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| <b>AGENCY FOR INTERNATIONAL DEVELOPMENT</b><br><b>PROJECT PAPER FACESHEET</b><br>TO BE COMPLETED BY ORIGINATING OFFICE | <b>1. TRANSACTION CODE</b><br>("X" appropriate box)<br><input type="checkbox"/> Original <input checked="" type="checkbox"/> Change<br><input type="checkbox"/> Add <input type="checkbox"/> Delete | <b>PP</b><br><br><b>DOCUMENT CODE</b><br>3 |
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| <b>2. COUNTRY/ENTITY</b><br>PANAMA | <b>3. DOCUMENT REVISION NUMBER</b> |
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| <b>4. PROJECT NUMBER</b><br>525-22-530-181 | <b>5. BUREAU</b><br>a. Symbol LA      b. Code 05 | <b>6. ESTIMATED FY OF PROJECT COMPLETION</b><br>FY   8   1 |
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| <b>7. PROJECT TITLE - SHORT</b> (stay within brackets)<br><input type="checkbox"/> Rural Health Delivery System <input type="checkbox"/> | <b>8. ESTIMATED FY OF AUTHORIZATION/OBLIGATION</b><br>a. INITIAL <sup>mo.</sup> 6 <sup>yr.</sup> 76      b. FINAL FY   7   7 |
|--|--|

| 9. ESTIMATED TOTAL COST (\$000 or equivalent, \$1 = ) |                     |        |          |           |        |          |
|---|---------------------|--------|----------|-----------|--------|----------|
| a. FUNDING SOURCE                                     | FIRST YEAR FY _____ |        |          | ALL YEARS |        |          |
|   | n. FX               | c. L/C | d. Total | e. FX     | f. L/C | g. Total |
| <b>AID APPROPRIATED TOTAL</b>                         |                     |        |          | 9,500     |        | 9,500    |
| (Grant)   | ( )                 | ( )    | ( )      | ( )       | ( )    | ( )      |
| (Loan)  | ( )                 | ( )    | ( )      | 9,500     | ( )    | 9,500    |
| Other   |                     |        |          |           |        |          |
| 1.  |                     |        |          |           |        |          |
| U.S. 2.   |                     |        |          |           |        |          |
| <b>HOST GOVERNMENT</b>                                |                     |        |          | 8,680     |        | 8,680    |
| <b>OTHER DONOR(S)</b>                                 |                     |        |          |           |        |          |
| <b>TOTALS</b>   |                     |        |          | 18,180    |        | 18,180   |

| 10. ESTIMATED COSTS/AID APPROPRIATED FUNDS (\$000) |                         |                       |          |         |          |         |          |         |           |         |  |
|--|-------------------------|-----------------------|----------|---------|----------|---------|----------|---------|-----------|---------|--|
| a. Approp-riation (Alpha Code)                     | b. Primary Purpose Code | c. Primary Tech. Code | FY _____ |         | FY _____ |         | FY _____ |         | ALL YEARS |         |  |
|  |                         |                       | d. Grant | e. Loan | f. Grant | g. Loan | h. Grant | i. Loan | j. Grant  | k. Loan |  |
| PH   | 534                     | 510                   |          |         |          |         |          |         |           | 9,500   |  |
|  |                         |                       |          |         |          |         |          |         |           |         |  |
|  |                         |                       |          |         |          |         |          |         |           |         |  |
|  |                         |                       |          |         |          |         |          |         |           |         |  |
|  |                         |                       |          |         |          |         |          |         |           |         |  |
| <b>TOTALS</b>                                      |                         |                       |          |         |          |         |          |         |           |         |  |

|                                   |
|-----------------------------------|
| <b>11. ESTIMATED EXPENDITURES</b> |
|-----------------------------------|

**12. PROJECT PURPOSE(S)** (stay within bracket)     Check if different from PID/PRP

[ To institutionalize an improved integrated low cost public health delivery system providing preventive and curative health care services and adequate environmental sanitation conditions to the marginal population residing in rural areas. ]

**13. WERE CHANGES MADE IN BLOCKS 12, 13, 14, or 15 OF THE PID FACESHEET? IF YES, ATTACH CHANGED PID FACESHEET.**

Yes       No

|  |   |
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| <b>14. ORIGINATING OFFICE CLEARANCE</b><br>Signature: <i>Steven A. Maguire</i><br>Title: Director, USAID/Panama<br>Date Signed: mo. 05 day 20 yr. 76 | <b>15. Date Received in AID/W, or For AID/W Documents, Date of Distribution</b><br>mo. 05 day 21 yr. 76 |
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PROJECT PAPER  
RURAL HEALTH DELIVERY SYSTEM LOAN

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PART I - SUMMARY AND RECOMMENDATIONS

A. Recommendations

On the basis of the conclusions of the Capital Assistance Committee that the project for a Rural Health Delivery System is technically, economically and financially justified, it is recommended that a loan to the Government of the Republic of Panama (Borrower) for an amount not to exceed nine million five hundred thousand U.S. dollars (\$9,500,000) be authorized subject to the following conditions:

1. The following conditions will be met by the Borrower in form and substance satisfactory to the Lender prior to the issuance of any commitment document or disbursement:

- a. legal opinion of Procurador General;
- b. specimen signatures;
- c. the appointment of a Project Coordinator.
- prior to construction:
  - a. criteria for selecting the locations for health posts, health subcenters, and health centers;
  - b. final designs and specifications for health posts, health subcenters, health centers and related equipment.
- prior to training health assistants:
  - a plan for training, supervising, and evaluating health assistants, including a training curriculum.
- prior to training public health personnel other than health assistants:
  - a training plan setting forth, but not limited to, the nature and duration of such training.
- prior to the remodeling of any health unit:
  - plans and specifications for that unit.

2. Borrower shall covenant that during the course of the Project and at least once a year, Borrower shall conduct with A.I.D. periodic evaluations of the Project.

The loan will be repayable within forty (40) years, including a grace period of ten (10) years. The interest rate will be two percent (2%) per annum during the grace period and three percent (3%) per annum thereafter.

#### B. Description of the Project

The purpose of this project is to institutionalize an improved integrated public health delivery system providing basic preventive and curative health care services and adequate environmental sanitation conditions to the marginal population residing in rural areas. Since coming to power in 1968, the present Government has made a determined and significant effort to change the country's traditional distribution of benefits, including those related to health. With the objective of raising the health standards of individuals, families and communities throughout the Republic on an equitable basis, the Government of Panama has launched an ambitious health program designed to integrate the Ministry of Health (MOH) and Social Security Agency (CSS) health care systems, to extend health services to the marginal population, especially those less accessible populations in rural areas, to encourage community participation in the planning, execution and evaluation of health programs through local Health Committees, and decentralize the administration and execution of health care programs by granting greater autonomy to the Provincial Medical Directors. The Government's aggressive health programs in maternal/child health care, communicable disease control, improved nutritional and community sanitation conditions, and related community level health education programs are having a positive and significant effect on the country's health standards. Nevertheless, the results of the recent health sector assessment confirm the sharply skewed distribution of health sector resources in favor of the urban population and the significantly higher incidence of mortality and morbidity among rural Panamanian populations resulting from respiratory, diarrheal and other preventable diseases, and malnutrition. The basic thrust of this project is aimed at closing this gap between urban and rural population health conditions by establishing a low cost integrated public health delivery system servicing the marginal population.

Panama's public health network can be visualized as a pyramid, with the base composed of rural health posts staffed by

health assistants followed progressively by subcenters, centers, regional and provincial hospitals and, ultimately, specialized and national hospitals largely servicing urban populations. As indicated, it is the lower portion of this pyramidal structure which this loan project will fortify and expand, thereby supporting public health sector efforts already underway to shift investments in manpower and other medical resources from an urban hospital-based focus to a rural-based system of smaller, more dispersed rural hospitals, health centers, subcenters and health posts. Specifically, this project seeks to strengthen and expand the rural component of the public health structure by providing additional facilities (4 health centers, 14 subcenters, 225 health posts) to complement the existing rural network of medical facilities, by training 500 nurse auxiliaries and health assistants to staff these rural facilities, and by funding a team of management consultants to join forces with a group of MOH/CSS counterparts in developing a consolidated and more efficient administrative system for both the MOH and CSS at the provincial and national level.

Given the highly dispersed nature of the rural population and the limited resources available to the public health sector for addressing rural health needs, the Government has elected to focus initially on approximately 225 rural communities, or groups of communities in proximity with one another, where basic health needs are not adequately being attended and where growth potential exists for absorbing rural inhabitants living in the surrounding countryside. At this level the health assistant, operating from a simple two room health post, will provide primary health care and also serve as a portal of entry into and through the higher levels of the health care system. The health assistant will also support other elements of this project aimed at upgrading nutritional and environmental standards of the selected rural communities; namely, the establishment of community gardens, poultry projects, rural aqueducts, hand pumped wells, and latrines.

The individual components of this project have been developed and tested in on-going Panamanian public health sector programs. Their establishment on a coordinated basis within a relatively short timeframe is the key to the GOP strategy in this program. No one of these elements can individually solve the health problems of the rural marginal population; only through a coordinated upgrading of the entire health/nutrition/environmental sanitation field can a significant improvement in the health status of the marginal population be achieved. Moreover, as a working principle, the public health sector does not proceed with community based health programs such as those envisaged under this

project without the consent and direct participation of the community Health Committee or other local representative group. As the health sector assessment and other documentation point out, the record of Health Committee participation in public health projects has generally been excellent.

C. Summary Findings

The project described above has been analyzed on technical, financial, and economic grounds and found to be sound and feasible on each count. Economic models were developed based upon reasonable assumptions concerning several variables, including population, public health budgets, medical services coverage, utilization of hospital and outpatient facilities, and rates of construction and usage of health posts. These models, using the best data available, project considerable savings to the public health sector in utilizing the lower cost medical facilities contemplated for expansion under the project. Since about 86% of the Ministry's budget is directed toward the delivery of health services, the Ministry's ability to finance the expanded services is dependent on their receiving an appropriate share of the GOP national budget. The economic models demonstrate that the savings resulting from the proposed rural health delivery system may actually result in lower health sector requirements as a percentage of the GOP budget. Other components of the project concerned with upgrading rural nutritional and environmental standards were also examined in terms of cost/effectiveness and found to be reasonable by comparison with alternative solutions.

In terms of technical feasibility, it is noteworthy that the various components of the project have been developed and tested in on-going programs of the public health sector. Nevertheless, it is recognized by all concerned that the coordinated development of several health/nutrition/environmental sub-projects within a four year timeframe in 225 selected rural communities will require careful planning and execution to achieve the expected impact on rural health standards. The Ministry of Health's proven capacity in developing community health committees to cooperate in government sponsored health programs in rural areas augers well for the success of this project. Furthermore, the training and placement of health assistants in each of the selected rural communities, or cluster of communities, will provide a key catalytic agent in this health improvement program. Special care will be taken in the selection, training, supervision, and evaluation of the health assistants.

It is imperative that the health assistants be accepted by the communities to which they are assigned and that they have a clear understanding of the medical and community development tasks expected of them.

The engineering phases of the project, involving the planning and construction of health centers, subcenters, health posts, latrines, aqueducts and hand pumped wells, are based on standards and procedures currently employed by the Engineering Division of the Ministry of Health in cooperation with the communities benefiting from these facilities and installations. The quantities of the various units to be established under the project are well within the proven capacity of the Ministry's technical divisions, including those employed at the provincial level.

The environmental analysis indicates that with reasonable care and precaution, no negative environmental impact is anticipated from the various project elements. To the contrary, the establishment of latrines and potable water systems, the use of improved agricultural practices, and the community health educational programs to be carried out by this project will improve the rural environment.

The project meets all applicable statutory criteria as indicated by Annex A, Mission Director's Certification, and Annex F, the Statutory Checklist.

#### D. Project Issues

The program mix has substantially changed from the PRP - what is the basis for this change and what is the effect?

|                         | <u>PRP</u> | <u>PP</u> | <u>Change</u> |
|-------------------------|------------|-----------|---------------|
| Health Posts            | 500        | 225       | -275          |
| Health Subcenters       | 0          | 14        | + 14          |
| Rural Health Centers    | 10         | 4         | - 6           |
| Barriada Health Centers | 4          | 0         | - 4           |
| Aqueducts               | 130        | 300       | +170          |
| Hand pumped wells       | 400        | 400       | 0             |
| Latrines                | 2,000      | 13,800    | +11,800       |
| Community Gardens       | 150        | 48        | -102          |
| Small Animal Projects   | 75         | 75        | 0             |

The period between the PRP and the PP has been an educational process for the Ministry of Health, the Social Security

System, the Ministry of Planning and USAID/Panama. Within the Government there has been a greatly increased awareness of the program and the interrelationships of the components. The Government's internal process for the submission of a loan to an international entity has focused far more attention on this program than it had ever previously received. The budgetary and political realities brought to bear by this process along with the technical analyses which were done in the period by Ministry personnel and by particularly helpful TDY experts (Harold Rice, Ken Farr, Paul Nutting) have greatly refined and improved the project.

The decrease in the number of health posts and the inclusion of subcenters was based upon a three-pronged analysis. The Ministry of Planning in viewing the ongoing operational costs, can budget for 14 subcenters and 225 posts for slightly over half the cost of 500 posts. The MOH/CSS from a technical/administrative viewpoint see this mix as providing a better supervisory relationship for the posts as well as creating a level of technical expertise (the nurse auxiliary) capable of handling more complex medical problems but without resorting to the more expensive and less geographically accessible doctors. From a political/geographic viewpoint, the utilization of slightly larger towns as the sites for subcenters both satisfies the political aim of the Government to create viable "service center towns" capable of servicing the social/economic needs of their dependent hinterlands, as well as recognizing the topographic and population density realities of the country which dictate the need for a facility larger than a post, but not as big or expensive as a center in some areas.

The elimination of the *barriada* centers and the reduction from 10 to 4 in the number of rural centers was based almost exclusively on the budgetary consideration of high initial cost, and more importantly, high operating costs. The four rural centers remaining in the project are the minimum number required for adequate supervision of the subcenters and posts and for geographical access for upward referral from the posts and subcenters.

Similarly, the reduction in the number of gardens has been dictated almost exclusively from a budgetary constraint.

The major increases in the project are in the environmental health area where the number of aqueducts has more than doubled and the number of latrines has increased almost seven-fold. These increases are based on the technical analyses and evaluations of the existing aqueduct and latrine projects which

have shown dramatically successful results in the reduction of intestinal disease. There are also very positive budgetary, administrative and political arguments for these increases. Aqueducts and latrines are virtually free of ongoing operational costs. The MOH sanitary engineers have the proven administrative and technical capacity to handle the program very efficiently. Politically, aqueducts and latrines are the most successful catalysts to community development in Panama, with a phenomenal success rate for self help and community organization. The expressed demand for aqueducts and latrines by the Representantes in National Assembly meetings exceeds the demand for any other type of project. Not only does the Ministry not have to sell this program - they can't keep up with the demand.

Finally, it must be admitted that the PRP was based on the desires of the MOH/CSS Technical Commission at that time and, because of the time pressures of the AID documentation process, was somewhat premature in its program mix - most notably in its estimated unit costs which did not take fully into account the critical item of ongoing operational budget impact.

#### CAPITAL ASSISTANCE COMMITTEE

##### A. USAID/Panama

|                     |                               |
|---------------------|-------------------------------|
| Felix Hurtado, M.D. | Chief of Health Division      |
| Abby Bloom          | I.D.I.                        |
| Barry Burnett       | Dep. Cap. Rsrs. Dev. Officer  |
| Herbert Caudill     | Environmental Health Engineer |
| Bernard Chapnick    | Associate Director            |
| Carl Gleason        | Chief Economic Office         |
| Rubén Obregón       | Economist                     |
| Jesús Sáiz          | Engineer                      |
| Samuel T. Scott     | General Eng. Advisor          |
| Richard Solloway    | Acnt. Finl. Analyst           |

##### B. Consultants

|                   |       |
|-------------------|-------|
| Dr. Kenneth Farr, | DHEW  |
| Dr. Paul Nutting, | DHEW  |
| Dr. Harold Rice,  | TAB/W |

## PART II - PROJECT BACKGROUND AND DETAILED DESCRIPTION

### A. Background

#### 1. Health Conditions in Panama

Panama has benefited, as has all of Latin America, from the medical advances made against disease over the past few decades. Increased scientific knowledge has been translated into growing public and private programs designed to combat the causes of disease, upgrade medical institutions and improve individual medical care. Improvements in Panama's health services, sanitation facilities, public information practices and other factors have led to commensurate progress in the country's general health profile.

Comparing this profile with those of the other eighteen Latin American countries in terms of a few generally accepted public health indicators, it is evident that Panama is in a relatively better position overall. For example, in 1970, Panama ranked fifth in life expectancy (65 years); second in the fewest cases of infant mortality (40.5/1000); sixth in the fewest number of persons per hospital bed (300); seventh in the fewest number of persons per doctor (1,750); and second in the fewest number of persons per practicing nurse (1,389). While far from ideal, these comparative indicators do show Panama to be in a relatively progressive stage of public medical health.

As might be expected, one of the effects of Panama's increasing good health during the past few decades has been an increasing net population growth rate. As the annual death rate fell from 17.1 per thousand in the 1920's to 7.2 in 1962, the population growth rate rose from 2.03% to 3.38% during the same period. Since 1962, however, the natural growth rate has fallen at a fairly steady pace -- from the historical high of 3.38% to a 1974 figure of 2.59% -- as birth, and to a lesser extent, death rates have declined since 1969, reaching 31.2/1000 and 5.3/1000 respectively by the end of 1974.

Demographically, Panama has experienced the same rural-to-urban migratory pattern found in many other countries that have undergone fundamental socio/economic changes. Panama City, for example, had a population increase of only 11% during the decade of the 1940's, but has nearly tripled its size since. As late as 1960 there were only two cities with a population of more than 25,000 (including Panama City); by 1974, there were five.

By the same token, the urban portion of the total population has increased from 36% in 1950 to 49% in 1974.

This formidable influx of population into the cities over the past two decades, coupled with the high population growth rate, has strained the GOP's capability to provide necessary health and other services to both the urban and rural populations. As a result, the impact of Panama's health efforts has been spread in a largely uneven manner. Health conditions in metropolitan Panama and other urban centers are generally better than in rural areas -- though there are pockets within these centers where living conditions in terms of housing, sanitation, facilities, etc., are also poor. Indications of the differences between urban and rural health environments are revealed by census data and various studies of the country's health status. In 1974, for example, the infant mortality rate for urban areas was 24.7 per thousand live births as against a rural area figure of 37.2 -- a 51% variance. While these rates represent a sharp improvement over those of 1960 (53.1 urban vs. 59.3 rural), the comparative proportion of improvement (53% urban vs. 37% rural) is indicative of the disparate pattern of health progress. It might also be pointed out that of all registered births that took place throughout the country in 1974, 98% occurred under professional care in urban areas versus 48% in rural areas.

In 1967, the Instituto de Nutrición de Centro América y Panamá (INCAP) carried out an extensive study of Panamá's nutritional situation. One of INCAP's major findings was that one-sixth of the rural population was not satisfying its basic daily food needs. While 36% of the families were judged to be consuming at least 90% of the recommended caloric-protein requirement, fully 15% were consuming less than 70% of the required level with 3% of this group below the 50% mark. Although figures for the urban area (represented by Panama City) were not presented in detail, INCAP's conclusion was that malnutrition in urban areas was not nearly as severe as it was in rural areas. Taking the food consumption information as a whole, however, the study does point out that 60% of all Panamanian children under five years of age were suffering from varying degrees of malnutrition. In fact, growth retardation was shown to be one year for the average Panamanian child for height and about two years for weight (the six-year old child registering approximately the same weight as a four-year old on the INCAP standard).

Other differences between rural and urban health conditions were brought out by INCAP's examination of individual phys-

ical disorders, particularly those caused by intestinal parasites. People tested for infestation in urban sectors were found to have markedly fewer parasitic problems, although the incidence level was still high by INCAP's standards. The variance was attributed, unsurprisingly, to the better water, sanitary and health facilities found in urban areas. The recent assessment of the health sector estimated that in 1975 all of the urban population had access to potable water, with more than 90% having home connections. Only about half of the rural population was estimated to have any access to a potable water supply system, with only 15% having home connections. Similarly, some 90% of the urban dwellers had an available sewerage system (even though in slum areas these systems were and are still probably overloaded), while rural populations had either no such system (at least 25%) or minimal sewerage systems available to them, these being primarily in the form of latrines. Significantly, two of the leading causes of death in Panama, particularly among children less than one year old, are intestinal parasitism and enteric infection, both of which are contracted through contaminated water and food.

Food purchases of lower income rural and urban families center around what is available or affordable rather than what may be nutritious. Many of the products within relatively easy financial reach tend to be those of limited nutritious value such as rice, plantain, sugar and several types of roots. Beans are about the only relatively high-protein food consumed with regularity. Beef, chicken, fish and dairy products while certainly desirable are generally too expensive in most areas to be purchased in anything but very small quantities, although hunting and fishing do add some protein to the rural diet. Inefficient food production and marketing systems are contributors to the high cost and limited availability of many nutritious foods. Seafood, for example, while obviously abundant on the coasts, does not get into the interior on a regular basis because of the lack of an effective marketing system. Vegetable products fall into the same pattern of almost over abundance in some areas and scarcity in others. Beef and poultry prices are high because of the high cost of feed grains -- which are costly because of low agriculture productivity. There is also a vicious cycle relationship between malnutrition and enteric infection. Enteric afflictions themselves cause and intensify malnutrition through malabsorption, altered food consumption, fluid losses and increased metabolism. Nutrition cannot be improved alone without also improving sanitation to eliminate secondary malnutrition caused by disease.

2. GOP Policies, Priorities and Programs and A.I.D. Assistance in the Health Sector

Despite the current differences between rural and urban health conditions, the GOP has for some time recognized the need to do more for the rural populace and in fact has developed policies and programs over the past decade or so which have significantly narrowed the rural-urban health standard gap. In April 1963, after an extensive analysis of the country's health program, the GOP launched a National Health Plan to span the years 1962-1970. Generally the plan sought to develop a wider spectrum of medical care to reach a larger portion of the population. Priorities were aimed at improving rural and suburban community sanitary conditions with emphasis on water supply programs, improved housing and expanded medical services. More specifically, major efforts were outlined to provide care to mothers and children for the prevention and cure of gastroenteritis, acute childhood diseases, malnutrition and complications of pregnancy and delivery. Medical service delivery targets of 65% and 90% were set for rural and urban populations, respectively. Other objectives included the digging of 300 wells a year in order to supply potable water to 80% of the rural dwellers by 1970; all of the urban areas were to obtain adequate water supplies by the same year.

Health sector programs initiated during the 1962-1970 period in support of the National Plan included:

a. Decentralization moves in 1962 to relocate a previously urban-based health service to three rural-based health regions along with the establishment of eleven rural health centers - there are currently 73 such centers and 105 sub-centers. Both the Pan American Health Organization (PAHO) and USAID assisted the GOP with its decentralization planning at the time. USAID has continued to provide development grants in support of the rural health centers.

b. Start-up in 1963 of the A.I.D. supported Rural Mobile Health Program (PUMAR). The PUMAR program, conceived as a means of providing basic health services to remote areas, was initiated in 1963 with USAID grant support. During the period 1963 to 1966, USAID provided over \$300,000 in grant funding for mobile dispensary units, drugs and other medical supplies, and operating expenses. In 1966, a loan project was proposed in support of the program. According to the Capital Assistance Paper for the PUMAR Loan Project, "In the first three years of operation, PUMAR

had reached approximately 100,000 rural inhabitants at less than two dollars per patient contact. Furthermore, it provided the stimulus for community development whereby democratically elected committees had been organized to help solve mutual problems through the effective utilization of local resources." With the view to expanding the PUMAR program, the Loan (No. 525-L-029) provided an additional \$500,000 for medical equipment and supplies, 25 Carryalls, two 2-1/2 ton trucks equipped with winches, and the renovation of two excess property vessels. In spite of implementation delays, resulting largely from A.I.D. administrative and legal requirements, "... the GOP continued the Rural Health Program and made it an integral part of the services provided by the MOH."<sup>1/</sup>

c. Extensive expansion and improvement of the Panama City and Colon water and sewerage facilities. A.I.D. extended five loans totaling \$37.0 million between the years 1963-1971 in support of this effort.

d. A three-year (1969-1972) malaria eradication effort was supported by an A.I.D. Loan (\$1.4 million) and UNICEF grants. The GOP has since 1972 been maintaining the program at previous levels with its own funds and technical assistance from PAHO.

The emphases of the National Health Plan were reaffirmed in the GOP's Four Year Program (1971-1974). In addition to decentralization, improved services and preventive care, family planning (a rather low-key, largely private effort prior to 1970) was made a central element of the new program. The government's vigorous implementation of the program has made family planning today a publicly accepted vehicle of social change. As of 1974, over 30% of the country's estimated 341,000 fertile-age women were utilizing some form of contraceptive device obtained through public or commercial channels with 15% of them having become acceptors through the Ministry of Health's family planning program. All of the present 73 health centers are now offering family planning assistance as an integral part of their services. Moreover, training in family planning techniques is provided to the health assistants serving at the community level. USAID supported the program

<sup>1/</sup> Office of the Auditor General, Area Auditor General - Latin America, Audit Report No. 1-525-74-2, July 23, 1973, p. 4.

between 1967-1970 with limited grant assistance to APLAFA (the Panamanian Family Planning Association) and with more substantial assistance (average \$400,000/year) to the Ministry ever since.

To further improve the health delivery infrastructure in rural areas, the legal structure for a national system of Community Health Committees was established in 1970. Now numbering over 900, the Committees, which are comprised of local community citizens, have been organized to examine the health and nutrition needs of the individual community, to motivate people to improve their environment in order to feed their children properly and help prevent diseases, and to direct community participation in present and proposed public health programs.

Following closely on the heels of the GOP decree establishing the Community Health Committee system, the Ministry began on a pilot basis in 1971 a Rural Community Health and Nutrition project designed to coordinate central government inputs with direct local participation in a joint effort to improve the communities' quality of life. Utilizing resources from the GOP and the local communities, some 73 community garden projects were initiated to determine the feasibility of conducting similar efforts on a nationwide scale. In 1972, A.I.D. authorized a \$3.8 million Loan (No. 525-L-040) to the GOP in support of the program's expansion. The program is divided into three basic components: (a) health services; (b) nutrition; (c) potable water supply.

In component (a), health services, teams of MOH technicians are working with the communities in providing immunizations, health education, maternal/child health care, adult medicine, family planning and improved sanitation.

Component (b), nutrition, is designed to combat widespread malnutrition by educating the communities in the importance of a balanced diet and teaching them how to grow more nutritious foods. Garden equipment, fertilizers, insecticides and seeds are supplied in conjunction with training in modern agricultural techniques to establish community vegetable gardens to produce additional food for those who participate and provide a demonstration of the benefits of modern agricultural practices to the entire community. Component (c), potable water supply, is designed to assist the communities to construct aqueducts and install hand operated wells in those areas where the people demonstrate a willingness to provide the labor and are able to pay the costs of maintaining the system. The physical progress of this Loan Project to date is as follows:

| <u>Activity</u>             | <u>Target</u> | <u>Completed<br/>4/30/76</u> |
|-----------------------------|---------------|------------------------------|
| Aqueducts                   | 200           | 206                          |
| Hand Pump Wells             | 1200          | 823                          |
| Community Vegetable Gardens | 200           | 133                          |
| Poultry Raising Projects    | -0-           | 40                           |

A technical analysis of this program can be found in Part III. A. of this Paper.

### 3. Other Donor Assistance in Health Sector

WHO/PAHO is providing approximately \$350,000 this year in technical assistance, equipment, and scholarships for health sector purposes. The principal areas of WHO/PAHO assistance are (1) vector control and eradication of malaria, *Aedes Aegypti*, and hoof and mouth disease; (2) environmental sanitation; (3) health planning; and (4) assistance to medical and dental students enrolled in the Faculty of Medicine and Dentistry at the University of Panama. The WHO/PAHO sponsored technical assistance and training programs provided for Ministry of Health and IDAAN personnel working in the area of environmental sanitation will complement this Project's capital investments in rural potable water systems and latrine construction. In the area of health planning, a planning consultant recently completed a three year tour-of-duty assisting both national and provincial medical personnel in the design, execution, and evaluation of health programs.

UNICEF has provided 230 hand diesel tractors for the Ministry's community garden program. The Ministry currently has 20 of these tractors available for future gardens contemplated under the Project. Additional tractors required for the Project will be obtained with counterpart funding.

Between 1962 and 1973 the IDB authorized three loans totaling nearly \$14 million to help IDAAN finance water supply and sewerage projects for rural communities and several of the smaller urban centers in Panama. A fourth loan for approximately \$9 million is presently being negotiated with IDAAN to finance additional rural aqueducts, extensions of existing aqueducts, and sewerage systems. As a working principle, IDAAN installs aqueducts in population centers exceeding 500 while the MOH assists communities with fewer than 500 inhabitants to install their potable water systems; hence there is no duplication of effort between these two public health sector entities. The IDB is also contemplating a loan for \$15 to

\$20 million to the CSS for constructing a maternal-child hospital in Panama City.

The GOP and the World Bank are exploring the possibility of jointly financing a \$12,000,000 project for the design and construction of a new water treatment plant and transmission piping to meet the potable water demands of the City of Colon and its adjacent suburban area, in addition to the increased water demands required by the industrial projects presently under study by the Ministry of Planning and Economic Policy. This project would also include water systems for Chorrera and Arraiján as well as sewer lines in downtown Panama City.

The proposed A.I.D. project will be part of the larger GOP multi-sectoral programs for comprehensive development for the campesino population. It is compatible with the proposed Integrated Rural Development (IRD) Projects in selected areas where growth potential appears most advantageous. While highlighting agricultural production and related infrastructure, IRD also encompasses health and educational needs of the selected regions. The proposed health project will provide the basic health care services, including improvements to environmental sanitation conditions, for the selected IRD areas, as well as for other segments of the marginal population currently lacking one or more of the basic health services defined in the project. The IRD program will be supported by A.I.D., IDB, the Panamanian Government and the local beneficiaries of the program.

#### 4. Opinions of Other Institutions

The Inter-American Development Bank (IDB), the International Bank for Reconstruction and Development (IBRD), and the Export-Import Bank have expressed no interest in financing the proposed project.

#### 5. Health Sector Constraints Identified by Sector Assessment

This section of the Project Paper will summarize the major constraints to improving the health of the marginal population.

##### a. Institutional

The Health Sector Assessment's findings with respect to administration and financial control within the major public health entities (MOH, CSS, IDAAN) indicate a clear need for

establishing more efficient systems for purchasing, maintenance, data gathering, personnel administration, accounting, budgeting, and management. For example, there is a dearth of cost information regarding the various types of medical institutions found in Panama's health sector. Accounting systems must be better designed to more precisely identify costs associated with each type of major medical facility, thereby permitting management to have a more informed basis for making decisions regarding existing and future physical plant development. More accurate data is also required in connection with mortality and morbidity rates, particularly among the marginal population. This information is obviously required by public health authorities in order to more accurately assess the nature, location, and extent of health problems so that proper interventions can be designed and executed accordingly. The combination of more accurate cost data coupled with detailed information regarding health needs will permit the public health authorities to develop health plans and budgets that more efficiently respond to the real demand for health services, particularly among Panama's marginal population groups.

The ongoing consolidation of MOH and CSS health care systems at the Provincial level will facilitate the establishment of uniform objectives, standards, and procedures for providing public health services. See Annex H of this Paper for more information on the integration of CSS and MOH.

b. Population Dispersion

Table II A-1 reflects the widely dispersed nature of Panama's population. In 1970 nearly 540,000 people, representing about 38% of the population, resided in communities of less than 500. These population centers of less than 500 inhabitants constitute 97% of all population centers in Panama and account for fully 72% of the rural population. As we shall see in the subsequent section of this Paper, the design of a responsive public health delivery system is in part a function of this highly dispersed demographic fact of life in rural Panama.

c. Health Consciousness

Perhaps the most pervasive constraint to improved health care among marginal population groups is the low consciousness level within these groups as to what constitutes good health and, more importantly, how to achieve and maintain good health. In short, they have generally not been taught the rudiments of basic health

Table No. II A-1

PANAMAPOPULATION BY SIZE OF COMMUNITY

| SIZE                          | 1 9 6 0      |              |                               |              | 1 9 7 0      |              |                               |              |
|-------------------------------|--------------|--------------|-------------------------------|--------------|--------------|--------------|-------------------------------|--------------|
|                               | <u>Place</u> | <u>(%)</u>   | <u>Pop.</u><br><u>(000's)</u> | <u>%</u>     | <u>Place</u> | <u>%</u>     | <u>Pop.</u><br><u>(000's)</u> | <u>%</u>     |
| <u>TOTAL</u>                  | <u>8,595</u> | <u>100.0</u> | <u>1,076</u>                  | <u>100.0</u> | <u>9,313</u> | <u>100.0</u> | <u>1,428</u>                  | <u>100.0</u> |
| Less than 50                  | 5,669        | 66.0         | 105                           | 9.8          | 5,897        | 63.3         | 109                           | 7.7          |
| 50 - 99                       | 1,341        | 15.6         | 95                            | 8.8          | 1,530        | 16.5         | 108                           | 7.6          |
| 100 - 499                     | 1,391        | 16.2         | 276                           | 25.7         | 1,597        | 17.2         | 321                           | 22.4         |
| 500 - 999                     | 124          | 1.4          | 83                            | 7.8          | 187          | 2.0          | 125                           | 8.8          |
| 1,000 - 4,999                 | 61           | 0.7          | 105                           | 9.8          | 88           | 0.9          | 160                           | 11.2         |
| 5,000 - 9,999                 | 4            | 0.1          | 31                            | 2.8          | 6            | 0.1          | 39                            | 2.8          |
| 10,000 - 24,999               | 3            | 0.0          | 47                            | 4.4          | 3            | 0.0          | 39                            | 2.7          |
| 25,000 - 99,999               | 1            | 0.0          | 60                            | 5.5          | 4            | 0.0          | 178                           | 12.4         |
| 100,000 or more <sup>1/</sup> | 1            | 0.0          | 274                           | 25.4         | 1            | 0.0          | 349                           | 24.4         |

<sup>1/</sup> Panama City

Source: Estadística y Censo

care. Therefore, attempting to relate to such concepts as personal hygiene, nutrition, and environmental sanitation will not be automatic and cannot be taken for granted. This educational gap must be closed if health improvements on a meaningful scale are to be achieved.

d. Health Sector Personnel

The Sector Assessment identified as a major constraint the lack of trained para-professionals for providing basic preventive and curative health services for the marginal population. Considering existing and projected supply of health personnel at all levels in the public health sector, and comparing these levels with projected demand for health services, the Assessment concluded that the greatest need for health personnel was at the level of the nurse auxiliary and health assistant.

## B. Project Description

### 1. Project Goal

The broader objective to which this Project contributes is the elevation of the health level of the marginal population <sup>1/</sup> to acceptable standards. Goal achievement will be verified to the extent that by 1985 (1) life expectancy for the target group increases from 50 years to 55 years, (2) infant mortality is reduced from 37.2 per thousand to 30 per thousand, (3) general mortality is reduced from 6 to 5.3 per thousand, and (4) the incidence of diarrheal diseases declines by 30%, from 29,000 cases reported in 1974 to 20,000 cases. Goal achievement will be measured through special surveys conducted periodically by the Ministry of Health and the Statistics and Census Bureau of the Contraloria General de la Republica.

### 2. Project Purpose

The purpose of this project is to institutionalize an improved integrated public health delivery system which provides basic preventive and curative health care services and adequate environmental sanitation conditions for 25 percent of the marginal population. This purpose is consistent with the Panamanian Government's sector goals which include:

- a. accelerating the process of incorporation the marginal population, especially those residing in the rural sector, within the scope of health service coverage;
- b. guaranteeing the quality and efficiency of health services within the context of an integrated public health system;
- c. reducing health risks devolving from inadequate environmental sanitation conditions.

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<sup>1/</sup> The "marginal population" refers to those people lacking some or all of the basic public services - electricity, potable water, sewerage, access to secondary schools, etc. It is estimated that the marginal population of Panama totals 600,000.

Since coming to power in 1968, the present Government has made a determined and significant effort to change the country's traditional distribution of benefits, including those related to health. With the objective of raising the health standards of individuals, families and communities throughout the Republic on an equitable basis, the Government of Panama has launched an ambitious health program designed to integrate the Ministry of Health and Social Security Agency health care systems, to extend health services to the marginal population, especially those less accessible populations in rural areas, to encourage community participation in the planning, execution and evaluation of health programs through local Health Committees, and decentralize the administration and execution of health care programs by granting greater autonomy to the Provincial Medical Directors. The Government's aggressive health programs in maternal/child health care, communicable disease control, improved nutritional and community sanitation conditions, and related community level health education programs are having a positive and significant effect on the country's health standards. Nevertheless, the results of the health sector assessment confirm the sharply skewed distribution of health sector resources in favor of the urban population and the significantly higher incidence of mortality and morbidity among rural Panamanian populations resulting from respiratory, diarrheal and other preventable diseases, and malnutrition. The basic thrust of this project is aimed at closing this gap between urban and rural health conditions by establishing a low cost integrated public health delivery system servicing the marginal population.

