with co-payment features similar to the one in Chile. The next paragraphs describe and provide background on the reform options.

Policies to reduce waste, inefficiencies and over-investment. The inherent waste in the Cuban health system was documented in an earlier section. This waste included extremely high rates of use of ambulatory services (i.e. doctor visits), especially for infants and pregnant women. Also high staffing rates of non-health care personnel were observed at hospitals, whose utilization rates had decreased from the high levels of utilization of the early eighties (80%) to the current levels in the low seventies. To all these inefficiencies the family doctors program must be added, which appears to be unneeded, and should only be maintained in unserved rural areas. Finally, the excessive overheads of the Ministry of Public Health must be cut down to levels commensurable with the experience of other countries in Western Europe and North America.

The Cuban standards for the number of ambulatory health visits exceed those of the United States for two main cohort groups: infants with less than one year of age and pregnant women. In the case of the infants the Cuban standard was reduced from 16 annual visits to the U.S. standard of 8, thereby reducing ambulatory visits in half. The U.S. standard of visits for pregnant women of 12 visits was also adopted, leading to a 7.7% decrease in ambulatory visits for women in the 15-44 years old cohort. Policies to reduce waste in hospitals include increasing the utilization of hospital beds from the low 72% percent of the nineties to the 80% utilization rate of the early eighties and, in addition, reducing the current high rate of administrative and housekeeping staff per bed of 1.24 workers to the lower rate of 0.40 staff per bed of both Jamaica and the Dominican Republic.[115] The number of family doctors is frozen at the 1993 level of doctors in rural and mountain sectors plus half the number of family doctors in agricultural cooperatives.

The final waste reduction adjustment concerns the Ministry of Public Health overhead, which, at the current 27% (of all other current costs) level, exceeds by at factor of two or three all the other overhead costs referred to in the literature. The adjusted overhead expenses proposed kept intact the costs of the research institutes, the other health facilities, and the health tourism facilities, but a cut in half of the Ministry of Public Health's general and administrative expenses is proposed. The current overhead expenses are so large that, even with this draconian cut, the modified overhead expense rate hovers around 12.5% of the 1992 level of current expenses, a level larger than in all the countries researched, with the exception of the tiny Caribbean island of Dominica. The unit cost model impacts of these changes are presented in Table 12, while cost projections of the reformed system are presented in Tables 13 and 14 for two health financing system scenarios: a financing system financed entirely through taxes on wages (without co-payment features), and a second financing system with co-payment. Costs are smaller with co-payment because of the depressing effect of co-payment on demand for health care; since the effect of co-payment is to reduce unneeded visits to health care facilities (both ambulatory and hospital usage). The reader should note that expenses in doctors, nurses and allied health personnel remain unaltered, with the exception of the elimination of the unneeded family doctors, that is, basic health services remain unchanged under these reform proposals.

Health Care Financing Options without Co-Payment. The design of the financing option without co-payment follows the one in place in Costa Rica. In Costa Rica health and maternity benefits are financed through mandatory payroll deductions, where as percent of salaries, the employee pays 5.5 % of salary, the employer pays 9.25 % of all salaries paid by his firm, with the state contributing the remainder 1.25 % of wages and salaries. The total cost of health and maternity benefits in Costa Rica by the early eighties amounted to 16.0 percent of salaries and wages[116]. The health financing costs had been increasing in Costa Rica. According to Mesa-Lago[117], by 1979 health and maternity benefits were 11.0% of the total wages and salaries paid in Costa Rica, with salaried workers contributing 4.0 % of salaries, employers contributing 5.0 % of salaries and the residual 2.0% was contributed by the state. Focusing only on the relationship between employee vs. employer contribution, in 1979 employees paid 44.44 % of the combined employee/employer contributions, while after 1983 employees paid a lesser proportion: 37.29% of the combined employee/employer contributions to maternity and health benefits.

The high rates of payroll taxes used to finance health benefits in Costa Rica (14.75% of wages counting employer and employees contributions) are excessive. When applied to Cuban salaries and wages these rates are more than enough to finance an increase of 50% above the current Ministry of Public Health budget. In addition, the division of the burden between employer and employee is very unequal. The analytical task at hand is to design a payroll-based health financing system, without co-payment provisions, that would enable the financing of health for all the persons employed with their families. A 50%-50% split in payroll taxes is contemplated, with the employer responsible for the premiums (payroll taxes) to finance the employee's health expenses, and the employee roughly responsible for the premiums (payroll taxes)to cover his family's expenses.

Because of the large number of unemployed and handicapped persons resulting from the economic collapse of Cuba, the incipient private employer sector cannot afford to finance their expenses, which will be the responsibility of the state and which will be financed out of general tax revenues. Using the employment estimates presented in our earlier paper published by La Sociedad Económica[118], which were 3.998 million persons in year t+5, 4.195 million persons in year t+10, 4.757 million persons in year t+15 in the CBI scenario and 5.921 million persons in year t+15 in the NAFTA scenario, it was estimated that the Cuban government will be responsible for financing out of general tax revenues 20.10% of the population in years t+5, 20.26% in year t+10, and 13.03% of the population in year t+15 in the CBI scenario. The cohort groups financed by the state will include the unemployed and in addition the handicapped, which are estimated as 0.75% of the population following the 1980 survey of the handicapped conducted by the Ministry of Public Health.[119]

The final simulation of this modified Costa Rican system with no co-payment options is presented in Table 13, which shows that the combination of the reduction of waste and having the state become responsible for financing the unemployed and the handicapped results in payroll taxes of 3.84% - 3.99% of wages for the employers, employees and pensioners separately, a very competitive rate for financing health costs without adversely affecting the international competitiveness of Cuban exports.

Health Care Financing Options with Co-Payment . Co-payment has been a regular feature of health insurance programs in highly developed countries. The co-payment feature consist of the beneficiary sharing the cost of the health service--whether hospital or ambulatory -- with the insurance company or with the state as appropriate. Co-payment rates, measured in terms of the percentage of total hospital costs paid from general public revenues, vary among developed countries[120], ranging from 54% in the United States, 79% in West Germany and in excess of 90% in Canada (91%), France (92%), U. K. (99%) and Sweden (100%) in 1980. This variance extends to underdeveloped countries, with experiences in co-payment rates as varied as those in the Dominican Republic (97.3%-98.5% in 1986), Honduras (94.7%-96.5% in 1985) and Jamaica (92.5%-97.7% in 1986-87), and on the other extreme Bolivia (38.4%-64.0% in 1986-88).[121] .

In between these co-payment rates is the co-payment system of Chile, a country of interest to us because of its strong free market and free enterprise orientation. Chile's health system, which is devoid of employer health financing costs, has several tiers of service.: the state finances 100% of the costs of the National Health Service System (SNSS), which include municipal hospitals and clinics, as well as immunization and public health functions) which serve mostly unskilled and domestic workers, small farmers, the poor and indigent; and a health insurance system, called the Preferred-Provider System (SPP), administered by the National Health Fund (FONASA), which serves the rest of the population and is financed through a 6% mandatory payroll deduction plus a copayment system administered through vouchers bought at public outlets, such as banks, clinics, public health offices and other institutions.

The co-payment rates in the Chilean system vary by the quality of the freely-elected health service provided : the co-payment for the most basic service covering service by the general practitioners is 50%, a second tier of services has a co-payment rate of 33%, with the most expensive services, covering services from experienced specialists, having a 25% co-payment rate. Most persons covered by this system experience a co-payment rate which ranges from 50% to 33% of the costs of service. Private doctors and private hospitals participate in the system and negotiate rates with the government agency administering the system. In addition, the employee may contract with a private health insurance company approved by the state or with officially-approved health maintenance organizations, called Instituciones de Salud Previsional (ISAPREs), and remit his 6% payroll deduction contribution to any of these other plans. Private providers accounted for 66% of the value of health services provided in Chile in 1980, up from 53% in 1969.[122] The relative participation of Chileans in these systems in 1983 were: 28.0% were served by SPP, 4.2% were served by the ISAPREs' pre-payment plans (similar to our HMOs), with the rest 67.8% served by SNSS.[123]; that is, 67.8 % of the Chilean population were exempt from paying for health care. The state ends up paying 60% of the costs of serving both SNSS and SPP patients, with workers' mandatory payroll contributions accounting for the rest, or 40% of the public health system costs[124]. This translates into the fact that FONASA experiences a surplus in its services to the tax-paying SPP customers and that the surplus is used to finance partially services to the unskilled workers, the poor and indigent served by SNSS.

While the 6% Chilean payroll tax and the co-payment feature are generally adequate to finance the Cuban health sector, a modification of this system is proposed because of the lack of burden sharing (i.e. tax sharing) with the employers in the Chilean scheme. The analysis focuses on a payroll tax of half the Chilean rates (close to 3% of payroll for each -employer and employees-), thus getting rid of the pro-employer bias of the Chilean health system. Health users, except the unemployed and the handicapped,

are assumed to pay 20% of the medical fees charged as a result of use of health facilities, a co-payment feature more advantageous to them than in the current Chilean health financing system. As in the first option, the health expenditures of the unemployed and the handicapped are assumed by the state, which should help in minimizing the regressive features of user fees and co-payments, since the price elasticities for health care expenses are more elastic for the lower income groups.[125] Using the mid-point elasticity formula, at price elasticity rate of -0.2, the imposition of 20% user fees will depress usage rates 33% for the population subject to user fees and by 26.0%-29.0% for the total population. The lower rate for the general population reflects the fact that 13.03% - 20.26% (the lower figure is for year t+15) of the population are unemployed and handicapped persons not subject to paying user fees.

The results of the simulation of the costs of a health financing system with co-payment are presented in Table 14. The costs with prepayment options are smaller due to the elimination of some perhaps unneeded wasteful usage of medical facilities. Under this health financing system employers pay health insurance taxes in the range of 2.70% - 2.80% of the payroll wages, again very competitive tax rates for competing in international export markets. Employees also pay less under co-payment provisions, but as the result of lower usage of medical services. The simulation of these health financing options shows that it is possible to cut wasteful practices and expenses in the Cuban health system without affecting the basic quality of medical care in Cuba.

Summarizing the discussion above, the government financing share of the two health financing options, which range from 13.03% to 20.26% of the health costs, while high in comparison to most countries, is still within the experience of countries like Switzerland (22.0%), Sweden (15.0%) and Japan (14.0%), that is the government financing share is reasonable. The employer payroll rates of 2.70% to 3.99% are in the lower third tier of the countries surveyed by the U.S. Social Security Administration[126] and in closed correspondence to those of Singapore (3.0%), Austria (3.0%), Canada (3.45%), Uruguay (4.0%), Korea (4.0%) and Belgium (4.0%) while higher than those of Spain (2.20%) and the United States (1.45%). This employer payroll rate is altogether reasonable and will not jeopardize the cost position of Cuban firms facing international competition.

Privatization Strategies within the Health Reform Options. Both health reform options--with and without co-payment--include strong privatization components. Private participation in both ambulatory care and in hospital care would be actively promoted.[127] The financing of health expenditures on the services provided by the private health sector would be financed in a fashion similar to the scheme adopted in Chile; that is, the health insurance financed through payroll taxes would be responsible for financing a "basic" service at fees equivalent to the cost of the public sector hospitals and polyclinics, while the excess over the "basic service fees" will be the responsibility of the individual health system user. This is similar to the way the Chilean system operates, where the individual pays sometimes 75% of the fees for some services provided by the private health sector, with the payroll tax-financed health insurance paying for the rest. In addition, individuals and firms should have the option of contracting directly with health maintenance organizations and opting out of the state health insurance system.

While it is unrealistic to expect that the private participation in the health sector can match the private participation in the days of pre-revolutionary Cuba in the short projection period (15 years) analyzed in this study, rapid movement to privatization should be expected as a result of the excess supply of doctors available now, excess supply that can only find employment in the private sector or self-employment by opening private practice offices. In 1954, approximately 34% of the hospital beds of Cuba were in private hospitals and health maintenance organization, while close to 50% of the doctors were providing services in the private sector[128]. The goal for privatization activities in Cuba would be to achieve half of these pre-revolutionary privatization rates by year t+15 of the projection period.

Section III

Reform of Unemployment Compensation

The reform of unemployment compensation is perhaps one of the most difficult tasks to be faced by the future democratic government of Cuba. The problem has several dimensions, namely: as shown earlier, by 1992 Cuba was spending 867.4 million of pesos in unemployment compensation, figure which amounted to 7.94% of the wages paid during that year and may be too large to be supported by a private sector faced with international competition. But the problem is that unemployment is expected to continue to grow for at least six to eight years more in the transition period, thereby compounding the problem. Another related issue is that some of Cuba's export competitors, such as Costa Rica, the Dominican Republic and Jamaica, do not have unemployment compensation, a factor that needs to be kept in mind when designing the reform options. Finally to be considered is the abject current poverty of the Cuban population, whose current salary levels are well below the poverty lines measured at black market prices, as is shown in a later section of the study.

A summary of some unemployment compensation systems in the world are presented in Table 15, which shows two major unemployment compensation system designs: one is a legislatively-mandated system which specifies that employees be compensated for lay-offs and dismissals with a lump-sum severance payment equivalent to one month compensation for every year of service up to a maximum that varies in each country. These systems are generally privately-run (by each individual firm), with employers contributing 100% of the costs. But there is nothing inherently in the design that would prevent the firms from depositing their contributions into a State-run unemployment compensation fund. A second alternative design is the state-run unemployment insurance fund concept, where firms contribute quasi-insurance premiums financed from payroll taxes, with the actual tax rates based on the firm's experience in contributing to the flow of unemployed workers, thus, the greater the experience in laying-off or dismissing workers the greater the tax rate which the firm must pay.

A key concept in the design of the social insurance fund for unemployment compensation is the level of benefits, defined in terms of the wage replacement rate. In most of the Latin American countries the rate of benefit hovers around 50% of wages up to a maximum of 3 to 8 times the minimum wage level.[129] The benefits are paid for 4-6.5 months, reflecting the temporary nature of unemployment compensation as perceived in its design principles. In Europe the rate of benefits are greater in some countries, 88% of wages in Sweden, 65% of wages in Portugal and 60%-80% of wages in Spain depending on the duration of the benefits. In Spain the duration may be as large as 24 months, in Portugal is 15 months. Spain has an interesting variation where idle workers exhausting their benefits as well as workers not covered receive as benefit 75% of minimum wages for up to 18 months. But some industrialized countries exhibit lower wage replacement rates, such as the United States (40%), Germany (44%) and the United Kingdom (34%).[130] To be eligible for unemployment compensation, the employee must have worked from 6 to 18 months previously during a period ranging from one to two years. Only employees who work in jobs whose employers pay payroll taxes for unemployment compensation are eligible for benefits.

In Brazil and Chile, the Government pays 100% of the benefits, but in most of the countries the State pays for nothing under the unemployment insurance systems. Employers pay for the bulk of the unemployment insurance premiums: 80% in Spain, 69% in Portugal, 57% in Uruguay, etc., while workers pay generally for smaller proportions: 43% in Uruguay, 31% in Portugal and 18% in Spain. The payroll tax rates for financing social insurance programs range from 0.85% in Venezuela to 5.2% in Spain, rates which are smaller than the implicit rates under the employer-based severance pay formula of one month per year of service (i.e. 1/12 = 8.33%). In practice the tax rates implicit in the privately-run employer system (one month per year of service) are larger than in the unemployment insurance plans because the employees dismissed in the employer system receive their benefits evaluated at their highest salary level. Of course, this problem could be avoided by having the employer deposit the unemployment contribution in an interest-bearing fund which would pay the employee the employer contribution plus

interest. The fund schemes would be allowed to invest in Cuban industry and help to finance the reconstruction effort. The task then is to design variations of both alternative unemployment compensation systems to fit without strangling the precarious Cuban economy.

The estimation of unemployment compensation costs during the 15-year period analyzed is presented in Table 16. The benefit rate assumed is 50% of wages and twelve months of work before becoming eligible. As shown in this Table, the costs of unemployment compensation in Cuba are large. Faced with unemployment rates of 32% in year t+o, 18.7% in year t+5, 19.0% in year t+10 and 11.5% in year t+15 in the CBI scenario, the payroll tax rates required to finance unemployment compensation are of the order of 10.3% in year t+5, 11.0% in year t+10, and 5.7% in year t+15. In the earlier years, that is, years t+5 and t+10, the payroll tax rates required to finance unemployment compensation are close to the 8.33% implicit rate on payroll wages inherent in the private employer-run system. However, by year t+15 the social insurance system is less costlier for employers. It is assumed that employees share on the unemployment compensation payroll tax rates, a practice common in most countries with a few exceptions.