Achievement of the project's purpose will be verified in terms of health service accessibility as well as effectiveness. By 1981, the accessibility <sup>1/</sup> of the marginal population to basic health facilities will have increased from 25 % to nearly 50%.<sup>2/</sup>

By 1981, the target population's access to excreta disposal systems for the marginal population will have increased from 76 % to 83 %. The effectiveness of the health service delivery system will be verified

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<sup>1/</sup> With regard to the medical facilities financed under this project, accessibility will be defined as a health care unit with sufficient capacity to service the primary health care needs of the population residing within 2 hours of that unit, using normal routes and transportation means.

<sup>2/</sup> All targets expressed in this Project Paper are based on an A.I.D. loan of \$9.5 million and an equal counterpart contribution.

to the extent that professional attention during child-birth for the target population increases from 48% to 60% by 1981. Also by 1981, immunization for the marginal population will have increased from 50% to 60%. Data collected annually by the Statistical Department of the MOH and Statistics and Census Bureau of the Contraloria General will be used to measure progress towards these targets.

### 3. Project Outputs

The following project outputs have been selected to address the major institutional and resources constraints on the achievement of the project purpose, as identified by the sector assessment:

1. provide on an integrated, low-cost basis access to basic health care services and facilities for communities representing approximately 25% of Panama's marginal population.
2. develop the public health sector's capacity to train and utilize health assistants as the fundamental personnel staffing the rural health delivery system.
3. Strengthen the integrated health services provided by the Ministry of Health and Social Security Agency to the marginal population.

These three outputs have been identified as critical to the implementation of a comprehensive system of public health services, making both preventive and curative services available to that segment of the population which has heretofore had little or no access to these resources.

1. The first project output will be the provision of primary health care services, as well as a systematic referral system, for communities that represent approximately 25% of the marginal population. Panama's population is highly dispersed, with 72% of the rural population living in communities of less than 500 inhabitants, according to statistics compiled for the health sector assessment. Because of the limited resources available to address the health needs of the rural population, the Government has elected to focus initially on 225 rural communities, or groups of communities in proximity with one another with unmet basic health needs and where there is the potential

for attracting inhabitants currently living in the surrounding countryside. The auxiliary health worker will function at this level to provide appropriate primary health services, and will refer patients to the higher levels of the health care system when necessary.

A pyramidal health care structure will be strengthened through the provision, by 1981, of the following: a) 4 rural health centers (constructed, equipped, and staffed); b) 14 health subcenters (constructed, equipped, and staffed); c) 225 rural health posts (constructed, equipped, and staffed). Adequate environmental sanitation conditions will be provided through: a) construction of 300 rural aqueducts; b) installation of 400 hand-pumped wells; and c) construction of 13,800 latrines. The nutrition component of this output target consists of a) 48 additional community gardens, averaging 5 hectares each, established and functioning, for a total of about 200 functioning gardens; b) 75 small animal projects.

2. A second output financed under the Project is to strengthen and enlarge the capacity of the public health sector for training and utilization of indigenous health assistants. This is a crucial aspect of the program, for the health assistants will staff the rural health posts providing basic health services and a mechanism of referral through the health care system. This output target will be verified to the extent that approximately 225 health posts are staffed with health assistants who will have received adequate training in primary and community health care; i.e., the basics of vaccination, first aid, child-birth, family planning, MCH care, environmental sanitation, nutrition, community organization and specific activities required to appropriately refer patients within the system.

Panamanian public health authorities are conscious of the needs for expanding in-country training capacities for preparing health assistants to carry health information and services to families living in remote rural areas. This concern is prompted in large measure by the realization that many tasks now being performed by doctors and other professionals can be performed by less highly trained auxiliaries and community workers in order to effectively extend basic preventive and curative health services at minimum cost. Furthermore, the health assessment indicates that health manpower resources are unevenly distributed to the detriment of the rural populace.

There is a vast and growing experience in the utilization of paraprofessional personnel for the provision of health services. Such experience has resulted in a nearly universal acceptance of paraprofessional usage. Nevertheless, studies on the subject generally emphasize the need for definition of the specific tasks to be performed to help insure the paraprofessional's effectiveness in upgrading the health status of the target population. This is particularly critical where the paraprofessional is expected to function as a portal of entry into a larger health care system, as is the case in this loan supported program.

In Panama, health assistants have been and continue to be trained in Colon and Bocas del Toro provinces. Selected from communities throughout their respective province, they receive a four month intensive training program, sponsored jointly by the MOH and CSS, in first aid, family planning services, child-birth, and other basic maternal/child health care. They are also charged with providing guidance and instruction to local Health Committees and other community residents concerning personal hygiene, nutrition and community sanitation. Each health assistant is assigned to a specific geographical region and is expected to make periodic visits to the families residing in their region. The health assistants are visited periodically by agronomists, nutritionists, physicians and nurses operating out of the nearest health center or hospital. In addition to supplying the auxiliary with medical supplies, the more experienced medical personnel attend to those problems requiring priority or a higher level of medical competence. The community health worker also maintains up-to-date medical records on the individuals living within the assigned region, thereby providing a data base for identifying health needs of the rural populace and the subsequent design of strategies and programs to effectively deal with these health problems.

The health assistants will be selected and trained at the provincial level by medical personnel with a working knowledge of the assistants' assigned tasks. The Project will fund educational materials, training programs for the trainers, trainees' per diem, transportation, and curriculum development. To ensure adequate mobility within their assigned regions, health assistants will also be provided with appropriate transportation; e.g., horse, small boat, etc.

3. Article 107 of the 1972 Constitution of the Republic of Panama stipulates that the government health entities, including autonomous and semi-autonomous institutions, shall be integrated organically and functionally. In accordance with this mandate,

the two principal public health sector entities - Social Security and the Ministry of Health - have begun to integrate their health care systems at the provincial level. The integration process was initiated in 1973 in the provinces of Colon, Bocas del Toro and Veraguas, and subsequently in Los Santos, Herrera, and Chiriqui. Current plans indicate that most of the provinces will have initiated the integration process by 1976. The health systems established in the integrated provinces are administered by the General Directorate of the Social Security Agency, although in a functional sense they use as their point of reference basic health programs developed by the Ministry of Health.

The clear intent of the integration mandate is to provide an organizational framework within which the available public health sector resources may be more rationally employed, particularly for the benefit of marginal population groups currently excluded partially or completely from health care coverage. The health sector assessment indicates that, with the basic exception of paraprofessionals (i.e., auxiliary nurses and community health assistants), the medical manpower constraint to improved health care for marginal groups is geographical distribution rather than absolute numbers. A consolidated public health care system will facilitate optimal resource allocation, thereby reducing the duplication of medical facilities and manpower which presently undermines "salud igual para todos". With each passing year the integration process has been refined with a view to developing a single provincial health care budget based on agreements reached at the national and provincial levels between CSS, MOH, the Juntas Municipales de Salud and representatives of local communities.

The improvement of MOH and CSS health care systems will be achieved to the extent that by 1981 health objectives, policies, and functions will have been uniformly established and administered at both the national and provincial levels. As part of the continuous evaluation of the proposed project, periodic reviews will be conducted by the GOP to monitor the progressive coordination and consolidation of the various administrative elements - management, purchasing, transportation, laboratory analysis, budgeting, accounting, data gathering, maintenance, and medical services. As the integration process takes form, the integrated systems will be more rigorously evaluated to determine their managerial and organizational capacities for:

- (1) enumerating health needs, estimating extent to which needs are being met, estimating impact on health status of meeting needs, identifying priority health needs;
- (2) identifying alternative strategies for meeting health needs, estimating resource

requirements for each alternative, estimating extent to which each strategy would meet needs, defining strategy within the context of one or more health programs; (3) executing programs according to plan; and finally, (4) evaluating the extent to which the programs meet the defined health needs, the impact of meeting needs on the communities' health status, and the cost of the program operation in terms of (a) the need met, (b) improvement in health status.

The health care system evolving from the integration process must be adequately structured and effectively administered to ensure better health care coverage at reduced unit costs. The assessment's findings with respect to administration and financial control within the major health sector entities (MOH, CSS, IDAAN) indicate a clear need for establishing more efficient systems for purchasing, maintenance, data gathering, personnel administration, accounting, budgeting, and management. As these functions are consolidated for MOH and CSS at the provincial and national levels, it is imperative that major inefficiencies be corrected at the outset. Technical personnel and training programs will be financed under the loan project to address these administrative constraints.

Specific components of these output targets have been developed and tested in current Panamanian public health sector programs. Coordination of the various components within the timeframe indicated is the key to the GOP strategy in this program. No one of these elements can individually solve the health problems of the marginal population; only through a coordinated upgrading of the entire health/nutrition/environmental sanitation field can a significant improvement in the health status of the marginal population be achieved. All of these activities will involve direct participation of community residents through their Community Health Committees, thereby strengthening the capacity of rural localities to address health as well as other development needs. As a working principle, the public health sector does not proceed with community-based health programs without the consent and direct participation of the Community Health Committee or other local representative group. As the assessment and other documentation point out, the record of Health Committee participation in public health projects has generally been excellent.

## The Role of Women in the Rural Health Delivery System Project

Women play a major role in the project both as direct beneficiaries and participants. Most of the health services provided through the health posts, subcenters and centers will directly improve the health status of the female user population. For example, the MCH component, the major function of the health posts, will include pre-natal and post-natal counseling for mothers, and health assistants will be trained to deliver babies. Mothers will be advised on how to provide adequate nutrition for themselves during pregnancy (resulting in fewer premature births, higher birth weights, and improved chances for normal growth and development of the infants), and for their children during the early years of life. The referral system will allow potentially difficult births to be identified early, so that women can receive attention at the health center or subcenter, as required, resulting in fewer maternal deaths. Immunization of young children will also help decrease infant and young child mortality. Family planning services - supplies and counseling - will be provided at the local level, at health posts, centers and subcenters, so that these services will be readily available to the rural female population. Provided with household, or at least community potable water sources, the laborious routine of women in these communities of securing water for drinking, washing, and cooking will be considerably relieved.

The project will, by design, involve women as active participants: most of the 500 health assistants and auxiliaries will be women trained to deliver basic health services. Previous performance has demonstrated that although the men in the community construct the hen houses for the poultry projects, it is the women who will operate the project and manage the production.

PART III - PROJECT ANALYSES

A. Technical Analysis of the Community Garden and Poultry Programs

1. Background

As was shown in Part II A of this Paper, malnutrition is a serious health problem in rural Panama. The INCAP nutrition survey of the late 1960s confirmed what many public health authorities already knew or suspected: a significant percentage of the rural population (1/6) was not satisfying basic caloric-protein requirements. Given (1) the highly dispersed nature of the rural population, (2) the Ministry of Agriculture's strategy of working almost exclusively with a few hundred campesino groups to augment food production through highly mechanized farming techniques, and (3) the inaccessibility of nutritious foods for the bulk of the campesino population, the Ministry of Health concluded that a nutrition intervention was necessary at the community level to help upgrade health standards. With loan support from AID in 1973, a community garden program was strengthened and expanded in the rural sector. During the early phases of the project the Ministry of Health had to recruit and train the field technicians who were to be involved in the garden activities, stockpile the various supplies and equipment necessary to carry out the project and select the target communities where garden and, subsequently, animal raising projects would be initiated. At present there are eighteen agronomists assigned to different areas throughout the country and one chief agronomist, who also serves as overall supervisor, stationed in Panama City. Each field office is further staffed with a home economist who trains women in the participating communities with regard to proper preparation and use of the different vegetables, grains, and eggs produced in the gardens and poultry projects. Once the people in a community have expressed a desire to establish a food production project and fulfilled the criteria for the establishment of a garden or poultry raising project, an MOH agronomist then delivers a package of equipment, including a small hand operated tractor, a mechanized irrigation system, various hand tools, fertilizers, insecticides, fungicides and vegetable seeds. He then works with the villagers in site preparation and planting the first crop. Initial operations also include seminars on proper agricultural practices. Follow-up visits to see how the garden is developing are conducted at least twice a month, with each visit lasting a half day or so.

After somewhat more than two years of intensive field operations, approximately 2,500 families are actively

participating in the program with a total of over 600 hectares under cultivation in 133 rural communities. The results to date have been mixed, however. Forty-three additional gardens have failed for a variety of reasons, but mainly due to: difficulties experienced by the community in obtaining title to the land, inadequate water resources for irrigating during the dry season, a shortage of labor during certain periods of the year, or the general unsuitability of the land for agricultural pursuits. Recognizing these constraints, the Ministry of Health in early 1975 tightened the standards for establishing new gardens. These criteria are the following:

1. Gardens will only be established in communities which have already organized a Community Health Committee, Agricultural Club, Production Cooperative or other community organization seeking to promote the production of foodstuffs;

2. Availability of a minimum of five hectares of land suitable for agriculture which is either owned by the community or which can be rented under a formal arrangement for at least one year;

3. Suitability of at least three hectares of the selected land for the cultivation of vegetables and located near a source of water for irrigation during the dry season;

4. Availability of at least 15 families willing to participate in the garden project who can be organized into work groups in a manner which will allow continuous field activity in the different crops;

5. The various farm tools, power equipment, seeds, fertilizers and other materials provided by the MOH will be utilized only for the production of foodstuffs through the collective work of the community people;

6. The food output of the community garden is for the participating families, with any excess being sold either locally or in nearby towns for the benefit of the participants.

Gardens established in accordance with these criteria have been very successful, with no failures reported to date

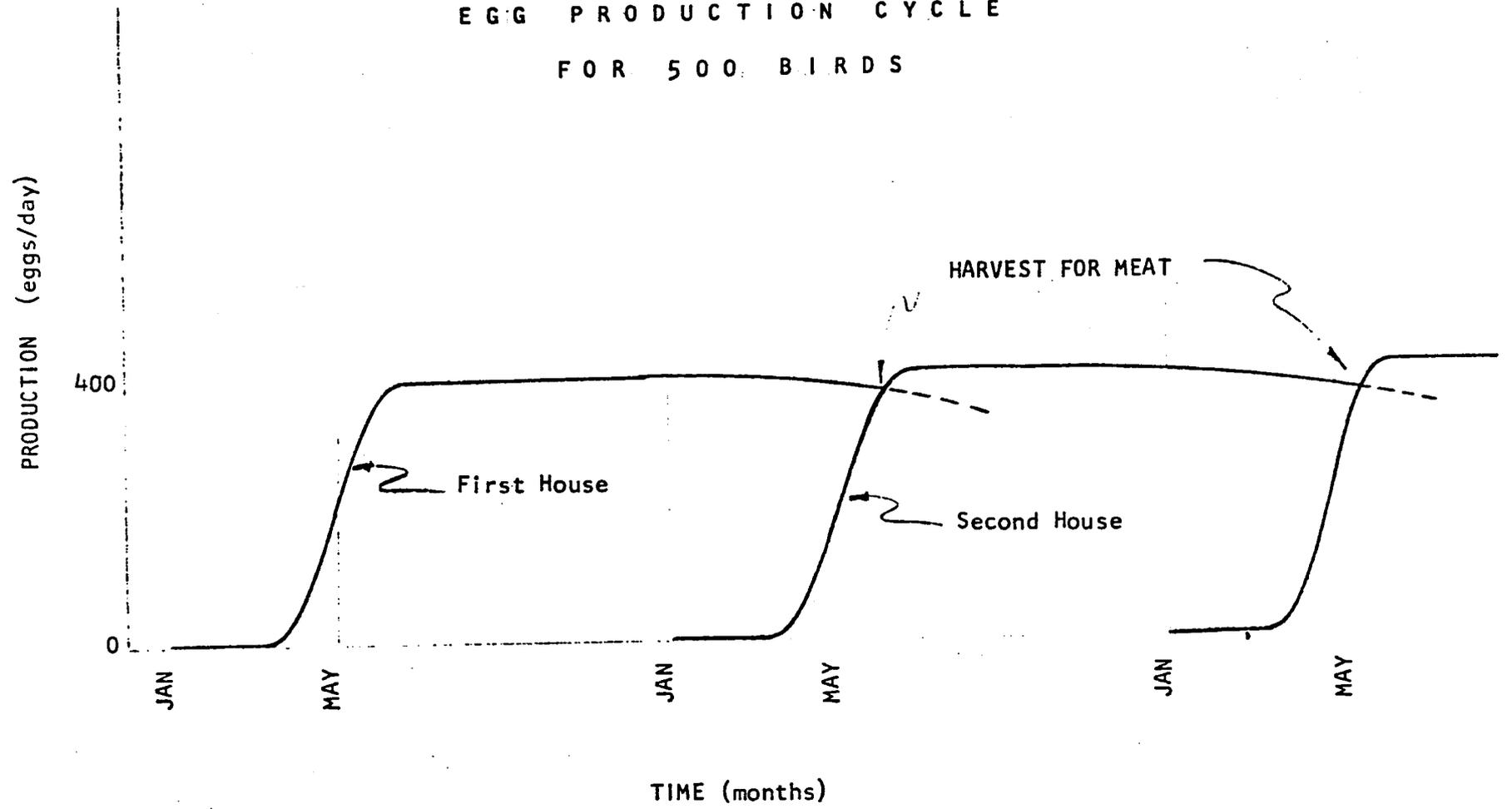
of the gardens initiated under the revised criteria. The establishment of tighter standards for community gardens, the expansion of the number of agronomists assigned full time to

the garden program, improved supervision of the agronomists, agronomists, and the addition of poultry projects in many of the communities augurs well for the future of this nutrition program since these developments reveal versatility and a determination on the part of the Ministry of Health to achieve the fundamental health objectives of the project.

The experience of the MOH in the introduction of poultry projects has been better than expected. The projects have caught the imagination of the local Health Committees who have shown themselves capable of managing them. To date, 40 poultry projects have been established and none has failed. Such projects require only a small plot of land and a lesser number of participating villagers to be successful. The community constructed hen houses are made of poles and palm thatch obtained locally, with rice hulls, obtained from rice mills, used to cover the floor. The MOH provides 500 baby chicks and poultry rations to sustain the chickens until they reach egg production age (usually 6 months). Vaccines to inoculate the chicks against the more common poultry diseases are provided and the agronomists train the people in their use. Miscellaneous items such as feeders and waterers are also provided by the MOH. The men of the communities construct the hen house, although the village women usually operate the project after the chicks are delivered. Once egg production commences, the women manage the distribution and sale of the eggs. Egg production reaches a maximum about two months after initiation of laying. The villagers must of necessity sell approximately 50% of the production in neighboring markets to obtain sufficient funds for purchasing additional stocks of poultry rations. The remainder of the production is divided among the participating villagers and consumed. Even if we assumed that the participating families consumed only 25% of their egg output, this would increase dietary protein by about 15%, significantly reducing protein malnutrition. At present the MOH is supporting a single cycle in the poultry raising project. To maintain continuous year round production it will be necessary to initiate a second cycle approximately 12 months after the start of the first one. (See Graph III A-1.) This will require a second hen house and additional community participation. Since the MOH plans to provide stocks of poultry rations for only the first cycle, the entire cost of raising the second cycle will have to be paid from first cycle profits. Further refining of field operations will be required to allow for profitable commercialization of the poultry project. Specifically, the agronomists must train the communities to maintain accurate records of input costs and sales revenues to ensure that sufficient savings are realized to initiate the second cycle in a timely manner. Preliminary estimates indicate that the poultry projects can be managed profitably by including community-grown corn with a purchased concentrate, establishing a rotating range, or altering the breed of chicken (e.g., Hy-Line) to reduce feed consumption per unit of output.

GRAPH III - A-1

EGG PRODUCTION CYCLE  
FOR 500 BIRDS



## 2. Evaluation Findings to Date

Efforts to evaluate the nutritional component of the Rural Health and Nutrition Loan Project have met with some resistance in the past, in part because evaluation, per se, was given less priority as a management tool than it deserved, but also because of the difficulty in holding exogenous variables constant in attempting to determine the nutritional benefits derived from eating the foodstuffs produced from the community gardens. During the past year, however, the Ministry established a highly professional research unit (Direccion de Docencia e Investigacion) directed by a physician - epidemiologist. As we shall see in the evaluation section of this Paper, both USAID and the Ministry expect this unit to perform the major role in evaluating the health impact of the proposed loan project.

Data currently available to the Ministry severely complicates a meaningful nutrition study at this time. To visualize the difficulty in obtaining production figures one must realize the absence of devices to measure and weigh produce, even grain at times. The result is that productivity estimates are, at best, very crude. Because of the poor quality of the production data for vegetables, and equally poor estimates of the amounts consumed (or sold), the lack of base line status studies to measure longitudinal, before and after, effects, and the perishability of some of the crops carrying important nutrients (Vitamin A, minerals), any estimates on nutritional well-being resulting from the garden program would be invalid according to Dr. Harold Rice, AID/W nutritionist. Nevertheless, given the state of traditional agriculture in Panama, the widely dispersed nature of the farming population, the low consciousness level among campesino families as to what constitutes a healthy diet, a long dry season which precludes production without some form of irrigation, and a marketing system which channels foodstuffs mainly to urban markets, the GOP and USAID remain convinced that the basic design of this component of the program is appropriate as a tool for improving rural health conditions. Widely dispersed populations must master a number of different interdependent technological changes if they are to remain self-sufficient at a higher level of well-being. Another way of saying this is that same degree of organization and specialization will be necessary to achieve a higher state of well-being. The Health Committee was formed for this reason. Increasing community organization in this project has been visualized to have at least two effects, one avoiding or resolving problems in the application of new technologies, another is the development of

more control and predictability over future events.

A recent MOH survey of 51 garden projects indicated that nearly 60% of the gardens were planting two, and in some instances three, crops per year whereas before only one planting was possible. The significance of a second crop should not be underestimated since it occurs, with irrigation, during the dry season and permits a significantly higher level of food consumption than otherwise would be possible. Beans, corn and other grains are generally grown during the dry season and subsequently stored.<sup>1/</sup>In the 51 garden survey, all but nine are producing corn in thousands of pounds. The survey also shows that 84% of the gardens are producing vegetables in the thousands of pounds and only seven are selling all of the production, the rest consuming generally between 50 and 100 percent of their production. See Annex G-1 for further details of this survey.

In addition to the production/usage survey, the MOH also investigated general attitudes and levels of understanding concerning the program and its objectives. 429 families in 18 communities were questioned in this survey. Some of the more salient conclusions are summarized below:

1. 91.8% of the sample considered the community garden to be important. The major reasons offered were: a) to obtain vegetables, b) to acquire foodstuffs inexpensively, c) to acquire healthy foods, d) to improve nourishment, and e) to provide income.

2. Acceptance rates were highest for tomatoes, cucumbers, bell peppers, squash, carrots, and cabbage; and lowest for egg plant, okra and radishes.

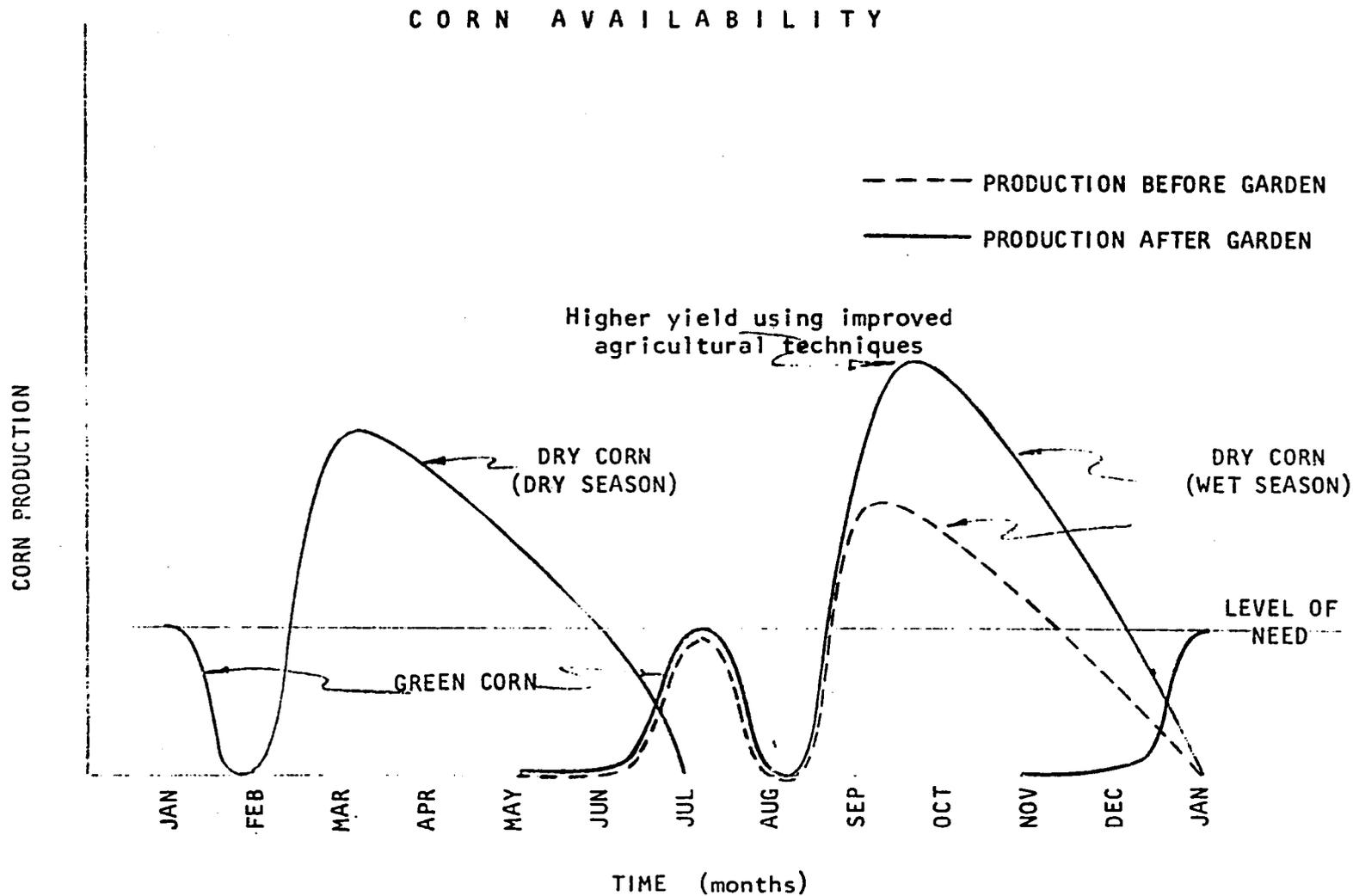
3. The vegetables with highest acceptance are generally consumed as a salad; the rest are prepared in soups, stews, or fried.

4. 96% of those sampled indicated that the vegetables were consumed by all members of the family; the balance indicating that their children did not like the taste and therefore would not eat them.

5. Frequency of vegetable consumption during harvest season:

<sup>1/</sup> (See Graph III A-2.)

-26-



|                      | <u># of<br/>Families</u> | <u>Percent</u> |
|----------------------|--------------------------|----------------|
| Daily                | 94                       | 21.9           |
| Six times/week       | 2                        | 0.5            |
| Five times/week      | 18                       | 4.2            |
| Four times/week      | 20                       | 4.6            |
| Three times/week     | 74                       | 17.2           |
| Two times/week       | 150                      | 35.0           |
| Once a week          | 25                       | 5.8            |
| No information given | <u>46</u>                | <u>10.7</u>    |
| Total                | 429                      | 99.9           |

6. 89.7% of those sampled indicated that vegetables should be washed prior to their consumption.

The results of the survey indicate a high level of acceptance for most of the vegetables grown under the program. This is significant as vegetables, with rare exception, are not part of the campesino's typical diet. Those vegetables not readily accepted, such as egg plant and okra, will not be included in the seed supplies of future garden operations.

### 3. Assessing the Programs' Future

The experience gained by Ministry personnel involved in the community garden program, and more recently with the poultry program, will serve to improve the effectiveness of these programs in the future. We have already noted several design changes with respect to the garden program. In this regard, the Ministry is presently developing plans to form marketing cooperatives for groups of communities in proximity with one another which have demonstrated sufficient interest and capability at producing vegetables and eggs to warrant commercial ventures. Although not originally conceived as production centers, the gardens and poultry projects are more likely to endure and expand on a self-sustaining basis rather than as a government welfare program. For the moment, the Ministry has selected 19 communities for inclusion in this "second phase" of the project. Of these 19, a total of 7 started operations in 1972, 9 in 1973, and 3 in 1974. Nine of the 19 have both garden and poultry projects and one has, in addition, the only successful in-land fish raising project in Panama. All of these communities have experienced a continuous series of successful garden harvests and are now knowledgeable about proper agricultural practices. The

MOH considers that these communities have attained the stage of development where they can continue to produce grains, vegetables and animal products without any direct support from the Ministry other than occasional visits by an agronomist. Each of these communities will develop a production plan for their "community farm" which should result in crops being planted and harvested to cover all nutrition needs of the community as well as an excess which can be sold, with the profits used to purchase necessary agricultural inputs previously provided free by the MOH.

To further the institutionalization of these marketing schemes, the MOH agronomists will assist the communities in developing contacts with COAGRO (Federation of Agricultural Cooperatives) and FEDPA (Federation of Credit Union Cooperatives). COAGRO sells farm supplies and equipment to member cooperatives and also provides technical advice concerning the development of production plans and credit sources. FEDPA would provide assistance in developing a credit union for communities producing in close proximity with one another, thereby facilitating their ability to secure credit.

With respect to garden/poultry projects in a more nascent stage of development, as well as those to be funded under this loan project, the Ministry is planning to improve the communication system between the community and the MOH field technical staff by establishing a voice communication (radio) system. (This system will also serve the health assistant who will need to consult with higher level medical personnel from time to time.) Learning successful agricultural practices is a long term process and the sudden appearance of a plague of insects or fungus wilt, or the breakdown of an irrigation pump, can be very disconcerting to a newly organized group of farmers. Radio contact with the MOH agronomist should substantially alleviate potentially serious garden or poultry husbandry problems.

Table III A-1 summarizes annual output, costs, and net benefits for the 150 five hectare gardens. <sup>1/</sup>

These estimates are considered reasonably accurate as they are based on nearly three years of experience with similar garden projects. The gross benefit/cost ratio for the crop portion of the project is a very favorable 1.99 to 1, even after deducting an allowance of 20% for crop failure and making conservative assumptions for both yields and prices. Other benefits not subject to easy quantification, such as the

<sup>1/</sup> Although fewer gardens (48) are contemplated under the project, the benefit/cost ratio is the same.

introduction of better farming techniques and their spread effect, would likely increase the ratio substantially. The calculation is for an average year after the project has been extended to all of the communities. Prices for both inputs and outputs are based on 1975 prices and assumed constant for projection purposes.

Table III A-1  
 Projected Annual Output, Costs and Net  
 Benefit from Crops Planted on 150 Community Gardens  
 of 5 Hectares Each.

| (1)                                    | (2)                        | (3)                              | (4)  |       | (5)                                      | (6)                              | (7)                           | (8)                                 | (9)                                  | (10)   | (11)  |
|--|----------------------------|----------------------------------|--|-------|--|----------------------------------|-------------------------------|-------------------------------------|--------------------------------------|--|---|
| Crop                                   | Yield per<br>Hectare<br>1/ | Number<br>of Crops<br>per Yr. 2/ | Area to be<br>Allocated<br>to Crop 3/<br>% Hect. |       | Total Output<br>per Year<br>(2)x(3)x(4B) | Current<br>Wholesale<br>Price 4/ | Value of<br>Output<br>(5)x(6) | Cost per<br>Unit (With<br>Labor) 5/ | Cost per<br>Unit (Excl.<br>Labor) 5/ | Total Cost<br>per Yr. (Excl.<br>Labor) 6/<br>(5)x(9) | Net Benefits<br>per Yr. (Excl.<br>Labor Costs) 7/<br>(7)-(10) |
|  |                            |                                  | (A)  | (B)   |  |                                  |                               |                                     |                                      |  |   |
| Dry Beans                              | 1,500 lbs.                 | 2                                | 15   | 112.5 | 337,500 lbs.                             | .18                              | 60,750                        | .150                                | .054                                 | 18,225   | 42,525  |
| Corn                                   | 3,000 lbs.                 | 2                                | 20   | 150.0 | 900,000 lbs.                             | .07                              | 63,000                        | .038                                | .022                                 | 19,800   | 43,200  |
| Rice                                   | 3,500 lbs.                 | 2                                | 15   | 112.5 | 787,500 lbs.                             | .09                              | 70,675                        | .066                                | .049                                 | 38,587   | 32,288  |
| Squash                                 | 20,000 lbs.                | 2                                | 10   | 75.0  | 3,000,000 lbs.                           | .08                              | 240,000                       | .064                                | .048                                 | 144,000  | 96,000  |
| Cucumber                               | 35,000 lbs.                | 2                                | 5  | 37.5  | 2,625,000 lbs.                           | .12                              | 315,000                       | .108                                | .082                                 | 215,250  | 99,750  |
| Lettuce (leaf)                         | 20,000 lbs.                | 2                                | 5  | 37.5  | 1,500,000 lbs.                           | .24                              | 360,000                       | .066                                | .041                                 | 61,500   | 298,500   |
| Cabbage                                | 20,000 lbs.                | 2                                | 5  | 37.5  | 1,500,000 lbs.                           | .10                              | 150,000                       | .050                                | .033                                 | 49,500   | 100,500   |
| Tomatoes                               | 45,000 lbs.                | 2                                | 10   | 75.0  | 6,750,000 lbs.                           | .20                              | 1,350,000                     | .109                                | .064                                 | 432,000  | 918,000   |
| Green Peppers                          | 20,000 lbs.                | 2                                | 10   | 75.0  | 3,000,000 lbs.                           | .15                              | 450,000                       | .109                                | .072                                 | 216,000  | 234,000   |
| Onions                                 | 40,000 lbs.                | 2                                | 5  | 37.5  | 3,000,000 lbs.                           | .15                              | 450,000                       | .109                                | .072                                 | 216,000  | 234,000   |
| <b>Total</b>                           | -                          | -                                | 100  | 750   | -  | -                                | 3,509,625                     | -                                   | -                                    | 1,410,862  | 2,098,763   |
| Less: Allowance<br>for Failure, 20% 8/ |                            |                                  |  |       |  |                                  | 701,925                       |                                     |                                      |  |   |
| <b>Total</b>                           |                            |                                  |  |       |  |                                  | 2,807,700                     |                                     |                                      |  |   |
| <b>Benefit/Cost Ratio</b>              |                            |                                  |  |       | $2,807,700 \div 1,410,862 = 1.99$        |                                  |                               |                                     |                                      |  |   |

FOOTNOTES TO TABLE III A-1

- 1/ Yields per hectare for all crops were estimated with the help of technicians from USAID/Panama and Ing. Agronomo Tomas Ugarte, the agronomist in charge of the project at the Ministry of Health.
- 2/ The number of crops per year (2) is based on the assumption that irrigation will be available during the dry season. Perhaps by the end of project the number of crops per year can be increased to three as the communities gain more experience in the proper utilization of improved agricultural techniques.
- 3/ The figures in this column are based on observations of hectarages planted in community gardens during the previous three years' activity.
- 4/ Wholesale prices for most of these products were obtained from a publication entitled, Informacion Agropecuaria - Precios Recibidos por el Agricultor, published by the Direccion de Estadistica y Censo in December of 1975. For products not listed in that publication, price estimates were provided by USAID technicians and Ing. Ugarte from the Ministry of Health.
- 5/ Column 8 estimates the cost of production per pound with labor included, while column 9 shows the cost with labor excluded. These cost estimates were calculated by USAID/Panama technicians and Ing. Ugarte of the Ministry of Health using various documents published by the GOP and experience gained in the field during the past three years.
- 6/ Total production cost per year in column 10 excludes labor costs. The rationale for excluding this production factor is that: (a) labor is itself the beneficiary of the project; and (b) its value in alternative uses is probably very low.
- 7/ The net benefit per year in column 11 is the difference between columns 7 and 10.

8/ As a result of the past three years of experience in the previous project it was felt advisable to deduct 20% from the gross value of the output to allow for crop failures. Certain communities have had crop failures due to unfavorable climatic conditions including drought and excessive rains as well as serious insect and disease outbreaks. Note, however, that even with this allowance the benefit/cost ratio is still a very favorable 1.99 to 1.

## B. Technical Analysis of Potable Water and Sanitation Facilities

### 1. Background

The interrelationship between the level of health of the population and the provision of adequate sanitation facilities is well known. Numerous epidemiological studies have identified water as the principal agent in transmitting typhoid, cholera and bacillary dysentery. Lack of adequate water for drinking and bathing contributes to the spread of diarrheal diseases in the developing world - of which there were some 29,000 reported cases in Panama in 1974. While these and other parasitic diseases can be linked to unsanitary conditions, documenting the extent to which improved water and sanitation can reduce such diseases is difficult, since alternative vectors exist and diseases which are epidemic in nature may be absent in project areas temporarily. In the Republic of Panama, one can observe that among the ten leading causes of death (See Table III B-1) appear gastroenteritis, infant mortality (all causes), and tuberculosis. These diseases are closely related to the level of environmental sanitation. Mortality and morbidity rates are also high for other environmentally-related diseases such as diarrhea, parasites, typhoid, and infections. Table III B-2 shows the number of cases of communicable diseases reported in 1974. It is clear that the human and economic cost of an unsanitary environment is great.

The Government of Panama through the Ministry of Health has recognized the importance of preventive medicine. Therefore a prime concern has been the provision of adequate water supplies and human waste disposal facilities. These facilities can greatly affect the health level of the population directly by 1) reducing the incidence of water-borne diseases, diseases transmitted through the improper disposal of human waste, and diseases related to lack of personal cleanliness, and indirectly by 2) helping to improve the nutritional level of the population by preventing diarrhea and other gastrointestinal diseases. By lowering diarrhea, one can in effect raise the amount of food the body can utilize even though the actual intake may remain constant.

There are two agencies within the Government of Panama which have direct responsibility for providing domestic water to communities. The IDAAN (National Water and Sewerage Institute) has responsibility for providing water to communities with a population of 500 or more. In all communities of 500 in-

| 8th Edition<br>ICDA     | Position |      | Causes   | No. of Deaths |       | Rates * |       |
|-------------------------|----------|------|--|---------------|-------|---------|-------|
|                         | 1970     | 1974 |  | 1970          | 1974  | 1970    | 1974  |
| 410-414                 | 1        | 1    | Ischemic heart disease                                     | 896           | 736   | 62.5    | 45.5  |
| 800-999<br>E 800-E999   | 4        | 2    | Accidents, suicide and homicide                            | 485           | 698   | 33.8    | 43.1  |
| 140-209                 | 2        | 3    | Neoplasms  | 576           | 630   | 40.1    | 38.9  |
| 430-438                 | 5        | 4    | Cerebrovascular disease                                    | 428           | 539   | 29.8    | 33.3  |
| 480-486                 | 3        | 5    | Pneumonia  | 526           | 414   | 36.7    | 25.6  |
| 000-009<br>561<br>305.5 | 6        | 6    | Gastroenteritis  | 344           | 222   | 23.9    | 13.7  |
|                         | 8        | 7    | Infant, mortality all causes                               | 203           | 203   | 14.1    | 12.5  |
| 630-634<br>760-779      | 9        | 8    | Complications of pregnancy, child birth and the puerperium | 199           | 200   | 13.9    | 12.3  |
| 010-019                 | 7        | 9    | Tuberculosis   | 211           | 171   | 14.7    | 10.6  |
| 390-392                 | 10       | 10   | Diseases of the circulatory system                         | 103           | 150   | 7.2     | 9.3   |
| Total/10 leading causes |          |      |  | 3,971         | 3,963 | 276.8   | 244.9 |
| General Total           |          |      |  | 5,841         | 5,787 | 407.2   | 357.6 |
| Other Causes            |          |      |  | 1,870         | 1,824 | 130.4   | 112.7 |

\* Death per 100,000 inhabitants  
Source: Estadísticas Vitales, D.E.C.

Table III B-1 - The ten leading causes of medically certified deaths.

| DISEASE                          | NUMBER OF CASES |
|----------------------------------|-----------------|
| Typhoid Fever                    | 10              |
| Paratyphoid Fever                | 97              |
| Other types of Salmonellosis     | 24              |
| Bacillary Dysentery              | 36              |
| Food-borne Intoxication          | 65              |
| Amebiasis                        | 350             |
| Diarrheal illness                | 29,041          |
| Tuberculosis, all forms          | 898             |
| Tuberculosis, respiratory system | 851             |
| Brucellosis                      | 4               |
| Diphtheria                       | 2               |
| Pertussis                        | 691             |
| Scarlett Fever                   | 799             |
| Erisipela                        | 583             |
| Tetanus, all forms               | 101             |
| Tetanus, newborns                | 17              |
| Chicken Pox                      | 642             |
| Measles                          | 508             |
| Yellow Fever                     | 4               |
| Infectious Hepatitis             | 232             |
| Mumps                            | 899             |
| Malaria                          | 1,240           |
| Leishmaniasis                    | 81              |

Table III B-2 - Communicable Diseases reported in 1974

habitants or more, 100% of the population has reasonable access to potable water, although only 93.2% of the population is in fact connected to the community system. Responsibility for providing water to the rest of the population is vested with the Ministry of Health. Due to poverty, ignorance, poor nutrition, and an unsanitary environment, the people living in the small villages of rural areas are the very ones that are most susceptible to illness.

Great strides have been made toward improving the health of the rural poor through the water supply program of the Ministry of Health, with the cooperation of AID through Loan 525-L-040. Since the implementation of the program, 352 aqueducts have been constructed. Table III B-3 shows the current population coverage of water supplies and sewage and human waste disposal systems in the urban and rural areas.

A survey conducted by the Ministry of Health demonstrated that the overall decrease in diarrhea in communities where aqueducts have been installed has been 57.3%. <sup>1/</sup> However, in those areas where a latrine construction program has been implemented, the decrease has been much more dramatic. In the province of Coclé, for example, where 92.2% of the population is served with either latrines or water-borne waste disposal systems, the incidence of diarrhea was reduced by 67.7%. This demonstrates the value of a program that combines the provision of a safe water supply and a safe human waste disposal system. The same survey demonstrated dramatic reductions in other diseases related to the environment: Infections, 44.3% decrease; parasites, 65.2% decrease; gastroenteritis, 57.1% decrease; typhoid, 64.2% decrease. There was a 42.4% increase in the number of families reporting, "no illness." Table III B-4 shows estimated diarrhea rates by province before and after the construction of aqueducts.

1/ Ministerio de Salud de Panamá, Dirección de Docencia e Investigación, Evaluación Socioeconómica en 66 Acueductos Rurales en la República de Panamá, 1976, p.24.

| ITEM  | TOTAL     |       | URBAN   |       | RURAL   |      |
|---|-----------|-------|---------|-------|---------|------|
|   | Number    | %     | Number  | %     | Number  | %    |
| Population  | 1,636,000 | 100.0 | 820,000 | 49.8  | 826,000 | 50.2 |
| Population with water supply available            | 1,259,200 | 76.5  | 820,000 | 100.0 | 439,200 | 53.2 |
| Aqueducts   | 994,250   | 60.4  | 820,000 | 100.0 | 174,250 | 21.1 |
| Sanitary wells                                    | 264,950   | 16.1  | 0       | 0     | 264,950 | 32.1 |
| Population with sewage or excreta disposal system | 1,386,000 | 84.2  | 797,900 | 97.3  | 588,100 | 71.2 |
| Sanitary sewer                                    | 597,000   | 36.3  | 591,280 | 72.1  | 5,720   | 0.7  |
| Septic tank                                       | 55,000    | 3.3   | 55,000  | 6.7   | 0       | 0    |
| Sanitary latrine                                  | 734,000   | 44.6  | 151,620 | 18.5  | 582,380 | 70.5 |

Table III B-3 - Population covered with potable water and/or sewage disposal system

Source: IDAAN

| PROVINCE       | CASES OF DIARRHEA PER 1,000 PEOPLE |                 |
|----------------|------------------------------------|-----------------|
|                | Before Aqueducts                   | After Aqueducts |
| Bocas del Toro | 61.8                               | 26.0            |
| Coclé          | 62.6                               | 20.2            |
| Colón          | 45.4                               | 34.5            |
| Chiriquí       | 49.5                               | 21.3            |
| Herrera        | 32.3                               | 18.9            |
| Los Santos     | 42.0                               | 15.2            |
| Panamá         | 56.7                               | 28.5            |
| Veraguas       | 108.2                              | 35.9            |
| NATIONWIDE     | 61.9                               | 26.4            |

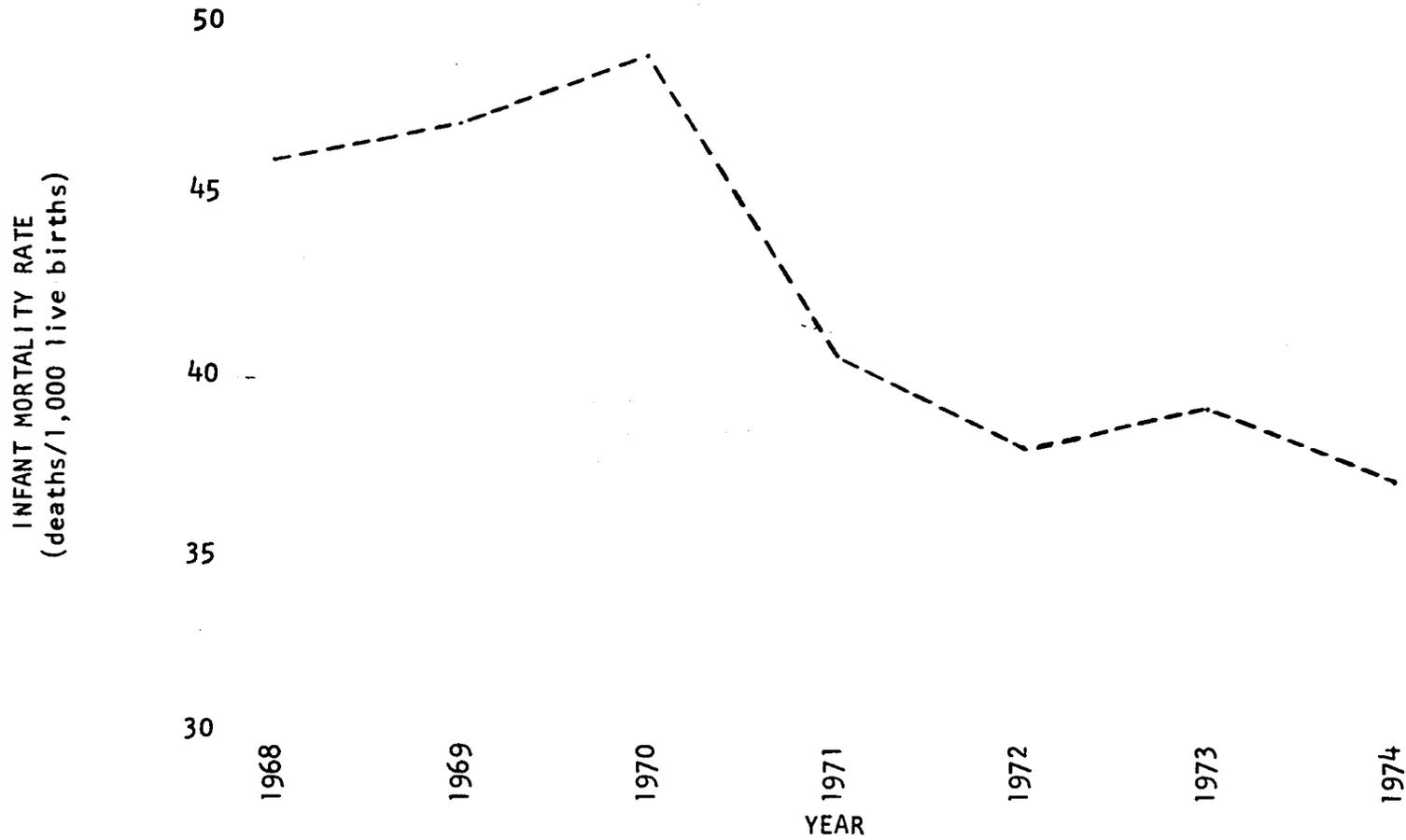
Table III B-4 - Diarrhea rates by province before and after construction of aqueducts. Rates in "cases/1,000 population."

Source: Op. Cit., Evaluación Socioeconómica en 66 Acueductos Rurales, p.31.

The infant mortality rates, which are a good index of general sanitation levels, have shown a marked decrease with the installation of the aqueducts and other environmental interventions in the rural areas. (See Graph III B-1)

## 2. Criteria for the Selection of Communities to Receive Aqueducts

There are various financial, technical and political criteria in the decision to locate a rural aqueduct. The more important of these are as follows:



GRAPH III B-1.- INFANT MORTALITY RATE FOR RURAL AREAS FROM 1968 TO 1974

Source: Panamá en Cifras

- a. There should be an adequate source of water, both in quantity and quality, which previous research by the Department of Engineering of the MOH has certified.
- b. There must be a need in the community for potable water and a deficiency in the supply of the same. Special importance will be given to areas with a high incidence of diarrheal diseases or other waterborne diseases.
- c. The population should be between 300 and 500 persons with a concentration of houses such that it will not be uneconomical to construct the aqueduct or household connections. As previously indicated, IDAAN installs water systems for communities of over 500 people. Communities with fewer than 300 people are generally considered too small, on economic grounds, to warrant an aqueduct unless they have the potential for population growth.
- d. There must be interest in the community in solving its water problems, which will be indicated by their agreement to the following:
  - (1) organize itself by establishing a local health committee;
  - (2) the community must actively participate in the construction of their water supply system;
  - (3) the community must provide 20% of the total cost of the work;
  - (4) the community must take care of the equipment, tools and materials used in the construction of the effort;
  - (5) the community will administer, operate and maintain the aqueduct with supervision of the MOH, and conform to established norms which include the local payment of monthly quotas established for the consumption of water. This quota will vary depending on whether it is a commercial establishment, private homes, etc. It is to be noted that supervision and maintenance responsibility for the aqueduct is a community responsibility. The MOH

passes the aqueduct legally into the hands of the community through a formal document, so that no ongoing maintenance costs are accrued by the Ministry of Health.

- e. The community must be sufficiently accessible to permit the transportation of equipment, supplies, materials, and MOH supervisory personnel for carrying out the work.
- f. Political criteria for locating an aqueduct are similar to those for locating a health post; that is, it must have the approval of the Junta Local, the Junta del Distrito, and the Junta Técnica Provincial.

### 3. Community Organization

Before a community is assisted in the construction of an aqueduct, the Ministry of Health requires that a local organization be established for the operation and maintenance of the system. In most cases, the Health Committee has assumed this responsibility. In a few cases, committees with such names as "Committee for Improvements," or "Community Board" have been established. It is interesting to note that none of the aqueducts constructed so far have failed. Pumps have been repaired, equipment has been upgraded, and lines have been extended. Those communities beyond the reach of electrical power were fitted with diesel or gasoline powered pumps. As the rural electrification program has reached those areas, the fuel powered pumps have been replaced with the more economical and maintenance-free electrical submersible pumps, and the salvaged fuel powered pumps have been used elsewhere. Table III B-5 demonstrates the trend favoring electric over diesel, and diesel over gasoline. Diesel motors are more efficient, economical, and maintenance-free than equivalent gasoline motors.

| TYPE OF PUMPING EQUIPMENT | INITIAL PERCENTAGE | CURRENT PERCENTAGE |
|---------------------------|--------------------|--------------------|
| Gasoline                  | 43.1 %             | 15.6 %             |
| Diesel                    | 52.9               | 56.8               |
| Electric                  | 4.0                | 27.4               |

Table III B-5 - Percentages of types of pumping equipment used at the beginning of the aqueducts program and currently.

Fees charged to the population for the use of the water vary from \$0.50 to \$2.00 per household per month. One would expect that people would feel that this was high, considering the low economic level of the communities served. However, the survey conducted by the Ministry of Health revealed that 84.5% of the people felt that the rates were fair. Only 10% felt that it was too high, and a surprising 4.6% felt that the rate was actually too low.

Certain other indirect benefits have been observed in the communities where aqueducts have been constructed. There has been a tendency of the population to concentrate in these villages from the surrounding rural areas. This tendency is viewed as a benefit because of the ease with which the population can then be served with other services, and because of the fact that quite often the migration is proceeding from the rural areas to the small villages rather than from the rural areas to the already overcrowded cities of Panama and Colon. In Colon province many of those moving to the small villages were coming from the city of Colon itself, which is quite congested. Since the construction of the aqueducts, there has been a rise in population of 26.7% in the communities served. In the aforementioned survey, 12.8% of the respondents that identified themselves as "newcomers" specifically stated that they had moved to that community because of the new water system. Another indirect benefit has been a pronounced tendency to make other improvements once the water system has been installed. There appears to be a desire by the community to improve streets, schools, houses, etc., once they have been able to observe at first hand that progress can be made. In many cases people requested assistance with the construction of latrines after seeing the value of a more sanitary environment.

#### 4. Proposed Work

Construction of sanitation facilities is projected in areas where such facilities currently do not exist. In these areas water is being obtained from rivers, streams, and ponds which are quite subject to contamination. The water is hauled in tin cans to the homes, providing yet another opportunity for contamination. Human excreta is generally disposed of in the open. The cycle for disease transmission is then complete, in that pathogenic organisms can be transmitted from feces to hands or to food, and back into the body (oral-fecal cycle). Water is not used to a great degree for personal and home cleaning because of the difficulty in transporting it. It is precisely in the areas not served with sanitation facilities that diarrhea, gastroenteritis,

typhoid, and a host of other environmentally-related diseases are prevalent.

The Ministry of Health proposes to construct small aqueducts in communities where the density and number of houses is such that a community type system is justified. The systems will be designed with simplicity uppermost in mind. A typical system will have a 6' well fitted with a pump that can provide one day's supply of water in six to eight hours. Selection of pump will depend on local factors such as availability of electricity, depth of well, volume of water expected, etc. The well installation will be protected with a wellhouse, which could eventually be used as a place to inject chlorine or fluorides into the water if the need arose. A water storage facility will be situated such as to provide a minimum pressure of 5 psi. The distribution main will generally be about 6,000 linear feet of 2" PVC (Poly-vinyl-Chloride) pipe, and the house service lines will be 3/4" PVC pipe. PVC pipe will be used because of its advantages over other materials. It is simple to install and repair. It is light and long lengths can be handled easily by one man. It will not corrode, and is not as likely to be subject to mineral incrustations as other materials. It is economical, and is manufactured locally. In cases where high-pressure pipe is necessary, a suitable grade of PVC can be obtained for the particular application. The design used by the Ministry of Health is simple, durable, economical, and easy to operate and maintain.

In areas where the density and number of houses does not justify a community system, each house or group of houses will be provided with a 4' well, fitted with a conventional hand pump. The hand pumps will be located as close to the house as practical in order to encourage their use. Provisions will be made for spilled water to drain away and not cause a nuisance.

Latrines built under this project will consist of a hole in the ground, dug by the homeowner, with a pre-cast concrete slab placed as a cover, and a structure constructed out of available materials. Special care will be taken in the individual designs to insure that access is denied to flies and other vermin into the pit itself.

The MOH has the proven capacity for installing annually 100 aqueducts, 300 hand pumped wells, and 10,000 latrines. Since the project's target outputs for these components are well within the Ministry's capacity, no difficulties are anticipated in completing this phase within the life of the project.

## 5. Alternatives to Aqueduct Program

The Ministry of Health has considered all possible alternatives in providing water to the rural villages and scattered homes. Where feasible, springs have been developed, and gravity systems provided in order to simplify operation and maintenance. Where a spring is not available, wells have been constructed and utilized. The only alternative to these two water sources is a surface supply. Surface supplies have to be treated in order to be utilized because they are generally contaminated and contain suspended materials that need to be removed. Treatment facilities are expensive to construct, operate and maintain, and require skilled personnel for operation. <sup>1/</sup> For this reason, utilization of surface supplies is not being considered. The only other alternative is a "no action" one, which would simply mean that no solution will be sought for the problems discussed earlier in this section.

It would be ideal to have everybody served with water through an aqueduct, but unfortunately, there are many homes that are scattered, and running a pipe to them would be completely unfeasible. For these homes the project will provide individual drilled wells. Drilled wells are preferred to hand-dug wells, because the latter are more susceptible to contamination once they are in operation.

## 6. Alternatives to Latrine Program

The two basic alternatives to the latrine program are a more sophisticated method of sewage and human excreta disposal or a "no action" alternative. A more sophisticated approach could be either a community sewer system with some means of treatment that would insure no pollution of the environment, or septic tank systems for each individual dwelling. Either one of these alternatives would be much more expensive than the latrines. The "no action" alternative would to a great extent negate the value gained from the aqueducts by continuation of the practice of open human waste disposal. The possibility of disease transmission through direct contact with the feces or through mechanical transmission by flies and other insects would continue to be very real.

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<sup>1/</sup> Recent World Bank study shows likelihood of much higher cost involved in the use of surface water by comparison to wells or even aqueducts.

See Village Water Supply, p.81.

C. Technical Analysis of Health Posts, Health Assistants, Subcenters and Rural Health Centers

Introduction

The Health Sector Assessment has already indicated the pyramidal structure of the integrated health system, which Panama is in the process of developing. The proposed project will plug directly into this framework, providing critically needed assistance to effect its more rapid implementation. The hierarchy of referrals and relationships from health posts through regional hospitals is laid out in full detail in Annex I. For each province there is a listing of each regional hospital, the health centers dependent upon it and the subcenters and health posts dependent upon each health center. In this structure the existing facilities are clearly differentiated from those proposed to be built in this project. It is evident that the proposed facilities are to be located where clear gaps exist in current coverage, with the health posts representing a large scale effort at the lowest level.

Several distinct levels of medical attention and health services are offered in this system. The first level, the health post, will offer attention to the most remote rural populations through the health assistant to be trained to staff it. The second step is the health subcenter, which is differentiated from the first level by the addition of dental capabilities and staffing by a nurse auxiliary who has been given deeper and more comprehensive instruction in primary and community health care. When cases are too complicated for either a post or a subcenter they are to be referred to the health center. The functional relationship of the distinct levels of this integrated structure is a two-way relationship. The health assistant will be able to refer patients upward, while at the same time he/she receives norms of control and follow-up for each of the patients in the community. In addition, the health center level with its superior resources of doctors, nurses and equipment will be assigned a geographical area of responsibility for a given number of posts and subcenters. Each of the doctors working in a health center will be responsible for covering a geographical sector, whose size will depend on terrain, population density, and ease of communication. Within that sector he will be directly responsible for and in charge of supervising, advising, and training of the health assistants on a continuing basis through periodic visits to the assigned zone. The decision to use doctors for such direct supervision, rather than nurses, is based on the experience in Bocas del Toro Province

where over the past two years a pilot project using health assistants has been carried out. In Bocas, direct supervision by doctors gave superior results to supervision by nurses or auxiliaries. Direct supervision by physicians will be facilitated on a continuous basis through radio communications during health center working hours, and through similar radio hookup to Regional Hospital emergency rooms during hours when health centers are closed.

With this proposed supervision and communication, along with continuous follow-up of patients by the health assistant, it will be possible to determine the communities' health status. The number and cause of outpatient visits, operating costs, and number of visits per doctor and health assistant will facilitate evaluation of the program and its impact on health status.

This project will specifically deal with those levels in the system most directly beneficial to the marginal rural population. Thus 225 health posts are proposed, 300 assistants trained to staff them (20% attrition rate anticipated), 14 health subcenters and 4 rural health centers. These new facilities will fill gaps in the existing system as well as reach out to communities not properly serviced by the public health care system in the past.

### Health Posts

The health post is designed to become the first line of primary care in the rural areas; in fact, it will represent the first time that much of this target population will have been serviced by any type of medical care facility. The idea is to construct, or where possible use existing buildings, of approximately 38 sq. meters in size, divided into 2 rooms. It will serve as the location and operating point for the health assistant serving that area. It will, therefore, provide the lowest cost approach to health care for the rural dispersed population, previously unreached on a regular basis.

### Criteria for Locating a Health Post

At the outset an attempt is made to locate a health post so as to maximize the population served within a radius of 2 hours walk from the facility. This is a worldwide WHO standard. Therefore, in looking at location sites for health posts a major consideration is areas which currently are more than that distance away from the nearest health facility.

Related to the above, preference is given to locating health posts in a community or a cluster of communities with a population from 200 to 500 people. It is necessary to recall the tremendous dispersion of population in Panama into more than 9,000 population sites with 500 or less population. In 1970 there were 5,897 communities with between 50 and 99 inhabitants, and 1,597 communities with 100 to 499 inhabitants.

One of the typical ways of locating a health post will be to choose a site which is among 4 or 5 populated places of 25 - 50 or 50 - 100 inhabitants; then the health post will serve several communities, totaling two to five hundred people.

If each of the proposed 225 health posts in this project serves 500 persons, then a total of 112,500 people will be served. If an average of 5 communities is served per post, then 1,125 communities previously unserved will be reached.

Several other criteria are also used in selecting the site for a health post. These include:

1. Health indices or health indicators in the areas where the health post is to be located show health status to be below national or provincial levels.
2. Unfavorable environmental health conditions exist in the area, but the area is favorable to improvement. That is, water, waste, garbage, and housing are in a condition requiring community attention and public sector support, and a favorable climate exists in the community for making this response. The location of a health post will serve as a nucleus for organizing such a response.
3. Since the GOP has a broader community development policy than just health, one of the criteria for locating health posts is that they be situated in zones of community development designated by the Ministry of Planning so as to assist in promoting overall integrated rural development.
4. Groups susceptible to modification in motives for improving their health exist in the community. This will be determined through surveys by health educators and community workers in the areas.
5. There must exist the possibility of maintaining on-going supervision, support services, supply, etc., in an efficient manner.

- 6. There must be previous recommendation by the Regional Health Director.
- 7. There must also be political support in the community for the location of the health post. The community, through the Junta Local, which is composed in part by the community health committee, along with the local political functionaries, must give its approval. The Junta del Distrito (the District Board) as well as the Junta Técnica Provincial (Provincial Technical Board) must also give its approval to the location of a health post. This assures coordination among District and Provincial levels as to the allocation of funds and the location of facilities, in a wedding of technical and political support.
- 8. No health post will be built unless the community itself or the cluster of communities can provide one or two candidates for health assistants to staff the health posts.

Demand for Health Services

The actual need for additional health posts can be easily documented. As a rough estimate, we can use the percentage of rural population not covered by services in 1975, which according to the MOH was 75%, or some 600,000 people. If we assume 3.2 visits per served population (as actual 1974 visit data indicate), some 1,900,000 unmet visits existed in 1974. If each post served only 1760 visits per year (8/day/220 day year), then 1,080 posts would have been potentially needed for 100% coverage in 1974. This figure is probably very high, however, since it assumes all additional rural coverage only through health posts, none through health centers or subcenters. It also is based on 3.2 visits/served population. A figure much lower in rural areas than urban could be expected; the 3.2 figure is a national average including urban areas where the number of visits is higher.<sup>1/</sup>

If we assumed only half of the now uncovered rural population (300,000) would be covered by posts (the rest by subcenters and centers), and only 2 visits/person/year, then only some 341 posts were needed in 1974 --  $300,000 \times 2.0 \text{ visits} \div 1760 \text{ visits/post}$ .

<sup>1/</sup> Served population is only 25% of the rural population; total visits/total population of Panama for 1974 is less than .7 visits per person.

With a projected rural population in 1980 of 938,090<sup>1/</sup> this would mean 59 more posts needed by 1980, given the latter assumptions, for a total of 400.

If the population in the rural areas begins to concentrate in larger numbers, as official GOP policy is trying to promote, the posts can be expanded to become subcenters or centers since they are built on a modular design with this expansion capability.

### Health Assistants

The search for low cost alternative facilities to impact on the rural areas has resulted in the development of the health posts concept. A complementary ingredient in the delivery system at this level is a low cost person to deliver services, a health assistant who can be located in the remote rural community. It would be very costly to prepare persons with the technical capabilities of those in large urban areas. At the same time, these disperse communities are not able to offer the working conditions adequate enough to attract quality technical people from urban areas and in fact, the tendency is to emigrate from the rural areas. Even if personnel such as doctors and nurses could be attracted to remote rural areas the cost of maintaining such a staff would be prohibitively high for the government to bear. Finally, important communication barriers would exist between people of university level education and the campesinos of the remote rural areas.

Taking into account the above, the MOH has decided to utilize the strategy of preparing health assistants. This person would work out of the health posts described above. The health assistant's major duties will include vaccination, first aid, maternal/child care, including family planning, and promoting environmental sanitation, good nutrition, and community development in general. The assistant will also refer patients, as appropriate, to higher levels in the health care system. In addition to the health services traditionally delivered in a health center or hospital, the health assistant would be a community leader, a community developer in all areas, but particularly health. Assisting in organizing communities to construct aqueducts, wells, and latrines, along with the community health committee, would be part of the assistant's responsibility. Getting the

1/ Official projection of Dirección del Censo, Panama.

committee motivated to develop along these lines will also no doubt lead to community development efforts in other areas, such as housing, and so forth.

Criteria for Selection and Location of Health Assistants.

1. The health assistant must live or decide to live in the area where he/she expects to work.
2. It is important that the health assistant be accepted by the community and enjoy prestige in the community. This is a major consideration in the MOH strategy in selecting health assistants. Existing persons at the community level connected with health activities, such as midwives, curanderos, or other personnel already enjoying prestige due to their health background, would be likely candidates. However, the MOH prefers community selection of candidates, and not specific recruitment of such candidates.
3. Capacity to accept and learn supervision. The health assistants are to be given psychological tests before being placed and this is considered an important component in successful training.
4. The health assistant must have the ability to communicate well and relate well with the community residents. Candidates will therefore be interviewed by higher level personnel before being placed.
5. The assistant should have completed primary school. However, a person able to read and write with less education may be accepted if experienced in health matters and respected by the community.
6. The assistant should be 18 or over.
7. The assistant should be healthy, able to travel, and well trained. This means that young candidates would more likely be selected even though older persons may have developed more prestige in the community due to longer experience.
8. Either sex may qualify as assistants depending on community norms and preferences.

In general, the selection process for health assistants is similar to norms developed by WHO.

Sufficient health assistants must be trained over the next 4 years to staff the 225 health posts proposed for construction. This is estimated to be 300 people, due to anticipated attrition of 20% or so.

Annex J presents a detailed technical methodology for developing the task structures of the health assistants, helping to insure their optimum training and impact on community health needs. Protocols will be developed relating to the above methodology, including appropriate referral procedures to follow, so that patients are properly referred upward and then no further than necessary. The health assistants will be supervised by medical personnel from the health center for that region.

#### Health Subcenters

The subcenter is a small establishment with a full-time nurse auxiliary, a part-time sanitarian, and periodic visits by personnel from the supervising health center.

In 1975 there were 105 subcenters of varying sizes. Some in fact had operating costs close to those of small rural health centers making them difficult to distinguish. A subcenter should serve a minimum population base of 2,000 people. The 14 subcenters proposed in this project are to be located at the sites indicated in Annex I.

#### Health Centers

As of 1975 the MOH had a total of 76 health centers -- 24 with an MCH annex, 52 without such annex. The standard health center has been located in rural areas where larger communities exist, and in certain periurban areas where a mass influx of poor rural population has settled - the urban barriadas. Generally a health center will have the following facilities and equipment: waiting room, medical and dental examining rooms, pharmacy, laboratory, emergency treatment area, sanitary inspector's office and administration. From this, one can infer the staffing requirements for a center.

In areas where there is either high birth rates and/or difficult access to hospital maternity care, an MCH annex may be added to the basic center, and in other cases one or two beds exist for overnight observation and treatment.

The new health centers are to serve a population of 15,000 to 20,000 people. Such a population already exists in

Soná and in Santiago, where centers are proposed. A third center is proposed in Las Minas, due to expected economic development and population growth. Las Minas currently has a population of 8,000 people. In the case of El Llano, it would be the only health center for all of eastern Panama Province and the western half of Darien Province, an enormous land expanse, even though the immediate area has only 4,200 people.

The second criteria for locating health centers is directly related to their role in supervising, training and assisting subcenters and health posts in their region. The pattern of this relationship is shown in Annex I.

The program of health centers being proposed by the GOP represents a modest increase of 4 rural health centers, although each is large in size and staff.

## D. Engineering Analysis

### 1. General Description

The Engineering and Construction phase in which AID is expected to participate will entail a number of varied components. These components range from relatively simple and rudimentary community water supply projects, serving domestic needs, to the construction of well equipped health centers and sub-centers which will serve both as an upward referral point in the health system, and as an administrative supervision point for a larger geographic area including posts, aqueducts and gardens. The proposed construction represents a continuation of the Ministry of Health's efforts to develop a health delivery system which provides basic preventive and curative health care services to an increasingly larger segment of the rural population.

Technical and professional guidance and assistance for planning, design, procurement, construction and operation of the proposed facilities will be furnished by the Ministry through its architectural, engineering and other technical divisions. These divisions have considerable experience in design and development of facilities similar to those proposed for this project.

The Ministry maintains a complete staff of architects, engineers, surveyors, well drillers, as well as a limited inventory of materials, equipment and vehicles. Additionally, it contracts, as appropriate, skilled tradesmen (plumbers, masons, carpenters, electricians, etc.) required to carry out its construction programs in both rural and urban areas.

In addition to some 187 health facilities which have been constructed by the MOH throughout the Republic of Panama, since 1956 a total of 4,976 hand pumped wells have been installed, and since 1968 some 352 rural aqueduct systems have been put into operation. The provision of these basic services by the MOH has been a major factor in helping the inhabitants of rural areas to meet their water supply needs. It is based on this extensive experience that the Ministry staff has planned and developed a program for the proposed health posts, health centers, community water supply systems, and latrine units.

## 2. Health Posts

a. General Design Aspects - The typical unit which has been proposed by the Ministry is a simply designed facility which can be easily constructed and maintained. Maximum emphasis has been placed on utilization of locally available materials and the community's labor force. Since few specialized building techniques or materials are anticipated, the community is expected to provide much of the materials, skilled labor, when available, through a "self-help" type construction approach. Under this arrangement the Ministry will provide the community with any particular components that are difficult to obtain and also supervision and inspection assistance from the provincial or national level. Where a self-help approach is not deemed to be feasible, the units will be built directly by the MOH.

b. Construction Approach - A standard health post unit will be 35 square meters and it is expected that the nature of government assistance and self-help effort to construct the 225 units will vary with different locations. Since only minimum plumbing, wiring, masonry, or other skilled worker requirements exists, the community's self-help effort will concentrate on only a few simple tasks which can be provided from locally available labor resources. The MOH will provide the engineers, inspectors and administrative personnel required to administer construction of health posts at the various locations throughout the country. A typical health post will be constructed with materials such as cement block walls, timber truss and a corrugated metal roof. Because the construction standards are simple, there will be no need to acquire and operate costly construction equipment.

c. Construction Costs: The land, design, supervision, labor, construction management and basic construction materials will form the major part of the GOP/community contribution to construction costs. AID will assist in the purchase of some materials and general construction expenses. The following costs are based on design data prepared by the MOH for construction of the proposed health post units. Design concept and equipment listings are provided in Annexes G-2 and G-3, respectively.

SINGLE UNIT (HEALTH POST)

| <u>Item</u>  | <u>\$</u>       | <u>\$/S.M.</u> | <u>A.I.D.</u>   | <u>GOP</u> | <u>COMMUNITY</u> |
|--|-----------------|----------------|-----------------|------------|------------------|
| Land<br>500 S.M.   | 500.00          | 1.00           | -               | -          | 500.00           |
| Construction<br>35.3 S.M.                                  | 4,600.00        | 130.00         | 4,000.00        | -          | 600.00           |
| Design/Supervision and<br>Construction Management<br>(10%) | 460.00          | -              | -               | 460.00     | -                |
| Equipment  | <u>2,000.00</u> | <u>-</u>       | <u>2,000.00</u> | <u>-</u>   | <u>-</u>         |
| Totals   | 7,560.00        | -              | 6,000.00        | 460.00     | 1,100.00         |

225 (Total Units Proposed) X 7,560.00 = \$1,701,000

d. Site Selection: The standardized and uniform design of the basic health post will not require any special or unusual site characteristics. Land and space to expand is not anticipated to be a problem in the rural areas where the health posts are to be constructed. Where possible these units will be located in such a way as to be accessible to several small communities and close enough to community public services to utilize existing utilities, where available. In order to make the units accessible for the target groups to be served, maximum consideration will be given to those sites having ideal topography characteristics. Community officials and MOH staff will combine efforts to insure that the health posts will be located at sites which take into consideration the community's overall planning objectives and growth projections of the districts.

### 3. Health Centers and Sub-Centers

a. General Design Aspects - The MOH has developed a design concept which allows the basic health post unit to be expanded to a "sub-center" health facility. This sub-center facility can also be further expanded, by increasing the number of rooms, to a complete rural health center facility. A total of 4 rural health centers and 14 sub-center units are proposed for the current four year loan financed construction program.

The same basic design principles which have been established for the health posts are planned for these larger units. Because the centers are larger and somewhat more complex units, greater emphasis will be placed on direct MOH technical staff inputs. The MOH technical staff's design for the centers encourages maximum utilization of locally available building materials and construction techniques.

b. Construction Approach - Based on the design concept for the proposed health centers, the MOH plans to implement a "force-account" type construction program which will permit completion of the facilities with its own resources. The MOH plans to maintain total control and supervisory responsibility over the various construction activities. This responsibility will include construction material and equipment procurement and installation, site preparation, and the actual physical completion of the facilities. To carry out the above, the MOH will utilize its architectural, engineering and construction management personnel. Overall responsibility for coordinating and scheduling construction activities will rest with the Plans and Projects Division of the Ministry of Health.

c. Construction Costs (Health Centers): The following costs are based on design data prepared by the MOH for construction of the health centers (rural and sub-center units). Design concept and equipment listings are provided in Annexes G-2 and G-3, respectively.