Since the payroll tax rates required to finance unemployment compensation in Cuba are large, and since Cuban export competitors (Costa Rica, Dominican Republic and Jamaica) do not have unemployment compensation programs, the task at hand is to decide what share of the unemployment compensation costs should employers be responsible for and what share should be assigned to the State.

A review of the worldwide experience with unemployment compensation programs conducted by the U.S. Social Security Administration,[131] reveals that in four countries analyzed (Australia, New Zealand, Brazil and Chile) 100% of the cost are defrayed by the government and that in a few other countries the government share of expenses hovers from 46% in Sweden, to 27% in Israel and to 25% in Japan. In all the other countries, the government's share is nil (0.0%). In view of this experience it was decided to design a financing plan where there would be no need for government financing by year t+15, but that for the earlier years t+5 and t+10, the government share of expenses would be 25%, that is, similar to Japan and Israel. The government share of financing during the first four years was set to correspond to the highest payroll taxes presented in the aforementioned report. The highest observed employer payroll contributions were 8.33% corresponding to the private severance payment system of Colombia and Mexico, while the highest employee earnings tax rates was found to be 2.9% corresponding to those of France and Canada. Applying the maximum payroll tax rate during the immediate transition period results in a government financing share of 50%, higher than Sweden's and exceeded only by the four countries mentioned earlier. The estimates of government financing shares are presented in Table 16.

The unemployment compensation fund is assumed to be 100% financed from payroll taxes in year t+15. But the sizeable unemployment possibly remaining in Cuba forces the selecting of high payroll tax rates of 4.29% for employers and 1.25% for employees. This payroll tax incidence is exceeded by few countries, including the United States, Spain, Colombia, Mexico and Canada. The employee tax rates were set at 2.0% for the intermediate years t+5 and t+10, with the employer payroll tax rates estimated as residuals. While these payroll tax rates are within the worldwide experience and can be absorbed by the incipient private sector, it is valid to search for other options. A less costly alternative, not explicitly analyzed in this study, is for the State and non-governmental organizations (NGOs) to open food kitchens throughout Cuba to supplement the nutritional needs of the unemployed and those under the poverty levels. The food kitchen alternative is a candidate for further exploration, analysis and design.

Section IV

Reform of Old Age Retirement, Disability, and Survivor_s Pensions.

The current Cuban Social Security system allows for pensions in the event of old-age retirement and disability, and for survivor_s pensions. These are specified in Law Number 24 on Social Security which was enacted on August 28, 1979. This law includes in the Social Security regime all individuals who receive salaries or wages for their work in Cuba and those who work for Cuban entities abroad. It also extends coverage to the families of the workers included in the Social Security regime. There are other laws covering old-age retirement and other pensions for certain occupational groups such as the Armed Forces and Ministry of Interior personnel, but they are ignored in this analysis.

In 1989, old age retirement, disability, and survivor_s pensions amounted to $1,042.5 billion of the $1,282.6 billion paid through Social Security[132]. For the same year, the second largest Social Security monetary expenditure was for sickness, accident, and maternity subsidies which together totaled $178.9 million[133]. Both of these expenditures constituted 95% of all Social Security expenditures through monetary payments for that year. Benefit payments are projected to grow from 18% of total salaries in 1991 to 26% of total salaries by the year 2010[134].

Law No.24 provides for old-age retirement pensions equal to at least 50% of final average salary at age 60 for men and 55 for women after 25 years of service. It also provides for payment of pensions after 15 years of service after age 65 for men and 60 for women, and for payment of pensions from 55 for men, 50 for women for those that have worked at least 12 years in dangerous conditions[135]. Law #24 also provides for disability, and survivor_s pensions.

Social Security pension systems differ from other welfare benefits that the participants earn the right to their benefits during a period different from the time when they receive them. Furthermore current active participants are supposed to pay the pensions of those participants who have already retired or become eligible for some other kind of pensions. The Cuban Social Security system faces the prospect that current participants will retire at a time when the potentially economically active population will be a lower proportion of the potentially retired population than the current ratio[136]. A separate analysis by one of the authors[137] shows that the contribution rates required from current active participants to finance both existing old-age retirement pensions and their future old-age retirement pensions will range in 1995 from 28% of pay to 80% of pay depending on the economic scenario envisioned.[138] Under a CBI scenario which assumes a real annual interest rate of 6%, and real salary increases starting in 1997 at .7% and increasing to 2.3% after 2004, the contribution rate will be around 36% of pay in 1995[139].

This contribution rate is calculated as the ratio of the actuarial present value of future old-age retirement pension payments to the actuarial present value of salaries of all current participants. This contribution rate exceeds the rate required to pay current pensions in 1995 (20%) with the excess being used to accumulate a fund from which the future pensions of current active participants will be paid. Currently the Social Security system is being financed by a payroll tax of 10% of gross pay which is paid by the employer. This payroll tax percentage is set in the annual Budget Law but it is clearly insufficient to pay current pensions.

Table 17 presents the distribution of the contribution rates between the portion destined to pay current pensions and that destined to pay future pensions. This Table also shows the effect of postponing the funding of future pensions through current contributions as evidenced through the increase in the total contribution rate. The increase in the contribution rate over time is due to the aging of the population, and the fact that there are no accumulated assets to meet future obligations[140].

There are some changes which would reduce the contribution rate and provide for a more stable system. These changes would be implemented during a transitional period during which the existing pension promises to current retirees and those workers near retirement will be respected. The changes would be as follows:

Increase retirement age to 65 for both men and women.

Exclude from the current retirement system those younger than 45 in 1995.

Require the accumulation of retirement savings for all workers.

Finance disability and survivor_s pensions through separate insurance.

Increasing the retirement age for both men and women to 65 will bring the Cuban retirement system in line with most other Latin American and OECD countries. This is warranted in view that Cuban life expectancy at birth is above that of most Latin American countries and close to the life expectancy in OECD countries. Increasing the retirement age to age 65 will bring down the contribution rate to 24% in 1995[141].

Excluding those younger than 45 in 1995 from the current system will reduce the contribution rate for the current system to 16% in 1995[142]. This would be accompanied by the requirement that all workers accumulate 10.5% of their salaries in individual retirement accounts. After 30 years of contributions this 10.5% of pay is expected to accumulate to the actuarial value of a pension equal to 50% of final pay beginning at age 65 with a 70% continuation of the pension to the surviving spouse of the retiree[143].

This system resembles the so-called Chilean Social Security model which has been adopted by three countries in Latin America and which goes by the name of Provident Fund in various African and Asian countries. To complement the old-age retirement benefits, it would be advisable to provide disability and survivor_s benefits through separate insurance, which could cost as much as 4.5% of pay[144]. Table 18 shows the effect on the contribution rate of all these changes, while Table 19 presents the population projections by age and sex cohort.

Section V

Considerations for poverty mitigation

At the end of 1987, evidence began to mount that the economic situation in Cuba was deteriorating. The Gross Social Product (GSP) showed a decrease of about 1.8 percent and the budget deficit increased from 188.0 billion to 609.0 billion pesos. Further evidence of the decline in domestic economic activity was also noticed in the external accounts. The consumer had just suffered the loss of the "Farmers Markets" which from 1981 to 1986 provided additional agricultural produce and other goods which the state was not capable of supplying. This loss provided another clue of forthcoming economic difficulties and consumer shortages. Consequently, consumers' expectations were shattered and soon a decrease in their overall welfare occurred. Nonetheless, it was not until 1989, when the ex-Soviet Union and Eastern Europe began to realign their economies, that Cuba's consumers really experienced a severe reduction in their standard of living.

As the leadership was unable to put together a serious economic package, subsidies began to diminish and supply shortages appeared all over. The effects of the endless Soviet assistance were felt in the industrial sector of the country. Carlos Lage reported during his October 1992 interview with Susana Lee of Bohemia that industrial capacity utilization declined by 10-20 percent. Oil supplies became scarce because the country was no longer receiving shipments from Russia, having to acquire them now with convertible currency. This was an additional indication of the inability of the economy to generate foreign exchange. Therefore, imports were compromised and hampered by the country having to sell the sugar at world market prices in an already saturated market. The implications of having the state reduce the import basket did not bode well for providing the consumers with food, since the country's food import bill is approximately over 26.0 percent of the total food consumed. In the labor sector, the state

reacted by sending surplus workers home with a 60.0 percent salary and transferring them to almost mandatory agricultural work.

By mid 1990, the consumers began to experience serious shortages of both goods imported and domestically produced. As a result of insufficient supplies, the black market began to expand and considerable amounts of currency were amassed in the consumers' hands because they had no outlet for spending it. However, for the powerless consumers, the only outlet was to go to the black market where most of the goods available were from government warehouses. These transactions were performed in the black market at high prices as a consequence of a very strong excess demand. The black market exchange rate for the peso provided an indication of the economic deterioration. By the middle of 1990 the exchange rate went from 35.00 to 60.00 pesos per dollar. Presently, the prevailing exchange rate continues to fluctuate at a rate of 60 to 100 pesos per dollar. In the meantime, wages remained the same while consumer purchasing power and the standard of living deteriorated to a near subsistence level. Mirta Rodríguez Calderón[145] reported that of seventeen regulated commodities once purchased for about 17.29 pesos, their cost in the black market was now in the order of 1014.0 pesos, an increase of 576.0 percent. Therefore, given the subsistence status experienced by the consumers today, their loss of purchasing power and a largely unadjusted level of wages, a real poverty situation is now faced by the population.

To ameliorate and correct for the existing price/wage disparity and the existing poverty conditions during the transition to a free market economy and a democracy, it is proposed that a one time realignment of wages and salaries and pensions occur to compensate the consumer and close the price-income gap relationship. This adjustment will have no effect on any of the proposed alternatives to the existing safety net. Both wages and benefits will proportionally increase since the relative proportions will be maintained. The tax rate imposed as contribution to the social safety net will not be changed for any of the society groups. To have a better understanding of the magnitudes of the wage adjustment needed for the mitigation of consumers' poverty, the following estimates have been made using the scant available data.

Claes Brundenius estimated a 1978 wages and salary distribution[146] which had an annual average wage of 1,667 pesos. Assuming that the relative wage distribution today is similar, and based on an annual average wage estimated by Alonso and Lago at 2,737 in 1992 pesos[147], the differential in the annual average wage exceeds 164.0 percent. Table 20 presents the relative wage distribution adapted from Brundenius. This almost doubling of wages indicates that in the period from 1978 to 1992, wages and salaries did not keep pace with the black market price inflation experienced by the consumers. The State had to absorb substantial amounts of the income-expenditure gap with their subsidy programs, as reflected in the government budget. Further aggravating the situation has been the inability of the state to promote a price revision and a wage adjustment since the eighties. This situation was possible for as long as the Soviet Union provided the needed financial and material assistance to maintain the subsidy levels.

In order to have a better view of the relationship between household income and expenditures, selected years of rationing card allotments for basic commodities in the Cuban diet were priced at the prevailing 1992 black market prices. Table 21 presents these calculations. The monthly range of expenditure for those rationing card allotments in 1992 pesos were from 357.00 to 413.95 pesos. Reviewing the differences through time on the rationing card allotments, it was noticed that their quantities and item composition changed through time, implying that the State was unable to import the items, and possibly changed the basket composition or substituted those items due to foreign exchange difficulties. Rodríguez Calderón's Bohemia article, cited earlier, further confirms the need of the consumer to purchase in the black market to acquire those products in the rationing card system which the state, due to the severe economic difficulty is not longer able to supply. In addition, Cuba's wage earners are unable to purchase the ration card allotments at the 1992 black market prices, thus qualifying virtually all

citizens as poor, that is, below the poverty level established relative to the annual average income estimated as 2767 pesos of 1992.

The consumer is faced with little expenditure choice and a meager income to survive a difficult economic situation. Therefore, this poverty status widely affecting society could be mitigated for some

strata of the population utilizing public assistance. A supplemental consumer basket consisting of a choice of four public assistance diets is proposed.[148]

Table 21 shows the proposed diets which will provide the consumer with a subsistence basket.[149] It is assumed that once the country is on the way towards a free market, food will be available. However, given the cost to the State, these public assistance diets should be granted only to citizens whose income potential is very limited or whose possibilities of raising their income above the poverty line is an almost impossibility. Using 1992 black market prices, the costs for those four proposed daily rations range from 28.85 to 42.04 in 1992 pesos.

Using Prais and Houthakker's[150] economies of scale index of household consumption expenditures of 2.83 adult equivalent for the average Cuban household size of 3.5 members (as derived from four income groups.) The annual costs of the household's food basket further confirm that the entire society qualifies for this benefit. In addition, the cost of any chosen food ration further justifies the need for the one-time wage and salary adjustment to maintain the price-income relationship and avoid social disruptions. Clearly, most of the citizens will qualify for all the above described benefits since virtually the entire country is below the poverty level.

The required one-time wage increment[151] necessary for shifting wage earners from the poverty status was estimated from the 1981 Census of Population and Housing. Using the average number of wage earners per household (1.5 workers) it was assumed that the relative wage rate for the second earner was 75.0 percent of the wage of the head of household. This resulted in a required adjustment of 2.34 times current wages for meeting the cost of the rationing card and an adjustment of 5.0 times current wages to meet the cost of the basic diets. In addition, the wage earners have to be compensated for the extra payroll taxes that they are required to pay under the social safety net reform options. The wage earners will have to pay payroll tax rates of 13.6% in the case of "pay-as-you-go" financing systems for pensions, health insurance and unemployment compensation and 16.14% payroll taxes under actuarial estimations of the cost of the social safety net. These wage and payroll tax adjustments were applied to the minimum wage rates presented in Tables 22a and 22b.

The resulting one-time wage increments are as follow: the combination of rationing cards and "pay-as-you-go" payroll rates will increase the monthly minimum wage from the current $1.55U.S to $3.84 U.S, with the compensation for inflation in the rationing card amounting to $2.08US, while the increased payroll taxes should add $0.21US to the minimum wage level. Compensation for the combination of balanced diets and actuarial payroll taxes will increase the monthly minimum wage to $7.89US, with the compensation for the payroll taxes contributing $0.25US to the increment, with the need to compensate for the balanced food diets contributing the extra $6.09US. The increased monthly minimum wages required for poverty mitigation are presented in Tables 22a and 22b. **Section VI**

Evaluation of Proposed Reform Alternatives

This section summarizes the proposed reform alternatives and evaluates them in terms of the five design alternatives presented earlier.

Summary of Reform Alternatives

The proposed reform alternatives of the Cuban social safety net are presented in Tables 22a and 22b. The payroll rates and shares presented in these tables refer to year t+5 (year 2000) of the transition to free markets and democracy in Cuba. Two health options are summarized in the above referenced tables. The higher health cost option has no health financing co-payment features, that is, a system analogous to Costa Rica's; whereas the less expensive option has health co-payment financing features somewhat similar to that of Chile.

Two alternative reform options are presented for old age retirement, disability and survivor's pensions[152]. The more expensive option corresponds to the 31.0% payroll rates determined through acturial methods, which include the 26.5% actuarial rate for old age retirement pensions plus the 4.5% payroll rate for disability and survivor's pensions. The actuarial rate of 31.0% of payrolls would become the 3rd. highest in the world exceeded only by Singapore (35.5%) and Portugal (34.5%). The burden sharing proposed for the actuarial rate is: employees (0.33): employers (0.67), which is the norm for high payroll rate systems and is similar to the burden sharing in Brazil, Portugal, Greece, Mexico and Costa Rica, among others. This burden sharing proposal results in the 5th. largest employee payroll rate and in the 3rd. largest employer payroll rate in the world.[153]

The less expensive financing option for old age retirement, disability and survivor's pensions corresponds to the "pay-as-you-go" financing option. The "pay-as-you-go" payroll rate is 19.50%, comprising 15.0% payroll rates for old age retirement and 4.5% for financing disability and survivor's pensions. The burden sharing for the "pay-as-you-go" option is specified as : employees (0.45): employers (0.55), a burden sharing which is the norm for countries with the equivalent payroll rate. This burden sharing is similar to those of Uruguay, Malaysia, France, Belgium and Austria, and would result in the 11th. largest payroll rates in the world for both employees and employers.

The temptation to reduce these high payroll rates by having the Cuban government pay a share of the pension bill should be avoided to the extent possible. In the Americas only the governments of Argentina (30% subsidy) and the Dominican Republic (21% subsidy) subsidize pensions. In Western Europe, only Sweden (25% subsidy), Switzerland (20% subsidy) and Germany (14% subsidy) do so. If the payroll burden due to pensions is found to be excessive in Cuba, an alternative-not considered here- is for the Cuban government to finance through general tax revenues close to 20% of the entire cost of pensions, that is, a rate for old age retirement, disability and survivor's pensions similar to Switzerland's. The reform options for the other elements of the social safety net are identical to the ones presented earlier in the text.

Evaluation of Reform Alternatives.

We are now ready to evaluate the reform options in terms of the following criteria described earlier:

Poverty Mitigation. Earlier, the poverty status of the Cuban population was analyzed using poverty lines developed from the Cuban rationing cards and from basic consumer diets developed for this purpose. It was shown that the major problem of poverty is the failure of the government-regulated and -controlled wages and salaries to keep abreast with the rampant inflation measured in term of black market prices. To alleviate poverty, a massive one-time wage and salary upward adjustment is recommended. Implementation of this one-time wage and salary upward correction will not change appreciably the payroll tax rates recommendations of this study, the reason being that the wage increases will increase both the costs of providing benefits (unemployment compensation, health care costs, social security benefits etc.) and the payroll tax base from which they are financed in approximately the same proportion. Thus, a major improvement in poverty mitigation is the focus of the proposed reform program.

International Microeconomic Efficiency. An analysis of minimum wages and payroll tax rates of Cuba and its close international competitors is presented in Table 22a. The burden of Cuba's social safety net, measured in term of payroll taxes, is slightly above those of Costa Rica and Mexico in the "pay-as-you-go" financing systems, but greatly exceeds those of its international competitors in case of actuarial payroll rates. The employer payroll tax rate of the "pay-as-you-go" financing options is slightly higher than Costa Rica's, but lower than Mexico's. But the employee payroll tax rates are higher than those of Cuba's competitors. The total payroll burden of the Cuban social safety net is dominated by the pensions, which account for 58.5 percent of all payroll taxes in the "pay-as-you-go" financing options. It can be observed from Table 22a, that Cuba's international competitive advantage of having an educated and inexpensive labor force is so large (as evidenced its low minimum wage rates) that it could support the high payroll tax regimes of even Mexico and Costa Rica without adversely affecting its competitive international position. The proposed reform program is moderate and leaves unaffected the competitive advantages derived from its low cost labor resources.

Macroeconomic Efficiency. All the reform options analyzed diminish the size of the Cuban government deficit and therefore will have a restraining effect on the rampart inflation taking place in Cuba.

Domestic Microeconomic efficiency. The social safety net design options presented in this study have no major effect on decisions to work, save and invest. In fact, by setting unemployment compensation benefit rates at 50% of wages and salaries, the encouragement to work is clearly present. In addition, the reform proposals open up both the pension and health industries to private sector participation which will provide an incentive to increase savings because of the larger rates of return in privately-run pension plans. Private participation in the health sector will provide an incentive for the capitalization and investments in new medical facilities, an important aspect given the fact that investments in renovating the existing public hospitals have not been made.

Administrative Ease and Cost. Privatization activities in the fields of health care and pensions will have positive effects on improving productivity and thereby dampening cost inflation in these sectors. Unemployment compensation could also be privatized via lump sum severance payments, as in Mexico and Colombia, which would reduce administrative costs. Unfortunately, opting for the privately-run lump sum severance payment schemes will increase the costs of employers, since the severance pay formulas used in these schemes are inherently more costlier than the social insurance designs financed via payroll taxes.

CONCLUSION.

A series of options for reforming the social safety net of a democratic Cuba have been proposed, analyzed and evaluated in this paper. The reform proposals include one-time upward wage adjustments to mitigate the current poverty status of most of the Cuban population and reforms to cut waste, reduce the government budget deficit and increase private participation in pensions, health services and unemployment compensation. The reforms all satisfy evaluation criteria to guide their design. The reforms are candidate for implementation in a post-Castro democratic Cuba.

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Footnotes

A First Approximation Design of the Social Safety Net for a Democratic Cuba

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[16] The 1992 population figures come from: República de Cuba. Ministerio de Salud Pública. Informe Anual 1992. (La Habana, Cuba: MINSAP, 1993, pp. 16.). Unfortunately these health-oriented population projections lump the age cohorts of interest in the analysis of the labor force to solely three groups: 15-49, 50-64 and 65+ years old.

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[18] The Defense Intelligence Agency estimates that in the eighties Cuba had regular armed forces of 200,000 persons (including 6,000 Ministry of Interior troops, 15,000 internal security troops and a 20,000 persons special police battalion) in addition to 135,000 army reserves, plus militia, rapid reaction battalions and other non-regular forces. See: Defense Intelligence Agency. Handbook on the Cuban Armed Forces. Defense Research Reference Series, DDB-2680-62-86. Washington D.C. 1986, pp.I-12. A smaller level of 250,000 persons in the Cuban armed forces is presented in Richard Millett. " Cuba's Armed Forces: From Triumph to Survival." The Cuba Project. Center for Latin American Studies, Georgetown University. Cuba Briefing Paper Series No. 4. September 1993.

[19] República de Cuba. Ministerio de Salud Pública. Informe Anual 1992. La Habana, Cuba. 1993., page 84.

[20] José Luis Rodríguez and George Carriazo Moreno. Op. Cit. pp. 139.

[21] Carmelo Mesa-Lago. Op. Cit. pp. 646

[22] Ibid., page 647.

[23] Ibid., page 662.

[24] José F. Alonso and Armando M. Lago. Op.cit. pp.63

[25] Claes Brundenius. Economic Growth, Basic Needs and Income Distribution in Revolutionary Cuba. (Lund, Sweden: Research Policy Institute, 1981), pp. 158.

[26] Medea Benjamin, Joseph Collins and Michael Scott. No Free Lunch: Food and Revolution in Cuba Today. A Food First Book. Grove Press Inc. New York. 1984, pp. 80.

[27] José Luis Rodríguez and George Carriazo Moreno. Op. Cit. pp. 88.

[28] "Sobre la Reforma de Precios Minoristas y las Gratuidades Indebidas". in the newspaper Gramma,

14 December 1981.

[29] Enrique Pérez Marín and Eduardo Muños Baños. Agricultura y Alimentación en Cuba. Editorial de Ciencias Sociales, 1991, pp. 19

[30] Ibid., pp. 10.

[31] See: José Luis Rodríguez and George Carriazo Moreno. Op.Cit. pp. 73.

[32] Ibid. , page 107.

[33] Claes Brundenius. Op. Cit. pp. 98.

[34] . This figure is based on an estimate GDP of 10,043 million of current pesos in 1993, which was estimated by the authors from the information presented by Dr. Alfonso Casanova Montero, "La Economía de Cuba en 1993 y Perspectivas para 1994," Centro de Estudios de la Economía Cubana, Prensa Latina, La Habana, Cuba, Marzo, 1994. A higher rate of 12.9 percent of GDP is quoted by Gastón de Cárdenas and Ricardo A. Puerta from Cuban sources in Cuba: Medicina y Salud, paper presented at the second congress of the Christian Democratic Party (Cuba) held at the Instituto de Formación Demócrata Cristiana in Caracas, Venezuela on May 13-14, 1992 (Revised 1993) pp.34.

[35] Osvaldo Castro mentions plans to expand hospital facilities to achieve ratios of 8.0 hospital beds per person by year 2000. See: Osvaldo Castro Miranda. "Situación Actual y Perspectiva de la Salud Pública en Cuba". Revista Cubana de Administracion de Salud. Vol. 7. abril-junio 1981. pp. 116.

[36] The projected rates of doctors per 10,000 persons for the year 2000 are: Cuba 62.5 and USA 25.9; that is the Cuban rates are more than double those of the United States, an example of waste of resources and decreasing returns to investments in health in a poor country. See: Roberto Pasos Nogueira and Pedro Brito. "Recursos Humanos en Salud de las Américas". Educación Médica y Salud. Vol. 20 No. 3. 1986. pp. 301. Detailed data on Cuba's planned expansion in health facilities appears in : Osvaldo Castro Miranda. "Recursos Humanos en Salud de Cuba." Educación Médica y Salud. Vol. 20. No. 3. 1986. pp. 378.

[37] There are also rehabilitation facilities available for medical tourists at "Topes de Collantes," in the province of Sancti Spíritus, at the Escambray mountains.

[38] See: Charles J. Brown and Armando M. Lago. The Politics of Psychiatry in Revolutionary Cuba. Transactions Books. Rutgers University. New Brunswick, New Jersey. 1991.

[39] Jacinto Torras. "Los Factores Económicos en la Crisis Médica". Economía y Desarrollo. Instituto de Economía de la Universidad de la Habana, Vol. 13. septiembre-octubre 1992. pp. 14.

[40] . A 1960 Organization of the American States publication titled: America en Cifras, No.7, (Unión Panamericana, Instituto Interamericano de Estadísticas), Washington, DC. 1960. shows

Cuba's infant mortality rates to be the lowest in Latin America. Similarly, Jacinto Torras op.cit. pp. 14, quoting World Health Organization statistics places Cuba's supply of doctors above those of Uruguay and Argentina. More recent studies now place Cuba's indexes slightly below those of these two other countries.

[41] A comparison of United States and pre-revolutionary Cuba health status and resources appears in Jacinto Torras, Op-Cit., pp. 7-33. Another source of information on health outcomes and standards in

pre-revolutionary Cuba is: Ross Danielson. Cuban Medicine. Transaction Books. Rutgers University. New Brunswick, New Jersey. 1979.

[42] Sergio Díaz-Briquets. The Health Revolution in Cuba. University of Texas Press. Austin, Texas. 1993. pp. 19, shows the life expectancy at birth in Cuba to have been 55.8 years in 1950 and 64.0 years in 1960. Cuban life expectancy in 1955 was 58.8 according to the United Nations. Department of International Economics and Social Affairs. World Population. Selected Years; quoted in Sergio Díaz-Briquets. "How to Figure Out Cuba: Development Ideology and Mortality". Caribbean Review. Vol. 15, No. 2. Spring 1986, pp. 11.

[43] United States Bureau of the Census. Statistical Abstract of the United States. Selected issues 1962-1970. Washington D.C. U.S. Government Printing Office.

[44] See: Pablo Castell-Florit, Luis Suárez Rosas and Sergio R. Ledo. "Estudio comparativo entre los indicadores de salud de la provincia La Habana y los señalados por la OMS para alcanzar la meta de salud para todos en el año 2,000: Factores políticos, económicos y sociales influyentes." Revista Cubana de Administración de Salud. Vol. 10. octubre-diciembre 1984. pp. 325-332. The WHO/PAHO goals for Latin America included: life expectancy at birth of no less than 70 years of age, infant mortality rates of no more than 30 deaths per 1,000 live births, mortality rates for children 1-4 years old of no more than 2.4 deaths per 1000, and 100 percent coverage of the population for immunization services and for general health services. See: Pan American Health Organization. Health For All By The Year 2000: Plan for Action for the Implementation of Regional Strategies. Official Document No. 179. 1982., pp. 4. The reader will note how close was pre-revolutionary Cuba from achieving the goal for life expectancy at birth by 1958, but it was off in the others.

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[45] Carmelo Mesa-Lago. Op.Cit. pp. 662.

[46] Kathleen Barrett. The Impact of the Collapse of the Soviet Union on the Cuban Health Care System. Master Thesis. Georgetown University. January 1993.

[47] This section borrows extensively from Antonio Gayoso. "Cuba: Food Issues During The Transition". Paper presented at the Cuba Transition Workshop held at Shaw, Pittman, Potts & Trowbridge Conference Center. Washington D.C. January 27, 1994.

[48] James P. Grant, The state of world's children 1993, New York: Oxford University Press for UNICEF, 1993, pp.1-90.

[49] Antonio Gayoso. Op. Cit.

[50] Gillian Gunn. Cuba in Transition: Options for U.S. Policy. 20th Century Fund Paper. (New York: 20th Century Fund Press. 1993) pp. 29.

[51] Ricardo A. Puerta. "Legado y Lineamientos Para la Transición en Salud. " Paper presented at the Forum Foro Sobre la Cuba del Mañana, held at the Guiteras Memorial Library. Belén School. Miami, Florida. February 22, 1994.

[52] David Werner. "Health Care in Cuba: a model service or a means of social control-or both?", in David Morley, Jon E, Rohde and Glen Williams, Editors. Practicing Health For All. Oxford University Press. Oxford, 1983, pp. 15-37.

[53] Ibid., pp. 34.

[54] This information on the coerced exploitation of Cuban women by the Cuban Ministry of Public Health comes from the written testimony of Maida Donate-Armada. ex-Director of Research on Global and Territorial Consumption of the Cuban Institute of Research and Orientation of Internal Demand. Memorandum of June 21, 1994 from Madrid, Spain.

[55] República de Cuba. Ministerio de Salud Pública. Informe Anual. 1992., pp. 139.

[56] David Werner, Op.Cit. pp. 34.

[57] República de Cuba. Ministerio de Salud Pública. Informe Anual 1987. La Habana, Cuba 1988., pp. 61.

[58] Egon Johnsson and Duncan Newhouser. "Hospital Staffing Ratios in the United States and Sweden", in R. Elling, ed. Comparative Health Systems. Supplemental volume of Inquiry. Vol. 12. June 1975. pp. 25-40. U.S. staffing ratios are also presented in Milton I. Roemer and Jay W. Friedman, Doctors in Hospitals. The Johns Hopkins University Press, 1971, pp.107.

[59] T. R. Anand, P. N. Ghei and A. Timmappaya. Guide to Staffing Pattern for Hospitals. National Institute of Health and Family Welfare. New Delhi, India. 1977.

[60] Central administration overhead costs, including public health, research and administrative functions, (but excluding education) as percentages of 1975 total health care expenses range from 5.7% in Australia, to 11.5% in France. In between were: Canada (6.0%), United Kingdom (8.6%), West Germany (9.5%) and the United States (9.6%) (See: Robert J. Maxwell. Health and Wealth. Lexington Books. D.C. Heath and Company. Lexington, MA 1981., pp. 83.) For developing countries only two estimates are available. In Costa Rica, strictly administrative costs were 4.6%-5.2% of the 1975-79 total expenditures of health/maternity social insurance (See: Carmelo Mesa-Lago. "Health Care in Costa Rica: Boom and Crisis". Social Science Medicine. Vol. 21, No. 1, 1985., pp. 17), while in Dominica the overhead rate comprising public health, research and administration costs is the largest in the sample, amounting to 15.3% of total health care expenditures. (See: Pan American Health Organization. Strengthening the Implementation of Local Health Systems. The English-Speaking Caribbean Countries Assessment for Change. Document HSD/SILOS-16. Washington D.C. 1992, pp. 75.)

[61] The inefficiency that results from these extravagant standards of health care in a poor country was brought up by Sergio Díaz-Briquets. "How to Figure Out Cuba: Development, Ideology and Mortality". Caribbean Review. Vol. 15, No. 2. Spring 1986. pp. 8-42.

[62] Milton I. Roemer. Cuban Health Services and Resources. Pan American Health Organization. Washington D.C. 1976. pp. 27.

[63] The United Kingdom experienced rates of 5.5 annual outpatient visits per person in 1950. See: W.P.D. Logan and E. Brooke. The Survey of Sickness 1943-to 1952. London 1957.

[64] Estimated from: República de Cuba. Ministerio de Salud Pública. Informe Anual. 1992., pp. 118. This estimate assumes an average of three obstetric doctor visits for the 41 percent of all pregnant women who terminate their pregnancies through an abortion. The crude unadjusted (unadjusted for abortions) rate of obstetric doctor visits was 17.2 visits in 1992.

[65] The number of healthy baby visits standard of Cuba was estimated from telephone interviews with Cuban doctors recently arrived from Cuba. Contrast these high rates with those of Chile, where maternal

visits per live birth were 3.4 annually in 1979 and pediatric visits per person under the 15 years old were 1.2 in 1980. See: Clara S. Haignere. "The Application of the Free Market Economic Model in Chile and the Effects on the Population's Health Status". International Journal of Health Services. Vol. 13, No. 3, 1983. pp. 399.

[66] U.S. Department of Health and Human Services. Public Health Service. "Health 1992: United States and Healthy People 2000 Review." Washington D.C. 1992. pp. 117 and U.S. Department of

Health and Human Services. Public Health Service. Vital and Health Statistics: Current Estimates from the National Health Interview Survey, 1992. Series 10, No. 189. Washington D.C. January 1994. pp. 8 and 115.