(SINGLE UNIT - HEALTH SUB-CENTER)

| <u>Item</u>   | <u>\$</u> | <u>\$/S.M.</u> | <u>A.I.D.</u> | <u>GOP</u> | <u>COMMUNITY</u> |
|---|-----------|----------------|---------------|------------|------------------|
| Land<br>500 S.M.  | 500.00    | 1.00           | -             | -          | 500.00           |
| Construction<br>83.0 S.M.                                     | 12,900.00 | 155.00         | 12,900.00     | -          | -                |
| Design/Supervision and<br>Construction<br>Management<br>(10%) | 1,290.00  | -              | -             | 1,290.00   | -                |
| Equipment   | 4,000.00  | -              | 4,000.00      | -          | -                |
| Totals  | 18,690.00 | -              | 16,900.00     | 1,290.00   | 500.00           |

14 (Total Units Proposed) X 18,690 = \$261,660

d. Site Selection (Health Centers) - As with the health post, the site selection process will be based on the concept of a network of health posts which are supervised by a sub-center, and in turn by a rural center. Since the health center facilities (both sub-center and rural) are larger units, a more detailed analysis of prospective sites will be required. The considerations of proximity to public services, utilities, and roads which will make for easy access by community target groups, and for travel to its circuit of posts will be major factors. Location maps showing community boundaries, existing and proposed facilities, topography and utilities are being used by the MOH to make the final determination of construction sites.

REMODELING AND RENOVATION OF EXISTING FACILITIES

In addition to the construction of new facilities, the MOH intends to remodel and/or renovate fifty existing health center

and sub-center facilities. The primary objective is to maximize utilization of existing facilities and also bring them into conformity with design criteria established for the units which are to be constructed as part of this project. The extent of remodeling or renovation required is based on evaluations and construction estimates done by the Ministry's technical staff. Even though the immediate concern is construction of the new facilities, the MOH recognizes the need to improve existing health centers and sub-centers in order that they also can meet the increased health care and treatment requirements of the rural communities.

In the past, AID has participated in the Ministry's ongoing health center renovation and remodeling program by providing grant funded financial assistance. A total number of sixty-seven health center facilities throughout the country have benefited from this assistance. Under this program the MOH provides materials, labor, supervision, designs and plans to upgrade and expand sub-centers and centers in the rural areas of the country.

As part of the AID contribution/ under this loan, \$349,000 has been allocated for the remodeling and renovation of existing health center and sub-center facilities.

(SINGLE UNIT - HEALTH CENTER)

| <u>Item</u>   | <u>\$</u> | <u>\$/S.M.</u> | <u>A.I.D.</u> | <u>GOP</u> | <u>COMMUNITY</u> |
|---|-----------|----------------|---------------|------------|------------------|
| Land<br>2,000 S.M.  | 4,000.00  | 2.00           | -             | -          | 4,000.00         |
| Construction<br>259 S.M.                                      | 46,620.00 | 180.00         | 46,620.00     | -          | -                |
| Design/Supervision and<br>Construction<br>Management<br>(10%) | 4,662.00  | -              | -             | 4,662.00   | -                |
| Equipment   | 20,000.00 | -              | 20,000.00     | -          | -                |
| Totals  | 75,282.00 | -              | 66,620.00     | 4,662.00   | 4,000.00         |

4 (Total Units Proposed) X 75,282 = \$301,128

(Note: Construction cost figures include a built-in inflation factor based on an annual increase of 12%.

4. Aqueducts, Hand Pumped Wells and Latrines

a. Aqueducts (Domestic Water Supply Systems).

Design Aspects - The rural aqueducts systems will comprise the following:

1. A source, usually a 6-inch cased well with slotted-pipe prefabricated screen, over 80 feet deep.
2. A centrifugal pump and 10 hp diesel motor. As an alternative, an electrical submersible pump and motor will be used where electric power is available.
3. A supply main and distribution network with individual house connections.
4. A storage and distribution reservoir.

Basic design criteria will be as follows:

1. A supply capable of furnishing 30 gallons per capita per day (gpcd) - i.e., twice current population.
2. A pumping capacity, coordinated with storage, to limit pumping to 8 to 10 hours per day.
3. A minimum distribution system pressure of 10 pounds per square inch.
4. Individual house connections and limited public taps.

Since treatment costs would be prohibitively high, efforts will be concentrated in the development of the deeper ground-water sources to effectively eliminate contamination hazards. However, where the needed quantities can be readily and more economically developed from nearby springs, this will be done.

The pumping facility to be installed, either within the well casing or a pump suction pit supplied from surface flow,

will be housed for protection of the unit, both from vandalism and the elements.

The source will be developed as close to the center of usage as practicable. This will minimize the length of the supply main. This main, together with the distribution network, will consist of either polyvinyl chloride (PVC) plastic tubing and/or galvanized steel pipe. Experience has shown that, in the lower pressure ranges below 20 pounds per square inch (psi), locally manufactured PVC pipe has performed well. In the higher pressure ranges and in the more complex piping layouts, such as for pump discharges and for inlets and outlets to tanks, imported galvanized steel pipe will be utilized.

Under this program it is proposed, as practicable, to provide individual house connections to bring the water supply into the household. Closed storage and distribution tanks of either reinforced-concrete or welded steel-plate are proposed. Where the topography permits, a reinforced-concrete reservoir will be located and constructed on the ground at a selected high point near the center of consumption, and thus will serve as an elevated tank. Where this is not practicable, a pre-fabricated, welded, steel-plate reservoir will be installed on a reinforced-concrete or welded steel pipe tower.

b. Hand Pump Water Supply Systems

Rural population centers of 50 to 100 inhabitants, with a scattered and dispersed housing layout, may not fully justify expenditures for a complete system with distribution and storage. Under these conditions, the Ministry proposes to locate up to two 3-inch or 4-inch diameter wells per system in which hand pumps will be installed for public usage.

c. Costs - The Ministry will procure and furnish all materials, vehicles and equipment including that portion to be financed from loan funding. For rural aqueduct supplies the following Table D-1 summarizes materials and construction costs for 300 systems. Costs are further proportioned between the Ministry (GOP), community and AID to identify each party's participation. These data are based upon costs analyses and reviews prepared by the Ministry Sanitary Engineering Department of its existing program, and all systems are projected to utilize a ground water source. However, this will not preclude the development of surface sources should the planning analysis show these to be more feasible.

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TABLE III D-1

ESTIMATED MATERIAL AND CONSTRUCTION COSTS

THREE HUNDRED - RURAL AQUEDUCTS  
(UNIT - U. S. DOLLARS)

| (SINGLE UNIT)   | A. I. D. | G. O. P. | COMMUNITY |
|---|----------|----------|-----------|
| Wells. (Development, Casing, Screen)<br>100 In. Feet. Galv. Steel 6" dia.<br>and 5 Ln. feet Stainless steel well<br>screens.  | 2,100    | 650      | --        |
| Pump Houses (Structure, Pump and<br>Motor) 30 Gal. per min. Centrifugal<br>Pump. and 10 HP Diesel Motor and<br>Couplings.   | 2,000    | 300      | 350       |
| Storage Tank (Tower and Tank) 4000<br>Gal. Prefabricated Steel Tank on<br>Welded Steel Tower or Concrete<br>Tank and Tower  | 750      | 200      | 1,300     |
| Distribution Net - Pipes - (Supply-<br>Street Mains, House connections<br>6000 In. feet P.V.C. 1-1/2" to<br>2-1/2 200 In. feet Galv. pipe 2"<br>to 3" 6000 In. feet P.V.C. 1/2 to<br>1" and valvs accessories, etc. | 8,400    | 500      | 3,850     |
| Misc. (Shovels, picks, wheelbarrow)   | 100      | -        | -         |

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TABLE III D-1 (Cont'd)

RURAL AQUEDUCTS

| (SINGLE UNIT)                                 | AID    | GOP    | COMMUNITY |
|---|--------|--------|-----------|
| Skilled Labor (Mason, Plumbers<br>Carpenters) | -      | 3,200  | 300       |
| Transportation (Fuel, Oil, Tires,<br>etc.)    | -      | 500    | -         |
| Right of Way                                  | -      | -      | 500       |
| Planning                                      | -      | 500    | -         |
| TOTALS  | 13,350 | 5,850  | 6,300     |
| TOTAL (AID)                                   | 13,350 |        |           |
| TOTAL (GOP/COMMUNITY)                         |        | 12,150 |           |
| OVERALL TOTAL (SINGLE UNIT)                   | 25,500 |        |           |

TOTAL NUMBER OF UNITS PROPOSED = 300

300 X \$25,500 = \$ 7,650,000

(Total Cost 300 units)

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TABLE III D-2  
ESTIMATED MATERIAL AND CONSTRUCTION COSTS  
FOUR HUNDRED - DOMESTIC HAND PUMP WATER SUPPLIES  
(UNIT - U. S. DOLLARS)

| (SINGLE UNIT)   | A.I.D. | G.O.P. | COMMUNITY |
|---|--------|--------|-----------|
| Well - (Development, Casing)<br>80 In. feet. Galv. Steel 4"<br>dia. well casing       | 300    | 440    | --        |
| Hand Pump and Cylinder  | 110    | --     | --        |
| Pipe 70 In. feet 1-1/4" dia.<br>Galv. steel pipe and 70 in.<br>feet of 7/16 steel rod | 90     | --     | 40        |
| Concrete Pad for Mounting<br>Pump and Installation                                    | 30     | 60     | 60        |
| Transportation (Fuel, oil,<br>tires, etc.)  | --     | 40     | --        |
| Right of Way  | --     | --     | 100       |
| TOTALS  | 530    | 540    | 200       |
| TOTAL (AID)   | 530    |        |           |
| TOTAL (GOP/COMMUNITY)   |        |        | 740       |
| OVERALL TOTAL (SINGLE UNIT)   | 1,270  |        |           |

TOTAL NUMBER OF UNITS PROPOSED = 400

400 X \$1,270 = \$508,000 (Total Cost 400 units)

Annex G-2 presents sketches of a typical installation for a ground water supply system.

Similarly Table D-2 summarizes the materials and construction cost for 400 hand pump ground water supplies for the smaller population concentrations. Annex G-2 presents sketches of a typical installation. Responsibility for maintaining and repairing existing wells is with the Ministry Sanitary Engineering Department which has a commendable record of upkeep for the 200 systems installed under AID Loan 040.

d. Latrines - The Ministry of Health has decided that latrine construction be included as an integral part of its rural environmental sanitation program. In each province of the country the construction of latrines has been the most feasible solution in helping to satisfy basic excreta disposal requirements at the small rural village level. Ministry policy is directed toward insuring that each household has, as a minimum, this simple and easy to construct sanitary unit.

COSTS: (SINGLE UNIT)

|                     | <u>AID</u> | <u>GOP</u> | <u>Community</u> | <u>Total</u> |
|---------------------|------------|------------|------------------|--------------|
| Latrine House       | -          | 68         | 32               | 100          |
| Concrete Pad & Seat | 60         | -          | -                | 60           |
| Excavation          | -          | -          | 8                | 8            |
| Totals              | 60         | 68         | 40               | 168          |

Total Number of Units proposed = 13,800

13,800 X \$168 = \$2,318,400. (Total Cost for Latrines)

5. Maintenance of Facilities

a. Water Supply Systems

The responsibility for maintaining and operating the community water supply systems will be assumed by each local

water supply administrative committee. Training and guidance, together with any needed technical and engineering assistance, will be provided by the Sanitary Engineering Department of the Ministry of Health. This operational practice, based on the experience-record under its existing domestic water supply program, has proven sufficiently effective to warrant its continuation.

Vehicle and equipment maintenance will be the responsibility of the Ministry, and this will be performed within its present maintenance program and practices. The Ministry now has vehicle and equipment maintenance shops in Panama City, Aguadulce and David, each under the supervision of a qualified master mechanic and helpers and which have been effective in keeping its pieces operable, well past usual life expectancies.

b. Latrines

Since this basic unit represents an investment of time, labor and materials by the individual family or household, the maintenance requirements will primarily be the responsibility of the family members. Periodic maintenance inspections and guidance will be provided by MOH sanitary inspectors to insure satisfactory upkeep in accordance with MOH regulations and standards.

c. Health Posts and Health Centers

As with aqueducts, hand pump wells and latrines, the communities will assume the basic responsibility for maintenance of the health posts and health centers proposed for construction. The MOH will rely heavily on the willingness of the community's inhabitants to actively participate in efforts to keep the buildings in proper condition. A plan for maintenance of the buildings will be developed by the local health committees under the guidance of MOH staff. These committees will assume responsibility for identifying and solving problems concerning upkeep and general repair. The community's health committee plays an important role in promoting the idea that effective maintenance is the key to the successful operation and function of these facilities which will be constructed as a service to the community.

6. Implementation Plan

The implementation of the engineering planning and design, construction and operation phases of the health posts, health centers, and water supply projects will be based on the procedures established and followed in previous building construction and domestic water supply systems (aqueducts, hand pumped wells), latrines and health posts. The degree of community input (self-help) is expected to be a significant factor. Construction of facilities of this type under a cooperative arrangement is an established practice and with government help in providing some equipment, guidance, and money, the facilities can be completed with a minimum of difficulty.

The rural health centers represent a considerably larger construction task for the Ministry. Based on the overall construction climate in the country and its experience in handling construction projects of equivalent size and complexity, the MOH plans to execute this work under a "force account" type of arrangement utilizing its own technical staff to implement the construction phase.

The following represents an outline schedule of project requirements and timing for the implementation of construction activities:

| <u>Activity</u>                                      | <u>From</u>   | <u>To</u>  |
|--|---|------------|
| Aqueducts, Hand Pumped Wells, Latrines, Health Posts | Beginning of Loan -<br>(25% of total requirements completed)                                | End 1977   |
|  | Additional 25% segments to be completed at annual intervals through to the end of CY 1980). |            |
| Health Centers and Sub Centers                       | Beginning of Loan   | - End 1980 |

See Annex G-4 for a more detailed implementation schedule for the various construction components of the project.

## 7. Method of Reimbursement

The fixed amount reimbursement method (FAR) is anticipated for use in the various construction components of the project. This method, which is to be used for health posts, health centers, sub-centers, latrines and aqueducts, provides for AID payment of a "fixed" previously agreed amount to the MOH after: (1) the MOH has satisfactorily completed the project construction according to previously agreed specifications and plans, and (2) AID has inspected the project (s) to see that it has, in fact, been completed according to the specifications.

USAID engineering staff will monitor and conduct periodic inspections to satisfy themselves that the various project elements are being implemented in accordance with agreed specifications in order to facilitate final inspection and acceptance. As the units are completed, USAID will make the final inspection and, if acceptable, reimburse the MOH the agreed amount per completed unit.

## 8. Technical Feasibility

The engineering phases of the project, involving the planning and construction of health posts, sub-centers, health centers, latrines, rural aqueducts, and hand pump wells, are based on standards and procedures developed and currently practiced by the Ministry through its Sanitary Engineering and Plans and Projects Depts. In <sup>the</sup> implementation of these types of projects, the engineering staff has furnished assistance and guidance in planning, design, construction, operation and maintenance.

Based on this experience, the Ministry has developed the preliminary planning and cost data for the proposed construction activities. The construction will be implemented in accordance with established and accepted standards and practices. Cost data, prepared by the Ministry, are based on this previous experience and include a 12% allowance for estimated annual price increases which could influence material and equipment procurement, more than the actual construction which will be performed on a force account and community self-help basis.

It is considered that the technical and engineering requirements of FAA 611 have been met.

## E. Environmental Analysis

The Project described herein can be divided into three categories for convenience in analyzing effects of the proposed activities on the environment. These categories are:

- (1) The construction of health services facilities.
- (2) The construction of community and individual sanitation facilities.
- (3) The development of community gardens and small animal farms.

### 1. The Construction of Health Services Facilities

#### a. Project Description

The Ministry of Health plans to construct three basic types of health services facilities: Health Posts, Rural Health Sub-Centers, and Rural Health Centers. The Health Posts are small ( 35 sq. meters), two-room structures located in remote rural areas. Rural Health Sub-Centers are slightly larger ( 83 sq. meters) and provide more services. Rural Health Centers are 259 sq. meters in size, service the larger rural population centers and provide overall supervision and assistance to the various sub-centers and health posts within its area of influence.

#### b. Possible Negative Environmental Impact

The new health facilities could possibly have the following negative impact on the environment:

- (1) Utilization of land area that might be available for alternate uses;
- (2) Changes in traffic patterns;
- (3) Generation of solid wastes;
- (4) Additional use of domestic water from existing supplies and a corresponding increase in sewage flows;

- (5) Generation of noise and dust during the construction period.

c. Proposed Mitigation Action

None of the above negative impacts are significant. In order to minimize adverse effects: (1) care will be taken to select sites such as to make optimum use of land, (2) existing and future traffic patterns will be taken into account, (3) in those cases where solid waste pickup and disposal by local authorities are available, these services will be used; in other cases, proper sanitary disposal of solid waste will be incorporated into the plans, and (4) provision of adequate water sources and waste disposal systems will be incorporated into the design of the centers located beyond the service of community water and sewage systems.

d. Alternatives to Proposed Project

The only available alternative to the proposed construction of health facilities is to not construct them. The provision of direct health services and health education which will tend to enhance the health level of the population surrounding the centers far outweighs the minor negative environmental impact.

2. Construction of Individual and Community Sanitation Facilities

a. Project Description

The Ministry of Health plans to construct community aqueducts serving small villages, hand-pumped wells, and latrines (pit privies). The aqueducts will consist of a drilled well, an elevated storage tank, about 6,000 linear feet of 2" main, and service lines with a private yard faucet adjacent to each home.

b. Possible Negative Environmental Impact

The new community and individual sanitation facilities could have the following negative impact on the environment:

- (1) Possibility of overpumping the aquifer;
- (2) Spillage of water at faucet and hand pumped well sites causing puddles which could become mosquito breeding areas.

c. Proposed Mitigation Action

Pumps will be sized according to test pumping results. Adequate drainage will be provided at individual faucets and hand pumped well sites.

d. Alternatives to Proposed Project

(1) More sophisticated water and sewage systems could be provided. However, the cost of this alternative would be much higher, and would not allow the coverage that is anticipated with existing funds.

(2) A "no action" alternative. The provision of safe, potable water to individuals as opposed to their hauling unsafe water from other sources, the incentive that the available water provides for personal cleanliness, and the disposal of human excreta in a sanitary manner will all contribute to an enhanced environment. Excreta disposed of in the open can promote fly breeding, transmission of a number of diseases, in addition to being an esthetic nuisance. The "no action" alternative would allow the environment to continue as it is, rather than to be improved.

3. Development of Community Gardens and Small Animal Farms

a. Project Description

The development of community gardens and small animal farms is a multi-purpose activity designed to stimulate community action, improve the economy of the area, introduce new agricultural techniques and products to the population, and to improve the nutritional intake of the population. The gardens and farms are run by a community health committee which receives technical assistance from a trained agronomist provided by the Ministry of Health. Products from the gardens and farms are consumed by the participants, and the excess is sold for cash.

b. Possible Negative Environmental Impact

The gardens and small animal farms could have the following negative impact on the environment:

- (1) Potential for erosion of new land opened for agriculture;
- (2) Potential for pollution of domestic water supplies or surface streams by improper use

of pesticides, herbicides, and fertilizer;

- (3) Pollution and fly-breeding areas resulting from improper disposal of feces from small animal farms.

c. Proposed Mitigating Action

The community garden and small animal farm projects will be developed, as in the past, with the technical assistance of an agronomist. Measures will be taken to insure that land erosion is prevented, and that chemicals are applied to the land in such a way as to prevent pollution of bodies of water. Feces resulting from the small animal farms will be cleaned daily and disposed of in a sanitary manner such as composting.

d. Alternative to Proposed Project

The community garden and small animal farm projects appear to be the only means of achieving the multiple goals desired. A "no action" alternative certainly would not bring about any improvements in the well-being of the community.

## F. Financial and Economic Analysis

### Financial and Administrative Capability.

The models used in the following section to analyze Panama's medical services delivery system show that an average real increase of only 5% annually in the current operating budgets of the MOH and CSS would provide the financial resources needed to support the proposed health sector expansion. Expenditures in the rural areas have increased from 24% of the total MOH health budget in 1970 to 30% in 1974, an increase of 27%. This shift in allocation of MOH resources toward the rural sector during a period of increasing urban population is a clear reflection of overall GOP policy of increasingly focusing efforts and resources toward the rural sector. It is estimated that a continuation of this trend, as manifested by the proposed rural oriented expansion of health resources, will increase the rural proportion to roughly 40% by 1985. This increase is held back by the need for additional specialized hospital beds at the national level, but which actually serve the entire country.

The MOH has demonstrated its capability to implement an AID loan which encompassed elements similar to those in the proposed loan, such as gardens, poultry raising, latrines, wells, and aqueducts, as well as medical facilities. However, the sector assessment identified areas of inefficiency where improvements were needed in various management and financial areas. This is discussed in more detail in Section II A 5. The savings that could result from the proposed system as demonstrated by the models do not include consideration of potential savings as a result of management technical assistance planned under the loan.

From 1970 to 1974, the C.S.S. total expenditure budget expanded at an average rate of 19.2% annually compared to a 21.4% annual growth rate in its income. Income is comprised of contributions, premiums, and return on investments. Only about 50% of Panama's workers are

covered by C.S.S., and the majority of those not covered are in agricultural areas.

The C.S.S. expenditure budget in 1975 was \$97.9 million, and \$115.8 million in 1976. The strong financial position of the CSS is indicated by income increasing at a rate greater than expenditures, which makes it self-sufficient and even able to have an active and financially viable investment program.

Approximately 70% of the CSS budget currently is spent in Panama City, where 70% of those covered by CSS live. From 1970 to 1974, the average annual expenditure in the capital increased by 168%. At the present time, the funding for the integrated system is coming from two separate entities but <sup>is</sup> functionally integrated at the provincial level. Since MOH and CSS use different accounting and budgeting systems, it is impossible to gather any sound budget or cost information from the organizations themselves on the results of the integration carried out so far. No central accounting system exists within the MOH, and the system utilized by the Controller General is not conducive to the development of the type of cost analysis which would be useful in analyzing the effects of this new system or which could be used as a basis for management decisions. Obviously, it is not going to be possible to consolidate or to require conformity between the MOH and CSS systems. The point at which to establish a sound financial information system is at the provincial level, where the annual plan is prepared and where the funds from the two sources are integrated to implement the system. Establishment of standard programming, budgeting, accounting, and reporting at the provincial level is critical to the development of managerially useful financial information. It is important that a standard system be adopted as soon as possible to preclude the further development of disparate systems in the provinces.

Economic Analysis of Medical Services  
Delivery System

At present, the two basic medical service delivery systems in Panama, the Ministry of Health (MOH) and the Social Security (CSS), are operating on a partially integrated basis (provinces of Colon, Bocas del Toro, Veraguas, Herrera, Los Santos and Chiriqui -- of a total of nine provinces -- are integrated into a single system). Since integration is to be completed reasonably soon, the relevant data for the two systems have been combined here to represent a single system, into which any new programs must be fitted.

Two basic types of medical services -- a hospital inpatient bed day and an outpatient visit to a health facility -- are provided currently through the government's medical programs, in both CSS and MOH as shown in the following table:

| <u>A. Hospital Beds</u> | <u>Number</u> | <u>Beds</u> | <u>Per Day (x365)</u> | <u>% Used</u> |
|-------------------------|---------------|-------------|-----------------------|---------------|
| National Hospitals      | 3             | 2,212       | 807,380               | 79.6          |
| Provincial Hospitals    | 10            | 2,849       | 1,039,885             | 49.2          |
| Rural Hospitals         | 15            | 488         | 178,120               | 18.9          |
| Total                   | 28            | 5,549       | <u>2,025,385</u>      |               |

Table III-F-1 (cont.)

B. Outpatient Visits (doctors, nurses, and auxiliaries)

Health centers/sub-centers

|                               |         |                         |
|-------------------------------|---------|-------------------------|
| MOH                           |         | 2,047,383               |
| CSS                           |         | 2,188,887               |
| Less: Integrated (incl.above) |         |                         |
| Colon                         | 184,647 |                         |
| Veraguas                      | 180,183 |                         |
| Bocas                         | 90,736  |                         |
|                               |         | <u>455,566</u>          |
|                               |         | 1,733,321               |
| Total                         |         | <u><u>3,780,704</u></u> |

There are also 294 beds in health centers. However, these are omitted from the calculations on inpatient hospital services since they do not have this essential character, but are more an overnight accommodation for patients who are essentially outpatients but for the lack of a community health worker to do follow-up work must remain in the higher cost facility.

Data for health centers and sub-centers were combined - along with data on the CSS clinics, since the variation in size and staffing within the categories makes the distinction somewhat blurred. Also, outpatient visits to hospitals are excluded from the calculations on outpatients visits since they comprise a relatively small part of the total, and moreover, are expected to be gradually eliminated by being directed to the health centers.

The cost of a hospital bed per day, for each of three types of hospitals, or of an outpatient visit to a health center, cannot be determined directly since cost data are not compiled on the basis of the individual installations. These unit costs were estimated on the basis of direct unit costs developed for a "typical" provincial hospital, rural hospital, health center, and health sub-center in an integrated province, and applied to the portion

of the total health sector budget allocated to the medical delivery system, as shown in Table III-F-2. <sup>1/</sup>

TABLE III-F-2  
MEDICAL BUDGETS - 1974  
(\$000)

|                                     |                     |          |
|-------------------------------------|---------------------|----------|
| CSS - Total                         | <u>\$77,127</u>     |          |
| Sickness/Maternity                  | 39,011              | (54)     |
| Old Age Insurance                   | 23,676              |          |
| Professional risk program           | 7,346               |          |
| Investment management               | 1,754               |          |
| Sub-Total                           | (71,787)            | (100%)   |
| General Administration              | 5,340               |          |
| Medical Program                     | 39,011              |          |
| plus 54% of general admin.          | 2,900               |          |
| less free drugs/medicines           | <u>-5,800</u>       |          |
| <br>Total CSS Medical Program       | <br><u>\$36,100</u> |          |
| MOH - Total                         | \$28,620            | (actual) |
| Sickness/Maternity*                 | 15,820              | 86       |
| Environmental Health                | 2,800               | 14       |
| Sub-Total                           | (18,620)            | (100%)   |
| Administration                      | 10,000              |          |
| Medical Program                     | 15,800              |          |
| plus 86% of general/admin.          | <u>8,600</u>        |          |
| <br>Total MOH Medical Program       | <br><u>\$24,400</u> |          |
| <u>Total Sector Medical Program</u> | <u>\$60.5</u>       |          |

\* This category includes the Maternal and Child Health and Adult Health Program budgets.

(1) Azuero Region (Herrera and Los Santos Provinces combined) was used to develop this typical model, since it had the best cost data according to expert opinion; PAHO consultant there for 3 years could assist in interpreting this data; and concurrent study of unit costs being carried out for a doctoral thesis could be used for comparability.

Table III-F-3HEALTH SECTOR COST DISTRIBUTION - 1974  
(\$ Million)

|   |           |                       |                      |
|---|-----------|-----------------------|----------------------|
| CSS - Current Expenditures - Total                  |           | \$77.1                |                      |
| Medical Program                                     |           | 39.0                  |                      |
| Share of Admin.                                     |           | 2.9                   |                      |
| Prescription drugs (free) <sup>1/</sup>             |           | <u>-5.8</u>           |                      |
| Total Medical Program                               |           |                       | 36.1                 |
| MOH - Current Expenditures - Total                  |           | \$28.6                |                      |
| Medical Program                                     |           | 15.8                  |                      |
| Share of Admin.                                     |           | <u>8.6</u>            |                      |
| Total Medical Program                               |           |                       | 24.4                 |
| <u>MEDICAL SECTOR CURRENT EXPENDITURE</u>           |           |                       | <u>\$60.5</u> (100%) |
| Nat'l Hosp. - Total                                 |           |                       | \$16.6 27.4          |
| Avail. Bed days                                     | 807,380   |                       |                      |
| Cost/bed/day  |           | \$20.53 <sup>2/</sup> |                      |
| Provinc. Hosp. - Total                              |           |                       | 25.7 42.4            |
| Bed days  | 1,039,885 |                       |                      |
| Cost/bed/day  |           | 24.67 <sup>2/</sup>   |                      |
| Rural Hosp. - Total                                 |           |                       | 3.0 5.0              |
| Bed days  | 178,120   |                       |                      |
| Cost/bed/day  |           | 16.98 <sup>2/</sup>   |                      |
| Health clinic/center/sub center <sup>3/</sup> Total |           |                       | 15.2 25.2            |
| Outpatient - visits                                 | 3,780,704 |                       |                      |
| Cost/visit  |           | 4.03 <sup>4/</sup>    |                      |

Table III-F-3 (cont.)

NOTES TO TABLE III-F-3

- 1/ Eliminated as part of the integrated medical services program on the grounds that free prescription drugs and medicines are available only to those covered under Social Security, and which in effect have been "paid for" through contributions.
- 2/ Based on available bed-days rather than utilized bed-days since there is little difference in cost.
- 3/ Data on the different types and sizes of outpatient facilities were grouped principally because the differences in unit costs of various type health centers were not significant. Data on the higher cost CSS policlinicas were also merged into this group because of their relatively small, and declining role in Panama's overall medical services delivery system.
- 4/ Based on assumption of full capacity utilization of these outpatient facilities and staff.

Models of Health Care Requirements and  
Costs through 1985

Using actual data from 1974, and making various assumptions about coverage, population growth, and other variables, two macro-models of the health sector budget requirements to 1985 are derived. For both models there is a discussion of how each element of the model was developed.

The quality and availability of data required for this analysis varies considerably from item to item. The unit cost data, in particular, is somewhat less firm since it was developed especially for this analysis on the basis of a small sampling of the various types of health sector medical facilities. However, base year (1974) costs are actuals, covering the entire public health sector, so that any unit cost error reflects only possible error in distributing total costs among the various components of the medical services delivery system. Any such error in cost distribution in the base year is carried forward uniformly in the projection and would not be enough to have significant impact on projected 1974-85 CHANGES in the medical services delivery system and their costs, which is the central focus of this analysis. This principle applies equally to other variables and parameters used in the analysis.

Model I. The complete elaboration of this Model appears as Table III-F-4, following page; its components are elaborated below.

In 1974 an estimated 72.6% of the population had access to the Government of Panama's medical delivery system.<sup>1/</sup> While the proportion varies from province to

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<sup>1/</sup> Based on % of births with medical attention. Varies widely between rural and urban areas.

Table III-F-4

| MODEL I   |             |             |             |             |             |             |             |             |              |              |              |              |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|
|   | 1974        | 1975        | 1976        | 1977        | 1978        | 1979        | 1980        | 1981        | 1982         | 1983         | 1984         | 1985         |
| Population (000)  | 1,618       | 1,668       | 1,719       | 1,771       | 1,826       | 1,881       | 1,939       | 1,991       | 2,045        | 2,100        | 2,158        | 2,217        |
| Medical Budgets (\$M11)   |             |             |             |             |             |             |             |             |              |              |              |              |
| Social Security (CSS) (+5% p.a.)  | 36.1        | 37.9        | 39.8        | 41.8        | 43.9        | 46.1        | 48.4        | 50.8        | 53.3         | 56.0         | 58.8         | 61.7         |
| Ministry of Health (MOH) (+5% p.a.)   | 24.4        | 25.6        | 26.9        | 28.3        | 29.7        | 31.2        | 32.8        | 34.4        | 36.1         | 37.9         | 39.8         | 41.8         |
| <b>A. Total Medical Budget (+5% p.a.)</b>   | <b>60.5</b> | <b>63.5</b> | <b>66.7</b> | <b>70.1</b> | <b>73.6</b> | <b>77.3</b> | <b>81.2</b> | <b>85.2</b> | <b>89.4</b>  | <b>93.9</b>  | <b>98.6</b>  | <b>103.5</b> |
| GDP (\$M11)   | 1,835       | 1,866       | 1,950       | 2,077       | 2,222       | 2,389       | 2,592       | 2,812       | 3,051        | 3,310        | 3,591        | 3,895        |
| % Increase  |             | 1.7         | 4.5         | 6.5         | 7.0         | 7.5         | 8.5         | 8.5         | 8.5          | 8.5          | 8.5          | 8.5          |
| <b>B. Total Medical Budget (\$M11)</b>  | <b>60.5</b> | <b>62.5</b> | <b>65.3</b> | <b>69.6</b> | <b>74.5</b> | <b>80.1</b> | <b>86.9</b> | <b>94.2</b> | <b>102.3</b> | <b>110.9</b> | <b>120.4</b> | <b>130.6</b> |
| Constant % 1974 GDP   | 3.3         | 3.3         | 3.3         | 3.3         | 3.3         | 3.3         | 3.3         | 3.3         | 3.3          | 3.3          | 3.3          | 3.3          |
| % Population w/Medical coverage   | 72.6        | 77.1        | 81.6        | 86.2        | 90.8        | 95.4        | 100.0       | 100.0       | 100.0        | 100.0        | 100.0        | 100.0        |
| Population covered (000)  | 1,175       | 1,286       | 1,403       | 1,527       | 1,658       | 1,774       | 1,939       | 1,991       | 2,045        | 2,100        | 2,158        | 2,217        |
| Outpatient visits 3.2/yr<br>per unit cov.pop.(100% capacity)(000)   | 3,781       | 4,115       | 4,490       | 4,886       | 5,306       | 5,741       | 6,205       | 6,371       | 6,544        | 6,720        | 6,906        | 7,094        |
| <b>C1. Cost: \$4.03/outpatient visit (\$mil)</b>  | <b>15.2</b> | <b>16.6</b> | <b>18.1</b> | <b>19.7</b> | <b>21.4</b> | <b>23.1</b> | <b>25.0</b> | <b>25.7</b> | <b>26.4</b>  | <b>27.1</b>  | <b>27.8</b>  | <b>28.6</b>  |
| Hospital National-bed-day/yr.(80%use)<br>.667/unit cov.pop./yr. (000)   | 807         | 883         | 964         | 1,049       | 1,139       | 1,232       | 1,332       | 1,368       | 1,405        | 1,443        | 1,483        | 1,523        |
| <b>C2. Cost: 20.53/bed/day (\$000)</b>  | <b>16.6</b> | <b>18.1</b> | <b>19.8</b> | <b>21.5</b> | <b>23.4</b> | <b>25.3</b> | <b>27.3</b> | <b>28.1</b> | <b>28.8</b>  | <b>29.6</b>  | <b>30.4</b>  | <b>31.3</b>  |
| Hospital provincial-bed days/yr.<br>50 to 80% use 1974-80 (.885/unit-1974,<br>.536/unit from 1980)            | 1,040       | 1,040       | 1,040       | 1,040       | 1,040       | 1,040       | 1,040       | 1,067       | 1,096        | 1,126        | 1,157        | 1,188        |
| <b>C3. Cost: 24.67/bed/day (\$000)</b>  | <b>25.7</b> | <b>26.3</b> | <b>27.0</b>  | <b>27.8</b>  | <b>28.5</b>  | <b>29.3</b>  |
| Hospital-Rural-bed days/yr.-20-80% use<br>1974-85 (at .151/unit) (000)  | 178         | 178         | 178         | 178         | 178         | 178         | 178         | 178         | 178          | 178          | 178          | 178          |
| <b>C4. Cost: \$16.98/bed/day (\$M11)</b>  | <b>3.0</b>   | <b>3.0</b>   | <b>3.0</b>   | <b>3.0</b>   |
| Total bed days/year   | 2,025       | 2,101       | 2,189       | 2,267       | 2,357       | 2,450       | 2,550       | 2,613       | 2,679        | 2,747        | 2,818        | 2,885        |
| <b>C. Total Medical Current Operating<br/>Costs - Present structure (\$M11)</b>                               | <b>60.5</b> | <b>63.4</b> | <b>66.6</b> | <b>69.9</b> | <b>73.5</b> | <b>77.1</b> | <b>81.0</b> | <b>83.1</b> | <b>85.2</b>  | <b>87.5</b>  | <b>89.7</b>  | <b>92.2</b>  |
| Health Posts 75/year  | -           | -           | 75          | 150         | 225         | 300         | 375         | 450         | 525          | 600          | 675          | 750          |
| Outpat. visits-1760/yr. (000's)   | -           | -           | 132         | 264         | 396         | 528         | 660         | 792         | 924          | 1,056        | 1,188        | 1,320        |
| Costs: 4.03 ea. - health centers (\$000)  | -           | -           | 532         | 1,063       | 1,596       | 2,128       | 2,660       | 3,191       | 3,724        | 4,256        | 4,787        | 5,319        |
| Costs: 1.46 ea. - health posts (\$000)  | -           | -           | 193         | 385         | 578         | 771         | 964         | 1,156       | 1,349        | 1,542        | 1,734        | 1,927        |
| Savings: 2.57 ea. (\$000)   | -           | -           | 339         | 678         | 1,018       | 1,357       | 1,696       | 2,035       | 2,375        | 2,714        | 3,053        | 3,392        |
| <b>D. Total Medical current Operating costs<br/>75 health posts/yr. (\$M11)</b>                               | <b>60.5</b> | <b>63.4</b> | <b>66.3</b> | <b>69.2</b> | <b>72.5</b> | <b>75.7</b> | <b>79.3</b> | <b>81.1</b> | <b>82.8</b>  | <b>84.8</b>  | <b>86.6</b>  | <b>88.8</b>  |
| Population covered by health service<br>25 decline 1978-85:visits/unit<br>cov. pop.                           | 1,175       | 1,286       | 1,403       | 1,527       | 1,658       | 1,794       | 1,939       | 1,991       | 2,045        | 2,100        | 2,158        | 2,217        |
| Resultant Outpatient visits (000)   | 3,781       | 4,115       | 4,490       | 4,886       | 5,140       | 5,392       | 5,623       | 5,575       | 5,522        | 5,460        | 5,395        | 5,321        |
| Reduction in outpatient visits  | -           | -           | -           | -           | 166         | 359         | 582         | 796         | 1,022        | 1,260        | 1,511        | 1,773        |
| Health posts  | -           | -           | -           | -           | 12          | 33          | 62          | 99          | 144          | 198          | 260          | 330          |
| Savings: 1.46 ea. (\$000)   | -           | -           | -           | -           | 18          | 48          | 91          | 145         | 210          | 289          | 380          | 482          |
| Health centers  | -           | -           | -           | -           | 154         | 326         | 520         | 697         | 878          | 1,062        | 1,251        | 1,443        |
| Savings: 4.03 ea. (\$000)   | -           | -           | -           | -           | 621         | 1,314       | 2,096       | 2,809       | 3,538        | 4,283        | 5,042        | 5,815        |
| Total Savings (\$000)   | -           | -           | -           | -           | 639         | 1,362       | 2,187       | 2,954       | 3,738        | 4,569        | 5,422        | 6,297        |
| <b>E. Total Medical current operating costs -<br/>25% reduction 1977-85 visits/unit cov.<br/>pop. (\$M11)</b> | <b>60.5</b> | <b>63.4</b> | <b>66.3</b> | <b>69.2</b> | <b>71.9</b> | <b>74.3</b> | <b>77.1</b> | <b>78.1</b> | <b>79.1</b>  | <b>80.2</b>  | <b>81.2</b>  | <b>82.2</b>  |

1/ Projected at +3.1% annually through 1980, +2.7% 1980-85 (rates currently used by GOP)

province, this rate properly applies equally to all echelons of medical services; i.e., the people who do not have access to the system at the lowest level obviously do not have access at the higher (national hospital) level, and correspondingly, those who do have access at the lowest level (health sub-center), through upward referral have the same access throughout the system. In other words, access to the SYSTEM is the determining factor. In order to reach a targeted 100% coverage by 1980, coverage will need to increase by 4.5 percentiles per year. Using the GOP's estimated annual population growth rate of 3.1 percent for 1975-80, the number of people covered by the system would thus increase from 1,175,000 in 1974 (72.6% of the population) to 1,939,000 in 1980 (100% of the population). The increases following 1980 are at the 2.7% annual population growth rate currently used in GOP projections.