[67] Pan American Health Organization. Las Condiciones de Salud en Las Américas 1981-1984. Vol. 1. Washington D.C. 1985. pp. 166.

[68] The swedish rates appear in Medical World. Vol. 98. No.1, 1963.

[69] These rates come from: Pan American Health Organization. Las Condiciones de Salud en Las Américas, Edición de 1990. Vol. I. Washington D.C. 1992. pp. 300-305, and from the earlier PAHO report Las Condiciones de Salud en Las Américas 1981-1984. Vol. I. pp. 166.

[70] See: I. D. Bogatyrev. "Establishing Standards for Outpatient and Inpatient Care" in Morbidity of Urban Populations and Standards of Therapeutic-Prophylactic Care. American Public Health Association. New York. 1974, pp. 49

[71] Fondo de las Naciones Unidas para la Infancia/ Fondo de Población de las Naciones Unidas/ Organización Panamericana de la Salud./ Ministerio de Salud Pública de la República de Cuba. El Plan del Médico de la Familia de Cuba. New York: UNICEF. 1992.

[72] All these figures come from: República de Cuba. Ministerio de Salud Pública. Informe Anual. Selected years 1985-1993.

[73] UNICEF. Op. Cit. pp. 38.

[74] The fact that changes in the population and labor force composition of Cuba will affect the demands for education and health care is discussed in Sergio Díaz-Briquets. "Collision Course: Labor Force and Educational Trends in Cuba". Cuban Studies. Vol. 23. 1993.

[75] U.S. Department of Health and Human Services. Public Health Service. United States and Health People 2000 Review. Washington D.C. 1992.pp. 117 and U.S. Department of Health and Human Services, Public Health Service, Vital and Health Statistics: Current estimates from the National Health Interview Survey 1992. Series 10, No. 189, Washington, D.C. January 1994, pp.8 and 115.

[76] American College of Obstetrics and Gynecologists. Standard for Obstetrics and Gynecologic Services. Seventh Edition. Washington D.C. 1989. pp. 15-16.

[77] The Cuban standard for ambulatory care visits was developed from telephone interviews with Cuban doctors recently arrived in the United States.

[78] Ibid.

[79] American Academy of Pediatrics. Committee on Psychosocial Aspects of Child and Family Health,

1985-1988 Guidelines For Health Supervision II. Elk Grove, Illinois. 1988. pp. 155-159.

[80] Nancy Birdsall, Francois Orivel, Martha Ainsworth, and Punham Chuhan. "Three Studies on Cost Recovery in Social Sector Projects". CPD Discussion Paper 1983-8. World Bank, Washington D.C. 1983.

[81] These outpatient price elasticities come from Howard Barnum and Joseph Kutzin. Public Hospitals in Developing Countries. Published for the World Bank. The Johns Hopkins University Press. Baltimore 1993. pp. 153, and are in general agreement with the estimates of other researchers. See for example: Paul Gerthler, Luis Locay and Warren Sanderson. " Are User Fees Regressive? The Welfare Implications of Charging for Medical Care in Peru". in Pan American Health Organization. Health Economics: Latin American Perspectives. Washington D.C. 1989. pp. 95.

[82] José F. Alonso and Armando M. Lago. Op.Cit. pp. 29-33.

[83] For a discussion on how the different concepts of price elasticities are affected by free prices (prices equal to zero) see: Armando M. Lago et al. Patronage Impacts of Changes in Transit Fares and Services. Prepared for the U.S. Department of Transportation. Urban Mass Transportation Administration. Office of Service and Methods Demonstration. (Bethesda, MD: Ecosometrics Incorporated, 1981) pp. 5-10.

[84] These price elasticities come from Howard Barnum and Joseph Kutzin. Op. Cit., pp. 153.

[85] Osvaldo Castro Miranda. "Estrategia en el Financiamiento de la Salud." Cuba Económica. Vol. 2 No. 3. Marzo-Octubre 1992. pp. 111-117.

[86] UNICEF. Op. Cit. pp. 32.

[87] See for example: Milton I. Roemer. "Primary Health Care and Hospitalization: California and Cuba". American Journal of Public Health. Vol. 83 No.3. March 1993. pp. 317-318.

[88] See: Alejandro García Gutiérrez, Fidel Cathcart Roca and Carmen Pascual Jacomino. "Determinación de las Necesidades de Camas en un Servicio de Cirugía General". Revista Cubana de Administración de Salud. enero-marzo 1982. pp. 78.

[89] Pedro E. Alemán Ramírez, María de los Angeles García and Ana Brito Felipe. " Controles Administrativos para la Reducción de los Costos Hospitalarios en el Epígrafe de Medicamientos y Materiales de Curaciones." Revista Cubana de Salud Pública. Vol. 14. No. 2. abril-junio 1988, pp. 43.

[90] Osvaldo Castro Miranda. Op. Cit. pp. 111-117. The unit cost figures presented in the text are the ratio of O. Castro's hospital cost figures and the product of the number of hospital beds (excluding the social assistance beds) times 365 days.

[91] República de Cuba, Ministerio de Salud Pública, Informe Anual 1992, La Habana, p.85.

[92] República de Cuba. Comité Estatal de Estadísticas. Anuario Estadístico 1989. La Habana. pp. 116.

[93] Sergio R. Ledo Duarte y José Cobas Manrique. " El Método Normativo como Fundamentación Científica en el Proceso de Planificación de Salud". Revista Cubana de Administración de Salud. Vol. 13. No. 4. octubre-diciembre 1987. pp. 531-532.

[94] See for example: Carmen Valenti Pérez, Hugo Reboredo Rodríguez and Amado Ulloa Rivero. "Estudio sobre la Atención Especializada en la Atención Ambulatoria en dos Municipios del País". Revista Cubana de Administración de Salud. Vol. 10. No. 2. abril-junio 1984. pp. 116-121, and José A.

Fernández Sacasas, Germinal Alvarez Batard, Jose Díaz Novas, Wilfrido Ruíz León, Nelson Rodríguez Mesa and Pablo Hernández Rodríguez. "Programa Integral de Salud para el Adulto Según el Modelo de Medicina en la Comunidad" Revista Cubana de Administración de Salud. Vol.1. No. 3-4. julio-diciembre 1975, pp. 155-173.

[95] See: Pan American Health Organization. Strengthening the Implementation of Local Health Systems: The English Caribbean Assessment for Change. Document HSD/SILOS-16. Washington D.C. 1992. pp. 112.

[96] Pan American Health Organization. Health Conditions in the Americas 1977-1980. Scientific Publication No. 427. Washington D.C. 1982. pp. 361.

[97] Hospital manning standards are presented in : Sergio R. Ledo Duarte, Daniel Peña Amador and Roberto Sordo Rivera. "Sistema Único de Normas de Plantilla en las Instituciones Hospitalarias" Revista Cubana de Administración de Salud. Vol. 11, No. 2. abril-junio 1985. pp. 99-112 The specific staffing of the Hermanos Almejeiras hospital is presented in: Raul Gómez Cabrera and Boris Kleindorf Shainblatt. "Cuba: La Interrelación Hospital-Médico de la Familia dentro de las Estrategias de la Atención Primaria de Salud" Educación Médica y Salud. Vol. 25. No. 3. 1991. pp. 229.

[98] Julie Margot Feinsilver. Op.Cit. pp. 157.

[99] Willy de Geyndt. "The Cuban Hospital System". World Hospitals. Vol. 8, No. 3. July 1972. pp. 279-284.

[100] Pedro E. Alemán Ramírez, María A. Aguila García, Teresa Muñoz Díaz, and Ana Brito Felipe. "Algunos Aspectos Organizativos y Económicos de un Servicio de Ginecología". Revista Cubana de Administración de Salud. Vol. 10, No. 4. 1984, pp. 320.

[101] Ibid. pp. 322.

[102] V. Y. Shilinskas. Metodología de Planificación y Financiamiento de Salud Pública Soviética y sus Aspectos Económicos. Centro Nacional de Información de Ciencias Médicas. La Habana. 1979. The application of Shilinskas' costing methodology is reported in: Pedro Alemán Ramírez, María A. Aguila García, Teresa Muñoz Díaz and Ana Brito Felipe. Op. Cit., pp. 316.

[103] UNICEF. Op. Cit. , pp. 36

[104] IBID. , pp. 38.

[105] . The above cost relationship is the most frequently estimated in developing nations. See: Barnum and Kutzin (1993) Op.Cit. pp. 86-87.

[106] Robert J. Maxwell. Op. Cit., pp. 71.

[107] Phillip Musgrove. "The Economic Crisis and its Impact on Health and Health Care in Latin America and the Caribbean". International Journal of Health Services. Vol. 17, No. 3, 1987. pp. 430.

[108] All the capital costs and maintenance cost standards come from Howard Barnum and Joseph Kitzin. Op. Cit. pp. 23 and 141.

[109] Robert J. Maxwell. Op. Cit. pp. 83.

[110] Robert J. Maxwell. Op. Cit. pp. 79-80.

[111] J. Price Gittinger, Editor. Compounding and Discounting Tables for Project Evaluation. (Washington, D.C. : EDI Teaching Materials Series No. 1, Economic Development Institute, International Bank for Reconstruction and Development, 1973)

[112] Philip Musgrove. Op. Cit. pp. 430

[113] Estimated by the authors from the U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States. U.S. Government Printing Office. Washington D.C. Selected Annual Issues.

[114] Ricardo Donate-Armada. "Cuban Social Security: A Preliminary Actuarial Analysis of Law # 24 of Social Security." Paper presented at the 4th annual meeting of the Association for the Study of the Cuban Economy (ASCE) in Miami, Florida. August 11-13, 1994.

[115] . Howard Barnum and Joseph Kutzin Op. Cit. (1993), pp.112.

[116] See: Carmelo Mesa-Lago. Ascent to Bankruptcy. University of Pittsburgh Press. Pittsburgh, PA. 1989. pp. 54., and Lynn M. Morgan. " Health Without Wealth: Costa Rica's Health System Under Economic Crisis". Journal of Public Health Policy. Spring 1987. pp. 86-105.

[117] Carmelo Mesa-Lago. "Health Care in Costa Rica: Boom and Crisis". Social Science Medicine. Vol. 21. No.1. (1985). pp. 16.

[118] José F. Alonso and Armando M. Lago. Op. Cit. pp. 40-44.

[119] . Ministerio de Salud Pública, "Encuesta Nacional de Minusvalidos, Informe Preliminar," La Habana, 1982. Anexo 1, quoted in Rodríguez and Carriazo Moreno, op.cit., pp. 180-181. To the 0.62% handicapped rate from this survey we have added 0.13% to represent handicapped persons institutionalized according to the Anuario Estadístico de Cuba, 1889, op.cit., pp. 349.

[120] These hospital co-payment rates come from: Vicente Navarro. "The Public/Private Mix and the Funding and Delivery of Health Services: An International Survey". American Journal of Public Health. Vol. 75, No. 11. November 1985. pp. 129. Comparable rates for ambulatory services from the same source are: USA (56%), France (58%), Canada (72%), West Germany (84%), Sweden (91%) and U.K. (94%).

[121] The hospital co-payment rates for these underdeveloped countries come from: Howard Barnum and Joseph Kutzin. Op. Cit. pp. 182-183.

[122] Joseph L. Scarpaci. "Restructuring Health Care Financing in Chile". Social Science Medicine. Vol. 21, No. 4, 1985. pp. 423.

[123] Estimated by the authors from the information presented in Joseph L. Scarpaci. Op. Cit., pp. 420 and 424.

[124] Tarsicio Castañeda. "The Chilean Health System: Organization, Operation, and Financing". in Pan American Health Organization. Health Economics: Latin American Perspectives. Scientific Publication No. 517. Washington D.C. 1989., pp. 9.

[125] See: Paul Gethler, Luis Locay and Warren Sanderson. Op. Cit. pp. 95.

[126] . U.S. Department of Health and Human Services, Social Security Administration, Office of International Policy, Social Security Programs throughout the World, 1991, SSA, Publication No. 61-006, September 1992.

[127] An interesting privatization proposal appears in Gastón de Cárdenas and Ricardo A. Puerta. (1993) Op. Cit., pp. 50-59.

[128] The privatization rates of pre-revolutionary Cuba come from: Jacinto Torras. Op. Cit. pp. 15.

[129] . All the data on unemployment compensation presented in this section comes from: U.S. Department of Health and Human Services. Social Security Administration, Office of International Policy, Social Security Programs throughout the World 1991, SSA Publication No. 61-006. September, 1992.

[130] Vicente Navarro. "Taking Care of the Unemployed". International Journal of Health Services. Vol. 20, No. 1. 1990. pp. 194.

[131] . U.S. Department of Health and Human Services, Social Security Administration, (1992), op.cit.

[132] Anuario Estadístico de Cuba-1989, Comité Estatal de Estadísticas, 1989. La Habana, Cuba, pp. 128.

[133] Ibid.

[134] Ricardo A. Donate-Armada, Op-Cit.

[135] Ley No.24, Seguridad Social, Gaceta Oficial de la República de Cuba, No. 27, Año LXXVII, 29 de Agosto de 1979, pp.345.

[136] Ricardo A. Donate-Armada, Op. Cit..

[137] Ibid.

[138] Ibid.

[139] Ibid.

[140] Ibid.

[141] Ibid.

[142] Ibid.

[143] Ibid.

[144] Ibid.

[145] .Mirta Rodríguez Calderón, "Dedo en la Llaga," Bohemia, 26 Noviembre, 1993.

[146] . Claes Brundenius, Op.Cit., pp. 184.

[147] . José F. Alonso and Armando M. Lago, Op. Cit., pp. 39-45.

[148] . The emergency assistance diets proposed per person are based on 2500 calories, covering the Recommended Daily Allowances of the United States Department of Agriculture. In the diet design, we observed the 2-2-4-4 rule for protein, carbohydrates, fruit and vegetables, and dairy. Considerations as to fat content were not observed because we assumed that lean meats could be obtained in the country. International relief agencies could provide powder milk as relief grants. In the design we avoided recommending commodities which would have to be imported.

[149] The authors wish to express their appreciation to Ms. Susan Moore, Registered Nutritionist, with the George Washington University Obesity Management Program, our consulting dietician and mentor, whose advise and patience made possible for us to understand the importance of those vital elements of life.

[150] . S.J.Prais and Houthakker, H.S., The Analysis of Family Budgets, University of Cambridge, Department of Applied Economics, Monograph 4, Cambridge University Press, 1971, pp.141.

[151] Ernesto Hernández-Catá argues that in the case of Russia a comprehensive price liberalization, could lead to a once-and-for-all jump in the general price level -- possibly a very large one if, it occurred against the background of a sizeable monetary overhang. See his "Russia and the IMF: The Political Economy of Macro-Stabilization", IMF Paper on Policy Analysis and Assessment Washington, DC., September, 1994. pp. 4.

[152] Ricardo A. Donate-Armada. Op. Cit.

[153] The payroll rates quoted for old age retirement, disability and survivor's pensions come from: U.S. Department of Health and Human Services, Social Security Administration,(1992), Op. Cit

Table 1.
Overview of the cost of cuban social safety net
Selected years 1980-1992 (in million pesos)

Item	1992	1990	1989	1987	1985	1982	1981	1980
Gross Domestic Product	12100.0	18731.0	19430.0	19178.0	19222.0	16420.0	15506.0	13259.0
Wages and salaries paid	8227.4	N/A	7971.0	7290.0	7139.0	6089.0	5748.6	4851.0
Social Safety Net								
Cash benefits								
Pension and Maternity								
Revenues	N/A	N/A	N/A	608.9	739.1	629.2	587.2	490.8
Expenses	1528.6	1399.9	1313.1	1097.0	930.6	778.6	713.1	686.8
Subsidies	N/A	N/A	N/A	488.1	191.5	149.4	125.9	196.0
Unemployment Compensation	867.4	N/A	390.1	N/A	N/A	N/A	173.8	N/A
Educational Cash Grants	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
In-kind Benefits								
Health benefits	1038.8	1045.1	1015.6	922.2	794.3	594.7	558.9	440.2
Housing subsidies	N/A	N/A	N/A	116.8	115.9	103.4	98.4	84.6
Food subsidies	N/A	N/A	800.0	610.0	N/A	N/A	671.0	1887.0
Social assistance								
Day Care								
Revenues	N/A	N/A	2.1	1.7	1.5	1.4	1.3	1.3
Expenses	N/A	N/A	7.2	5.8	5.2	4.8	4.5	4.3
Subsidies	N/A	N/A	5.1	4.1	3.7	3.4	3.2	3.0
Other Social assistance	N/A	N/A	41.2	37.3	32.9	28.6	26.8	19.3
Educational subsidies								
Boarding students								
Room	N/A	N/A	36.2	35.8	35.5	34.9	34.8	30.2
Board (food)	N/A	N/A	87.0	85.8	85.2	83.8	83.6	72.4
Total	N/A	N/A	123.2	121.6	120.7	118.7	118.4	102.6
Semi-boarding students (food)	N/A	N/A	35.1	31.6	32.0	28.8	27.0	25.6

Note: N/A denotes information not available

Sources: The Gross Domestic Product (GDP) data come from Alonso and Lago (1994), the wage data come from the Anuarios Estadísticos de Cuba (Selected years). For all the other data, see the text.