Annual requirements for available hospital bed days and out-patient visits over the next ten years were projected by applying to the projected covered population the rate of hospital bed availability and number of outpatient visits per unit of covered population in 1974. Present (1974) unit costs for each type of service were then used to arrive at their respective total annual costs.

National Hospitals: There were 0.687 available bed days in National hospitals per unit of covered population in 1974. Since the occupancy rate was 80% or higher, required availabilities were projected to increase in proportion to the increase in covered population, through 1985. The result is an increase from 807,000 available bed days in 1974 to 1,232,000 required in 1980 and 1,523,000 in 1985. At \$20.53 per available bed day, the current operating cost of this level of availability increases from \$16.6 million in 1974 to \$27.3 million in 1980 and \$31.3 million in 1985.

Provincial Hospitals: Provincial hospitals had 0.885 available bed-days per unit of covered population in 1974. However, average occupancy rates are estimated at approximately 50%. Assuming an increase from 50% to 80% utilization by 1980, annual availability would be held constant until 1980 (0.536 bed days/pop. unit) and then increase proportionately with population. As a result, annual current costs at \$24.67/available bed day would remain at the 1974 level of \$25.7 million through 1980, then rise to \$29.3 million in 1985.

Rural Hospitals: Although there were only 0.151 rural hospital bed days available per unit of covered population in 1974, overall occupancy was an estimated 20% or less. Assuming an increase no greater than from 20% to 80% in occupancy rates by 1985, there would be no need to increase the available bed days from 178,000 in 1974, thus maintaining a \$3.0 million annual current cost through 1985.

Outpatient Visits: In 1974, there were approximately 3.2 out-patient visits per year per unit of covered population (2.3 per capita). Assuming that outpatient facilities have been operating and will continue to operate roughly "at capacity", and no change in the rate of visits, the demand for outpatient visits would increase from 3,781,000 in 1974 to 6,205,000 in 1980, and 7,094,000 in 1985. At \$4.03 per visit, the annual cost of outpatient services would thus increase from \$15.2 million in 1980 and \$28.6 million in 1985.

Thus, provision of public sector medical services for Panama's total population by 1980, based on the present health structure and scale of service provided, would entail an increase in current operating expenditures for the public sector medical program from \$60.5 million in 1974 to \$81.0 million in 1980 and to \$92.2 million in 1985. The average annual rate of increase would be 5.0% through 1980 and 2.6% from 1980 through 1985 -- or 3.9% for the entire period.

This data is summarized below in Table III-F-5.

Table III-F-5

|                     | <u>1974</u> | <u>1980</u> | <u>1985</u> |
|---------------------|-------------|-------------|-------------|
| National hospital   | \$16.6      | \$27.3      | \$31.3      |
| Provincial hospital | 25.7        | 25.7        | 29.3        |
| Rural hospital      | 3.0         | 3.0         | 3.0         |
| Outpatient visits   | <u>15.2</u> | <u>25.0</u> | <u>28.6</u> |
| Total \$ Millions   | \$ 60.5     | \$ 81.0     | \$ 92.2     |

By comparison, the Ministry of Planning has projected the annual growth rate for current expenditures of the operating ministries to rise from 5.0% to 7.0% during 1975-79, with 7% the implied longer run rate. As there is no reason to presume that increases planned for the health sector will be any less than for the other sectors, particularly with the GOP's highly publicized commitment to improved health services for the entire population, this planned rate of increase appears adequate to meet the increased current outlay needs of the health sector through 1980, and easily so for the longer term. Since the Social Security system continues to generate surpluses, albeit shrinking ones, provision for at least 5% annual increases in real terms in its current expenditure budget for health sector medical programs over the next 5-10 years can also be expected.

The Impact of Proposed GOP Program: One aspect of the GOP's overall health sector planning involves expanding medical services coverage primarily through establishment of small inexpensive health posts throughout the more remote rural areas where present deficiencies in coverage are most acute. Following are the estimated medical services provided and the current annual operating cost of a health post:

Table III-F-6  
Estimated Cost of Outpatient Visit to Health Post  
(Dollars)

|   | (Annual Cost)   |
|---|-----------------|
| Health worker ( \$100/mo )  | 1,200           |
| Materials, Supplies, and other costs  | <u>2,000</u>    |
|   | <u>3,200</u>    |
| 50% allocation to medical services  | <u>\$ 1,600</u> |
| 8 outpatient visits/day (2/hr - 4 hrs)  |                 |
| 8 x 220 days/yr = 1760/year =   | \$0.91/visit    |
| Plus allocation of admin. and Ministry overhead, estimated at same ratio of direct costs to total MOH costs, as other health facilities | <u>+0.55</u>    |
|   | \$1.46/visit    |

On the basis of establishing health posts at an average rate of 75 per year from 1976 through 1985, outpatient visits to health posts could displace or obviate outpatient visits to higher echelon health facilities by 132,000 in 1976, increasing to 660,000 in 1980 and to 1,320,000 in 1985. Actually, there is a minor complex of factors associated with the establishment of health posts that could affect total demand for outpatient visits. Some, such as health education or the "triage" function, would tend to increase demand while others, such as direct care offered by the health post or non-medical primary preventative programs would tend to decrease demand. It is assumed that these factors would be largely offsetting, so that as indicated above, the health posts will handle outpatients visits in lieu of other facilities. The savings in current operating costs at \$2.57 per visit (\$4.03 at health center minus \$1.46 at health post) rises from \$0.3 million in 1976 to \$1.7 million in 1980 and to

\$3.4 million in 1985. Thus, total annual current costs for the health sector medical program with inclusion of health posts increases from \$60.5 million in 1974 to \$79.3 million in 1980 compared to \$81.0 million without the health posts, and to \$88.8 million in 1985 with health posts compared to \$92.2 million without. Total savings amount to \$5.1 million during 1976-80 and \$13.6 million in 1980-85 - or \$18.7 million for the entire period.

The present and planned efforts of the Ministry of Health to improve the general level of health in Panama through preventative programs as well as curative programs should be reflected, inter alia, in a declining average number of outpatient visits per year for the covered population. A 25% reduction in this rate from an average 3.2 outpatient visits per year in 1977 to 2.4 per year in 1985 would result in substantial savings in current operating costs of the medical programs. There would be 166,000 fewer outpatient visits in 1978 and 1,773,000 fewer by 1985 under this assumption than with a constant 3.2 outpatient rate. The actual projected level of outpatient visits would reach a peak in 1980 and then decline moderately through 1985, i.e., as long as the rate of decline in this ratio declines more rapidly than the increase in (covered) population. Total annual costs would be \$0.6 million less in 1978 and \$6.3 million less by 1985 under the assumption of a declining outpatient visit rate, for cumulative savings of \$27.2 millions.

Capital Costs. Capital expenditure budgets for the health sector provide for construction and major equipment outlays, both new and renovative, with all other capital items covered under the current operating budget.

Table III-F-7 shows estimated capital consumption for the total health sector physical plant in 1974, i.e., the annual capital costs needed to maintain the existing physical plant.

TABLE III-F-7

ESTIMATED CAPITAL MAINTENANCE COSTS OF HEALTH SECTOR PHYSICAL PLANT IN 1974

(Dollars)

Outpatient Facilities\*

|   |                  |                   |
|---|------------------|-------------------|
| Health Sub-Centers - 105 units at 16,000    |                  | \$1,575,000       |
| an. cap. cost at 3%                         | \$47,250         |                   |
| equip. - 105 at 4,000                       |                  | 420,000           |
| an. cap. cost at 6%                         | 25,200           |                   |
| Total an. cap. cost                         | <u>\$72,450</u>  |                   |
| Health Centers - 97 units at 80,000         |                  | 7,760,000         |
| an. cap. cost at 3%                         | 232,800          |                   |
| equip. - 97 at 20,000                       |                  | 1,940,000         |
| an. cap. cost at 6%                         | 116,400          |                   |
| Total an. cap. cost                         | <u>\$349,200</u> |                   |
| Policlinics - 16 units at 320,000           |                  | 5,120,000         |
| an. cap. cost at 3%                         | 153,600          |                   |
| equip. - 16 units at 80,000                 |                  | 1,280,000         |
| an. cap. cost equipment at 6%               | 76,800           |                   |
| Total an. cap. cost                         | <u>\$230,400</u> |                   |
| <u>Total Outpat. Facilities - 218 units</u> |                  | <u>14,455,000</u> |
| an. cap. cost at 3%                         | 433,650          |                   |
| equipment                                   |                  | 3,640,000         |
| an. equipment cost at 6%                    | 218,400          |                   |
| Total an. cap. cost                         | <u>652,050</u>   |                   |
| I 3,780,702 outpat. visits at               | 0.17             |                   |
| II 4,726,000 outpat. visit capacity at      | 0.14             |                   |

Hospital Beds

|                                    |                   |                  |                   |
|------------------------------------|-------------------|------------------|-------------------|
| National (3)                       | 2,212 - at        | 16,000/bed       | 35,392,000        |
| Other (30)                         | 3,337 - at        | 16,000/bed       | 53,392,000        |
|                                    | <u>5,549</u> beds |                  | <u>88,784,000</u> |
| An. Capital Cost at 3%             |                   | 2,664,000        |                   |
| Equipment (+25%) at 4,000          |                   |                  | 22,196,000        |
| An. Equip. Cost at 6%              |                   | 1,337,000        |                   |
| Total Annual Capital Cost-hospital |                   | <u>3,996,000</u> |                   |
| Total An. cost per bed             |                   | \$720            |                   |
| Total An. cost per bed/day         |                   | \$1.97           |                   |

\* Valuations based on estimated average replacement cost.

TABLE III-F-7 (cont.)

TOTAL - ALL FACILITIES

|                           |                    |                      |
|---------------------------|--------------------|----------------------|
| 251 units                 |                    | 103,239,000          |
| Annual Capital cost at 3% | 3,097,650          |                      |
| equipment                 |                    | 25,836,000           |
| annual capital cost at 6% | 1,550,400          |                      |
| TOTAL VALUE               |                    | <u>\$129,075,000</u> |
| TOTAL ANNUAL CAPITAL COST | <u>\$4,648,050</u> |                      |

The cost of maintaining physical plant will obviously increase over time as the number of facilities is increased. A capital maintenance cost of \$1.97 per bed day for 1974 (Table III-F-7) applied to the projected increase in bed days indicates an increase in the annual capital maintenance costs for all hospitals from \$4.0 million in 1974 to \$5.0 in 1980 and to \$5.7 million in 1985 (Table III-F-8). Similarly, an average capital maintenance cost of \$0.17 per outpatient visit was applied to the projected number of outpatient visits (based on the assumed inclusion of health posts but without assuming any decline from 3.2 in the projected number of visits per unit of covered population). The results show an increase in annual capital maintenance of outpatient facilities from \$0.7 million in 1974 to \$1.1 million in 1980 and to \$1.2 million in 1985.

Thus, the total annual capital costs required to maintain the GOP health sector's expanding physical plant over the next ten years rises from \$4.6 million in 1974 to \$6.1 million in 1980 and to \$6.9 by 1985. These are real costs in that the capital in place is consumed and will sooner or later need to be replaced regardless of how much provision is made from year to year in the sector's capital budget. Assuming no major backlog of needs exists, \$27.7 million will be required during 1976-80 and \$38.5 during 1981-85, for a total of \$66.2 million over the next ten years to maintain the health sector's expanding physical plant, in addition to the initial outlays for new facilities.

New construction capital expenditures for outpatient facilities are difficult to predict. The need for additional hospital beds primarily at the national level is being addressed by tentative plans to construct a \$20-25 million CSS hospital in Panama City, which should meet most of the additional bed needs to 1985.

Table III-F-8

ANNUAL CAPITAL MAINTENANCE COST OF HEALTH SECTOR PHYSICAL PLANT  
(\$ Thousands)

MODEL I

|   | <u>1974</u>     | <u>1975</u>  | <u>1976</u>  | <u>1977</u>  | <u>1978</u>  | <u>1979</u>  | <u>1980</u>    | <u>1981</u>    | <u>1982</u>    | <u>1983</u>    | <u>1984</u>    | <u>1985</u>    |
|---|-----------------|--------------|--------------|--------------|--------------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Hospitals (33-1974)                           |                 |              |              |              |              |              |                |                |                |                |                |                |
| Expanding structure<br>bed days/yr. (000)     | 2,025           | 2,101        | 2,189        | 2,267        | 2,357        | 2,450        | 2,550          | 2,613          | 2,679          | 2,747          | 2,818          | 2,889          |
| Total at 1.97                                 | \$3,996         | 4,139        | 4,312        | 4,466        | 4,643        | 4,827        | 5,024          | 5,148          | 5,278          | 5,412          | 5,551          | 5,691          |
| Outpatient Facilities (218-1974)              |                 |              |              |              |              |              |                |                |                |                |                |                |
| outpatient visits (000)<br>at .17 ea. (\$000) | 3,781<br>\$ 652 | 4,115<br>700 | 4,490<br>763 | 4,886<br>831 | 5,306<br>902 | 5,741<br>976 | 6,205<br>1,055 | 6,371<br>1,083 | 6,544<br>1,112 | 6,720<br>1,142 | 6,906<br>1,174 | 7,094<br>1,206 |
| Total capital maintenance costs(\$000)        | \$4,648         | 4,839        | 5,075        | 5,297        | 5,545        | 5,803        | 6,079          | 6,231          | 6,390          | 6,554          | 6,725          | 6,897          |

(Health post savings - approx.  
\$50,000/year average)

MODEL II

|  |                 |              |              |              |              |              |              |              |              |              |              |                |
|--|-----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|
| Hospitals (33-1974)                                    |                 |              |              |              |              |              |              |              |              |              |              |                |
| Expanding structure<br>bed Jays/year (000)             | 2,025           | 2,079        | 2,134        | 2,193        | 2,254        | 2,318        | 2,385        | 2,477        | 2,575        | 2,676        | 2,782        | 2,889          |
| Total at 1.97  | \$3,996         | 4,096        | 4,202        | 4,320        | 4,440        | 4,566        | 4,698        | 4,880        | 5,073        | 5,272        | 5,481        | 5,691          |
| Outpatient Facilities (218-1974)                       |                 |              |              |              |              |              |              |              |              |              |              |                |
| outpatient capacity (000)<br>Total at 0.14 ea. (\$000) | 4,726<br>\$ 652 | 4,921<br>689 | 5,113<br>716 | 5,313<br>744 | 5,518<br>773 | 5,728<br>802 | 5,947<br>833 | 6,146<br>860 | 6,353<br>889 | 6,561<br>919 | 6,849<br>959 | 7,139<br>1,000 |
| Total Capital Maintenance Costs (\$000)                | \$4,648         | 4,785        | 4,920        | 5,064        | 5,213        | 5,368        | 5,531        | 5,740        | 5,962        | 6,191        | 6,440        | 6,691          |

(Health post savings - less than  
\$50,000/year average)

Model II. When discussing Model I several assumptions used were elaborated and actual operation data sources used. That model would seem to be at the pessimistic end of the range of outcomes, in terms of costs of the Panamanian medical care system until 1985. Even under that model, however one can demonstrate affordability, assuming optimal distribution of resources and good management.

Model II, appearing in full as Table III-F-9, is considered to include a more realistic, expected set of outcomes. Therefore, using this basic model, two or three variations in norms of service and mix of personnel are additionally described.

The major assumptions used in the two models are summarized below for easy comparability.

| <u>Assumptions</u>                                    | <u>Model I</u>                                | <u>Model II</u>                               |
|---|---|---|
| 1. Population growth rate:                            | 3.1% 1975-80<br>2.7% 1980-85                  | Same  |
| 2. Real annual growth rate of Health Budget (MOH-CSS) | 5% 1974-85                                    | Same  |
| 3. Real growth rate of GDP                            | 4.5% to 8.5% to 1979<br>8.5 after 1979        | 4.5% to 7.5% to 1979<br>7.5 after 1979        |
| 4. Medical budget as % of GDP                         | Constant 3.3%                                 | Same  |
| 5. % of Pop., with coverage                           | Even annual rise from 72.6% 1974 to 100% 1980 | Even annual rise from 72.6% 1974 to 100% 1985 |

| <u>Assumptions (cont.)</u>                  | <u>Model I</u>                                  | <u>Model II</u>                                 |
|---|---|---|
| 6. Utilization of Outpatient facilities     | At 100% capacity 1974 to 1985                   | 80% capacity in 1974 rising evenly to 100% 1985 |
| 7. Outpatient visits per covered population | (1) 3.2/year 1974-85, (2) 25% decline 1978-1985 | (1) 3.2/year 1974-85                            |
| 8. Hospital utilization                     | 80% optimal                                     | Same  |
| 9. Health posts to be constructed           | 75-year   | 50/year   |
| 10. Outpatient visits                       | 1760 (8/day/220 days)                           | (1) Same (2) 2640 (12/day/220 days)             |

The changed assumptions in Model II are more reasonable for a number of reasons. GDP growth has slowed sharply in the last two years after rapid growth in the 1960's and early 1970's. In 1975 it grew only 1.7%. New investments in large production projects such as copper, sugar, cement and pipeline are expected to revive this however.

To achieve 100% coverage by 1985 is much more likely than by 1980, so this assumed growth in covered population was stretched out over 5 more years. Similarly, instead of assuming that outpatient facilities are currently (1974) operating at 100% of capacity

Table III-F-9

MODEL II

|  | 1974           | 1975        | 1976        | 1977        | 1978        | 1979        | 1980        | 1981        | 1982        | 1983        | 1984        | 1985         |
|--|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| Population (000) <sup>1/</sup>   | 1618           | 1669        | 1719        | 1771        | 1826        | 1881        | 1939        | 1991        | 2055        | 2100        | 2158        | 2217         |
| Medical Budgets (\$Mil)  |                |             |             |             |             |             |             |             |             |             |             |              |
| Social Security (SS) (+5% p.a.)  | 536.1          | 37.9        | 39.8        | 41.8        | 43.9        | 46.1        | 48.4        | 50.8        | 53.3        | 56.0        | 58.8        | 61.7         |
| Min. of Health (MOH) (+5% p.a.)  | 24.4           | 25.6        | 26.9        | 28.3        | 29.7        | 31.2        | 32.8        | 34.4        | 36.1        | 37.9        | 39.8        | 41.8         |
| <b>A. Total Medical Budget (+5% p.a.)</b>  | <b>560.5</b>   | <b>63.5</b> | <b>66.7</b> | <b>70.1</b> | <b>73.6</b> | <b>77.3</b> | <b>81.2</b> | <b>85.2</b> | <b>89.4</b> | <b>93.9</b> | <b>98.6</b> | <b>103.5</b> |
| GDP (\$Mil)  | 1835           | 1866        | 1950        | 2077        | 2222        | 2389        | 2568        | 2761        | 2968        | 3191        | 3430        | 3687         |
| % increase   | -              | 1.7         | 4.5         | 6.5         | 7.0         | 7.5         | 7.5         | 7.5         | 7.5         | 7.5         | 7.5         | 7.5          |
| <b>B. Total Medical Budget (% GDP)</b>   | <b>30.5</b>    | <b>3.4</b>  | <b>3.4</b>  | <b>3.4</b>  | <b>3.3</b>  | <b>3.3</b>  | <b>3.2</b>  | <b>3.1</b>  | <b>3.0</b>  | <b>2.9</b>  | <b>2.9</b>  | <b>2.8</b>   |
| Constant % 1974 GDP  | 3.3            | 3.3         | 3.3         | 3.3         | 3.3         | 3.3         | 3.3         | 3.3         | 3.3         | 3.3         | 3.3         | 3.3          |
| % Population w/Medical coverage  | 72.6           | 75.1        | 77.6        | 80.1        | 82.6        | 85.1        | 87.6        | 90.1        | 92.6        | 95.1        | 97.6        | 100.0        |
| Population covered (000)   | 1175           | 1253        | 1334        | 1419        | 1508        | 1601        | 1699        | 1794        | 1894        | 1997        | 2106        | 2217         |
| Outpat. visits capacity-3.2 /unit<br>cov. pop., Capacity-100% used<br>1974-85 (000)                  | 3781           | 4035        | 4295        | 4569        | 4856        | 5155        | 5471        | 5777        | 6099        | 6430        | 6781        | 7139         |
| Capacity: in-cov-80-100% used<br>1974-85 (000)   | 4726           | 4921        | 5113        | 5313        | 5518        | 5728        | 5947        | 6146        | 6353        | 6561        | 6849        | 7139         |
| % capacity used  | 80             | 82          | 84          | 86          | 88          | 90          | 92          | 94          | 96          | 98          | 99          | 100          |
| <b>C. Cost: \$3.22/outpat. visit capacity</b><br>(\$15.2 mil + 4,726,000) -1974 (\$mil)              | <b>15.2</b>    | <b>15.8</b> | <b>16.5</b> | <b>17.1</b> | <b>17.8</b> | <b>18.4</b> | <b>19.1</b> | <b>19.8</b> | <b>20.5</b> | <b>21.1</b> | <b>22.1</b> | <b>23.0</b>  |
| Hospital Nat.-bed days/yr. (80% use)<br>.687/unit cov. pop/yr. (000)                                 | 807            | 861         | 916         | 975         | 1036        | 1100        | 1167        | 1232        | 1301        | 1372        | 1447        | 1523         |
| <b>C.2. Cost: \$20.53/bed/day (\$Mil)</b>  | <b>\$ 16.6</b> | <b>17.7</b> | <b>18.8</b> | <b>20.0</b> | <b>21.3</b> | <b>22.6</b> | <b>24.0</b> | <b>25.3</b> | <b>26.7</b> | <b>28.2</b> | <b>29.7</b> | <b>31.3</b>  |
| Hospital Provincial-bed days/yr.<br>50-80% use 1974-80 (at .885/<br>unit 1974, (.536/unit from 1980) | 1040           | 1040        | 1040        | 1040        | 1040        | 1040        | 1040        | 1067        | 1096        | 1126        | 1157        | 1188         |
| <b>C.3. Cost: \$24.67/bed/day (\$Mil)</b>  | <b>\$ 25.7</b> | <b>25.7</b> | <b>25.7</b> | <b>25.7</b> | <b>25.7</b> | <b>25.7</b> | <b>25.7</b> | <b>26.3</b> | <b>27.0</b> | <b>27.8</b> | <b>28.5</b> | <b>29.3</b>  |
| Hospital Rural-bed days/yr.<br>20-80% use 1974-85<br>(at .151/unit) (000)                            | 178            | 178         | 178         | 178         | 178         | 178         | 178         | 178         | 178         | 178         | 178         | 178          |
| <b>C.4. Cost: \$16.98/bed/day (\$Mil)</b>  | <b>\$ 3.0</b>  | <b>3.0</b>   |
| <b>C.5 Total Medical Current Operating<br/>Costs-Present structure (\$Mil)</b>                       | <b>60.5</b>    | <b>62.2</b> | <b>64.0</b> | <b>65.8</b> | <b>67.8</b> | <b>69.7</b> | <b>71.8</b> | <b>74.4</b> | <b>77.2</b> | <b>80.1</b> | <b>83.3</b> | <b>86.6</b>  |
| Health Posts - 50/yr.  | -              | -           | 50          | 100         | 150         | 200         | 250         | 300         | 350         | 400         | 450         | 500          |
| Output visits-1760/yr. (000)   | -              | -           | 88          | 176         | 264         | 352         | 440         | 528         | 616         | 704         | 792         | 880          |
| Costs: \$3.22 ea.-health centers (\$'000)  | -              | -           | 283         | 567         | 850         | 1133        | 1417        | 1700        | 1984        | 2267        | 2550        | 2834         |
| Costs: \$1.46 ea.-health posts (\$'000)  | -              | -           | 129         | 257         | 385         | 514         | 642         | 771         | 899         | 1028        | 1156        | 1284         |
| Savings: 1.76 ea. (\$'000)   | -              | -           | 155         | 310         | 465         | 619         | 775         | 929         | 1095        | 1239        | 1394        | 1550         |
| <b>D. Total Medical Current Operating<br/>Costs-50 health posts/yr (8/day<br/>basis) (\$Mil)</b>     | <b>60.5</b>    | <b>62.2</b> | <b>63.8</b> | <b>65.5</b> | <b>67.3</b> | <b>69.1</b> | <b>71.0</b> | <b>73.5</b> | <b>76.1</b> | <b>78.9</b> | <b>81.9</b> | <b>85.0</b>  |
| Health Posts - 50/yr.  | -              | -           | 50          | 100         | 150         | 200         | 250         | 300         | 350         | 400         | 450         | 500          |
| Outpatient visits-12/day=2640/yr (000)   | -              | -           | 132         | 264         | 396         | 528         | 660         | 792         | 924         | 1056        | 1188        | 1320         |
| Costs: \$3.22 ea.-health centers (\$'000)  | -              | -           | 425         | 850         | 1275        | 1700        | 2125        | 2550        | 2975        | 3400        | 3825        | 4250         |
| Cost: \$0.97 ea.-health posts (\$'000)   | -              | -           | 128         | 256         | 384         | 512         | 640         | 768         | 896         | 1024        | 1152        | 1280         |
| Savings: 1.76 ea. (\$'000)   | -              | -           | 297         | 594         | 891         | 1188        | 1485        | 1782        | 2079        | 2376        | 2673        | 2970         |
| <b>E. Total Medical Current Operating Costs<br/>50 health posts/yr-12/day basis<br/>(\$Mil)</b>      | <b>60.5</b>    | <b>62.2</b> | <b>63.7</b> | <b>65.2</b> | <b>66.7</b> | <b>68.5</b> | <b>70.2</b> | <b>72.6</b> | <b>75.1</b> | <b>77.7</b> | <b>80.6</b> | <b>83.6</b>  |

<sup>1/</sup> Projected at +3.1% annually through 1980, +2.7% 1980-85 (rates currently used by GDP)

and productivity, as in Model I, Model II assumes an 80% factor, with gradual growth to 100% by 1985.<sup>1/</sup>

Finally, regarding health posts, only 50 per year to be built is used, rather than 75, and one variant of Model II shows the impact of a 50% increase in number of visits per day by health assistants.

Results of the Model: First of all, we find a reduction in the total operating budget for health, when projected as a % of GDP, since this Model assumes slower growth. Thus, by 1985 there will be \$121.7 million operating budget based on a constant 3.3 % of GDP, compared to \$103.5 million based on growth in the medical budget of 5% (real) per year.

By slowing down the rate of increase in population covered, the burden on the budget between 1975 and 1980 is substantially reduced, stretching out to 1985 the full impact of 100% coverage.

Further substantial cost reductions in Model II are achieved by assuming that only 80% of the capacity for outpatient visits was realized. This means that instead of the 3,781,000 outpatient visits actually delivered at a cost of \$4.03/visit, 4,726,000 could have been delivered (100% productivity) at a cost of \$3.22/

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<sup>1/</sup> The model does not build in the small increment of cost of medical supplies needed to raise from 80% to 100% capacity, but only personnel and administrative costs which account for most operating expenses. Also, patients usually pay for their medicines.

visit. This results in a \$15.2 million expenditure for 1974 rising to \$23 million in 1985 for Model II, rather than to \$28.6 Million in 1985 for Model I.

Some of these savings are then offset by the lowered savings one now realizes from substituting health post visits for health center visits since we have reduced the cost of a health center visit in this model by \$0.81. While there is only a \$155,000 savings for each 50 posts per year, the accumulated savings by 1985 would be over \$1.5 million, with an annual savings of \$1.5 million 1985 and thereafter.

Line D of the model shows the total cost of medical care services including health posts of \$85 million to meet the need by 1985 clearly below the minimum expected medical budget of \$103.5 million.<sup>1/</sup>

Taking this same basic Model II other variants can be introduced. For example, Line E of Table III-F-9 shows the savings realized by increasing the number of outpatient visits substituted by health posts from 1760 to 2640 per year, from 8 to 12 per day. This is nearly \$300,000 savings per year.

The projected demand for government health care services has been based on an increase in estimated population coverage of 72.6% in 1974, rising to 100% in 1985. An assumed coverage of only 60% in 1974, rising to 100% in 1985 would increase the annual health care costs under Model II (with health posts) by rising increments to 1985, resulting in an increase in 1985 costs from the previously projected \$85 million to \$93 million. Such an increase reflects a 30% increase in the rate at which coverage is expanding over the period 1975-85. Obviously, if coverage was only 60% in 1974

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<sup>1/</sup> The reader is reminded that medical budget does not include the environmental sanitation budget of MOH, nor has this model projected costs of such services.

it is highly unlikely that 100% coverage could be reached by 1985.

One budget impact which these models have not shown is that reflected in changing the mix of health care personnel to a higher proportion of low-cost auxiliaries. The current ratios of personnel in the sector are as follows, with average monthly salaries:

|              | (Current)              | (Altered)           |
|--------------|------------------------|---------------------|
| Doctors      | 3 at \$800/mo= \$2,400 | 2 at \$800/mo= 1600 |
| Nurses       | 3 at 400/mo= 1,200     | 2 at 400/mo= 800    |
| Nurse Aux.   | 6 at 200/mo= 1,200     | 4 at 200/mo= 800    |
| Health Asst. | 0                      | 4 at 100/mo= 400    |
| Total        | 4,800                  | \$3,600             |

Substantial savings are realized by altering the current mix. For example, 2 doctors to 2 nurses to 4 nurse auxiliaries to 4 health assistants (at \$100/month) would cost \$3,600 for a savings of 25%. Assuming these 4 groups of personnel account for 40% of the total health sector budget as defined in these models, such a new distribution would save 10% of the total budget (.25 x .40). If such a distribution were achieved by 1985, there would be a saving of \$8.5 million that year, based on a budget of \$85 million as shown in Model II. While such a radical redistribution is impossible to achieve over such a short period, the magnitude of savings is illustrative of what the impact of using medical auxiliaries can be.

## Environmental Sanitation

The World Health Organization (WHO) considers a safe and convenient water supply to be the single most important element in improving the public health of rural people. It is recognized that safe water is essential for good health and is a prerequisite to controlling those diseases most common in rural areas. Despite considerable research, no satisfactory method has yet been developed for quantifying the various benefits derived from an improved water supply system. However, there are several nonquantifiable direct and indirect benefits which have been identified: 1/ direct benefits include improved public health and greater convenience of water supplies, both of which may increase productivity, plus some fire protection; indirect benefits include slowing down the rates of rural-urban migration, improved standard of living, and the development of village institutions. A study 2/ by the GOP's Ministry of Health has already determined that village institutions are developed and rural communities maintain or increase their size when a viable water supply system is installed in a community.

However, water supply systems are not without their problems. One of the most important is late payments by water users, but this has not negatively affected maintenance.

Both capital and operating costs increase with the level of service, but so does the possibility of mechanical failure. In order to reduce these costs, several positive actions have been initiated by the GOP and the rural communities. Principally, in order to keep costs to a minimum, standardized engineering designs have been developed, to the extent possible, for all three components. Furthermore, the rural communities actively

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1/ Village Water Supply, a World Bank Paper, March 1976.

2/ "Evaluación de los 66 Acueductos Rurales" - Panama 1976, MOH.

participate in the design, installation, and maintenance of the aqueducts, wells, and latrines installed for their benefit. Various members of the communities are already knowledgeable or are trained at the time of installation in the maintenance and operation of the systems. Due to the number of systems already being installed within the country as a whole, the MOH maintains or has access to an adequate supply of repair parts.

Aqueducts. Section III B discussed the criteria and sanitary alternatives to aqueducts. For populations of 500 and 800 inhabitants, the installation costs per inhabitant are \$51 and \$32 respectively.

Hand-Pumped Wells. Due to costs, hand-pumped wells are satisfactory water systems for communities of less than 300 inhabitants. Primarily, they provide reasonable access <sup>1/</sup> to safe water for the entire community. Communities contribute about 15.7% of the costs of the wells, and 3 hand-pumped wells could easily serve a population of 200 for an average per capita cost of \$19.05 <sup>2/</sup>. This per capital cost compares very favorably with the \$24 per capita cost (1970 dollars) for construction of hand-pumped wells in Latin America and the Caribbean <sup>3/</sup>. There are no substitutes for hand-pumped

<sup>1/</sup> In rural areas "reasonable access" is defined as sufficiently close so that family members do not spend a disproportionate part of the day fetching water.

<sup>2/</sup> 1976 MOH evaluation of wells and aqueducts showed the following costs:

| <u>Drilled Wells in 1975</u> |                 | <u>Total Cost</u> | <u>Cost Per Capita</u> |
|------------------------------|-----------------|-------------------|------------------------|
| 90 at 4"                     | 8024 pop.served | \$130,338         | \$16.24                |
| 43 at 6"                     | 3630 pop.served | 103,129           | 28.41                  |
| Total 133                    | 11654           | \$233,467         | \$20.03                |

Cost per capita = \$20.03 in 1975 compared with L.A. cost of \$24/capita in 1970 dollars.

<sup>3/</sup> Table 1:6, pg. 78, Village Water Supply, March 1976.

wells; but to reduce the per capita cost, they could be installed in larger communities.

Latrines are the least-cost solution to disposal of body waste in sparsely populated rural areas. Moreover, the GOP has determined that it is cheaper to construct latrines than to pay for curative measures in combating excreta disposal related diseases. The total cost of each latrine is \$168, which compares favorably with the latrine costs cited in the World Bank Paper Village Water Supply. Except for the salary costs of sanitary inspectors already employed by the MOH, there are no additional on-going costs to the Ministry. Alternatives to latrines are discussed in Section III B.

Nutrition. Community vegetable gardens and poultry raising projects are designed to combat widespread malnutrition, and represent the third integral component for improving the health status of the rural population. The objectives of this project component are to produce more nutritious foods, obtain additional income, and transfer the first-hand knowledge gained from the community models to personal use. Most importantly, these programs result in nutritious food being consumed which would not normally be part of the local diet.

The most readily available alternative to this program is the traditional supplemental feeding program. The biggest advantage of a supplemental feeding program is that its coverage, and consequently its cost, can be easily controlled. However, it has the distinct disadvantage of not providing a permanent solution to the nutrition problem; and, of course, the continued dependence on outside sources for food does not build any self-reliance and confidence. Supplemental feeding is most appropriate only where severe malnutrition is a threat or a reality.

See Part III A for the benefit/cost analyses for community gardens and poultry raising projects.