Table 2.
Cuba: Health indicators selected years 1958-1992

Years	Life Expectancy at Birth (years)	Infant Mortality per 1000 Births	Health Inputs per 1000 Population			Health Spending (as Percent of GDP)
			Physicians	Nurses	Hospital Beds	
1993		9.4	4.7	6.7	6.0	11.7
1992	76.0	10.2	4.3	6.8	6.0	8.6
1991		10.7	4.0		6.0	7.3
1990		10.7	3.7		6.0	5.6
1989		11.1	3.3	6.1	6.0	5.5
1988		11.9	3.0	5.6	5.7	5.5
1987	74.5	13.3	2.7	5.2	5.6	5.4
1986	74.4	13.6	2.5	4.7	5.3	5.0
1985		16.5	2.3	4.2	5.1	4.1
1984	74.3	15.0	2.1	3.8	5.2	3.9
1983	74.2	16.8	1.9	3.5	5.0	3.7
1982		17.3	1.7	3.2	4.8	3.8
1981	73.0	18.5	1.7	3.0	4.7	3.6
1980		19.6	1.6	2.8	4.5	3.4
1979		19.4	1.5	2.7	4.5	3.2
1978	73.0	22.4	1.5	2.7	4.4	3.1
1977		24.9	1.5	2.6	4.5	2.9
1976		23.3	1.1	2.5	4.5	3.0
1975		27.5	1.0	2.3	4.6	2.9
1974		29.3	0.9	2.1	4.8	3.0
1973		29.6	0.8	1.9	4.5	2.8
1972		28.7	0.7	1.6	4.6	3.1
1971		36.1	0.7	1.5	4.6	3.4
1970	70.0	38.7	0.7	1.4	4.7	
1969		46.7	0.7	1.7	5.0	
1968		36.8	0.7	1.6	5.0	
1967		37.2	0.8	1.5	5.0	
1966		37.1	0.9	1.3	5.0	
1965		36.9	0.8	1.2	5.0	
1964			0.9	1.1	4.9	
1963			0.9	1.0	4.9	

1962			0.9	0.9	5.0	
1961			0.9	0.9	4.8	
1960	64.0		1.0	0.8	4.6	
1959		34.7	1.0	0.8	4.4	2.3
1958				0.7	4.2	2.3

Source: Life expectancy for 1960 comes from Diaz Briquets (1993) and GDP data comes from Alonso and Lago (1994) for the period pre-1993. GDP for 1993 was estimated by the authors from Dr. Alfonso Casanova Montero, La Econom¡a de Cuba en 1993 y Perspectivas para 1994, Centro de Estudos de la Econom¡a Cubana, Prensa Latina, La Habana, Cuba, Marzo , 1994. The pre-1960 budgets on private hospitals and clinics come from Gast¢n de C rdenas and Ricardo A . Puerta. (1993), op.cit. pp.4. All the other data comes from Brundenius (1984) for the period 1959-1980 and from the Ministry of Public Health, "Informes Annuales (Selected Years)", and the "Anuarios Estad¡sticos de Cuba", (Selected years) for the post - 1980 period.

Table 3
Comparative world health indicators

Countries	1985 Life Expectancy at Birth (years)	1989 Infant Mortality (Per 1000 Births)	Health Inputs per 1000 Population			Health Spending (As percent of GNP) 1989
			Physicians 1985	Nurses 1985	Hospital Beds 1989	
C.B.I. competitors						
Jamaica	73	16	0.49	2.50	3.33	4.60
Dominican Republic	67	61	0.57	0.83	2.50	N.A
Costa Rica	75	17	1.04	2.22	3.41	6.9(1985)
Mexico	69	40	0.80	1.14	1.25	3.40
Dominica	75	17	0.32	1.88	4.44	5.30
Trinidad and Tobago	71	15	1.05	3.98	5.00	N.A
Panam	72	22	1.00	2.57	3.33	5.60
Barbados	75	13	0.89	4.49	8.53	N.A.
Selected O.E.C.D. countries						
Greece	77	12	2.85	2.24	6.16	5.30
Portugal	75	14	2.42	1.59	5.00	6.40
Spain	77	8	3.17	3.87	5.20	6.00
Selected Latin American countries						
Argentina	71	30	2.68	1.19	5.59	7.10
Chile	72	19	0.81	2.70	3.41	6.10
Uruguay	73	22	1.95	5.29	3.25	6.40
Selected Pacific countries						
Hong Kong	77	7	0.93	4.15	4.89	N.A.
So. Korea	70	23	0.87	1.72	1.68	5.10
Malaysia	70	22	0.52	0.99	2.50	3.50
Cuba	74	11.1	2.28	5.20	4.56	5.52
Cuba (1992)	76	10.2	4.33	6.83	6.00	8.59
Cuba (1993)	N.A.	9.4	4.70	6.70	6.0	11.70

Source: For data other than Cuba's, see: Howard Barnum and Joseph Kutzin, Public Hospital in Developing Countries, Published for the World Bank by The Jonhs' Hopkins University Press, 1973, pp. 73-75. For Cuban data see Table 2. For Costa Rica's GNP share see: Carmelo Mesa Lago. Financiamiento de la Atenci¢n a la Salud en la Am,rica Latina y el Caribe con focalizaci¢n en el Seguro Social. Instituto de Desarrollo del Banco Mundial, Documento No. 42, Washington, DC. 1988. pp. 41.
N.A. Not available

Table 4.
An international comparison of hospital utilization rates
Percent of beds utilization

Country (year)	Hospital types	Occupancy rates
West Germany (1981)	All hospitals	84.2 %
	General hospitals	82.4%
	Acute hospitals	82.3%
Austria (1980)	Accute hospitals	83.7%
Sweeden (1981)	All hospitals	83.56%
	General hospitals	90.8%
France (1982)	All general public hospitals	82.0%
United Kingdom (1977)	All hospitals	81.7%
	General hospitals	71.9%
Belgium (1980)	Accute hospitals	81.32%
Denmark (1982)	All somatic hospitals	80.0%
	General hospitals	84.0%
Switzerland (1981)	General hospitals	74.6%
Italy (1980)	All hospitals	69.9%
	General hospitals	80.4%
Greece (1981)	All hospitals	69.0%
	General hospitals	67.0%
Portugal (1979)	All hospittals	68.87%
	General hospitals	64.56%
Spain (1980)	All hospitals	65.52%
	General hospitals	70.84%
Cuba (1980)	All hospitals	80.4%
	General hospitals	80.7%
Cuba (1985)	All hospitals	85.9%
	General hospitals	87.1%
Cuba (1987)	All hospitals	84.1%
	General hospitals	84.5%
Cuba (1990)	All hospitals	78.5%
	General hospitals	74.5%
Cuba (1992)	All hospitals	72.6%
	General hospitals	72.2%

Source: Utilization rates of western european hospitals come from EuroHealth Handbook 1985. Robert S,

First , Inc. White Plains, N.Y. 1985. The cuban data come from: 'Rep£blica de Cuba, Ministerio de Salud P£blica. Informe Anual, 1987-1992

Table 5.
Hospital Staff Utilization - International Comparisons
Number of hospital staff per bed

Countries	Years	Doctors Staff	Nurses Staff	Technicians Staff	Nurses & Technicians Staff	Administrative Staff	Housekeeping Staff	Admin. & Housekeeping Staff	Total Staff
Colombia	1979	0.2	N/A	N/A	1.4	N/A	N/A	1	2.6
Dominican Republic	1989	0.9	N/A	N/A	0.8	N/A	N/A	0.4	2.1
Jamaica	1986	0.2	N/A	N/A	1.4	N/A	N/A	0.4	1.9
Indonesia	1985	0.6	N/A	N/A	1	N/A	N/A	1.2	2.8
India	1977	0.44	0.44	0.21	0.65	0.21	0.7	0.91	2
Cuba - Roemer	1976	0.23	N/A	N/A	N/A	N/A	N/A	N/A	2.25
Cuba - Hnos Almejeiras	1991	0.33-0.58	0.62	N/A	N/A	N/A	N/A	N/A	N/A
Austria	1981	0.11	0.27	0.21	0.48	N/A	N/A	0.36	0.96
Greece	1981	0.21	0.3	0.05	0.35	N/A	N/A	N/A	N/A
Denmark	1980	0.15	0.42	0.7	1.12	N/A	N/A	N/A	N/A
Norway	1981	0.06	0.37	N/A	N/A	N/A	N/A	N/A	2.25
Sweden	1982	0.09	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Switzerland	1979	0.11	0.62	0.27	0.89	N/A	N/A	N/A	N/A
West Germany	1981	0.11	0.37	0.1	0.47	N/A	N/A	N/A	N/A
United States - Roemer	1971	0.1	0.89	0.19	1.07	0.36	0.55	0.91	1.82

Source: Data for Colombia, Dominican Republic, Jamaica and Indonesia come from Howard Barnum and Joseph Kutzin, (1993).
Data for the Western European countries come from the EuroHealth Handbook, 1985,
Data for India come from Anand Ghei and Timmapaya (1977)
Data for the U.S. come from Roemer and Friedman (1971).
Data for Cuba come from Roemer (1976), UNICEF (1992) and G¢mez Cabrera and Kleindorf (1991).

Table 6a.
Cuba: Per-capita usage rates of ambulatory health facilities 1992

		Rates per person by age and sex cohort groups								
Type of services	**Total (mill. visits)**	**less than 1 yr.**	**1-4 yrs**	**5-14 yrs.**	**15-49 yrs.**		**50-65 yrs.**		**65+ yrs.**	
					males	**females**	**males**	**females**	**males**	**females**
Emergency room visits	18.204	1.680	1.680	1.680	1.680	1.680	1.680	1.680	1.680	1.680
Outpatiens visits	50.191	21.970	4.840	2.280	4.030	5.250	4.030	4.360	5.820	6.150
Internal medicine	30.509	0.000	0.000	0.000	3.470	3.470	3.470	3.470	4.860	4.860
Surgery	5.077	0.000	0.000	0.000	0.560	0.560	0.560	0.560	0.960	0.960
Pediatrics	10.495	21.970	4.840	2.280	0.000	0.000	0.000	0.000	0.000	0.000
Obstetrics	2.736	0.000	0.000	0.000	0.000	0.890	0.000	0.000	0.000	0.000
Gynecology	1.374	0.000	0.000	0.000	0.000	0.330	0.000	0.330	0.000	0.330
Family doctors visits	31.454	17.020	5.300	3.950	2.070	2.620	2.020	2.020	1.890	1.870
Pediatrics	5.071	5.790	2.540	1.510	0.000	0.000	0.000	0.000	0.000	0.000
Puericulture	2.461	9.380	0.910	0.200	0.000	0.000	0.000	0.000	0.000	0.000
Obstetrtics	1.679	0.000	0.000	0.000	0.000	0.550	0.000	0.000	0.000	0.000
Old age homes	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.040	0.020
Schools	0.586	0.000	0.000	0.390	0.000	0.000	0.000	0.000	0.000	0.000
Factories	1.283	0.000	0.000	0.000	0.170	0.170	0.170	0.170	0.000	0.000
Pre-employment checkups	0.301	0.000	0.000	0.000	0.050	0.050	0.000	0.000	0.000	0.000
General medicine	14.224	1.320	1.320	1.320	1.320	1.320	1.320	1.320	1.320	1.320
Home visits	3.940	0.360	0.360	0.360	0.360	0.360	0.360	0.360	0.360	0.360
Others	1.882	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
Dental visits	13.741	0.000	0.290	2.790	1.100	1.100	1.100	1.100	1.100	1.100
Total	113.590	40.670	12.110	10.700	8.880	10.650	8.830	9.160	10.490	10.800

Notes:

1) Internal medicine visits were allocated proportionally to the rates presented in Francisco Garc¡a Bertr n and Rafael D¡az Padr¢n, " "An lisis del Programa de Atenci¢n Integral al Adulto: Policl¡nico Pasteur 1976-1982," Revista Cubana de Administraci¢n de Salud, Vol.10, Julio-Septiembre, 1984, pp 237-238.

2) Surgery allocated proportionally to the data presented in Maria C. Fern ndez Gonz lez and Gil

Montelongo Dias, "Estructura de la Mobilidad y Comportamiento de la Estad¡a en 4 Servicios de Cirug¡a General de la Ciudad de La Habana, "Revista Cubana de Administraci¢n de Salud, Vol.11, Octubre - Diciembre 1985, pp.412.

3) All other rates follows the proportions presented in the "Informe Annual, 1992," of the Ministry of Public Health.

Table 6b.
Cuba: Per-capita usage rates of ambulatory health facilities 1987

		Rates per person by age and sex cohort groups								
Type of services	**Total (mill. visits)**	**less than 1 yr.**	**1-4 yrs**	**5-14 yrs.**	**15-49 yrs.**		**50-65 yrs.**		**65+ yrs.**	
					males	**females**	**males**	**females**	**males**	**females**
Emergency room visits	20.724	2.020	2.020	2.020	2.020	2.020	2.020	2.020	2.020	2.020
Outpatiens visits	45.544	17.220	5.670	2.170	3.710	5.210	3.710	4.290	5.480	6.060
Internal medicine	24.543	0.000	0.000	0.000	3.040	3.040	3.040	3.040	4.260	4.260
Surgery	5.572	0.000	0.000	0.000	0.670	0.670	0.670	0.670	1.220	1.220
Pediatrics	10.557	17.220	5.670	2.170	0.000	0.000	0.000	0.000	0.000	0.000
Obstetrics	2.630	0.000	0.000	0.000	0.000	0.920	0.000	0.000	0.000	0.000
Gynecology	2.242	0.000	0.000	0.000	0.000	0.580	0.000	0.580	0.000	0.580
Family doctors visits	8.986	4.270	1.870	1.140	0.600	0.760	0.590	0.590	0.590	0.590
Pediatrics	1.854	1.800	0.980	0.520	0.000	0.000	0.000	0.000	0.000	0.000
Puericulture	0.587	1.880	0.300	0.030	0.000	0.000	0.000	0.000	0.000	0.000
Obstetrtics	0.446	0.000	0.000	0.000	0.000	0.160	0.000	0.000	0.000	0.000
Old age homes	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Schools	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Factories	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pre-employment checkups	0.064	0.000	0.000	0.000	0.010	0.010	0.000	0.000	0.000	0.000
General medicine	4.563	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450
Home visits	1.259	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.120
Others	0.213	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020
Dental visits	15.691	0.000	0.360	2.780	1.360	1.360	1.360	1.360	1.360	1.360
Total	90.945	23.510	9.920	8.110	7.690	9.350	7.680	8.260	9.450	10.030

Notes: 1) Internal medicine visits were allocated proportionally to the rates presented in Francisco Garc¡a Bertr n and Rafael D¡az Padr¢n, " "Analisis del Programa de Atenci¢n Integral al Adulto: Policl¡nico Pasteur 1976-1982," Revista Cubana de Administraci¢n de Salud, Vol.10, Julio-Septiembre, 1984, pp 237-238. 2) Surgery allocated proportionally to the data presented in Maria C. Fern ndez Gonz lez and Gil Montelongo Dias, "Estructura de la Mobilidad y Comportamiento de la Estad¡a en 4 Servicios de Cirug¡a General de la Ciudad de La Habana, "Revista Cubana de Administraci¢n de Salud, Vol.11, Octubre -Diciembre 1985, pp.412. 3) All other rates follows the proportions presented in the "Informe Annual, 1992," of the Ministry of Public Health.

Table 7
Summary of hospital admissions by cohorts groups Selected years 1980-1992 (admissions per 100 persons)

Age and sex cohort groups	1980	1985	1987	1990	1992
Less than 1 years old	30.50	41.20	38.90	40.80	35.50
1-4 years old	11.60	19.60	17.80	17.60	15.10
5-15 years old	11.60	19.60	17.80	17.60	15.10
15-49 years old					
Males	5.31	6.60	6.83	7.09	5.55
Females	16.70	20.30	20.03	20.29	17.25
50-65 years old					
Males	5.31	6.60	6.83	7.09	5.55
Females	7.41	9.30	9.43	9.89	8.35\
65+ years old					
Males	17.94	22.58	23.12	22.27	17.31
Females	20.04	25.28	25.72	25.07	21.11
Total all ages	13.00	16.00	15.50	15.20	13.50

Source: Estimated by the authors from : 'Republica de Cuba, Ministerio de Salud P£blica, Informe Anual, Selected years 1987-1992.

Table 8.
Cuba: Per-capita usage rates of hospital bed by specialties. Selected years 1980-1992

Specialties	Patients-days per 100 persons by age and sex cohort groups								
	less than 1 yr.	1-4 yrs	5-14 yrs.	15-49 yrs.		50-65 yrs.		65+ yrs.	
				males	females	males	females	males	females
1992	262.44	87.34	87.34	85.9	158.3	85.9	97.1	243.55	254.75
Internal medicine	0.000	0.000	0.000	27.520	27.520	27.520	27.520	149.840	149.840
Psychiatry	0.000	0.000	0.000	32.680	32.680	32.680	32.680	32.680	32.680
Surgery	0.000	0.000	0.000	25.700	25.700	25.700	25.700	61.030	61.030
Pediatric surgery	13.900	13.900	13.900	0.000	0.000	0.000	0.000	0.000	0.000
Obstetrics	0.000	0.000	0.000	0.000	61.200	0.000	0.000	0.000	0.000
Gynecology	0.000	0.000	0.000	0.000	11.200	0.000	11.200	0.000	11.200
Pediatrics	73.440	73.440	73.440	0.000	0.000	0.000	0.000	0.000	0.000
Neo-natology	175.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1990	282.700	101.500	101.500	103.850	183.250	103.850	115.250	299.260	310.660
Internal medicine	0.000	0.000	0.000	32.560	32.560	32.560	32.560	177.280	177.280
Psychiatry	0.000	0.000	0.000	34.880	34.880	34.880	34.880	34.880	34.880
Surgery	0.000	0.000	0.000	36.410	36.410	36.410	36.410	87.100	87.100
Pediatric surgery	14.600	14.600	14.600	0.000	0.000	0.000	0.000	0.000	0.000
Obstetrics	0.000	0.000	0.000	0.000	68.000	0.000	0.000	0.000	0.000
Gynecology	0.000	0.000	0.000	0.000	11.400	0.000	11.400	0.000	11.400
Pediatrics	86.900	86.900	86.900	0.000	0.000	0.000	0.000	0.000	0.000
Neo-natology	181.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1987	274.300	102.900	102.900	103.160	183.360	103.160	115.060	311.910	323.810
Internal medicine	0.000	0.000	0.000	32.420	32.420	32.420	32.420	186.970	186.970
Psychiatry	0.000	0.000	0.000	35.420	35.420	35.420	35.420	35.420	35.420
Surgery	0.000	0.000	0.000	35.320	35.320	35.320	35.320	89.520	89.520
Pediatric surgery	13.700	13.700	13.700	0.000	0.000	0.000	0.000	0.000	0.000
Obstetrics	0.000	0.000	0.000	0.000	68.300	0.000	0.000	0.000	0.000
Gynecology	0.000	0.000	0.000	0.000	11.900	0.000	11.900	0.000	11.900
Pediatrics	89.2	89.2	89.2	0.000	0.000	0.000	0.000	0.000	0.000
Neo-natology	171.4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

1985	278.9	110.3	110.3	98.58	181.18	98.58	110.48	295.99	307.89
Internal medicine	0.000	0.000	0.000	30.700	30.700	30.700	30.700	177.090	177.090
Psychiatry	0.000	0.000	0.000	34.620	34.620	34.620	34.620	34.62	34.62
Surgery	0.000	0.000	0.000	33.260	33.260	33.260	33.260	84.28	84.28
Pediatric surgery	11.100	11.100	11.100	0.000	0.000	0.000	0.000	0.000	0.000
Obstetrics	0.000	0.000	0.000	0.000	70.700	0.000	0.000	0	0
Gynecology	0.000	0.000	0.000	0.000	11.900	0.000	11.900	0	11.9
Pediatrics	99.200	99.200	99.200	0.000	0.000	0.000	0.000	0.000	0.000
Neo-natology	168.600	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1980	226.600	67.700	67.700	83.300	153.000	83.300	93.600	236.650	246.950
Internal medicine	0.000	0.000	0.000	23.460	23.460	23.460	23.460	135.29	135.29
Psychiatry	0.000	0.000	0.000	31.420	31.420	31.420	31.420	31.420	31.420
Surgery	0.000	0.000	0.000	28.420	28.420	28.420	28.420	69.940	69.940
Pediatric surgery	8.600	8.600	8.600	0.000	0.000	0.000	0.000	0.000	0.000
Obstetrics	0.000	0.000	0.000	0.000	59.400	0.000	0.000	0	0
Gynecology	0.000	0.000	0.000	0.000	10.300	0.000	10.300	0	10.3
Pediatrics	59.100	59.100	59.100	0.000	0.000	0.000	0.000	0.000	0.000
Neo-natology	158.900	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes:

1) Not enough information is presented in the Ministry of Public Health's "Informe Anual," to be able to separate medicine and surgery within the 15-65 years old group

2) There are no persons below 15 years old at a Cuban Psychiatric Hospital. See Ferm¡n Gal n Rub¡ Algunas Variables de Ajuste Social y Equizofrenias," Revista del Hospital Psiqui trico de La Habana, Vol 14, No. 1. enero abril 1973, pp.34 and "Migdalia Soy£, Jorge L. Perera Horta y Alexis Alonso Rodr¡guez "Violaciones Disciplinarias de los Pacientes en el Servicio de Psiquatr¡a Forense," Revista del Hospital Psiqui trico de La Habana, Vol. 25 No. 4, Octubre-Diciembre 1984, pp.510.

3) All the other information come from the Ministry of Public Health," Informes Anuales," Selected years.

Table 9
Calibrating personnel costs
Selected years 1987-1992 in current pesos

	1987			1989			1992		
Health professions	**Numbers of Workers**	**Annual Salary**	**Wage Costs (000's)**	**Numbers of Workers**	**Annual Salary**	**Wage Costs (000's)**	**Numbers of Workers**	**Annual Salary**	**Wage Costs (000's)**
Physicians	26003	4356	113269.07	34752	4356	151379.71	46860	4356	204122.16
Dentists	5362	4356	23356.87	6482	4356	28235.59	8057	4356	35096.29
Pharmacists	664	3840	2549.76	649	3840	2492.16	700	3840	2688.00
Nurses				64510	2400	154824.00	73943	2400	177463.20
Licensed nurses	949	2808	2664.79		2808	0.00	5474	2808	15370.99
Technicians	51586	2376	122568.34		2376	0.00	68118	2376	161848.37
Nurse aides	1060	1416	1500.96		1416	0.00	351	1416	497.02
Allied health technicians				49848	2124	105877.15	54905	2124	116618.22
Dental	1642	2052	3369.38		2052	0.00		2052	0.00
Laboratory	8481	2376	20150.86		2376	0.00	2376	0.00	
X-Rays	3110	2376	7389.36		2376	0.00		2376	0.00
Pharmacy aides	4801	2052	9851.65		2052	0.00		2052	0.00
Others	30412	2052	62405.42		2052	0.00		2052	0.00
Day laborers	42776	1464	62624.06	40973	1464	59984.47	38446	1464	56284.94
Service workers	62268	1536	95643.65	59650	1536	91622.40	55972	1536	85972.99
Managers	8016	3840	30781.44	7683	3840	29502.72	7210	3840	27686.40
Adminstrative staff	21782	1800	39207.60	20870	1800	37566.00	19583	1800	35249.40
Other university graduates	5632	3840	21626.88	5382	3840	20666.88	5050	3840	19392.00
Total	274544		618960.096	290799		682151.09	310726		760826.78
Total from Anuario Estad¡stico de Cuba	274544	2256	619371.264	290799	2341	680760.46	n/a	n/a	n/a

Source: See text

Table 10a.
Approximate estimate of health costs by program type - 1989
In million of pesos, unless otherwise specified

				Polyclinics				Hospitals			
Cost elements	**Annual Salaries**	**Family Doctors**	**Direct costs**	**Indirect costs**	**Fixed Gen & Admin. costs**	**Total costs**	**Direct costs**	**Indirect costs**	**Fixed Gen. & Admin. costs**	**Total costs**	
Personnel											
Physicians	4356	34752	8965	4946			4946	16466			16466
Dentists	4356	6482		421			421	326			326
Pharmacists	3840	649			372		37 2		265		265
Nurses	2400	64510	8965	7807			7807	35952			35952
Allied health technicians	2124	49848			14735		14735		16294		16294
Day laborers	1464	40973				2105	2105			23195	23195
Service workers	1536	59650				2105	2105			34733	34733
Managers	3840	7683				632	632			1590	1590
Admi nistrative staff	1800	20870				3789	3789			12177	12177
Other university graduates	3840	5382					0				
Total staff		290799	17930	13174	15107	8631	36912	52744	16559	71695	140998
Total personnel costs			60.568	42.115452	32.72562	15.56208	90.403152	159.430752	35.626056	115.331568	310.388376
Food			0		0		0		54.517		54. 517
Medicines			1.211	18.08			18.08	136.294			136.294
Maintenance & supplies			3.755			6.328	6.328			43.977	43.977
Total current costs			65.534	60.195	32 .726	21.890	114.811	295.725	90.143	159.309	545.176
Capital (Annualized depreciation & interest costs)											
Buildings & installations			10.409 - 34.568 (a)				7.131				96.942
Equipment			3.504 - 12.258 (a)				13.943				49.582
Total capital costs			13.913 - 46.826 (a)				21.074				146.524
Total recurrent costs			79.447 - 112.360< td>60.195	32.726	21.890	135.885	295.725	90.143	159.309	691.700	

Table 10a. cont'd
Approximate estimate of health costs by program type - 1989
In million of pesos, unless otherwise specified

Cost Elements	Dental clinics	Research institutes	Min of Public Health Overhead	Overseas Medical Program	Health tourism	Other health facilities	Total health costs
Personnel							
Physicians		761	1628	1500	29	457	34752
Dentists	5735						8482
Pharmacists		11			1		648(?)
Nurses		715	6707	1500	29	2835	64510(?)
Allied health technicians	7198	242	9410	1000	9	960	49848(?)
Day laborers	326	461	13038		18	1830	40973
Service workers	326	692	19024		26	2744	59650(?)
Managers	163	66	4222		2	1008	7683(?)
Administrative staff	652	242	3041		9	960	20870(?)
Other university graduates		1691	3691				5382
Total staff	14400	48 81	60761	4000	123	10794	290799
Total personnel costs	?	?	?	?	?	?	?
Food	0	2.466	3.566	0	0.052	3.566	64167(?)
Medicines	8.61	6.165	24.741	0	0.1317.131	202383(?)	
Maintenance & supplies	3.016	1.523	6.685	0	0.032	1.633	(?)
Total current costs	11.626	10.154	34.992	0.000	0.215	12.330	1015830(>)
Capital							
(Annualized deprec iation & interest costs)							
Buildings & installations	6.645	3.356	14.73	0	0.071	3.598	149.694 - 178-853 (b)
Equipment	3.399	1.717	7.534	0	0.037	1.84	74.744 - 83.498 (b)
Total capital costs	10. 044	5.073	22.264	0	0.108	5.448	224.438 - 237.351 (b)
Total recurrent costs	21.670	15.227	57.256	0.000	0.323	17.778	1240.068 - 1272.981

Notes

(a) Using UNICEF's construction costs of 35,000 pesos per office and 10,400 pesos of equipment per office. Compares with annual construction costs of 97.3 million pesos in 1989, and equipment investments of 65.0 million pesos in 1989. (See: Comité Estatal de Estadísticas, Anuario Estadístico de Cuba, 1989. pp. 133.)

Table 10b
Approximate estimates of health costs by program type - 1992
In million of pesos, unless otherwise specified

				Polyclinics				Hospitals			
Cost elements	**Annual Salaries**	**Family Doctors**	**Direct costs**	**Indirect costs**	**Fixed Gen & Admin. costs**	**Total costs**	**Direct costs**	**Indirect costs**	**Fixed Gen. & Admin. costs**	**Total costs**	
Personnel											
Physicians	4356	46860	18503	5745			5745	16466			16466
Dentists	4356	8057		423			423	326			326
Pharmacists	3840	700			399		3 99		270		270
Nurses	2403	73943	18503	9035			9035	35952			35952
Allied health technicians	2124	54905			14805		14805		16294		16294
Day laborers	1464	38446				2115	2115			23195	23195
Service workers	1536	55972				2115	2115			34793	34793
Managers	3840	7210				635	635		1620	1620	
Ad ministrative staff	1800	19583				3807	3807			12177	12177
Other university graduates	3840	5050					0				
Total staff		310726	37006	15203	15204	8672	39079	52744	165 64	71785	141093
Total personnel costs			125.062	48.578913	32.97798	15.636	97.192893	159.538608	35.645256	115.538928	310.722792
Food			0		0		0		54.517		54 .517
Medicines			2.501	13.596			13.596	95.326			95.326
Maintenance & supplies			7.754			6.803	6.803			44.045	44.045
Total current costs			135.317	62.175	32.978	22.439	117.592	254.865	90.162	159.584	504.611
Capital											
(Annualized depreciation & interest costs)											
Buildings & installations			21.493 - 71.345 (a)				14.991				97.047
Equipment			7.235 - 25.300 (a)				7.667				49.635
			28.728								

Total capital costs			- 96.645 (a)				22.658				146.682
Total recurrent costs			164.045 - 231.962	62.174913	32.978	22.439	140.250	254.865	90.162	159.584	651.293

Notes
(a) Using UNICEF's construction costs of 35,000 pesos per office and 10,400 pesos of equipment per office.

Table 10b cont'nd
Approximate estimates of health costs by program type - 1992
In million of pesos, unless otherwise specified

Cost Elements	Dental clinics	Research institutes	Min of Public Health Overhead	Overseas Medical Program	Health tourism	Other health facilities	Total health costs
Personnel							
Physicians		761	3899	1000	29	457	46860
Dentists	7308						8057
Pharmacists		11	19		1		700
Nurses		715	5874	1000	29	2835	73943
Allied health technicians	7286	242	15309		9	960	54905
Day laborers	332	461	10495		18	1830	38446
Service workers	332	692	15270		26	2744	55972
Manage rs	166	66	3713		2	1008	7210
Administrative staff	660	242	1728		9	960	19583
Other university graduates		1691	3359				5050
Total staff	16084	4881	59666	2000	123	10794	310726
Total personnel costs	50.130552	14.509605	132.774822	6.759	0.309135	23.334861	760.795437
Food	0	2.466	3.566	0	0.052	3.566	64.167
Medicines	7.0126.165	11.817	0	0.131	4.988	141.536	
Maintenance & supplies	3.51	1.523	6.97	0	0.032	1.633	72.27
Total current costs	60.653	24.664	155.128	6.759	0.524	33.522	1038.768
Cap ital							
(Annualized depreciation & interest costs)							
Buildings & installations	7.732	3.356	15.359	0	0.071	3.598	163.647-213.499
Equipment	3.955	1.717	7.855	0	0.037	1.84	79.941-98.006
Total c apital costs	11.687	5.073	23.214	0	0.108	5.438	243.588-311.505
Total recurrent costs	72.340	29.737	178.342	6.759	0.632	38.960	1282.356 - 1350.273

Notes
(a) Using UNICEF's construction costs of 35,000 pesos per office and 10,400 pesos of equipment per office.

Table 11:
Projected annual real price inflation rates in the health sector (excess above the national rate of inflation)

Cost categories			
Health Services/Programs	Current costs	Capital costs	Total costs
Family doctors	0.20%	2.40% - 2.50%	0.55% - 1.08%
Dental clinics	1.10%	3.20%	1.42%
Hospitals	1.80%	3.20%	2.09%
Polyclinics	1.10%	3.20%	1.42%
Min. of Public Health overhead	1.00%	3.20%	1.28%

Note: Estimated from table 10b. assuming 9.4% annual rate of growth of real prices for medicines and equipment.