## Conclusion

The above models demonstrate that the costs of an expanding integrated medical services delivery system, utilizing a low cost health post approach to extend the system into rural areas without present access, can be covered by 5% real growth in MOE and CSS operating budgets (Min. of Plan. uses slightly higher rate). Significant savings through use of the low cost delivery system are also shown. Thus, the low cost medical services delivery system, combined with new sanitation facilities such as potable water and latrines, and nutrition improvement through community gardens, presents a reasonable expectation of significant operational savings through 1985 in the overall health delivery system far in excess of the cost of the project. There are other indirect benefits which will accrue to the overall economy as a result of improved health which have not been examined in depth, such as increased productivity due to fewer missed workdays; better education due to better attendance thereby enhancing future income and productivity possibilities; and increased life expectancy.

## Prospects of Loan Repayments

The total debt service for Panama's funded public debt is approximately \$150.0 million in 1976, including that of semi-autonomous government agencies and enterprises. Projections show a peak of \$275.0 million in 1979, falling to \$200.0 million by 1982 with both interest and amortization payments beginning to decrease in 1979. Moreover, according to the GOP's National Development Plan (NDP) external financing required by the government will also begin to decrease in 1979. Part of the NDP includes a restructuring of the funded public debt to lengthen the maturity schedule of short-term loans falling due within the next five years.

Implementation of the Plan is expected to double the country's export earning capacity by 1982,

and should provide the necessary base for Panama to achieve its targeted average annual real growth rate of 6-7.5% during the period 1975-1985. A major program is the mining of proven copper deposits which is expected to enhance Panama's foreign exchange earnings by some \$250 million annually by 1988 when fully developed. An agreement with a major foreign mining firm was signed in February 1976 to provide for the exploitation of these deposits at Cerro Colorado, which are among the largest in the world, with over 2 billion tons. Another important program is the construction of three major hydroelectric plants, which will increase Panama's hydroelectric capacity to 923 megawatts by 1982 and decrease its dependency on oil from 92% to 38%. Foreign exchange savings from these plants will begin in 1976 and should reach \$43.8 million by 1982. Projects relating to increased sugar production should result in increased foreign exchange earnings of \$50.0 million by 1977. Sugar specialists have forecasted a 15-20% increase in world sugar consumption between 1974 and 1980. Construction of an enlarged fishing and container port should provide by 1978 approximately \$18.0 million in foreign exchange earnings.

As a consequence of these programs plus other smaller investments projects, it is anticipated that the GOP will be able to increase annual foreign exchange earnings by approximately \$55.0 million in 1977, rising to \$245.0 million by 1982 and considerably more thereafter.

The loan terms are discussed in the summary recommendations of this paper. For a \$9.5 million loan,<sup>1/</sup> the average annual debt service charges (interest plus amortization) to be repaid over 30 years (after expiration of the 10-year grace period) will be approximately \$459,000.

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<sup>1/</sup> A 40-year loan with a 10-year grace period for principal and first 10 years of interest at 2% and 3% thereafter.

Panama has never defaulted on a foreign debt obligation. In view of its bright economic development prospects, and policy of retaining its essential economic character as an open economy with growing attraction as a servicecenter for international commerce and finance, Panama is not likely to blemish this outstanding repayment record. We foresee no difficulties in the repayment of this loan.

Table III -F-10

| Components                                   | Total No. of Units | Unit Costs | FINANCIAL PLAN |         |             | Total 1/ Cost     | Total Contributions |                  | Communities      |
|--|--------------------|------------|----------------|---------|-------------|-------------------|---------------------|------------------|------------------|
|  |                    |            | Contributions  |         | Communities |                   | A.I.D.              | G.C.P.           |                  |
|  |                    |            | A.I.D.         | G.O.P.  |             |                   |                     |                  |                  |
| I. HEALTH POSTS                              | 125                | \$9,960    | \$6,000        | \$2,460 | \$1,500     | 1,545,000         | \$750,000           | \$57,500*        | \$237,500*       |
| Investment                                   |                    |            |                |         |             |                   |                     |                  |                  |
| Land   |                    | 500        |                |         | 500         |                   |                     |                  |                  |
| Construction                                 |                    | 4,600      | 4,000          |         | 600         |                   |                     |                  |                  |
| Plans & Supervision                          |                    | 460        |                | 460     |             |                   |                     |                  |                  |
| Equipment                                    |                    | 2,000      | 2,000          |         |             |                   |                     |                  |                  |
| OPERATIONS                                   |                    |            |                |         |             |                   |                     |                  |                  |
| Personnel                                    |                    | 1,200      |                | 1,200   |             |                   |                     |                  |                  |
| Materials/Supplies                           |                    | 1,200      |                | 800     | 400         |                   |                     |                  |                  |
| II. SUB-CENTERS                              | 14                 | 27,040     | 16,900         | 8,040   | 2,100       | 495,480           | 236,600             | 207,060*         | 51,800*          |
| Investment                                   |                    |            |                |         |             |                   |                     |                  |                  |
| Land   |                    | 500        |                |         | 500         |                   |                     |                  |                  |
| Construction                                 |                    | 12,900     | 12,900         |         |             |                   |                     |                  |                  |
| Plans & Supervision                          |                    | 1,290      |                | 1,290   |             |                   |                     |                  |                  |
| Equipment                                    |                    | 4,000      | 4,000          |         |             |                   |                     |                  |                  |
| OPERATIONS                                   |                    |            |                |         |             |                   |                     |                  |                  |
| Personnel                                    |                    | 3,060      |                | 3,060   |             |                   |                     |                  |                  |
| Materials/Supplies                           |                    | 5,290      |                | 3,690   | 1,600       |                   |                     |                  |                  |
| III. RURAL HEALTH CENTER                     | 4                  | 155,282    | 66,620         | 64,662  | 24,000      | 941,128           | 266,480             | 498,648*         | 176,000*         |
| Investment                                   |                    |            |                |         |             |                   |                     |                  |                  |
| Land   |                    | 4,000      |                |         | 4,000       |                   |                     |                  |                  |
| Construction                                 |                    | 46,620     | 46,620         |         |             |                   |                     |                  |                  |
| Plans & Supervision                          |                    | 4,662      |                | 4,662   |             |                   |                     |                  |                  |
| Equipment                                    |                    | 20,000     | 20,000         |         |             |                   |                     |                  |                  |
| OPERATIONS                                   |                    |            |                |         |             |                   |                     |                  |                  |
| Personnel                                    |                    | 35,000     |                | 35,000  |             |                   |                     |                  |                  |
| Materials/Supplies                           |                    | 45,000     |                | 25,000  | 20,000      |                   |                     |                  |                  |
| IV. AQUEDUCTS                                | 150                | 25,500     | 13,350         | 5,850   | 6,300       | 3,825,000         | 2,002,500           | 877,500          | 945,000          |
| Equipment                                    |                    | 15,000     | 13,350         | 1,650   |             |                   |                     |                  |                  |
| Installation                                 |                    | 10,500     |                | 4,200   | 6,300       |                   |                     |                  |                  |
| V. HAND PUMP WELLS                           | 400                | 1,270      | 530            | 540     | 200         | 508,000           | 212,000             | 216,000          | 80,000           |
| Equipment                                    |                    | 990        | 530            | 460     |             |                   |                     |                  |                  |
| Installation                                 |                    | 280        |                | 80      | 200         |                   |                     |                  |                  |
| VI. LATRINES -                               | 10,000             | 168        | 60             | 68      | 40          | 1,680,000         | 600,000             | 680,000          | 400,000          |
| Equipment                                    |                    | 60         | 60             |         |             |                   |                     |                  |                  |
| Installation                                 |                    | 108        |                | 68      | 40          |                   |                     |                  |                  |
| VII. COMMUNITY GARDENS                       | 48                 | 19,000     | 15,000         |         | 4,000       | 912,000           | 720,000             |                  | 192,000          |
| VIII. SMALL ANIMAL PROJECTS                  | 75                 | 5,120      | 4,000          |         | 1,120       | 384,000           | 300,000             |                  | 84,000           |
| IX. ADMINISTRATION                           |                    |            | 400,000        |         |             | 400,000           | 400,000             |                  |                  |
| X. TRAINING                                  |                    |            | 260,000        |         |             | 616,912           | 260,000             | 356,912          |                  |
| XI. EQUIPMENT                                |                    |            | 252,420        |         |             | 252,420           | 252,420             |                  |                  |
| <b>TOTAL COSTS</b>                           |                    |            |                |         |             | <b>11,559,920</b> | <b>6,000,000</b>    | <b>3,393,620</b> | <b>2,166,300</b> |
| I. HEALTH POSTS                              | 100                | \$9,960    | \$6,000        | \$2,460 | \$1,500     | 1,236,000         | 600,000             | 446,000*         | 190,000*         |
| II. REODELING EXISTING SUB-CENTERS & CENTERS |                    |            |                |         |             | 349,500           | 349,500             |                  |                  |
| III. AQUEDUCTS                               | 150                | 25,500     | 13,350         | 5,850   | 6,300       | 3,825,000         | 2,002,500           | 877,500          | 945,000          |
| IV. TRAINING                                 |                    |            |                |         |             | 571,392           | 320,000             | 251,392          |                  |
| V. LATRINES                                  | 3,800              | 168        | 60             | 68      | 40          | 638,400           | 228,000             | 258,400          | 152,000          |
| <b>TOTAL COSTS</b>                           |                    |            |                |         |             | <b>6,620,292</b>  | <b>3,500,000</b>    | <b>1,833,292</b> | <b>1,287,000</b> |

\* Represents operating costs for two years (average for life of project).

1/ Due to the asterisk, Number Units X Unit Cost will not equal Total Cost.

#### PART IV - IMPLEMENTATION ARRANGEMENTS

##### A. Analysis of the Recipient's and AID's Administrative Arrangements

###### 1. Ministry of Health (MOH)

Top management of the Ministry of Health is hard working, imaginative, and professionally competent in discharging their responsibilities. Firmly committed to raising the health standards of individuals, families, and communities throughout the Republic on any equitable basis, the Ministry has launched or expanded programs over the past several years which have had a direct and significant impact on the country's health standards. Dramatic declines in morbi-mortality rates, reflected by the data in Annex G-5, have followed the continuing efforts by public health authorities to shift manpower and other medical resources from a hospital based focus to a more decentralized system of community health committees, health posts, sub-centers, centers, rural and provincial hospitals; and a corresponding shift in budget resources, all of which has made public health resources more accessible to marginal populations in greatest need of such resources. The MOH employs 3,528 personnel consisting of 661 doctors, 611 nurses, 108 dentists, 1,536 auxiliary nurses, 240 laboratory technicians, 102 x-ray technicians, 147 sanitary technicians, 26 nutritionist, 40 health educators, 55 health assistants, and other support personnel. Of the total, 42% are stationed in rural areas (outside of Panama City and Colon). In 1972, by comparison, 37% of total MOH personnel were stationed in rural areas.

Organizationally, the MOH consists of a national headquarters, nine Health Regions, and three specialized National Hospitals located in Panama City. The Regional subdivisions carry out health programs established at the national level. The creation in recent years of 21 health centers with maternal/child care annexes, 52 health centers without such annexes, 105 health sub-centers, and 60 health posts, has served to strengthen the decentralized structure of the MOH. Decentralization has been further strengthened in recent years by granting greater autonomy to the Regional Medical Directors in executing programs and policies established nationally.

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# MINISTRY OF HEALTH

**MINISTRO**  
**VICE-MINISTRO**

UNIVERSIDAD

I.D.A.A.N.

C.S.S.

ASESORIA LEGAL

RELACIONES PUBLICAS

ASUNTOS INTERNACIONALES

ASESORES INTERNACIONALES

COM. NACIONAL DE POLITICA DEMOGRAFICA

ESTUDIOS DE POBLACION

DOCENCIA E INVESTIGACION

ORGANIZACION Y EDUCACION DE LA COMUNIDAD

DIRECCION GENERAL DE SALUD

CONSEJO TECNICO

ESTADISTICA Y COMPUTOS ELECTRONICOS

DIRECCION DE SALUD FEMINEA

DIRECCION DE NUTRICION

DIRECCION DE PLANIFICACION

DIRECCION DE SALUD AMBIENTAL

DIRECCION DE EPIDEMIOLOGIA

SALUD DENTAL

SALUD MENTAL

SALUD ADULTA

SALUD INFANTIL

LABORATORIO CENTRAL

PROGRAMA DE PROMOCION Y PREVENION

PROGRAMA DE SALUD

VETERINARIA Y ALIMENTICION

FAMILIAR Y UROLOGIA

CONTROL DE VECTORES

INFERMERIA Y TRANSMISIBLES

LABORATORIO CENTRAL

DIRECCION ADMINISTRATIVA

AUDITORIA

ORGANIZACION Y METODO

INGENIERIA Y ARQUITECTURA

PERSONAL Y PLANILLAS

FINANZAS

PROVEEDURIA

IMPRESION Y PUBLICACIONES

SERVICIOS GENERALES

MANTENIMIENTO Y REPARACION EQUIPO MOD-INT

ALMACEN CENTRAL

REGION DE BOCCAS DEL TORO

REGION DE CHIRIQUI

REGION DE VERAGUAS

REGION DE AZUERO

REGION DE COCLE

REGION DE PANAMA

REGION DE COLON

REGION DE DARIEN

HOSPITALES NACIONALES

REGION METROPOLITANA

Moreover, the Ministry has systematically cultivated the direct participation of community residents through the establishment of over 900 Community Health Committees, thereby strengthening the capacity of rural and low-income urban localities to address common health and other development needs.

## 2. Social Security Agency (CSS)

The Panamanian Social Security Agency, created in 1941, is an autonomous entity of the public sector providing retirement benefits and insuring workers and their dependents for illnesses, maternity, funerals, and work-related accidents and illnesses. Social Security coverage is mandatory for all public sector employees, wherever employed, as well as workers employed with private individuals or firms established in any of the 65 districts presently incorporated under the Social Security program. (By contrast, in 1968, only 20 of the Republic's 65 districts were incorporated under the CSS system.) Recently, Social Security coverage was extended to organized farming groups with limited resources; i.e., asentamientos. As of 1974, 235,000 employees, 283,000 dependents, and 26,000 pensioners were covered by CSS, representing 34% of the total population and 45% of the total labor force gainfully employed.

Over the period 1970-1975, the CSS budget was as follows:

| <u>Year</u> | <u>Income</u> | <u>Expend-<br/>itures</u> |
|-------------|---------------|---------------------------|
| 1970        | 52.7          | 41.7                      |
| 1971        | 61.2          | 48.4                      |
| 1972        | 75.7          | 61.6                      |
| 1973        | 87.8          | 68.9                      |
| 1974        | 99.0          | 77.1                      |
| 1975        | 136.7         | 97.9                      |

Operating surpluses from all CSS operations over the period totaled \$117.5 million. The above demonstrates the financial soundness of CSS and reflects positively on the Agency's management. For greater detail on the financial condition of the Social Security Agency, see the Financial Analysis Section of this Paper.

Structurally, the CSS is composed of: (1) a Board of Directors consisting of the Minister of Health, who



presides, a medical doctor not employed with CSS, three representatives of management in the private sector, four representatives of insured workers and their dependents, one representative of the National Bank, one representative of the Controller General's Office, and one representative of pensioners; (2) a General Director appointed by the Executive Branch for a four year term and charged with the overall supervision of CSS activities; (3) a Technical Council consisting of the principal officers of the Agency which assists the Director General in discharging administrative responsibilities; (4) seven executive offices concerned with planning, professional risks, administration, medical attention, legal affairs, construction and maintenance; and (5) nine Regional Offices charged with executing the various CSS programs. The Medical Director for each of the integrated Provinces supervises and coordinates all public health activities within his Province. The present organizational management of the CSS is an improvement over the previous structure as it more precisely separates planning and execution functions, thereby facilitating greater efficiency in the ongoing and future operations of the Agency.

Medical facilities of the CSS consist of 5 hospitals, 22 policlinics, and 6 clinics. In addition, CSS assists the MOH with the operation and maintenance of the integrated health centers and other facilities in those provinces which have initiated the integration process. The Agency employs 6,410 medical, administrative, and service personnel. The health staff is composed of 714 doctors, 343 nurses, 760 nurse auxiliaries, 81 dentists, 80 pharmacists, 285 laboratory technicians and other support personnel. Of the total health personnel, 32% are stationed in rural areas (outside of Panama City and Colon). Annex G-6 shows the ratio of selected CSS and MCH health personnel per 10,000 population by Province.

### 3. Administrative Arrangements for Project Implementation

The Borrower will be the Government of the Republic of Panama and the principal executing agency for the loan project will be the Ministry of Health. The Social Security Agency will collaborate with the MOH in the execution of certain aspects of the project. As indicated previously in this Paper, the Ministry of Health has implemented a number of A.I.D. loan and grant projects in a satisfactory manner, reflecting their administrative and technical capacity for sound project management. Considering that the various project components are the outgrowth of a comprehensive sector assessment conducted by a high level technical commission composed of representatives from the MOH, CSS, IDAAN, and the Ministry of Planning, it is highly unlikely that the project will be

treated with anything less than the highest priority by the responsible public health authorities. It is noteworthy that top Ministry officials and high level technicians from the various entities of the public health sector have participated fully with USAID in the design of this project. In view of this close coordination and considering the high priority which the GOP places on this project, USAID anticipates that the Project will be completed by December 31, 1980.

The various construction activities contemplated under the project will be carried out mainly by the Engineering Division of the Ministry of Health, with assistance in the form of labor and materials from the communities benefiting from the various program elements. The MOH has had considerable experience with the installation of rural aqueducts, hand pumped wells, latrines, and establishing community gardens and small farm animal projects. The Ministry has the capacity for installing over 100 aqueducts, 300 hand pumped wells, and 10,000 latrines per year. The recent procurement of 12 well drilling rigs and several light and heavy duty vehicles for transporting crews and equipment will help to ensure timely execution of these elements of the project. Designs for the health centers, sub-centers and health posts have already been developed by the Ministry. The MOH plans to use a "force account" type construction program for the proposed health centers and sub-centers. Under this arrangement the Ministry will either contract out certain skilled labor requirements or perform these activities with its own resources. This approach has been used by the MOH for constructing these kinds of facilities in the past and it has proven to be both technically feasible and less time consuming and costly. Furthermore, the Ministry's ability to organize Community Health Committees and work with them in developing a wide range of community health projects, such as those contemplated under this project, has been amply demonstrated. (See Section 4.A.1 above). The Engineering Analysis contained in Part III of this Paper should be referred to for additional details concerning the various construction activities contemplated under the project.

Training health assistants to strengthen the community based foundation of the health services delivery system is relatively new in Panama. As indicated earlier, health assistants have been trained in two of the Republic's nine provinces. To help ensure that these and future training programs are adequately designed to impart the requisite skills, and that subsequent supervision and evaluation are appropriate, technical cooperation will be sought from a qualified source for assisting public health authorities in developing a program for training a cadre of Panamanian instructors who will, in turn,

prepare health assistants for their respective duties at the community and provincial levels. Considering the key role contemplated for the health assistants in extending the health care delivery system to marginal groups, it is of utmost importance that these health paramedics receive training and supervision appropriate to permit them to deal effectively with the health needs of their respective communities. An evaluation system will also be developed, providing the provincial medical authorities with continuous feedback on health auxiliary performance in terms of identifying and effectively dealing with community health problems. (See Section B, below, "Evaluation Arrangements for the Project.").

The further development of an effective health care system at the provincial level is dependent upon the ability of public health authorities to design a system capable of identifying health needs, formulating strategies and related programs to deal with these needs at minimum cost, executing these programs in an efficient manner, and having access to sufficient data with which to determine the effectiveness of the programs in meeting health needs and upgrading the health status of the target populations. Technical assistance and training programs will be provided under the project to correct inefficiencies identified by the assessment in administering and executing health programs of both the CSS and MOH. Management and other specialists in the various functional categories with observed inefficiencies (notably data gathering, personnel administration, maintenance, planning, budgeting, accounting and auditing, and procurement) will work at the provincial level to develop acceptable delivery systems within the political and legal framework of Panama's public health sector. To help insure an adequate managerial capacity for properly administering provincial health care systems, training programs for provincial medical directors will be provided for graduate studies in public health and public administration. The composite of a strengthened management functioning within an improved health care delivery system is expected to result in a significant improvement in the health status of Panama's marginal population.

Provincial Plans for Establishing Health Posts,  
Health Assistants, Aqueducts, Hand Pumped Wells,  
Latrines, Community Gardens, and Small Farm  
Animal Projects

By a given date each year during the Project's execution, the Provincial Medical Director, with the approval of the Provincial Coordinating Council will present to the Ministry of Health a detailed annual plan setting forth the sites selected for

establishing health sub-centers, health posts, health assistants, aqueducts, hand pumped wells, latrines, community gardens, small farm animal projects and the criteria utilized in their selection.

The annual Provincial plans will be reviewed by the Ministry of Health and CSS. Taking into account the Loan Agreement, available human and financial resources, and other relevant legal, administrative or policy considerations, these plans will be accepted, modified, rejected, or amplified. Upon acceptance by the Ministry and CSS, these plans will be forwarded to USAID for review and concurrence. The entire process of reviewing, modifying and accepting the annual Provincial plans should not require more than two months time.

The execution of the various elements of the provincial plans will be carried out by the appropriate technical division of the MOH under the supervision of the Provincial Medical Directors. The Ministry has a demonstrated capacity for executing the various elements contemplated under the provincial plans. As previously indicated, technical cooperation will be enlisted to precisely define the tasks, task structure, supervision, and evaluation of the health assistants. In accordance with established procedures, the CSS will be consulted regarding the establishment of new medical facilities under the project; i.e., health centers, sub-centers, and health posts. Since most of the provinces will have initiated the integration process prior to the project's execution, coordination between the MOH and CSS will develop naturally with regard to the administrative improvements, training programs, and physical plant development to be supported under the project.

#### USAID Monitoring Responsibility

The USAID Health and Population Sector Chief, as Project Manager, will have the primary responsibility for monitoring the project's implementation, assisted by the Office of Development Planning, Controller, and Engineering Section. The Project Team, composed of officers from each of these divisions, will review all procurement lists, plans and specifications (including those regarding training and technical assistance), periodically inspect construction progress, ensure that disbursement/reimbursement requests conform to A.I.D. regulations, that sound financial control methods are followed, and that provisions of the loan agreement and implementation letters are satisfactorily met.

### Disbursement Procedures

A four year disbursement period will be sufficient to permit the Borrower to draw down the loan funds for the contemplated investments in health facilities and activities, technical assistance, and manpower training. A four year program is deemed appropriate to minimize the project's impact on the public health sector's operating budget.

The Ministry and USAID have discussed the FAR method of disbursement and agreed to use it for most elements of the project with the exception of off-shore equipment and technical services, which will likely be financed through the conventional Letter of Commitment procedure, and in-country and foreign training programs which will be funded through reimbursements to the Borrower for eligible training expenses. The Borrower and USAID have further agreed, however, that in the event inflation or other unanticipated cost factors significantly increase unit costs for any of the sub-project elements financed under FAR procedures, a renegotiated unit cost agreement may be effected on an annual basis and formally established through an implementation letter.

### Procurement Procedures

The selection of consultants and contractors, procurement of equipment and materials, shipping and insuring shall be carried out in accordance with the standard procedures called for in the loan agreement. It is anticipated that most goods and services procured under the loan will be contracted directly by the Borrower, with A.I.D.'s prior concurrence only for those items not funded under the FAR system.

Appropriate reports will be obtained concerning procurement requirements, including 50/50 shipping and source and origin. These reports and requirements will be monitored by the Office of Development Planning and the Controller's Office through review of vouchers submitted in substantiation of reimbursement requests.

### B. Evaluation Arrangements for the Project

The strategy of this Project is to upgrade the health conditions for selected communities, or groups of communities in proximity with one another, through a variety of health, nutrition, and environmental sanitation interventions. No one of these undertakings can individually solve the health problems of the marginal

population. The synergistic effect of these various elements, however, is expected to significantly improve the health status of the target group. Therefore, a meaningful evaluation of this project will involve the gathering of baseline data for selected areas where interventions are anticipated, followed by a similar study one to two years after the various health programs have been established in the selected communities.

The Ministry of Health and the Instituto Nutricional de Centro América y Panamá (INCAP) are presently negotiating arrangements for such a study. It is anticipated that anthropometric studies of approximately 35 communities, each with a population of roughly 300 inhabitants, will be conducted in 1976. Special attention will be directed at securing height/weight measurements for children under five years of age. A portion of these communities will serve as a control group. The selected communities will have similar ecological and cultural conditions to reduce the influence of exogenous factors on the outcome of the study. Two 4 man teams will each spend three days in a community performing anthropometries for both the baseline and follow-up study. Approximately two months for each study should suffice, plus an additional two weeks to design the study and a couple of months for analysis purposes. The Ministry's new Dirección de Docencia e Investigación is fully qualified to perform this study. Their professional staff consists of a nutritionist, social-anthropologist, and epidemiologist-physician.

In addition to the anthropometric studies, the criteria outlined in the logical framework will be used for measuring both the progress of the project's implementation (i.e., achievement of the project's outputs) as well as the effectiveness in delivering health services - higher levels of immunizations, professional attention during childbirth, and so forth.

With respect to evaluating the performance of the health assistant in the expanded health care delivery system, the provincial medical supervisors will be expected to closely monitor the various tasks assigned to their respective health assistants. Reporting formats will be developed, such as those outlined in Annex J, to facilitate a complete, timely and continuous evaluation of the specific tasks delegated to the health assistants.

Annual evaluation reviews will be held between the Borrower and A.I.D. to evaluate the project's progress and reprogram targets as necessary. These evaluation meetings will also provide a convenient forum for reviewing compliance with conditions and covenants set forth in the Loan Agreement and agreeing on corrective measures if necessary.

### C. Training and Technical Assistance

Both the training and technical assistance components of this Project are considered crucial to the development of a low-cost integrated public health delivery system servicing rural populations in an effective manner.

#### 1. Training

The training program will consist fundamentally of intensive in-country training for a minimum of 200 nurse auxiliaries and 300 health assistants in the basics of vaccination, first aid, child-birth, family planning, MCH care, environmental sanitation, nutrition, community organization and, particularly for the health assistants, the specific activities required to appropriately refer patients to higher levels within the health care system. As the health sector assessment indicated, such paraprofessionals are needed and are appropriate for extending basic health care coverage to the rural sector. Both groups will be trained at the Provincial level by qualified medical personnel. As the Health assistants represent a relatively new approach to providing basic preventive and curative health care, a plan for training, supervising and evaluating health assistants, including a training curriculum, will be developed at the onset. Technical assistance will be obtained from a qualified source to assist in the development and execution of the training plan. The plan will specify health care standards for priority health problems as well as the tasks involved in achieving these standards. As a function of the task structure, simple monitoring tasks will be developed for the individuals (usually the MD at the referral health center) who are charged with the responsibility of supervising the health assistant. It is estimated that the development of health objectives and related health care standards will take no more than two months time, and training health assistants will require approximately six months over the course of a year. The loan will fund per diem and family maintenance costs (\$100/month) during the one year training cycle, which will include six months of class work and six months of field work. The MOH will not establish a permanent position for the assistant until he/she has successfully completed the training program. All other training costs (instructors, lodging, transportation, and teaching materials) will be borne by the Ministry. (Annex J should be referred to for a detailed explanation of the methodology likely to be employed in developing, supervising, and evaluating the health assistant's role in the health delivery system.) The Ministry will also assume complete funding

responsibility for training the nurse auxiliaries during and intensive nine month training program. The auxiliaries will be assigned to rural health centers, sub-centers, and provincial hospitals and will thus be subject to closer, more traditional, supervision than health assistants assigned to the more remote health posts.

Some twenty sanitary technicians will also be trained under the project to assist the Ministry in supervising rural environmental sanitation conditions. They will receive ten months of basic instruction in sanitary engineering, communicable diseases, GOP regulations and standards with respect to water, sewerage, and commercial food handling systems, and a general orientation to all other public health programs. Loan funds will provide a \$100/month stipend during the training program.

To help insure an adequate managerial capacity for properly administering provincial health care systems, between ten and fifteen provincial medical directors and other key administrative personnel will receive graduate level training in public health at qualified U.S. universities. Such loan funded training is expected to cost about \$15,000 per trainee.

## 2. Technical Assistance

The public health care system evolving from the consolidation of MOH and CSS health care systems must be adequately structured and effectively administered to ensure better health care coverage at reduced unit costs. Currently, the individual provinces which have initiated the integration process are attempting to consolidate the various administrative elements of two health systems. To assist them in this effort, the loan will provide for a team of U.S./third country management consultants to work with a group of MOH/CSS counterparts in examining present administrative arrangements for both MOH and CSS at the provincial and national levels. Following this initial review, the joint administrative team will develop consolidated sub-systems for accounting, budgeting, inventory control, personnel administration, data gathering, and maintenance at the provincial level. The various sub-systems will be so designed as to permit their replication or easy adaptation at the national level. Once the various sub-systems have been reviewed and accepted by both the Ministry of Health and the Social Security Agency, manuals will be drafted to outline and explain the new sub-systems to the appropriate administrative and technical personnel throughout the

public health sector. After the sub-systems have been tested and found workable, legislation is expected to legally institutionalize the new national health service.

The U.S./third country management team will be composed of individuals fluent in the Spanish language and qualified in the various disciplines outlined above. They will be expected to work with their Panamanian counterparts for a period of 12-18 months in developing, testing, evaluating, and then training appropriate public health employees in the various sub-systems' operations.

D. Conditions and Covenants

1. The following conditions will be met by the Borrower in form and substance satisfactory to the Lender prior to the issuance of any commitment document or disbursement:

- a. legal opinion of Procurador General;
- b. specimen signatures;
- c. the appointment of a Project Coordinator.

- prior to construction:

- a. criteria for selecting the locations for health posts, health sub-centers, and health centers;
- b. final designs and specifications for health posts, health sub-centers, health centers and related equipment.

- prior to training health assistants:

a plan for training, supervising, and evaluating health assistants, including a training curriculum.

- prior to training public health personnel other than health assistants:

a training plan setting forth, but not limited to, the nature and duration of such training.

- prior to the remodeling of any health units:

plans and specifications for that unit.

2. Borrower shall covenant that during the course of the Project and at least once a year, Borrower shall conduct with A.I.D. periodic evaluations of the Project.





# *República de Panamá*

*Ministerio de Planificación y Política Económica*

*Danamá*, 13 de mayo de 1976  
134-DPEyS

Señor  
Irving Tragen  
Director de la Agencia para el  
Desarrollo Internacional  
E.S.D.

Señor Director :

El año próximo pasado el Ministerio de Salud se avocó a la tarea de preparar un Diagnóstico de Salud a fin de identificar problemas y necesidades en el área de la salud en nuestro país y para, en base a ese conocimiento, elaborar los programas y los proyectos necesarios para satisfacer tales necesidades.

Por otra parte, nuestro Ministerio ha venido desarrollando gestiones con sus oficinas con el propósito de crear las bases para la obtención de un préstamo con la AID, que permita financiar los proyectos identificados en el Diagnóstico de Salud; por esa razón dicho Diagnóstico pasó a constituirse en el documento básico para la justificación del préstamo.

Posteriormente y a previa conclusión del Diagnóstico, se ha elaborado el documento del proyecto de "Sistema de Salud Rural" que incluye:

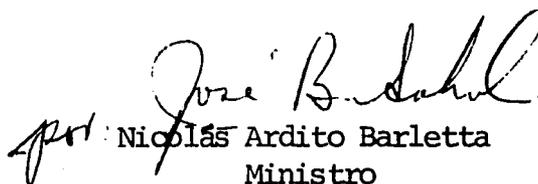
- a) Un componente de construcción de 125 Puestos de Salud; 14 Sub-Centros; 4 Centros de Salud Rural;
- b) Un componente de Saneamiento Ambiental, con la construcción de 150 acueductos rurales, 10,000 letrinas, 400 pozos, equipo y maquinaria;
- c) Un componente de nutrición, expresado en el establecimiento de 48 Huertos Comunales y 75 Criaderos de Aves;
- d) Un componente de Adiestramiento para la preparación de 200 ayudantes médicos, 20 inspectores sanitarios y 200 auxiliares de enfermería; y
- e) En administración; el desarrollo de los sistemas contables, de inventario y de personal.

Sr. Irving Tragen  
13 de mayo de 1976

Basado en estos antecedentes, este Ministerio, en representación del Gobierno Nacional, solicita formalmente a la Agencia para el Desarrollo Internacional (AID) la concesión de un préstamo que permitirá financiar el proyecto "Sistema de Salud Rural" que deberá ejecutarse en un período de 4 años y se estima, requerirá un total de B/.9.5 millones de recursos financieros externos. No obstante, el monto del préstamo solicitado será en esta primera etapa, de B/.6.0 millones, de acuerdo con los detalles de financiamiento previamente discutidos y deberá estar dentro de los términos normalmente empleados por la Agencia para el Desarrollo Internacional para la concesión de este tipo de préstamo. Posteriormente, y en su oportunidad, presentaremos la solicitud formal para el monto de los B/.3.5 millones restantes.

Esta solicitud se presenta en el entendido de que el Gobierno Central se compromete a respaldar dicho préstamo con los fondos requeridos como contrapartida y que corresponde a un monto de B/.3.4 millones para esta primera etapa, garantizando la inclusión de las partidas necesarias en los respectivos presupuestos anuales de operación del Ministerio de Salud. El préstamo — será además respaldado por la contribución de las Comunidades involucradas en el proyecto, estimada en B/.2.2 millones.

Atentamente,

  
Nicolás Ardito Barletta  
Ministro



# DEPARTMENT OF STATE TELEGRAM

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2. MIX OF SERVICES: THE MISSION IS REQUESTED TO PROVIDE AN ANALYSIS OF THE MIX OF HEALTH AND NUTRITION SERVICES PROPOSED IN THE GOP'S HEALTH PROGRAM IN ORDER TO JUSTIFY THE LOAN COMPONENTS PRESENTED IN THE PROJECT PAPER. WHILE THE EXACT MIX OF SERVICES WILL DEPEND ON LOCAL CIRCUMSTANCES, NATIONAL GUIDELINES MUST BE ADDRESSED FOR REGIONAL AND LOCAL PLANNERS IN ORDER TO ASSURE THAT THE TOTAL NATIONAL HEALTH SERVICE PROGRAM ACHIEVES NATIONAL HEALTH GOALS AND OBJECTIVES.

THE ANALYSIS SHOULD LIST ALTERNATIVE HEALTH PROGRAMS THAT MIGHT BE IMPLEMENTED THROUGH THE RURAL HEALTH SYSTEM; CONCISELY DESCRIBE THE COSTS AND EFFECTS OF EACH ALTERNATIVE; AND PRESENT THE RATIONALE FOR THE PROGRAM MIX SELECTED. IN THE ANALYSIS OF COSTS AND EFFECTS OF ALTERNATIVE PROGRAMS, THE MISSION IS URGED TO USE QUANTITATIVE PROCEDURES WHEN FEASIBLE AND TO INCLUDE DECISION CRITERIA WHICH ARE CRITICAL TO GOP DECISIONS ON NATIONAL HEALTH GUIDELINES. THUS, THE ANALYSIS OF EACH ALTERNATIVE COULD INCLUDE AS APPLICABLE TOTAL COST, GOVERNMENT EXPENDITURE, IMPACT ON MORBIDITY AND MORTALITY, PUBLIC SATISFACTION WITH SERVICES, AND ANY RELEVANT SOCIAL POLICY CONSIDERATIONS, SUCH AS BENEFITS DERIVED FROM COMMUNITY DEVELOPMENT AND COMMUNITY HEALTH COMMITTEES.

AID/W UNDERSTANDS MUCH OF THE ABOVE ANALYSIS HAS ALREADY BEEN UNDERTAKEN.

3. CRITERIA FOR CONSTRUCTION: NATIONAL GUIDELINES WILL INCLUDE NOT ONLY PRIORITIES ON THE VARIOUS PROGRAMS TO BE IMPLEMENTED, BUT ALSO REGULATIONS DEFINING CRITERIA FOR THE PLANNING OF CONSTRUCTION OF RURAL HEALTH FACILITIES, FOR THE LOCATION OF RURAL WELLS AND AQUADUCTS, FOR THE LOCATION AND CONTINUANCE OF SUPPORT FOR COMMUNITY GARDENS, AND FOR THE IMPLEMENTATION OF OTHER PROGRAMS. THESE CRITERIA SHOULD BE DESCRIBED AND DISCUSSED IN RELATION TO HOW THEY WILL BE IMPLEMENTED. THE DISCUSSION SHOULD ILLUSTRATE THAT THE EXPENDITURE LEVELS IMPLIED BY SUCH

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CRITERIA ARE CONSONANT WITH THE PROPOSED NATIONAL PROGRAM MIX. THE DISCUSSIONS SHOULD ALSO EXPLAIN WHY THESE CRITERIA WERE SELECTED.

4. INCAP EVALUATION OF NUTRITION AND ENVIRONMENTAL SANITATION PROGRAMS: THE MISSION SHOULD ENSURE THAT THE

SCOPE OF THE INCAP EVALUATION INCLUDES THE ANTICIPATED NUTRITIONAL BENEFITS FROM THE ON-GOING POTABLE WATER SUPPLY AND COMMUNITY GARDENS PROGRAMS. EITHER AS PART OF THAT EVALUATION OR COMPLEMENTARY TO IT, AN ANALYSIS SHOULD BE UNDERTAKEN WHICH COMPARES THE MARGINAL COST OF INCREASED NUTRIENT CONSUMPTION PROJECTED THROUGH THE COMMUNITY GARDENS PROJECT WITH THE MARKET COST OF NUTRIENTS IN THE COMMUNITIES. THESE ANALYSES SHOULD APPEAR IN THE REVISED ASSESSMENT DOCUMENT.

INTERIM REPORT:

THE INTERIM REPORT WAS APPROVED AND INTENSIVE REVIEW OF A LOAN PROJECT IN THE AMOUNT OF 6.8 MILLION DOLLARS WAS AUTHORIZED. THE DAEC RECOMMENDED THE PROJECT PAPER ADDRESS THE FOLLOWING SPECIFIC LOAN DESIGN ISSUES:

1. LOAN COMPONENT: THE DISTRIBUTION OF LOAN FUNDS FOR CERTAIN PROGRAM COMPONENTS MUST BE FULLY JUSTIFIED AND DESCRIBED IN THE PROJECT PAPER. FOR EXAMPLE, THE INTERIM REPORT PRESENTED A PROGRAM OF WHICH 40 PERCENT WAS FOR HEALTH FACILITIES CONSTRUCTION AND 16 PERCENT WAS FOR COMMUNITY GARDENS. THE RATIONALE FOR DEVOTING THIS PROPORTION OF THE PROGRAM TO FACILITIES CONSTRUCTION, THE CRITERIA BY WHICH THE CONSTRUCTION SITES WILL BE SELECTED, AND THE MIX OF FACILITIES TO BE BUILT SHOULD BE INCLUDED IN THE PROJECT PAPER, BASED ON THE FINDINGS OF THE UPDATED ASSESSMENT. THE ANALYSIS MAY INDICATE A REVISED FINANCIAL PLAN. AS A RESULT OF THE INCAP EVALUATION, THE PROJECT PAPER SHOULD INCLUDE THE RATIONALE FOR INCLUDING A PLAN FOR MEASURING THE NUTRITIONAL IMPACT OF THE ENVIRONMENTAL SANITATION AND COMMUNITY GARDENS COMPONENTS.

2. TARGET GROUP: THE REASON FOR INCLUDING SLUM DWELLERS AS PART OF THE TARGET GROUP JUSTIFICATION

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Classification

FOR SLUM AREA HEALTH CENTERS CONSTRUCTION, AND THE RELATIONSHIP OF THIS COMPONENT TO THE RURAL STRATEGY, IN GENERAL, SHOULD BE MADE EXPLICIT IN THE PP. THE COSTS OF DELIVERING HEALTH SERVICES TO SLUM POOR THROUGH HEALTH CENTERS SHOULD ALSO BE INCLUDED.

3. PROGRAM COSTS: SPECIAL ATTENTION SHOULD BE PAID TO THE INCREASE IN OPERATING COSTS OF THE EXPANDED HEALTH CARE SYSTEM FOR THE GOP BUDGET. THE PROJECT PAPER SHOULD PROVIDE FOR THE GATHERING OF COST DATA REQUIRED TO DETERMINE WHETHER THE GOP'S HEALTH DELIVERY SYSTEM IS AFFORDABLE OVER THE LONG TERM.

4. OTHER DONOR INTEREST: THE PROJECT PAPER SHOULD CLEARLY DESCRIBE THE ACTIVITIES OF OTHER INTERNATIONAL DONORS IN THE HEALTH SECTOR.

5. TRAINING: THE PROJECT PAPER SHOULD ADDRESS THE POSSIBILITY OF LOAN FINANCING SOME ASPECTS OF TRAINING IN COMMUNITY HEALTH AND FAMILY PLANNING WHICH IS CURRENTLY FUNDED BY TITLE X. AN EXAMPLE WOULD BE THE WOMEN'S HEALTH CARE SPECIALIST PROGRAM. FURTHERMORE, THE PROJECT PAPER SHOULD DETAIL HOW THE TRAINING PROGRAM FOR COMMUNITY HEALTH AIDES IS TO BE IMPLEMENTED. THE SPECIFIC COST COMPONENTS, E.G., CURRICULUM DEVELOPMENT, INSTRUCTORS, TRAINING, EDUCATIONAL MATERIALS, SHOULD BE IDENTIFIED. A CAREFUL EVALUATION SHOULD BE MADE OF THE ADEQUACY AND APPLICABILITY AT A NATIONAL LEVEL OF THE ON-GOING HEALTH AIDES TRAINING PROGRAM IN COLON AND BOCAS DEL TORO.

AID/W UNDERSTANDS THE MISSION WILL SUBMIT REQUESTS FOR TDY ASSISTANCE FOR BOTH THE REVISED ASSESSMENT AND PROJECT PAPER AS SOON AS THEY ARE IDENTIFIED AFTER DISCUSSIONS WITH THE GOP. INGERSOLL

**UNCLASSIFIED**  
Classification

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AID 1020-28 (1-73)  
SUPPLEMENT 1

PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

(INSTRUCTION: THIS IS AN OPTIONAL  
FORM WHICH CAN BE USED AS AN AID  
TO ORGANIZING DATA FOR THE PAR  
REPORT. IT NEED NOT BE RETAINED  
OR SUBMITTED.)

Life of Project 77 to FY 81  
From FY \_\_\_\_\_ to FY \_\_\_\_\_  
Total U.S. Funding \$9,500  
Date Prepared: May 1976

Project Title & Number: Rural Health Delivery System 525-22-530-181

| NARRATIVE SUMMARY   | OBJECTIVELY VERIFIABLE INDICATORS  | MEANS OF VERIFICATION  | IMPORTANT ASSUMPTIONS   |
|---|--|--|---|
| <p>A. Program or Sector Goal: The broader objective to which this project contributes: (A-1)</p> <p>Raise the health level of the Panamanian marginal population <u>1/</u> to acceptable standards.</p>     | <p>Measures of Goal Achievement: (A-2)</p> <p>For the marginal populations by 1985: <u>2/</u></p> <ol style="list-style-type: none"> <li>1. Increase life expectancy from 50 years to 55 years.</li> <li>2. Reduce infant mortality from 37.2 per thousand to 30 per thousand.</li> <li>3. Reduce general mortality from 6.0 per thousand to 5.3 per thousand.</li> <li>4. Reduce incidence of diarrheal diseases 30%; i.e., from 29,000 cases in 1974 to 20,000.</li> </ol> | <p>(A-3)</p> <ol style="list-style-type: none"> <li>1. Decennial census.</li> <li>2. Special surveys and studies conducted periodically by the MOH and Statistics and Census Bureau of the Contraloria General de la Republica.</li> </ol> | <p>Assumptions for achieving goal targets: (A-4)</p> <p>Vital statistics are reasonably accurate.</p> |
| <p><u>1/</u> The "marginal population" refers to those people lacking some or all of the basic public services - electricity, potable water, sewerage, access to secondary schools, paved streets, etc.</p> |  |  |   |

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AID 1020-28 (1-73)  
SUPPLEMENT 1

PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project: 77 to 81  
From FY \_\_\_\_\_  
Total U.S. Funding \$9,500  
Date Prepared: May 1976

Project Title & Number: Rural Health Delivery System 525-22-530-181

| NARRATIVE SUMMARY   | OBJECTIVELY VERIFIABLE INDICATORS   | MEANS OF VERIFICATION   | IMPORTANT ASSUMPTIONS                           |
|---|---|---|---|
| <p>B. Project Purpose: (B-1)</p> <p>To institutionalize an improved integrated low cost public health delivery system providing preventive and curative health care services and adequate environmental sanitation conditions to the marginal population residing in rural areas.</p> <p>a. Health services will be accessible. <u>1/</u></p> | <p>Conditions that will indicate purpose has been achieved: End-of-Project status. (B-2)</p> <p>By 1981:</p> <p>a.1 Increase accessibility of the marginal population to basic health facilities from 25% to nearly 50%.</p> <p>a.2 Increase the population with access to potable water from 54% in 1975 to 70%.</p> <p>a.3 Increase the population with access to excreta disposal systems from 76% in 1975 to 83%.</p> | <p>(B-3)</p> <p>Data collected annually by the Statistical Department of the MOH and Statistics and Census Bureau of the Contraloria General de la Republica.</p> | <p>Assumptions for achieving purpose: (B-4)</p> |

1/ Accessibility is defined as any public health facility within two hours using normal routes and transportation means.

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AID 1020-28 (1-75)  
SUPPLEMENT 1

PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project: \_\_\_\_\_  
From FY 77 to FY 81  
Total U.S. Funding \$9,500  
Date Prepared: May 1976

Project Title & Number: Rural Health Delivery System 525-22-530-181

| NARRATIVE SUMMARY  | OBJECTIVELY VERIFIABLE INDICATORS   | MEANS OF VERIFICATION | IMPORTANT ASSUMPTIONS                           |
|--|---|-----------------------|---|
| <p>Project Purpose: (B-1) (continued)</p> <p>b. Health services will be effectively delivered.</p> | <p>Conditions that will indicate purpose has been achieved: End-of-Project status. (B-2)</p> <p>By 1981:</p> <p>b.1 Increase professional services during childbirth from 47.6% in 1975 to 60% for the target population.</p> <p>b.2 Increase immunization for the marginal population from 50% to 60%.</p> | <p>(B-3)</p>          | <p>Assumptions for achieving purpose: (B-4)</p> |

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PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project 77 to FY 81  
From FY 77 to FY 81  
Total U.S. Funding \$9,500  
Date Prepared May 1976

AID 1020-26 (1-73)  
SUPPLEMENT 1

Rural Health Delivery System 525-22-530-181

Project Title & Number:

| NARRATIVE SUMMARY  | OBJECTIVELY VERIFIABLE INDICATORS   | MEANS OF VERIFICATION   | IMPORTANT ASSUMPTIONS  |
|--|---|---|--|
| <p>C. Project Outputs: (C-1)</p> <p>1. Increased efficiency of health services within the context of an integrated public health care system.</p> <p>2. An enlarged and strengthened capacity within the public health sector for training and utilizing health assistants.</p> <p>3. Providing / rural communities, representing approximately 25% of the marginal population, with access to basic health care services and facilities and a mechanism of referral through the health care delivery system</p> | <p>Magnitude of Outputs: (C-2)</p> <p>The improvement of MOH and CSS health care systems will be achieved to the extent that by 1981 health objectives, policies and functions will have been uniformly established and administered at both the national and provincial levels.</p> <p>By 1981, <u>225</u> health posts will have health assistants with intensive health care training in basic community health subjects, including vaccinations, first aid, childbirth, family planning and other basic MCH care and environmental sanitation.</p> <p>a. By 1981, <u>4</u> rural health centers will have been constructed, staffed and equipped.</p> | <p>(C-3)</p> <p>As part of the continuous evaluation of the program, periodic reviews will be conducted by the GOP to monitor the progressive integration of the various administrative elements - management, purchasing, transportation, laboratory analysis, budgeting, accounting, data gathering, maintenance, and medical services.</p> <p>Data collected annually by the Statistical Department of the MOH.</p> <p>Observation</p> | <p>Assumptions for achieving outputs: (C-4)</p> <p>GOP policy will continue to favor integration of MOH and CSS health care systems.</p> <p>Land titles will be obtained in a timely manner.</p> |

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AID 1020-20 (1-73)  
SUPPLEMENT 1

PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project:  
From FY 77 to FY 81  
Total U.S. Funding 9,500  
Date Prepared: May 1976

Project Title & Number: Rural Health Delivery System 525-22-530-181

PAGE 3

| NARRATIVE SUMMARY  | OBJECTIVELY VERIFIABLE INDICATORS   | MEANS OF VERIFICATION  | IMPORTANT ASSUMPTIONS                           |
|--|---|--|---|
| <p>Project Outputs: (C-1)<br/>as appropriate to the individual's health needs.</p> | <p>Magnitude of Outputs: (C-2)</p> <p>b. By 1981, 14 health sub-centers will have been constructed, staffed and equipped.</p> <p>c. By 1981, 225 rural health posts will have been established, equipped and staffed.</p> <p>d. By 1981, 300 rural aqueducts and 400 hand pumped wells will have been installed.</p> <p>e. By 1981, 13,800 latrines will have been constructed.</p> <p>f. Over the period 1977-1979, 48 community gardens will be established. By 1980 there will be a total of at least 200 functioning community gardens in the rural sector.</p> <p>g. Over the period 1977 - 1979, 75 small animal projects will be established.</p> <p>h. By 1981, 50 health centers and/or sub-centers will have been remodelled.</p> | <p>(C-3)</p> <p>Annual surveys by the Department of Training and Investigation of the MOH.</p> | <p>Assumptions for achieving outputs: (C-4)</p> |

D. INPUTS

See financial plan for details on funding.

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RURAL HEALTH DELIVERY SYSTEM PROJECT

| <u>Mo/Date/Yr.</u> | <u>PPT NARRATIVE</u>  |
|--------------------|---|
| 6/30/76            | 1. Loan Authorization Signed  |
| 10/31/76           | 2. Loan Signed  |
| 2/28/77            | 3. Initial Conditions Precedent met   |
| 3/31/77            | 4. First year provincial plans submitted (includes locations of health posts, aqueducts, subcenters, centers to be constructed during year 1) |
| 3/31/77            | 5. Standardized plans finalized for: a) health posts (225)<br>b) subcenters (14)<br>c) Centers (4)  |
| 7/ 1/77            | 6. Construction of Health Posts initiated   |
| 12/31/77           | 7. 10% of Health Posts staffed, equipped and functioning  |
| 1/1/78             | 8. Second year provincial plans submitted.  |
| 12/31/78           | 9. Additional 30% of health posts completed; total of 40% staffed, equipped, and functioning.   |
| 1/1/79             | 10. Third year provincial plans submitted.  |
| 12/31/79           | 11. Additional 30% of health posts completed; total of 70% staffed, equipped, and functioning.  |
| 1/1/80             | 12. Fourth year provincial plans submitted.   |
| 12/31/80           | 13. Additional 30% of health posts completed; total of 100% staffed, equipped, and functioning.   |

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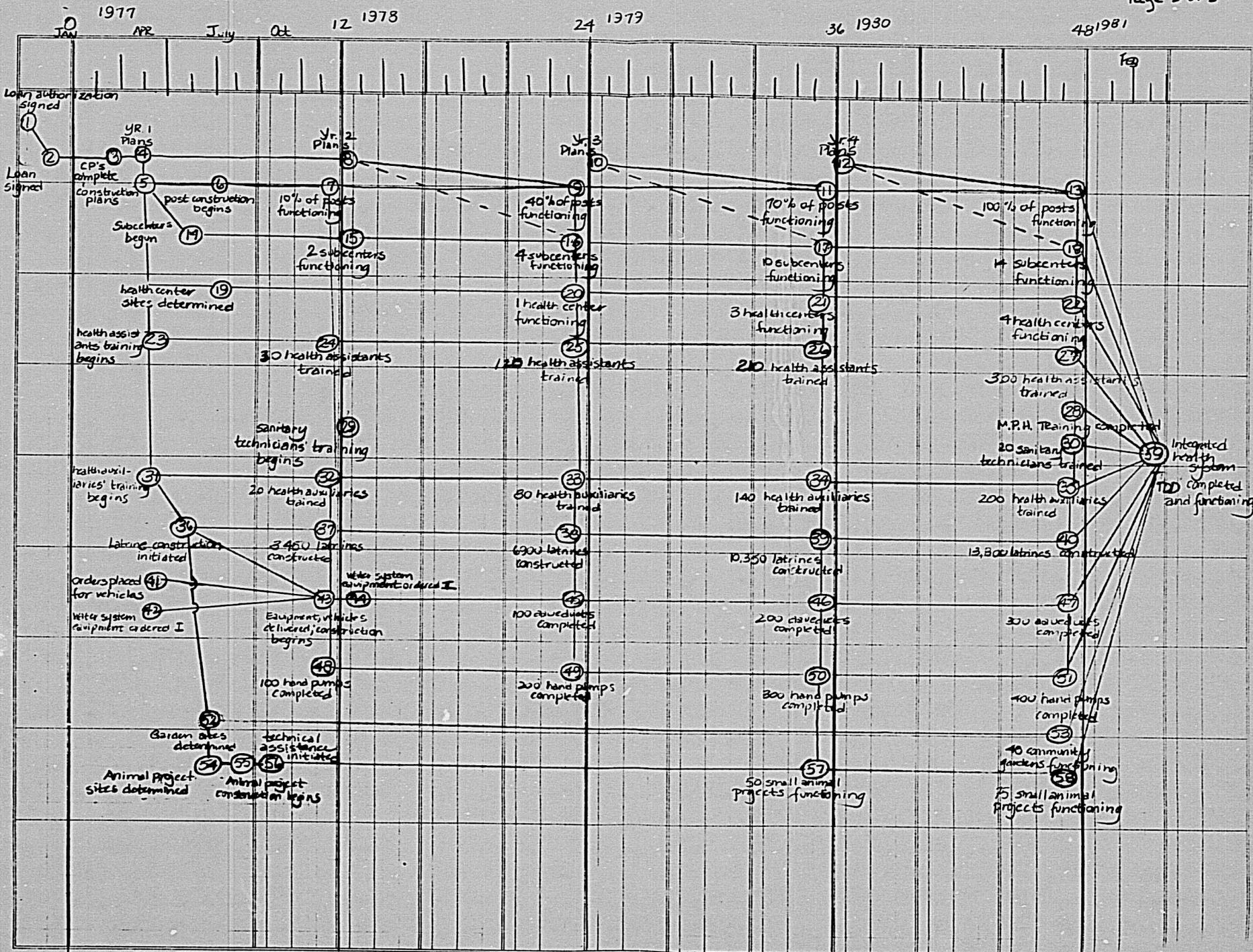
## PPT Narrative (cont'd)

| <u>Mo/Day/Yr.</u> | <u>PPT Narrative</u>  |
|-------------------|---|
| 5/15/77           | 14. Construction of Subcenters initiated  |
| 1/31/77           | 15. 2 subcenters constructed, equipped, staffed and functioning.  |
| 12/31/78          | 16. 4 additional subcenters completed; total of 6 subcenters equipped, staffed, and functioning.                |
| 12/31/79          | 17. 4 additional subcenters completed; total of 10 subcenters equipped staffed, and functioning.                |
| 12/31/80          | 18. 4 additional subcenters completed; total of 14 subcenters equipped, staffed, and functioning.               |
| 7/1/77            | 19. Health center sites determined.   |
| 12/31/78          | 20. 1 health center constructed, equipped, staffed, and functioning.  |
| 12/31/79          | 21. 3 health centers constructed, equipped, staffed, and functioning.   |
| 12/31/80          | 22. Total of 4 health centers constructed, equipped, staffed, and functioning.                                  |
| 4/1/77            | 23. Health assistants' training activities and curriculum established; training of health assistants initiated. |
| 12/31/77          | 24. 30 health assistants trained  |
| 12/31/78          | 25. 120 health assistants trained   |
| 12/31/79          | 26. 210 health assistants trained   |
| 12/31/80          | 27. Total of 300 health assistants trained  |

| <u>Mo/Day/Yr.</u> | <u>PPT Narrative</u>   |
|-------------------|--|
| 12/31/80          | 28. M.P.H. training completed for 10-15 key personnel                                      |
| 1/31/78           | 29. Training initiated for sanitary technicians.   |
| 12/31/80          | 30. 20 sanitary technicians trained.   |
| 4/1/77            | 31. Health auxiliaries' training activities and curriculum established training initiated. |
| 12/31/77          | 32. 20 health auxiliaries trained.   |
| 12/31/78          | 33. 80 health auxiliaries trained.   |
| 12/31/79          | 34. 140 health auxiliaries trained   |
| 12/31/80          | 35. Total of 200 health auxiliaries trained  |
| 4/30/77           | 36. Latrine construction initiated   |
| 12/31/77          | 37. 3,450 latrines constructed   |
| 12/31/78          | 38. 3,450 additional latrines constructed; total of 6,900.                                 |
| 12/31/79          | 39. 3,450 additional latrines constructed; total of 10,350.                                |
| 12/31/80          | 40. 3,450 additional latrines constructed, total of 13,800.                                |
| 4/1/77            | 41. Orders placed for vehicles   |
| 4/1/77            | 42. Orders placed for one-half total water system equipment.                               |
| 12/31/77          | 43. Equipment, vehicles delivered; construction begins on aqueducts.                       |
| 1/31/78           | 44. Orders placed for remaining water system equipment.                                    |
| 12/31/78          | 45. 100 aqueducts completed  |
| 12/31/79          | 46. Total of 200 aqueducts completed   |
| 12/31/80          | 47. Total of 300 aqueducts completed   |

## PPT Narrative (cont'd)

| <u>Mo/Day/Year</u> | <u>PPT Narrative</u>  |
|--------------------|---|
| 12/31/77           | 48. 100 hand pumps completed  |
| 12/31/78           | 49. Total of 200 hand pumps completed   |
| 12/31/79           | 50. Total of 300 hand pumps completed   |
| 12/31/80           | 51. Total of 400 hand pumps completed   |
| 5/1/77             | 52. Community garden sites determined (local health committees established, etc.) |
| 12/31/80           | 53. 48 community gardens functioning  |
| 5/1/77             | 54. Small animal project sites determined   |
| 6/1/77             | 55. Delivery of materials; construction of animal projects begins.                |
| 6/15/77            | 56. Ongoing, periodic technical assistance on animal projects initiated.          |
| 12/31/79           | 57. 50 small animal projects completed.   |
| 12/31/80           | 58. Total of 75 small animal projects completed.                                  |
| 2/28/81            | 59. Integrated health system completed and functioning.                           |



1979

CHECKLIST OF STATUTORY CRITERIA

In the right-hand margin, for each item, write answer or, as appropriate, a summary of required discussion. As necessary, reference the section(s) of the Capital Assistance Paper, or other clearly identified and available document, in which the matter is further discussed. This form may be made a part of the Capital Assistance Paper.

The following abbreviations are used:

FAA - Foreign Assistance Act of 1961, as amended.

FAA, 1973 - Foreign Assistance Act of 1973.

App. - Foreign Assistance and Related Programs  
Appropriation Act, 1974.

MMA - Merchant Marine Act of 1936, as amended.

BASIC AUTHORITY

1. FAA § 103; § 104; § 105;  
§ 106; § 107. Is loan being made

a. for agriculture, rural development  
or nutrition;

b. for population planning or health;

The basic purpose of the loan is to assist in institutionalizing and improving an integrated low cost public health delivery system capable of providing basic health services and adequate environmental sanitation conditions for the marginal population.

c. for education, public administration,  
or human resources development;

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d. to solve economic and social development problems in fields such as transportation, power, industry, urban development, and export development;

e. in support of the general economy of the recipient country or for development programs conducted by private or international organizations.

### COUNTRY PERFORMANCE

#### Progress Towards Country Goals

2. FAA § 201 (b) (5), (7) & (8); § 208

A. Describe extent to which country is:

(1) Making appropriate efforts to increase food production and improve means for food storage and distribution.

The GOP is implementing a broad range of agricultural programs, including farm credit, land development & resettlement schemes, & improved food distribution and storage.

(2) Creating a favorable climate for foreign and domestic private enterprise and investment.

Panama's Banking Law of 1970, the use of the U.S. Dollar as legal tender, and the complete freedom of international payments and exchange transactions combine to create a favorable climate for private enterprise.

(3) Increasing the public's role in the developmental process.

The GOP continues to encourage grass roots participation in the development process. For example, it has strengthened local gov'ts involvement in determining national priorities, policies, & programs; encouraged local initiative thru the establishment of community committees in health & education; and actively promoted the development of cooperatives.

(4) (a) Allocating available budgetary resources to development.

In 1974, gross domestic capital formation was 22.3% of GDP (using constant 1960 prices). The Nat. Gov'ts estimated investment expenditures for 1975, including lending operations, totaled \$405 Mil. or 59% of the GOP's budget.

(b) Diverting such resources for unnecessary military expenditure (See also Item No. 20) and intervention in affairs of other free and independent nations.) (See also Item No. 11).

Panama's military expenditures continue to represent a small percentage of the national budget. Panama has not intervened in the affairs of other free and independent nations.

(5) Making economic, social, and political reforms such as tax collection improvements and changes in land tenure arrangements, and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.

In recent years GOP has effected tax reforms to significantly increase public revenues; provided public land for group farming schemes; and has attempted, not always successfully, to maintain an open dialogue with the private sector.

(6) Willing to contribute funds to the project or program.

The Mission has discussed Project funding with the Ministry of Health and the Ministry of Planning and Economic Policy and agreement has been reached regarding the Project's scope and funding requirements.

(7) Otherwise responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.

The Government is clearly responding in an effective manner to the development needs of its people, particularly in the areas of agriculture, health, education, and housing. This Project will strengthen the GOP's equity oriented programs in the health sector.

B. Are above factors taken into account in the furnishing of the subject assistance?

Yes

Treatment of U.S. Citizens and Firms.

3. FAA § 620 (c). If assistance is to government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government?

The GOP is not known to be indebted under these circumstances to any U. S. citizen for goods and services furnished or ordered.

4. FAA § 620 (c) (1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?

No.

5. FAA § 620 (o); Fishermen's Protective Act. § 5. If country has seized, or imposed any penalty or sanction against any U.S. fishing vessel on account of its fishing activities in international waters,

One vessel was seized in early 1974.

a. has any deduction required by Fishermen's Protective Act been made?

No.

b. has complete denial of assistance been considered by A.I.D. Administrator?

Such a denial was considered by the A.I.D. Administrator and deemed not in the U.S. interest.

Relations with U.S. Government and Other Nations

6. FAA § 620 (a). Does recipient country furnish assistance to Cuba or fail to take appropriate steps to prevent ships or aircraft under its flag from carrying cargoes to or from Cuba?

Panama does not furnish assistance to Cuba. Panamanian flag carriers do carry cargo to and from Cuba.

7. FAA § 620 (b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement?

Yes, it has been so determined.

8. FAA § 620 (d). If assistance is for any productive enterprise which will compete in the United States with United States enterprise, is there an agreement by the recipient country to prevent export to the United States of more than 20% of the enterprise's annual production during the life of the loan?

Not applicable.

9. FAA § 620 (f). Is recipient country a Communist country?

No.

10. FAA § 620 (i). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression?

No.

11. FAA § 620 (j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property?

There have been two incidents of damage to the U.S. Embassy. The second incident was terminated by police action and the use of tear gas.

12. FAA § 620 (l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, in convertibility or confiscation, has the A.I.D. administration within the past year considered denying assistance to such government for this reason?

U. S. - Panama agreement relating to investment guarantees entered into force March 8, 1962.

13. FAA § 620 (n). Does recipient country furnish goods to North Viet-Nam or permit ships or aircraft under its flag to carry cargoes to or from North Viet-Nam?

No.

14. FAA § 620 (q). Is the government of the recipient country in default on interest or principal of any A.I.D. loan to the country?

No.

15. FAA § 620 (c). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?

No.

16. FAA § 620 (u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the A.I.D. Administrator in determining the current A.I.D. Operational Year Budget?

Panama is not delinquent with respect to dues, assessments, or other obligations to the U.N. for the purposes of Article 19 of the Charter.

17. FAA § 491. Has the government of recipient country failed to take adequate steps to prevent narcotics drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the U.S. unlawfully?

No. The Government of Panama is actively cooperating with U. S. and international agencies in the control of illicit drug and narcotics traffic.

18. FAA 1973 § 29. If (a) military base is located in recipient country, and was constructed or is being maintained or operated with funds furnished by U.S., and (b) U.S. personnel carry out military operations from such base, has the President determined that the government of recipient country has authorized regular access to U.S. correspondents to such base?

Not applicable.

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### Military Expenditures

19. FAA s 620 (s). What percentage of country budget is for military expenditures? How much of foreign exchange resources spent on military equipment? How much spent for the purchase of sophisticated weapons systems? (Consideration of these points is to be coordinated with the Bureau for Program and Policy Coordination, Regional Coordinators and Military Assistance Staff (FPC/RC).)

Less than 1% of 1975 budget was for military expenses. Less than 1% of 1974 foreign exchange resources expended on military equipment. No sophisticated weapons systems have been purchased by GOP.

### Conditions of The Loan

#### General Soundness

20. FAA s 201 (d). Information and conclusion on reasonableness and legality (under laws of country and the United States) of lending and re-lending terms of the loan.
21. FAA s 201 (b) (2); s 201 (e) Information and conclusion on activity's economic and technical soundness. If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds \$100,000, has country submitted to A.I.D. an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?
22. FAA s 201 (b) (2). Information and conclusion on capacity of the country to repay the loan, including reasonableness of repayment prospects.

The terms are both reasonable and consistent under the applicable U. S. and Panamanian laws.

The Borrower has made an application for loan financed assistance in this activity and there have been assurances that funds will be used in an economically and technically sound manner.

There are reasonable prospects of repayment.

23. FAA s 201 (b) (1). Information and conclusion on availability of financing from other free-world sources, including private sources within the United States.

Financing for this activity from alternative sources is not available.

24. FAA s 611 (a) (1). Prior to signing of loan will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the United States of the assistance?

Yes.

25. FAA s 611 (a) (2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of loan?

No further legislative action is required to accomplish the loan's purpose.

26. FAA s 611 (c). If loan is for Capital Assistance, and all U.S. assistance to project now exceeds \$1 million; has Mission Director certified the country's capability effectively to maintain and utilize the project?

Yes.

Loan's Relationship to Achievement of Country and Regional Goals

27. FAA s 207; s 113  
Extent to which assistance reflects appropriate emphasis on; (a) encouraging development of democratic, economic, political, and social institutions; (b) self-help in meeting the country's food needs; (c) improving availability of trained manpower in the country; (d) programs designed to meet the country's health needs;

This loan will enhance the ability of the public health system to extend basic health services to marginal populations while simultaneously strengthening community involvement in the design, execution, and evaluation of health programs. A significant portion of the health personnel to be trained under the loan will be women.

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(e) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (f) integrating women into the recipient country's national economy.

28. FAA § 209. Is project susceptible of execution as part of regional project? If so why is project not so executed?

This project cannot be executed as part of a regional project since it is designed to strengthen the public health delivery system wholly within Panama.

29. FAA § 201 (b) (4). Information and conclusion on activity's relationship to, and consistency with, other development activities, and its contribution to realizable long-range objectives.

The project is supportive of and consistent with the GOP's health sector goals which include: accelerating the process of incorporating the marginal population, especially those residing in the rural sector, within the scope of health service coverage; and guaranteeing the quality and efficiency of health services within the context of an integrated public health system.

30. FAA § 201 (h) (9). Information and conclusion on whether or not the activity to be financed will contribute to the achievement of self-sustaining growth.

The loan activities are designed to improve the health of Panama's population. A healthy population is a prerequisite for achieving any long term development objective.

31. FAA § 209; Information and conclusion whether assistance will encourage regional development programs.

Although the project is not designed with a view to promoting regional development programs, it may well serve as a model for health delivery systems in other developing countries.

32. FAA s 111. Discuss the extent to which the loan will strengthen the participation of urban and rural poor in their country's development, and will assist in the development of cooperatives which will enable and encourage greater numbers of poor people to help themselves toward a better life.
- As a working principle, the public health sector does not proceed with community-based health programs, such as those contemplated under this loan project, without the consent and direct participation of the Community Health Committee or other local representative group.
33. FAA s 201 (f). If this is a project loan, describe how such project will promote the country's economic development taking into account the country's human and material resources requirements and relationship between ultimate objectives of the project and overall economic development.
- See items 27, 29, 30, and 32.
34. FAA s 281 (a). Describe extent to which the loan will contribute to the objective of assuring maximum participation in the task of economic development on the part of the people of the country, through the encouragement of democratic, private, and local governmental institutions.
- See item 32.
35. FAA s 281 (b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.
- In addition to involving the marginal population in the execution of community based health activities, the project also supports the integration of the two principal public health entities, thereby rationalizing the utilization of existing health resources.
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36. FAA § 201 (b) (3). In what ways does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities? By extending basic health services coverage to a significant portion of the marginal population, the health and productive capacity of this target group will be improved. Furthermore, several hundred community residents will be trained to provide basic medical care within their communities and districts.
37. FAA § 601 (a). Information and conclusions whether loan will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions. Not applicable.
38. FAA § 619. If assistance is for newly independent country, is it furnished through multi-lateral organizations or plans to the maximum extent appropriate? Panama is not a newly independent country.

Loan's Effect on U.S. and A.I.D. Program

39. FAA § 201 (b) (6). Information and conclusion on possible effects of loan on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities This project will have no foreseeable adverse effects on the U.S. economy or areas of labor surplus. Assistance will be furnished in a manner consistent with improving the U. S. balance of payments position.

and assistance are furnished in a manner consistent with improving the U.S. balance of payments position.

40. FAA § 202 (a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources.
- Loan proceeds will be used to procure goods and services primarily from private sources.
41. FAA § 601 (b). Information and conclusion on how the loan will encourage U.S. private trade and investment abroad and how it will encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).
- It is anticipated that a portion of the technical assistance and most of the equipment for the project will be procured from U. S. private sector sources.
42. FAA § 601 (d). If a capital project, are engineering and professional services of U.S. firms and their affiliates used to the maximum extent consistent with the national interest?
- Services of U. S. professional firms will be utilized to the maximum extent practicable.

43. FAA § 602. Information and conclusion whether U.S. small business will participate equitably in the furnishing of goods and service financed by the loan.

Standard procedures will be followed to facilitate small business participation in AID financed procurement.

44. FAA § 620 (b). Will the loan promote or assist the foreign aid projects or activities of the Communist-Bloc countries?

No.

45. FAA § 621. If Technical Assistance is financed by the loan, information and conclusion whether such assistance will be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis. If the facilities of other Federal agencies will be utilized, information and conclusion on whether they are particularly suitable, are not competitive with private enterprise, and can be made available without undue interference with domestic programs.

Loan financed technical assistance will be furnished primarily from private sources on a contract basis.

Loan's Compliance with Specific Requirements

46. FAA § 110 (a); § 208 (a). In what manner has or will the recipient country provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the Loan is to be made?

The Ministry of Planning and Economic Policy has agreed to provide a counter-part contribution in excess of 25% of total project cost.

47. FAA § 112. Will loan be used to finance police training or related program in recipient country? No.
48. FAA § 114. Will loan be used to pay for performance of abortions or to motivate or coerce persons to practice abortions? No.
49. FAA § 201 (b). Is the country among the 20 countries in which development loan funds may be used to make loans in this fiscal year? Yes.
50. FAA § 201 (d). Is interest rate of loan at least 2% per annum during grace period and at least 3% per annum thereafter? Yes.
51. FAA § 201 (f). If this is a project loan, what provisions have been made for appropriate participation by the recipient country's private enterprise? Panamanian private enterprise is expected to participate in the project through the provision of commodities, construction and other professional services.
52. FAA § 604 (a). Will all commodity procurement financed under the loan be from the United States except as otherwise determined by the President? Loan funded commodity procurement will be limited to Panama, the United States and other AID Geographic Code 941 countries.

53. FAA § 604 (b). What provision is made to prevent financing commodity procurement in bulk at prices higher than adjusted U.S. market price?

While no bulk commodity procurement is contemplated under this loan, any such procurement would be subject to competitive bid procedures.

54. FAA § 604 (d). If the cooperating country discriminates against U.S. marine insurance companies, will loan agreement require that marine insurance be placed in the United States on commodities financed by the loan?

Yes.

55. FAA § 604 (e). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity?

Not applicable.

56. FAA § 604 (f). If loan finances a commodity import program, will arrangements be made for supplier certification to A.I.D. and A.I.D. approval of commodity as eligible and suitable?

This loan is not a program type loan. Nevertheless, AID will confirm that the commodities financed by the loan are suitable for the project and eligible for AID financing.

57. FAA § 608 (a). Information on measures to be taken to utilize U.S. Government excess personal property in lieu of the procurement of new items.

The Loan Agreement will so stipulate.

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58. FAA s 611 (b); App. s 101. If loan finances water or water-related land resource construction project or program, is there a benefit-cost computation made, insofar as practicable, in accordance with the procedures set forth in the Memorandum of the President dated May 15, 1962? Not applicable.
59. FAA s 611 (c). If contracts for construction are to be financed what provision will be made that they be let on a competitive basis to maximum extent practicable? Panamanian law so requires.
60. FAA s 612 (b); s 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the United States are utilized to meet the cost of contractual and other services Not applicable. The currency used in Panama is the U. S. Dollar although it is denominated a "Balboa". There is no U. S. owned "local currency".
61. App. s 113. Will any of loan funds be used to acquire currency of recipient country from non-U.S. Treasury sources when excess currency of that country is on deposit in U.S. Treasury? No.
62. FAA s 612 (d). Does the United States own excess foreign currency and, if so, what arrangements have been made for its release? Not applicable.

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63. FAA s 620 (g). What provision is there against use of subject assistance to compensate owners for expropriated or nationalized property? The loan agreement will preclude such use of loan funds.
64. FAA s 620 (k). If construction of productive enterprise, will aggregate value of assistance to be furnished by the United States exceed \$100 million? Not applicable.
65. FAA s 636 (i). Will any loan funds be used to finance purchase, long-term lease, or exchange of motor vehicle manufactured outside the United States or any guaranty of such transaction? No. No non-U.S. manufactured motor vehicle will be so financed under the loan.
66. App. s 103. Will any loan funds be used to pay pensions, etc., for military personnel? No.
67. App. s 105. If loan is for capital project, is there provision for A.I.D. approval of all contractors and contract terms? Yes.
68. App. s 107. Will any loan funds be used to pay UN assessments? No.