Table 12
Cuba: Health parametric costs functions
(In 1992 pesos, unless otherwise specified)

				Health cost parameters	
Program	Cost category	Cost elements	Cost-driving variables	Current system	Proposed reformed system
Family doctors	Current costs	Physicians and nurse wages			
		drugs, maintenance and supplies	Per family doctor	7313	7313
	Capital costs	Depreciation and interest charges of			
		building and equipments	Per family doctor	1553-5223	1553-5223
Dental clinics	Current costs	Dentist and dental technicians wages			
		maintenance and supplies	Per dental visit	4.41	4.41
	Capital costs	Depreciation and interest charges of			
		building and equipments	Per dental visit	0.85	0.85
Hospitals	Hospitalization direct and Indirect costs	Personnel cost of physicians and nurses,			
		pharmacists and allied health technicians			
		food and drugs	Per bed-day	13.380	13.380
	Outpatient and emergency room	Personnel cost of physicians and nurses,	Per outpatient and	3.345	3.345
	direct and indirect costs	pharmacists and allied health technicians	emergency room visit		
		food and drugs			
	General and administrative expenses	Personnel cost of laborer, service workers			
		housekeeping and adminstrative staff	As percentage		

			of direct		
		maintenance and supplies	and indirect cost	46.3 %	24.3%
	Hospitalization capital costs	Depreciation and interest charges of			
		building and equipments	Per bed-day	7.12	7.12
	Ourtpatient and emergency room	Depreciation and interest charges of	Per outpatient and	0.487	0.487
	Capital costs	building and equipments	emergency room visit		
Polyclinics	Direct and indirect costs	Personnel cost of doctors, nurses			
		pharmacist and allied health technicians			
		drugs	Per ambulatory visit	2.045	2.045
	Genral and administrative expenses	Personnel cost of laborer, service workers			
		housekeeping and adminstrative staff	As percentage of direct		
		maintenance and supplies	and indirect cost	23.6%	23.6%
	Capital costs	Depreciation and interest charges of			
		building and equipments	Per ambulatory visit	0.487	0.487
All other health related programs	Current costs of :				
and Ministry of Public Health general	Research institutes, health tourism,				
and administrative expenses	overseas medical programs, other health	Personnel cost, drugs, food, and	As percentage of the sum		
	facilities, and Ministry of Public Health	maintenance and supplies	of all other current costs	27.0%	fixed at 136,27 million pesos
	Capital costs of above facilities	Depreciation and interest charges of	As percentage of the sum		

	building and equipments	of all other current costs	4.1%	fixed at 33.83 million pesos

Source: Estimated from table 10b.

Table 13.
Cuba: analysis of the proposed reformed health system without co-payment financing
(In millions of 1992 pesos)

Programs and financing options	Year t+0, 1995	Year t+5, 2000	Year t+10, 2005	Year t+15, 2010
Family doctors program	276.06	47.66	50.73	54.13
Current costs	161.04	26.48	26.76	27.01
Capital costs	115.02	21.18	23.97	27.12
Dental program	75.97	86.05	95.74	107.20
Current costs	63.69	70.90	77.41	84.91
Capital cost	12.28	15.15	18.33	22.29
Hospital program	678.82	690.84	803.85	959.08
Direct and indirect costs - hospitalization	278.76	316.17	361.18	422.81
Direct and indirect costs - outpatients and emergency room	76.25	84.14	95.46	110.69
General and administrative expenses	164.37	97.28	110.96	129.64
Current costs	519.38	497.59	567.60	663.14
Capital costs - hospitalization	148.34	180.14	220.32	276.16
Capital costs - outpatients and emergency room	11.10	13.11	15.93	19.78
Polyclinics	146.93	154.58	172.87	198.50
Direct and indirect costs	99.67	103.06	113.10	127.23
General and administrative expenses	23.52	24.32	26.69	30.03
Current costs	123.19	127.38	139.79	157.26
Capital costs	23.74	27.20	33.08	41.24
All other programs, facilities and Ministry of Public Health general and administrative costs	269.73	170.1	170.1	170.1
Current costs	234.17	136.27	136.27	136.27
Capital costs	35.56	33.83	33.83	33.83
Total costs	1447.5103	1136.12	1277.36	1469.23
Total current costs	1101.47	858.62	947.83	1068.59
Total capital costs	346.04	277.50	329.53	400.64
Financing allocations	1447.51	1136.12	1277.36	1469.23
State	1447.51	228.36	258.79	191.44
Employers-payroll taxes	0.00	424.17	473.82	591.53

Employees-payroll taxes	0.00	424.17	473.82	591.53
Pensioners - taxes on earnings	0.00	59.42	70.93	94.73
Financing allocations - shares-percent	100.00	100.00	100.00	100.00
State	100.00	20.10	20.26	13.03
Employers-payroll taxes	0.00	37.33	37.09	40.26
Employees-payroll taxes	0.00	37.33	37.09	40.26
Pensioners - taxes on earnings	0.00	5.23	5.55	6.45
Total payroll wages paid	8.23	10.92	11.89	15.11
Total pensions paid	1.23	1.53	1.78	2.42
Health insurance tax rates (as percent of wages and pensions)				
Employers	0.00	3.84	3.99	3.91
Employees	0.00	3.84	3.99	3.91
Pensioners	0.00	3.84	3.99	3.91

Note: Total pensions estimated from Ricardo A. Donate-Armada's, ratio of pensions payments to payroll wages in the CBI scenario. See: Ricardo A. Donate-Armada, Op.cit. Source: See text

Table 14.
Cuba: analysis of the proposed reformed health system with co-payment financing
(In millions of 1992 pesos)

Programs and financing options	Year t+0, 1995	Year t+5, 2000	Year t+10, 2005	Year t+15, 2010
Family doctors program	276.06	47.66	50.72	54.13
Current costs	161.04	26.48	26.75	27.01
Capital costs	115.02	21.18	23.97	27.12
Dental program	75.97	63.67	70.85	76.11
Current costs	63.69	52.46	57.29	60.29
Capital cost	12.28	11.21	13.56	15.82
Hospital program	678.82	511.23	594.85	680.96
Direct and indirect costs - hospitalization	278.76	233.97	267.27	300.20
Direct and indirect costs - outpatients and emergency room	76.25	62.26	70.64	78.59
General and administrative expenses	164.37	71.98	82.11	92.05
Current costs	519.38	368.21	420.02	470.84
Capital costs - hospitalization	148.34	133.31	163.04	196.08
Capital costs - outpatients and emergency room	11.1	9.71	11.79	14.04
Polyclinics	146.93	114.4	127.92	140.93
Direct and indirect costs	99.67	76.27	83.69	90.33
General and administrative expenses	23.52	18.00	19.75	21.32
Current costs	123.19	94.27	103.44	111.65
Capital costs	23.74	20.13	24.48	29.28
All other programs, facilities and Ministry of Public Health general and administrative costs	269.73	170.10	170.10	170.10
Current costs	234.17	136.27	136.27	136.27
Capital costs	35.56	33.83	33.83	33.83
Total costs	1447.51	907.06	1014.44	1122.23
Total current costs	1101.47	677.69	743.77	806.06
Total capital costs	346.04	229.37	270.67	316.17
Financing allocations	1447.51	907.06	1014.44	1122.22
State	1447.51	182.32	205.53	146.23
Employers-payroll taxes	0.00	306.04	339.93	407.99

Employees-payroll taxes	0.00	306.04	339.93	407.99
Employees co-payment user fees	0.00	61.20	67.98	81.60
Pensioners-taxes on earinings	0.00	42.88	50.89	65.34
Pensioners co-payment user fees	0.00	8.58	10.18	13.07
Financing allocations - shares - percent	100.00	100.00	100.00	100.00
State	100.00	20.10	20.26	13.03
Employers-payroll taxes	0.00	33.74	33.51	36.36
Employees-payroll taxes	0.00	33.74	33.51	36.36
Employees co-payment user fees	0.00	6.75	6.70	7.27
Pensioners-taxes on earinings	0.00	4.73	5.02	5.82
Pensioners co-payment user fees	0.00	0.95	1.00	1.16
Total payroll wages paid	8.23	10.92	11.89	15.11
Total pensions paid	1.23	1.53	1.78	2.42
Health insurance tax rates (as percent of wages and pensions)				
Employers	0.00	2.80	2.86	2.70
Employees	0.00	2.80	2.86	2.70
Pensioners	0.00	2.80	2.86	2.70

Note: Total pensions estimated from Ricardo A. Donate-Armada ratio of pensions payments to payroll wages in the CBI scenario. See Ricardo A. Donate-Armada Op.cit. Source: see text

Table 15
Summary of worldwide unemployment compensation programs-selected countries

Countries	Benefits	Duration of Benefits	Maximum Benefits	Minimum Benefits	Requirements	Financing shares			Payroll tax rates, Severance pay rates		
						Employee	Employer	Government	Employee	Employer	
Uruguay	50% of wage	4 months.	8 times min. wage	50% of min. wage	worked 6 months during past 12 months.	43%	57%	0.0%			
Brazil	50% of wage	4 months.	3 times min. wage	100% of min. wage		0.0%	0.0%	100%	0.0%	0.0%	
Venezuela	50% of wage	13-26 weeks.				23%	77%	0.0%	0.25%	0.85%	
Chile	6,000 pesos per months.				52 weeks during previous 2 yrs.	0.0%	0.0%	100%	0.0%	0.0%	
China	50-75% of wage	1year if less than 5 years coverage, 2 years if more than 5 years coverage				0.0%	100%	0.0%	0.0%	1.0%	
Barbados	60% of wage	26 weeks.	US $300 per wk.	US $11 per wk.	20 weeks of work in 3 quarters	50%	50%	0.0%	0.5%	0.5%	
Portugal	65% of wage	5-15 months.	3 times min. wage	100% of min. wage	540 days of work in prev. 2 yrs.	31%	69%	0.0%			
Spain	60-80% of wage	Up to 24 months			6 months. of work during last 4 yrs.	18%	82%	0,0%	1.1%	5.2%	
Colombia	Lump sum payment of	1 months. per year of service					0.0%	100%	0.0%	0.0%	8.33%
Mexico	Lump sum payment of 3 months. wages plus 20 days paid per year of service					0.0%	100%	0.0%	0.0%	8.33%	

Source: US Department of Health and Human Services. Social Security Administration. Office of International Policy, Social Security Programs throughout the World 1991." SSA Publication No. 61-006, September, 1972.

Table 16.
Estimation of unemployment compensation payroll tax rates
Reformed social insurance system
In millions of persons and 1992 pesos

Categories	Year t+0, 1995	Year t+5, 2000	Year t+10, 2005	Year t+15, 2010
Civilian employment (in millions)	3.01	3.99	4.20	4.76
Military employment (in millions)	0.20	0.13	0.05	0.05
Total employment (in millions)	3.21	4.11	4.25	4.81
Economically active population (in millions)	4.76	5.10	5.28	5.48
Unemployment (in millions)	1.55	0.99	1.03	0.67
Unemployment (in percent)	32.65	19.35	19.51	12.28
Unelegible for unemployment compensation (in millions)	0.12	0.12	0.08	0.08
Elegible for unemployment compensation (in millions)	1.43	0.87	0.95	0.60
Unemployment compensation benefit per person at 50.0 % of wages (in pesos)	1368.50	1368.50	1417.00	1588.00
Total unemployment compensation payments (in million pesos)	1959.69	1183.75	1351.82	948.04
Total payroll wages (in million pesos)	8230.00	10920.00	11890.00	15110.00
Unmeployment compensation fund allocations (in million pesos)	1959.69	1183.75	1351.82	948.04
Employer	685.56	669.41	787.42	759.17
Employee	294.29	218.40	237.80	188.88
Government	979.85	295.94	326.60	0.00
Unmeployment compensation fund shares (in percent)	100.00	100.00	100.00	100.00
Employer	34.98	56.55	58.25	80.08
Employee	15.02	18.45	17.59	19.92
Governent	50.00	25.00	25.00	0.00
Payroll tax rates (in percent)				
Employer	8.33	6.13	6.62	5.02
Employee	3.58	2.00	2.00	1.25

Source: Labor force data extrapolated from ILO (Geneva) projections. Inelegible persons estimated as two times the number of entrance into the the labor force corresponding to 12-18 months continuous employment periods All other figures correspond to the full privatization option presented in Alonso and Lago (1994).

Table 17.
Proposed Cuban Social Security Contribution Rate as a Percentage of Salary
Retirement at Age 65 for both Men and Women

Categories	Year t+0, 1995	Year t+5, 2000	Year t+10, 2005	Year t+15, 2010
Contribution Rate for Paying Current Pensions	20%	22%	23%	23%
Contribution Rate for Funding Future Pensions	16%	17%	17%	18%
Total Contribution Rate	36%	39%	40%	41%

Source: Summarized from Ricardo A. Donate- Armada, Op.cit.

Table 18
Proposed Cuban Social Security Contribution Rate as a Percentage of Salary
Assumes Proposed Change will occur in 1995

Contribution Rate for Current Pensions	Rate
Current system (retirement at 60/55)	20.0%
Adjustment for Retirement at 65	-5.0%
Proposed System (Retirement at 65)	15.0%
Contribution Rate for Future Pensions	
Current System (Retirement at 60/55, Universal Coverage)	16.0%
Adjustment for Retirement at 65	-7.0%
Current System Benefits (Retirement at 65 Universal Coverage)	9.0%
Adjustment for Limiting Coverage to participants older than 45 in 1995	-8.0%
Current System Benefits (Retirement at 65, Coverage of participants older than 45 in 1995)	1.0%
Contribution Rate for Individual Retirement Savings	10.5%
Total Proposed Contribution Rate for Future Old Age Retirement Pensions [(2.e) + (2.f)]	11.5%
Contribution Rate for Proposed System	
Old-Age Retirement Pensions [(1.c)+)(2.g)]	26.5%
Disability and Survivor's Pensions	4.5%
Total Contribution Rate [(3.a) +(3.b)]	31.0%

Source: Summarized from Ricardo A. Donate Armada, Op. Cit.

Table 19
Cuba: Endyear population by age and sex
Selected years

Age/Sex	1989	1992	Year t+0, 1995	Year t+5, 2000	Year t+10, 2005	Year t+15, 2010
Males	5,323,483	5,499,049	5,658,689	5,860,074	5,992,673	6,091,880
Less than 1	95,031	94,559	92,245	83,368	76,879	76,312
1 to 4	360,490	377,376	371,237	346,169	313,213	299,613
5 to 14	790,236	785,942	858,524	917,342	886,910	814,029
15 to 49	3,014,420	3,085,918	3,102,327	3,147,171	3,224,962	3,293,986
50 to 64	610,191	668,507	719,648	821,866	897,487	954,460
65 and over	453,115	486,747	514,708	544,158	593,222	653,480
Females	5,253,438	5,447,928	5,632,769	5,873,789	6,040,781	6,170,280
Less than 1	87,856	94,559	92,245	83,368	76,879	76,312
1 to 4	341,767	359,670	372,477	347,324	314,258	300,611
5 to 14	753,742	748,828	813,916	892,846	890,895	817,687
15 to 49	2,992,564	3,056,066	3,066,278	3,094,667	3,150,733	3,226,484
50 to 64	612,826	676,589	734,840	851,922	937,235	998,866
65 and over	453,115	512,216	553,013	603,662	670,781	750,320
Total	10,576,921	10,946,976	11,291,458	11,733,863	12,033,453	12,262,160
Less than 1	182,887	189,117	184,490	166,736	153,757	152,624
1 to 4	702,257	737,046	743,714	693,493	627,471	600,224
5 to 14	1,543,978	1,534,770	1,672,440	1,810,188	1,777,805	1,631,716
15 to 49	6,006,984	6,141,984	6,168,605	6,241,838	6,375,695	6,520,470
50 to 64	1,223,017	1,345,096	1,454,488	1,673,788	1,834,722	1,953,326
65 and over	917,798	998,963	1,067,721	1,147,820	1,264,003	1,403,800
Over 14						
Males	4,077,726	4,241,172	4,336,683	4,513,195	4,715,671	4,901,926
Females	4,058,505	4,244,871	4,354,131	4,550,251	4,758,749	4,975,670
Total	8,136,231	8,486,043	8,690,814	9,063,446	9,474,420	9,877,596
% Female	49.88%	50.02%	50.10%	50.20%	50.23%	50.37%

Source: Ricardo A. Donate-Armada, Op.cit.

Table 20.
Cuba: Estimated distribution of wages and salaries
Selected years 1978 and 1992

Percent Distribution	Cumulative Percent	Annual Average Income 1978 (pesos)	Annual Average Income 1992 (pesos)
7.4	7.4	543	892
2.5	9.9	626	1028
6.1	16	684	1123
0.2	16.2	690	1133
2.7	18.9	737	1210
4.7	23.6	742	1218
1.4	25	838	1376
7.4	32.4	1086	1783
2.5	34.9	1251	2054
6.1	41	1368	2246
0.2	41.2	1381	2267
2.7	43.9	1474	2420
4.7	48.6	1483	2435
7.4	56	1678	2755
1.4	57.4	1775	2914
2.5	59.9	1877	3082
6.1	66	2052	3369
0.2	66.2	2071	3400
0.2	66.4	2103	3453
7.4	73.8	2171	3565
2.7	76.5	2212	3632
4.7	81.2	2225	3653
2.5	83.7	2502	4108
1.4	85.1	2513	4126
6.1	91.1	2736	4492
0.2	91.4	2762	4535
2.7	94.1	2949	4842
4.7	98.8	2966	4870
1.4	100.2	3350	5500
Average		1667	2737

Source: The 1978 data come from: Claes Brundenius, "Revolutionary Cuba: The Challenge of Economic Growth with Equity," Vestview Press, Inc., Boulder, CO. 1984, pp.184. The 1992 data was estimated by

the authors assumming that the 1978 income distribution remains the same . The 1992 average wage was derived from Alonso and Lago, Op.cit. pp. 63.

Table 21.
Cuba: market costs of food rationing card and proposed diet . Units in pounds and ounces

	Monthly rationing card allotments								Black Market in 1992 pesos	
Food Items	Units 1962	In 1992 pesos	Units 1971	In 1992 pesos	Units 1979	In 1992 pesos	Units 1989	In 1992 pesos	Price	Units
Beef	3.00	135.00	3.000	135.00	2.500	112.50	0.75	33.75	45.00	pound
Fish	1.00	13.20	4.000	52.80		0.00		0.00	13.20	pound
Chicken		0.00		0.00		0.00	1.75	70.00	40.00	pound
Pork		0.00		0.00		0.00		0.00 <20.00>	pound	
Sausage		0.00		0.00		0.00		0.00		
Rice	6.00	60.00	6.000	60.00	5.000	50.00	5.00	50.00	10.00	pound
Beans	1.50	18.00	1.500	18.00	1.250	15.00	10.00	120.00	12.00	pound
Tubers & roots	14.00	36.40	9.000	23.40		0.00		0.00	2.60	pound
Vegetable oil	2.00	40.00	1.000	20.00	0.750	15.00	0.50	10.00	20.00	24.15 fl.oz
Lard		0.00	1.000	20.00	0.750	15.00		0.00	20.00	pound
Butter	0.125	0.00		0.00		0.00		0.00		
Eggs	5.00	5.00	15.000	15.00		0.00		0.00	1.00	each
Condensed milk	6.00	36.00	3.000	18.00	3.000	18.00	3.00	18.00	6.00	each
Sugar		0.00	4.000	8.00	4.000	8.00	4.00	8.00	2.00	pound
Bread		0.00		0.00	15.000	84.90		0.00	5.66	pound
Cigarrette pack		0.00	4.000	32.00	4.000	32.00	3.00	24.00	8.00	each
Cigars		0.00	4.000	8.00	4.000	8.00	4.00	8.00	2.00	each
Coffee	1.00	10.00	0.375	3.75	0.375	3.75	0.13	1.25	10.00	pound
Beer-1/2 bot.		0.00		0.00		0.00		0.00	8.00	12 fl. oz.
Rum		0.00		0.00		0.00		0.00		
Bath soap	2.00	12.00		0.00	1.500	9.00	1.00	6.00	6.00	each
Detergent soap	1.00	8.00		0.00	0.500	4.00	1.00	8.00	8.00	pound
Totals		373.60		413.95		375.15		357.00		

	Cost of the rationing card allotment per person in 1992 black market

	prices (pesos)			
	1962	1971	1979	1989
Monthly	599.00	640.1	637.8	610.25
Yearly	7188.00	7681.20	7653.60	7323.00
Yearly cost per household of 3.5 persons	20342.04	21737.80	21659.69	20724.09

Sources: Rationing card allotments come from: Carmelo Mesa-Lago, "The Economy of Socialist Cuba," Univ of New Mexico Press. Albuquerque, NN, 1981, pp.158-163. and from: Juan Clark, "Mito y Realidad," Saeta Ediciones, 1992, pp. 279. Proposed diet is based on the recommended daily nutritional allowances (RDA) Using CSPI's Pyramid Nutritional Strategies, Designs for Heart-Healthy Living, National Live Stock and Meat Board, Beef Promotion and Research Board, 1990 See: Nutrition Action Healthletter, "CSPI Healthy Eating Pyramid, CSPI, Suite 300, 1875 Conn. Ave. N.W., Washington, DC. 20009-5728.

Cuba: Proposed daily public assistance diet based on a minimum of 2500 calories
Units in pounds and ounces

Food Items

Units No.1	In 1992 pesos	Units No.2	In 1992 pesos	Units No. 3	In 1992 pesos	Units No.4	In 1992 pesos	
Beef		0.00	0.188	8.44	0.219	9.85	0.188	8.44
Fish		0.00		0.00		0.00		0.00
Chicken	0.375	15.00		0.00		0.00	0.188	7.50
Pork		0.00	0.188	3.75		0.00		0.00
Sausage		0.00		0.00		0.00		0.00
Rice	0.250	2.50	0.250	2.50	0.250	2.50	0.250	2.50
Beans	0.500	6.00	0.500	6.00	0.500	6.00	0.500	6.00
Tubers & roots	0.500	1.30	0.500	1.30	0.500	1.30	0.500	1.30
Vegetable oil	0.054	1.09	0.054	1.08	0.054	1.08	0.054	1.08
Lard		0.00		0.00		0.00		0.00
Butter		0.00		0.00		0.00		0.00
Eggs		0.00		0.00	2.000	2.00	1.000	1.00
Condensed milk		0.00		0.00		0.00		0.00
Sugar /condiments	0.500	1.00	0.500	1.00	0.500	1.00	0.500	1.00
Bread	0.375	2.12	0.375	2.12	0.375	2.12	0.375	2.12
Cigarrette pack		0.00		0.00		0.00		0.00
Cigars		0.00		0.00		0.00		0.00
Coffee		0.00		0.00		0.00		0.00
Beer-1/2 bot.		0.00		0.00		0.00		0.00
Rum		0.00		0.00		0.00		0.00
Bath soap		0.00		0.00		0.00		0.00
Fruits	0.500	4.00	0.500	4.00	0.500	4.00	0.500	4.00
Milk	0.710	7.10	0.710	7.10	0.710	7.10	0.710	7.10
Totals		40.1085		28.8525		36.9485		42.04

	Proposed diet cost per person in 1992 black market prices (pesos)			
	Diet No. 1	Diet No. 2	Diet No. 3	Diet No.4
Montly	1203.26	865.58	1108.46	1261.20
Yearly	14439.06	10386.90	13301.46	15134.40

	40862.54	29394.93	37643.13	42830.35

Sources: Rationing card allotments come from: Carmelo Mesa-Lago, "The Economy of Socialist Cuba," Univ of New Mexico Press. Albuquerque, NN, 1981, pp.158-163. and from: Juan Clark, "Mito y Realidad," Saeta Ediciones, 1992, pp. 279. Proposed diet is based on the recommended daily nutritional allowances (RDA) Using CSPI's Pyramid Nutritional Strategies, Designs for Heart-Healthy Living, National Live Stock and Meat Board, Beef Promotion and Research Board, 1990 See: Nutrition Action Healthletter, "CSPI Healthy Eating Pyramid, CSPI, Suite 300, 1875 Conn. Ave. N.W., Washington, DC. 20009-5728.

Table 22 a.
Comparison of wages, social security, health and unemployment programs of Cuba and its competitors. 1994

		Payroll tax rates (percentages)					
Country	**Minimum wage per month in US $**	**Old age disability and survivor's pension**	**Health care**	**unemployment compensation**	**Work injury**	**Family Allowance**	**Total payroll tax rates**
Costa Rica	$193.60 (1994)	7.25%	14.75%	None	Included in old age disability & survivor's	5.0%	27.0%
Employers		4.75%	9.25%	None		5.0%	19.0%
Employees		2.50%	5.50%	Nome		0.0%	8.0%
Dominican Republic	$118.00 (1994)	9.50%	None	None	2.5%	None	12.0%
Employers		7.00%	None	None	2.5%	None	9.50%
Employees		2.50%	None	None	0.0%	None	2.50%
Jamaica	$60.60 (1994)	5.00%	Included in old age disability and survivor's	None	Included in old age disability and survivor's	None	5.00%
Employers		2.50%		None		None	2.50%
Employees		2.50%		None		None	2.50%
Mexico	$137.80 (1993)	6.65%	11.40%	8.33%	1.94%	1.00%	28.32%
Employers		4.90%	8.40%	8.33%	1.94%	1.00%	23.57%
				(lump sum severance)			
Employees		1.75%	3.0%	0.00%	0.0%	0.00%	4.75%
Cuba-current system	$1.55 (1994)	10.0% (a)	Included in old age disability and survivor's	0.00%	Included in old age disability and survivor's	None	10.00%
Employer		10.0%		0.00%		None	10.00%
Employee		0.0%		0.00%		None	0.00%
Cuba-proposed system	$3.84 - $7.89	19.5% - 31.0%	5.60% - 7.68%	8.13%	Included in old age & survivors	None	33.23% - 46.81%
Employers	(proposed)	10.7% - 20.7%	2.80% - 3.84%	6.13%		None	19.63% - 30.67%
Employees		8.8% -	2.80% -	2.00%			13.60% -

		10.3%	3.84%				16.14%

Source:
Payroll tax rate data come from: US Department of Health and Human Services, Social Security Administration. Office of International Policy, Social security programs throughout the World 1991. SA Publication No. 61-006, September, 1992. Minimum wage data comes from the Commercial Attach,'s of each country in the United States. Data on Cuba's proposed social security system come from Ricardo Donate Armada, 1994). The lower range of the minimum wage proposed corresponds to the expenditures necessary to purchase the rationing card at 1992 black market prices. The larger minimum wage proposed corresponds to the cost of a basic diet evaluated at 1992 black market prices. In both instances a household size of 3.5 persons with 1.5 wage earners per household are assumed following the information presented in the 1981 Censo de Poblaci¢n y Viviendas.
(a) Under the Cuban social security system prevailing today, employers paid 10.0 percent of salary for social security plus 2.0 percent for maternity and short - run subsidies. See: Caridad Lafita Navarro, "Salvar la seguridad social, Trabajadores, 8 agosto de 1994, pp. 3.

Table 22b. Comparison of wages, social security, health and unemployment programs of Cuba and its competitors. 1994

		Approximate Contributing shares (percentages)						
Country	**Minimum wage per month in US $**	**Old age disability & survivor's pension**	**Medical care**	**Unemployment compensation**	**Work injury**	**Family allowance**	**Total payroll tax**	
Costa Rica	$193.60 (1994)	100%	100%	None	100%	100%	100%	
Employers		64%	58%	None	100%	63%	60%	
Employees		33%	34%	None	0%	0%	26%	
Government		3 %	8%	None	0%	37%	14%	
Dominican Republic	$118.00 (1994)	100%	None	None	100%	None	100%	
Employers		58%	None	None	100%	None	66%	
Employees		21%	None	None	0%	None	17%	
Government		21%	None	None	0%	None	17%	
Jamaica	$60.60 (1994)	100%	Included in old age disability and survivor's	None	Included in old age dis. and surv.	None	100%	
Employers		50%		None		None	50%	
Employees		50%				None		None 50%
Government		0%				None		None 0%
Mexico	$137.80 (1993)	100%	100%	100%	100%	100%	100%	
Employers		71%	70%	100%	100%	100%	81%	

				(lump sum severance)			
Employees		25%	25%	0%	0%	0%	16%
Government		4%	5%	0%	0%	0%	3%
Cuba-current system	$1.55 (1994)	100% (b)	100%	100%		None	100%
Employers		56%	0%	0%	Included in old age dis. & serv.	None	24%
Employees		0%	0%	0%		Non e	0%
Government		44%	100%	100%		None	76%
Cuba-proposed system	$3.84 - $7.89	100% - 100%	100% - 100%	100%		None	100% - 100%
Employers	(proposed)	55% - 67%	34% - 37%	57%	Included in old age dis. & surv.	None	5 2% - 60%
Employees (a)		45% - 33%	46% - 43%	18%		None	36% - 31%
Government		0% - 0%	20% - 20%	25%		None	12% - 9%

Source: Contributing shares estimated from: US Department of Health and Human Services, Social Security Administration. Office of International Policy, Social security programs throughout the World 1991. SA Publication No. 61-006, September, 1992. Minimum wage data comes from the Commercial Attach,'s of each country in the United States. Data on Cuba's proposed social security system come from Ricardo Donate Armada, (1994). The lower range of the minimum wage proposed corresponds to the expenditures necessary to purchase the rationing card at 1992 black market prices. The larger minimum wage proposed corresponds to the cost of a basic diet evaluated at 1992 black market prices. In both instances a household size of 3.5 persons with 1.5 wage earners per household are assumed following the information presented in the 1981 Censo de Poblaci¢n y Viviendas.

Note : (a) Includes pensioner's shares

(b) Under the Cuban social security system prevailing today, employers paid 10.0 percent of salary for social security plus 2.0 percent for maternity and short - run subsidies. See: Caridad Lafita Navarro, "Salvar la seguridad social, Trabajadores, 8 agosto de 1994, pp.. 3.

Table 22b. Comparison of wages, social security, health and unemployment programs of Cuba and its competitors. 1994

		Approximate Contributing shares (percentages)					
Country	**Minimum wage per month in US $**	**Old age disability & survivor's pension**	**Medical care**	**Unemployment compensation**	**Work injury**	**Family allowance**	**Total payroll tax**
Costa Rica	$193.60 (1994)	100%	100%	None	100%	100%	100%
Employers		64%	58%	None	100%	63%	60%
Employees		33%	34%	None	0%	0%	26%
Government		3%	8%	None	0%	37%	14%
Dominican Republic	$118.00 (1994)	100%	None	None	100%	None	100%
Employers		58%	None	None	100%	None	66%
Employees		21%	None	None	0%	None	17%
Government		21%	None	None	0%	None	17%
Jamaica	$60.60 (1994)	100%	Included in old age disability and survivor's	None	Included in old age dis. and surv.	None	100%
Employers		50%		None		None	50%
Employees		50%				None	None 50%
Government		0%				None	None 0%
Mexico	$137.80 (1993)	100%	100%	100%	100%	100%	100%
Employers		71%	70%	100%	100%	100%	81%
				(lump sum severance)			
Employees		25%	25%	0%	0%	0%	16%
Government		4%	5%	0%	0%	0%	3%
Cuba-current system	$1.55 (1994)	100% (b)	100%	100%		None	100%
Employers		56%	0%	0%	Included in old age dis. & serv.	None	24%
Employees		0%	0%	0%		None	0%
Government		44%	100%	100%		None	76%
Cuba-proposed system	$3.84 - $7.89	100% - 100%	100% - 100%	100%		None	100% - 100%
		55% -	34% -				52% -

Employers	(proposed)	67%	37%	57%	Included in old age dis. & surv.	None	60%
Employees (a)		45% - 33%	46% - 43%	18%		None	36% - 31%
Government		0% - 0%	20% - 20%	25%		None	12% - 9%

Source: Contributing shares estimated from: US Department of Health and Human Services, Social Security Administration. Office of International Policy, Social security programs throughout the World 1991. SA Publication No. 61-006, September, 1992. Minimum wage data comes from the Commercial Attach,'s of each country in the United States. Data on Cuba's proposed social security system come from Ricardo Donate Armada, (1994). The lower range of the minimum wage proposed corresponds to the expenditures necessary to purchase the rationing card at 1992 black market prices. The larger minimum wage proposed corresponds to the cost of a basic diet evaluated at 1992 black market prices. In both instances a household size of 3.5 persons with 1.5 wage earners per household are assumed following the information presented in the 1981 Censo de Poblaci¢n y Viviendas.

Note : (a) Includes pensioner's shares

(b) Under the Cuban social security system prevailing today, employers paid 10.0 percent of salary for social security plus 2.0 percent for maternity and short - run subsidies. See: Caridad Lafita Navarro, "Salvar la seguridad social, Trabajadores, 8 agosto de 1994, pp.. 3.