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69. App. s 108. Compliance with regulations on employment of U.S. and local personnel. (A.I.D. Regulation 7).

Loan agreement and implementation letter will so provide.

70. App. s 110. Will any of loan funds be used to carry out provisions of FAA s s 209 (d)?

No.

71. App. s. 114. Describe how the Committee on Appropriations of the Senate and House have been or will be notified concerning the activity, program, project, country, or other operation to be financed by the Loan.

This loan project was included in the AID FY 76 Congressional Presentation.

72. App. s 601. Will any loan funds be used for publicity or propaganda purposes within the United States not authorized by Congress?

No.

73. MMA s 901. b; FAA s 640 C.

(a) Compliance with requirement that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed with funds made available under this loan shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates.

This loan agreement will require that Borrower comply with this provision.

(b) Will grant be made to loan recipient to pay all or any portion of such differential as may exist between U.S. and foreign-flag vessel rates?

Yes, in accordance with Section 2.G.4 of AID Handbook No. 15, provided funds are made available by AID/W.

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74. Section 30 and 31 of PL 93-189  
(FAA of 1973).

Will any part of the loan be used to finance directly or indirectly military or paramilitary operations by the U.S. or by foreign forces in or over Laos, Cambodia, North Vietnam, South Vietnam, or Thailand?

No.

75. Section 37 of PL 93-189 (FAA of  
1973); App. s. 111. Will any part

of this loan be used to aid or assist generally or in the reconstruction of North Vietnam?

No.

76. App. s 112. Will any of the funds appropriated or local currencies generated as a result of AID assistance be used for support of police or prison construction and administration in South Vietnam or for support of police training of South Vietnamese?

No.

77. App. s 604. Will any of the funds appropriated for this project be used to furnish petroleum fuels produced in the continental United States to Southeast Asia for use by non-U.S. nationals?

No.

STATUS OF COMMUNITY GARDEN AND POULTRY PROJECTS IN SELECTED COMMUNITIES

YEAR: 1975

| No.         | Comunidad            | Distrito    | Provincia   | Proyecto | Familias Participantes | Ejemplares Legal de la Tierra | Superficie bajo cultivo (Ha) | Puntos de agua para riego | Siembras y cosechas por año | Volumen anual de la Producción |                 |                 |                     |                  | Utilización de la cosecha |         | Proyecto | Cantidad | Ejemplares (aves) | Bienes diarios | Utilización de la Producción |         | Tipo de Organización | Atención Identificación Manual (Proyectos) | Estado actual del equipo  | Observaciones y comentarios generales            |   |   |  |  |
|-------------|----------------------|-------------|-------------|----------|------------------------|-------------------------------|------------------------------|---------------------------|-----------------------------|--------------------------------|-----------------|-----------------|---------------------|------------------|---------------------------|---------|----------|----------|-------------------|----------------|------------------------------|---------|----------------------|--|---|--|---|---|--|--|
|             |                      |             |             |          |                        |                               |                              |                           |                             | Hortalizas (quinales)          | Haja (quinales) | Aros (quinales) | Frijoles (quinales) | Otros (quinales) | Consumo Domestico %       | Venta % |          |          |                   |                | Consumo Familiar %           | Venta % |                      |  |   |  |   |   |  |  |
| 1.          | Los Martales .....   | Chorrera    | Panamá      | H        | 13                     | A                             | 2.5                          | 2.5                       | 2                           | 2                              | 400             | 60              | 8                   | 200              | 50                        | 50      | 490      | 7        | 350               | 10             | 90                           | CS      | 1                    | B  | Buena comunidad.  |  |   |   |  |  |
| 2.          | El Espino .....      | San Carlos  | Panamá      | H        | 10                     | F                             | 2.5                          | 1                         | 0                           | 0                              | 400             | 70              | 45                  | 100              | 75                        | 25      | 70       | 490      | 7                 | 350            | 20                           | 80      | CS                   | 2  | B   | Comunidad interesada en el programa.             |   |   |  |  |
| 3.          | Las Margaritas ..... | San Carlos  | Panamá      | H        | 20                     | F                             | 2                            | 1.5                       | 0                           | 2                              | 300             | 30              | 6                   | 50               | 75                        | 25      | 70       | 470      | 7                 | 350            | 20                           | 80      | CS                   | 2  | B   | Comunidad muy entusiasmada.                      |   |   |  |  |
| 4.          | La Merced .....      | Chorrera    | Panamá      | H        | 15                     | -                             | -                            | -                         | 0                           | 0                              | -               | -               | -                   | -                | -                         | -       | 70       | 500      | 10/2              | 200            | 15                           | 85      | CS                   | 2  | B   | Necesita un poco más de organización.            |   |   |  |  |
| 5.          | El Estero .....      | Chorrera    | Panamá      | H        | 11                     | F                             | 10                           | 1                         | 2                           | 2                              | 800             | 100             | 20                  | 300              | 50                        | 50      | -        | -        | -                 | 200            | 15                           | 85      | CS                   | 2  | B   | Planean cultivar toda la tierra este año 1976.   |   |   |  |  |
| 6.          | Santa Rosa .....     | Capira      | Panamá      | H        | 33                     | F                             | 5                            | 2                         | 0                           | 2                              | 100             | 25              | 10                  | 60               | NHI                       | NHI     | -        | -        | -                 | NHC            | NHC                          | CS      | 2                    | B  | La producción es ostentada, pues no se ha terminado de cosechar.  |  |   |   |  |  |
| 7.          | Alto de Pedregal ..  | Panamá      | Panamá      | H        | 15                     | PRO                           | 6                            | 2                         | 2                           | 2                              | 200             | 120             | 45                  | 200              | 80                        | 20      | 70       | 650      | 6                 | 486            | 10                           | 90      | CS                   | 4  | B   | Con mayor organización pueden producir más.      |   |   |  |  |
| 8.          | Bajo El Piro .....   | Chepo       | Panamá      | H        | 20                     | F                             | 5                            | 1                         | 2                           | 1                              | 50              | 40              | 15                  | 50               | 50                        | 70      | 470      | 8        | 486               | 10             | 50                           | CS      | 4                    | B  | Puede ser mejor si se le ayuda con más asistencia y organización. |  |   |   |  |  |
| 9.          | El José de Pedregal  | Panamá      | Panamá      | H        | 13                     | PRO                           | 7                            | 2                         | 2                           | 3                              | 60              | 160             | 60                  | 800              | 15                        | 85      | -        | -        | -                 | -              | -                            | CS      | 2                    | B  | Comunidad muy unida y trabajadora.                                |  |   |   |  |  |
| 10.         | Santa Cruz .....     | Panamá      | Panamá      | H        | 10                     | F                             | 5                            | 2                         | 2                           | 2                              | 20              | 12              | 6                   | -                | -                         | -       | -        | -        | -                 | -              | -                            | CS      | 2                    | B  | Responsable bien al programa. Comenidos nuevos.                   |  |   |   |  |  |
| 11.         | Santa Fe .....       | Chagres     | Colón       | H        | 28                     | PRO                           | 5                            | 1                         | 0                           | 1                              | 30              | 15              | 2                   | -                | -                         | -       | -        | -        | -                 | -              | -                            | CS      | 2                    | B  | Comunidad de difícil acceso en estación lluviosa.                 |  |   |   |  |  |
| 12.         | Cajón .....          | Colón       | Colón       | H        | 14                     | PRO                           | 5                            | 1                         | 0                           | 2                              | 120             | 80              | 90                  | -                | -                         | -       | -        | -        | -                 | -              | -                            | CS      | 2                    | NR   | Necesita mayor ayuda para mejorar su producción.                  |  |   |   |  |  |
| 13.         | El Guabo .....       | Chagres     | Colón       | H        | 15                     | F                             | 5                            | 2                         | 1                           | 1                              | 45              | 24              | 15                  | -                | -                         | -       | -        | -        | -                 | -              | -                            | CS      | 2                    | B  | Preparan tierra para nuevas siembras.                             |  |   |   |  |  |
| 14.         | El Silencio .....    | Changuinola | B. del Toro | H        | 50                     | PRO                           | 7                            | 2                         | 2                           | 2                              | 600             | 80              | 100                 | 400              | 85                        | 15      | 70       | 750      | -                 | -              | -                            | CS      | 2                    | B  | Programa coordinado con la Escuela de Producción.                 |  |   |   |  |  |
| 15.         | Las Tablas .....     | Changuinola | B. del Toro | H        | 10                     | F                             | 7                            | 2                         | 2                           | 1                              | 100             | 15              | 42                  | 100              | -                         | -       | -        | -        | -                 | -              | -                            | CS      | 2                    | B  | Necesitan equipo pesado para desmontar sus terrenos de trabajo.   |  |   |   |  |  |
| 16.         | Finca 31 .....       | Changuinola | B. del Toro | H        | 12                     | PRO                           | 10                           | 10                        | 2                           | 2                              | 1600            | 400             | 16                  | 1400             | 5                         | 95      | -        | -        | -                 | -              | -                            | CS      | 2                    | NR   | Alto espíritu de trabajo y dedicación al huerto.                  |  |   |   |  |  |
| 17.         | Finca 32 .....       | Changuinola | B. del Toro | H        | 20                     | PRO                           | 26                           | 6                         | 2                           | 1                              | 400             | 200             | -                   | 900              | 5                         | 95      | -        | -        | -                 | -              | -                            | CS      | 2                    | B  | Necesitan equipo pesado (desmontar y desmenuzar).                 |  |   |   |  |  |
| 18.         | Tubalá .....         | C. San Blas | C. San Blas | H        | 45                     | PRO                           | 8.5                          | 7                         | 2                           | 1                              | 30              | 15              | -                   | 200              | 100                       | -       | -        | -        | -                 | -              | -                            | CS      | 2                    | NR   | Preparan terreno para siembra.                                    |  |   |   |  |  |
| 19.         | Cajón .....          | C. San Blas | C. San Blas | H        | 30                     | PRO                           | 12.5                         | 7                         | 2                           | 2                              | 700             | 45              | 15                  | 75               | 50                        | 50      | -        | -        | -                 | -              | -                            | CS      | 2                    | B  | Trab. con entusiasmo; esperan mejorar este año.                   |  |   |   |  |  |
| 20.         | Año Anicari .....    | C. San Blas | C. San Blas | H        | 20                     | PRO                           | 9                            | 1                         | 2                           | 2                              | 40              | 12              | -                   | -                | -                         | 100     | -        | -        | -                 | -              | -                            | CS      | 1                    | B  | Com. interesada en que se le visite con mayor frecuencia.         |  |   |   |  |  |
| 21.         | Alligarif .....      | C. San Blas | C. San Blas | H        | 30                     | PRO                           | 37                           | 19                        | 2                           | 3                              | 4000            | 800             | 30                  | 1400             | 75                        | 25      | 70       | 500      | 2                 | -              | -                            | CS      | 2                    | B  | Com. que ha avanzado mucho más allá del programa.                 |  |   |   |  |  |
| 22.         | Alto Los Sánchez ..  | La Mesa     | Veraguas    | H        | 15                     | PRO                           | 5                            | 1                         | 0                           | 2                              | 100             | 140             | 90                  | 30               | 30                        | 25      | 70       | 500      | 8 días            | -              | -                            | CS      | 2                    | B  | Proyecto y parece ser una comunidad trabajadora.                  |  |   |   |  |  |
| 23.         | La Esca .....        | San Feo.    | Veraguas    | H        | 29                     | F                             | 5                            | 1                         | 0                           | 1                              | 450             | 60              | 9                   | -                | -                         | 25      | 75       | 70       | 600               | 8 días         | 400                          | 5       | 95                   | CS   | 2   | B  | Terminado de cosechar e iniciar nuevas siembras.    |   |  |  |
| 24.         | Llano Largo .....    | Montijo     | Veraguas    | H        | 14                     | PRO                           | 5                            | 1                         | 0                           | 1                              | -               | -               | -                   | -                | -                         | -       | -        | -        | -                 | -              | -                            | CS      | 2                    | B  | Comunidad no está respondiendo bien al programa.                  |  |   |   |  |  |
| 25.         | La Pita .....        | Las Palmas  | Veraguas    | H        | 19                     | F                             | 5                            | 2                         | 2                           | 2                              | -               | -               | 11                  | -                | -                         | -       | -        | -        | -                 | -              | -                            | CS      | 2                    | B  | Com. nueva, inicia trab. de prod. Muy buena.                      |  |   |   |  |  |
| 26.         | La Trinidad .....    | S. de Jesús | Veraguas    | H        | 16                     | PRO                           | 5                            | 1                         | 0                           | 2                              | 400             | -               | -                   | -                | -                         | -       | -        | -        | -                 | -              | -                            | CS      | 2                    | B  | Necesita ampliar el área de cultivo.                              |  |   |   |  |  |
| 27.         | El Pedregal .....    | Zuf         | Herrera     | H        | 18                     | PRO                           | 2                            | 1                         | 0                           | 2                              | 100             | 35              | 10                  | 100              | -                         | 100     | -        | 20       | -                 | 70             | 430                          | 6       | 293                  | 10   | 90  | CS   | 2   | B | Com. no inició con proyecto de cría de aves. |  |
| 28.         | El Estero .....      | San María   | Herrera     | H        | 7                      | F                             | 1                            | 1                         | 0                           | 2                              | 200             | 60              | 25                  | -                | -                         | 100     | -        | 70       | 540               | 7              | 250                          | 100     | -                    | CS   | 2   | B  | Compraron 2 Ha. de terreno para aumentar el H.      |   |  |  |
| 29.         | Chigá .....          | Nevarras    | Los Santos  | H        | 7                      | F                             | 5                            | 3                         | 2                           | 2                              | 100             | 300             | 45                  | -                | -                         | 100     | -        | 70       | 400               | 9              | 300                          | 10      | 90                   | CS   | 2   | B  | Com. integrada por mujeres, muy entusiasmadas.      |   |  |  |
| 30.         | Esley .....          | San Lorenzo | Chiriquí    | H        | 50                     | PRO                           | 3                            | 3                         | 2                           | 2                              | 50              | 40              | 350                 | 5                | 8                         | 100     | 70       | 400      | 9                 | 300            | 10                           | 90      | CS                   | 2  | B   | Com. muy avanzada en su producción y cosechas.   |   |   |  |  |
| 31.         | El Puerto .....      | Benedice    | Chiriquí    | H        | 30                     | PRO                           | 4                            | 2                         | 1                           | 1                              | 60              | 30              | 40                  | -                | -                         | 100     | -        | 70       | 800               | 4              | -                            | -       | CS                   | 2  | B   | Froy. mantenido en coord. con la Esc. de Prod.   |   |   |  |  |
| 32.         | Guabo del Guabo ..   | Benedice    | Chiriquí    | H        | 19                     | F                             | 4                            | 2                         | 1                           | 1                              | 30              | 40              | 40                  | -                | -                         | 50      | 50       | -        | -                 | -              | -                            | CS      | 2                    | B  | Necesitan mayor org. para mejorar los trabajos.                   |  |   |   |  |  |
| 33.         | Santa Lucía .....    | Benedice    | Chiriquí    | H        | 6                      | F                             | 4                            | 2                         | 1                           | 1                              | 150             | 40              | 15                  | -                | -                         | 100     | -        | 70       | 500               | 5              | -                            | -       | CS                   | 2  | NR  | Com. con nec. de orientación sobre el programa.  |   |   |  |  |
| 34.         | San Rita .....       | Gualea      | Chiriquí    | H        | 10                     | PRO                           | 7                            | 2                         | 2                           | 2                              | 75              | 120             | 100                 | 100              | -                         | 100     | -        | -        | -                 | -              | -                            | CS      | 2                    | B  | Huerto en preparación para nuevas siembras.                       |  |   |   |  |  |
| 35.         | Faja de Sábalo ..... | Gualea      | Chiriquí    | H        | 10                     | PRO                           | 5                            | 1                         | 0                           | 2                              | 25              | 25              | 60                  | -                | -                         | 100     | -        | -        | -                 | -              | -                            | CS      | 2                    | D  | Com. empezó 7 Ha. para trabajar el huerto.                        |  |   |   |  |  |
| 36.         | Las Lunas .....      | David       | Chiriquí    | H        | 18                     | F                             | 3                            | 1                         | 2                           | 1                              | 25              | 25              | 12                  | -                | -                         | 100     | -        | -        | -                 | -              | -                            | CS      | 2                    | D  | Com. interesada pero de dif. acceso en invierno.                  |  |   |   |  |  |
| 37.         | Alto de Cochón ..... | David       | Chiriquí    | H        | 12                     | F                             | 2                            | 1                         | 0                           | 1                              | 40              | 40              | 12                  | -                | -                         | 100     | -        | -        | -                 | -              | -                            | CS      | 1                    | B  | Froy. coord. con la J. Comunal de la comunidad.                   |  |   |   |  |  |
| 38.         | Las Brisas .....     | Delgado     | Chiriquí    | H        | 24                     | F                             | 4                            | 3                         | 2                           | 2                              | 400             | 90              | 200                 | 40               | 40                        | 50      | -        | -        | -                 | -              | -                            | CS      | 1                    | B  | El invierno no dejó avanzar los trab. del H.                      |  |   |   |  |  |
| 39.         | Las Brisas .....     | Delgado     | Chiriquí    | H        | 14                     | F                             | 2                            | 1                         | 0                           | 1                              | 300             | 75              | 60                  | 10               | 100                       | -       | 70       | 480      | 8                 | 350            | 10                           | 90      | CS                   | 2  | B   | Mucho interés; dificultad con el grupo de riego. |   |   |  |  |
| 40.         | Las Brisas .....     | Benedice    | Chiriquí    | H        | 8                      | F                             | 2                            | 1                         | 0                           | 1                              | 150             | 30              | 8                   | -                | -                         | 100     | -        | 70       | 480               | 8              | 350                          | 10      | 90                   | CS   | 2   | B  | Nuevo interés y organización en el grupo de Trab.   |   |  |  |
| 41.         | Cajón .....          | Benedice    | Chiriquí    | H        | 14                     | F                             | 2                            | 1                         | 0                           | 1                              | 450             | 80              | 40                  | -                | -                         | 100     | -        | 70       | 480               | 8              | 350                          | 10      | 90                   | CS   | 2   | B  | En proceso de prep. de tierra para nuevas siembras. |   |  |  |
| 42.         | Monte Lirio .....    | Benedice    | Chiriquí    | H        | 7                      | F                             | 2                            | 1                         | 0                           | 1                              | 500             | 80              | 40                  | -                | -                         | 100     | -        | 70       | 480               | 8              | 350                          | 10      | 90                   | CS   | 2   | B  | No cultivan el huerto; esperan equipo de riego.     |   |  |  |
| 43.         | Banalán .....        | Pequerón    | Chiriquí    | H        | 12                     | F                             | 4                            | 2                         | 0                           | 1                              | 450             | 80              | 40                  | -                | -                         | 100     | -        | 70       | 480               | 8              | 350                          | 10      | 90                   | CS   | 2   | B  | El equipo trabaja en forma de cooperativa.          |   |  |  |
| 44.         | Paraso Centro .....  | Pequerón    | Chiriquí    | H        | 9                      | A                             | 3                            | 3                         | 2                           | 1                              | 200             | 80              | 12                  | -                | -                         | 25      | 25       | -        | -                 | -              | -                            | CS      | 2                    | B  | Com. iniciándose en huerto y área al mismo tiempo.                |  |   |   |  |  |
| 45.         | Santa Rita .....     | Antón       | Coelí       | H        | 16                     | F                             | 6                            | 4                         | 0                           | 2                              | 200             | 45              | 150                 | 16               | 70                        | 30      | -        | -        | -                 | -              | -                            | CS      | 2                    | B  | Buen grupo de trabajo.  |  |   |   |  |  |
| 46.         | Las Alveras .....    | Antón       | Coelí       | H        | 15                     | F                             | 2                            | 2                         | 2                           | 2                              | 600             | 80              | 28                  | 6                | 100                       | 70      | 490      | 6        | 425               | 80             | 20                           | CS      | 2                    | B  | Com. con buena organización de trabajo.                           |  |   |   |  |  |
| 47.         | Cajón .....          | Antón       | Coelí       | H        | 20                     | F                             | 3                            | 3                         | 0                           | 2                              | 700             | 50              | 35                  | 5                | 100                       | -       | -        | -        | -                 | -              | -                            | CS      | 2                    | B  | Buena com. Participa muy unida en el programa.                    |  |   |   |  |  |
| 48.         | El Financé .....     | Agua Dulce  | Coelí       | H        | 13                     | A                             | 3                            | 3                         | 0                           | 2                              | 250             | 60              | 15                  | 42               | 75                        | 25      | 70       | 710      | 2                 | -              | -                            | CS      | 2                    | B  | No se trab. el huerto; esperan equipo de riego.                   |  |   |   |  |  |
| 49.         | Finca Grande .....   | Panagán     | Darién      | H        | 28                     | F                             | 4                            | 1                         | 1                           | 1                              | 175             | 45              | 20                  | 60               | 40                        | -       | -        | -        | -                 | -              | -                            | CS      | 1                    | B  | Buena perspectiva cult. huerto y prog. en general.                |  |   |   |  |  |
| 50.         | La Colonia .....     | Chapigana   | Darién      | H        | 14                     | PRO                           | 4                            | 1                         | 1                           | 1                              | 200             | 30              | 25                  | 8                | 175                       | 30      | 50       | -        | -                 | -              | -                            | CS      | 1                    | B  | Com. semi-independiente en sus trab. Muy unidos.                  |  |   |   |  |  |
| 51.         | Garabito .....       | Chapigana   | Darién      | H        | 30                     | F                             | 4                            | 1                         | 1                           | 1                              | 200             | 30              | 25                  | 8                | 175                       | 30      | 50       | -        | -                 | -              | -                            | CS      | 1                    | B  | Com. semi-independiente en sus trab. Muy unidos.                  |  |   |   |  |  |
| TOTAL ..... |                      |             |             |          | 1031                   |                               | 300                          | 114.21                    |                             |                                | 14670           | 2901            | 1212                | 882              | 4554                      |         |          | 2210     |                   |                |                              |         |                      |  |   |  |   |   |  |  |

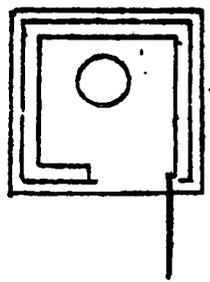
A = Alquiler    H = Huerto    R = Rfo    CS = Comité de Salud    B = Bueno    NHI = No hay información    \* = Área compraban al momento de la visita a la comunidad.  
 F = Frotada    PO = Ponedora    D = Quebrada    EP = Escuela de Producción    NR = Necesita reparación    NHC = No ha cosechado aún  
 PRO = Propia    M = No hay    AC = Asociación Campesino    EN = En reparación    D = Dado

Panamá, 29 de marzo de 1976

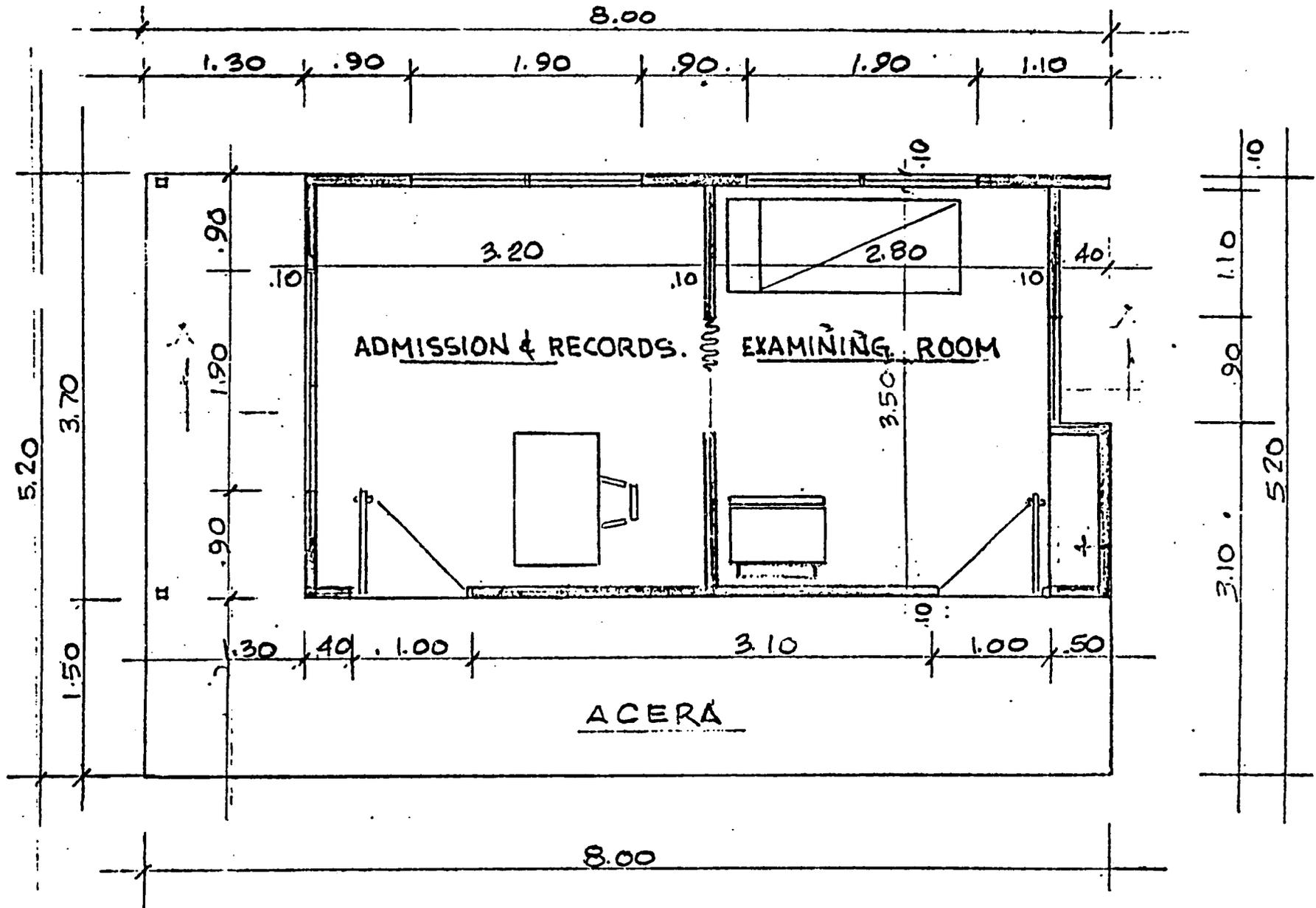
1/ Sales of egg production were high since MGH did not provide feed for sufficient period of time to enable communities to consume higher percentage of egg production. This problem has been corrected and community consumption rates have increased to 25-50% of production.

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# HEALTH POST



LETRINA



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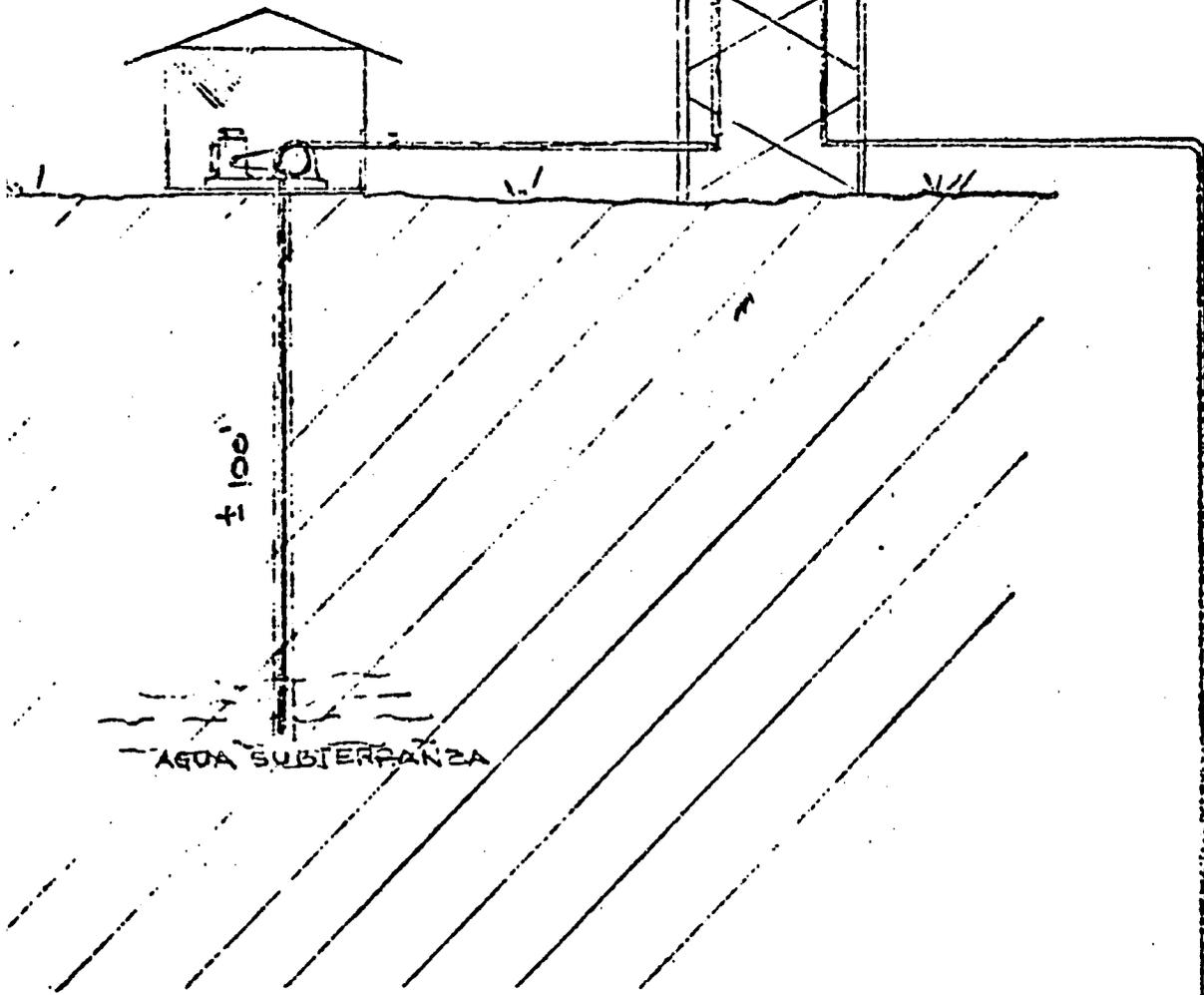
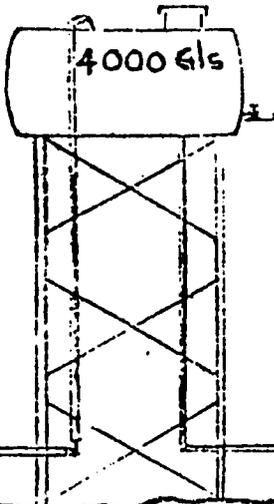


ESQUEMA  
ACUEDUCTO RURAL

TANQUE Y  
TORRE

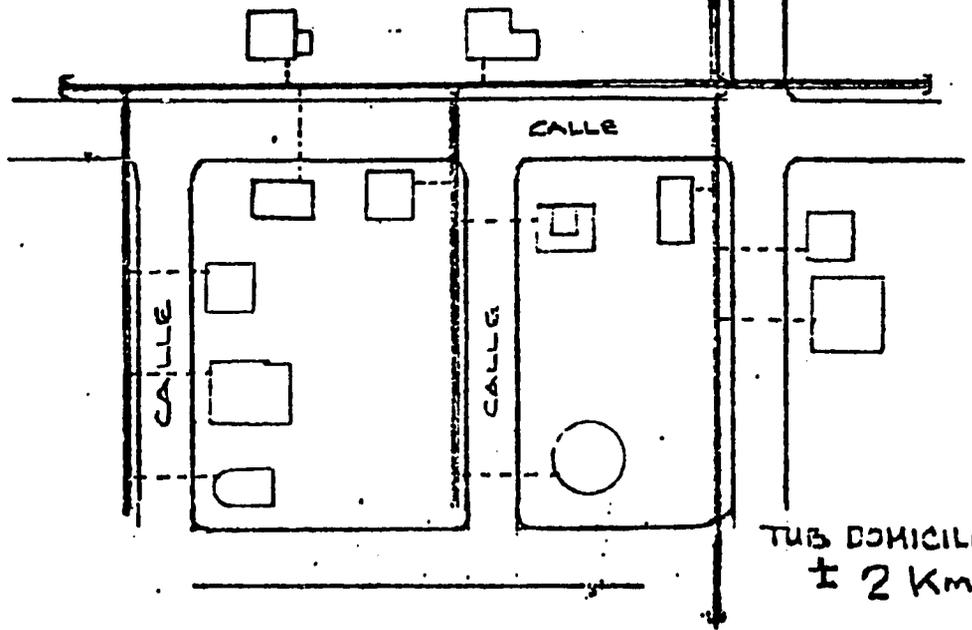
ANNEX G-2  
Page 4 of 6

CASETA MOTOR Y BOMBA



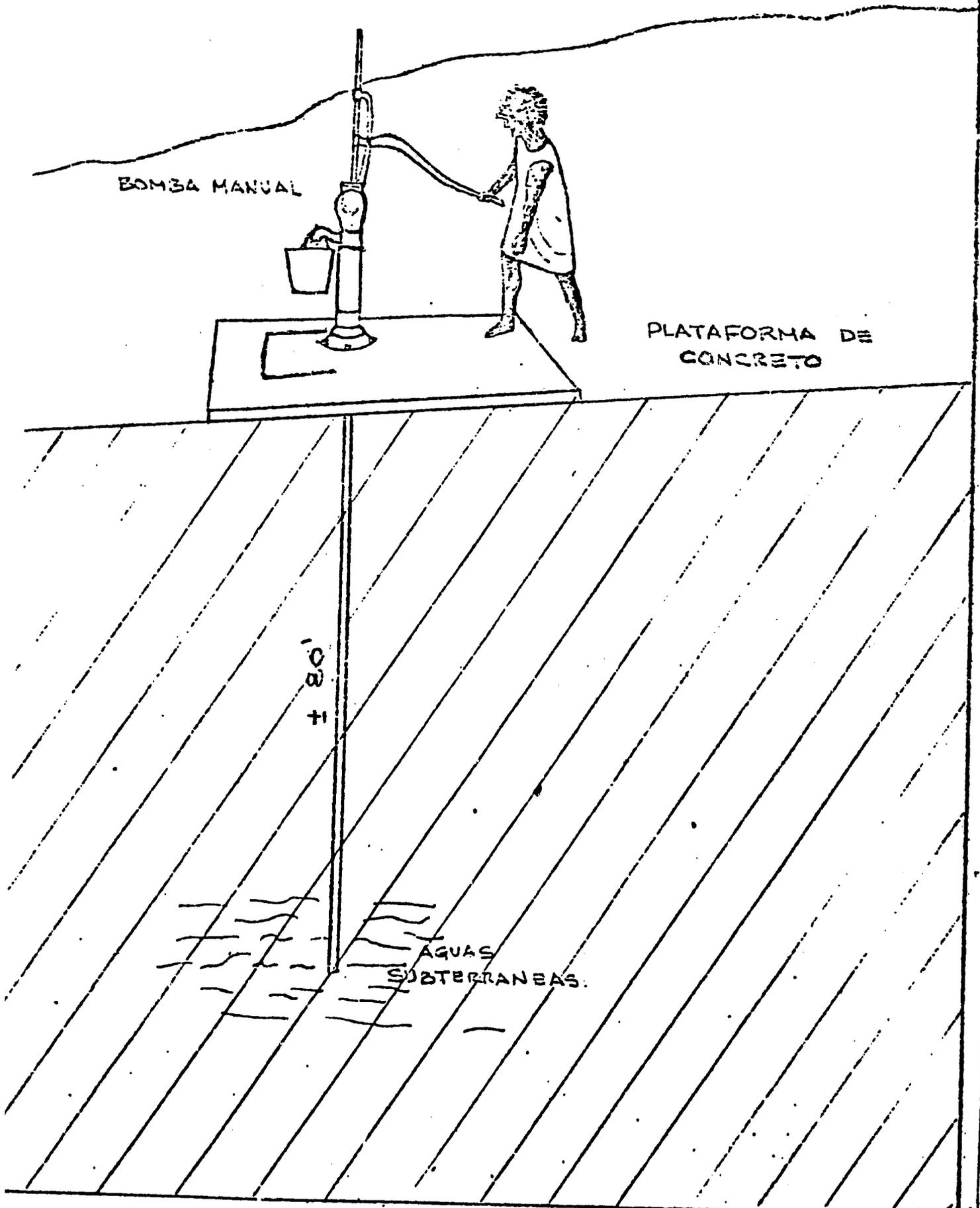
TUB DE DISTRIB.  
± 2.2 Km.

SALUD IGUAL  
PARA TODOS.  
PANAMA

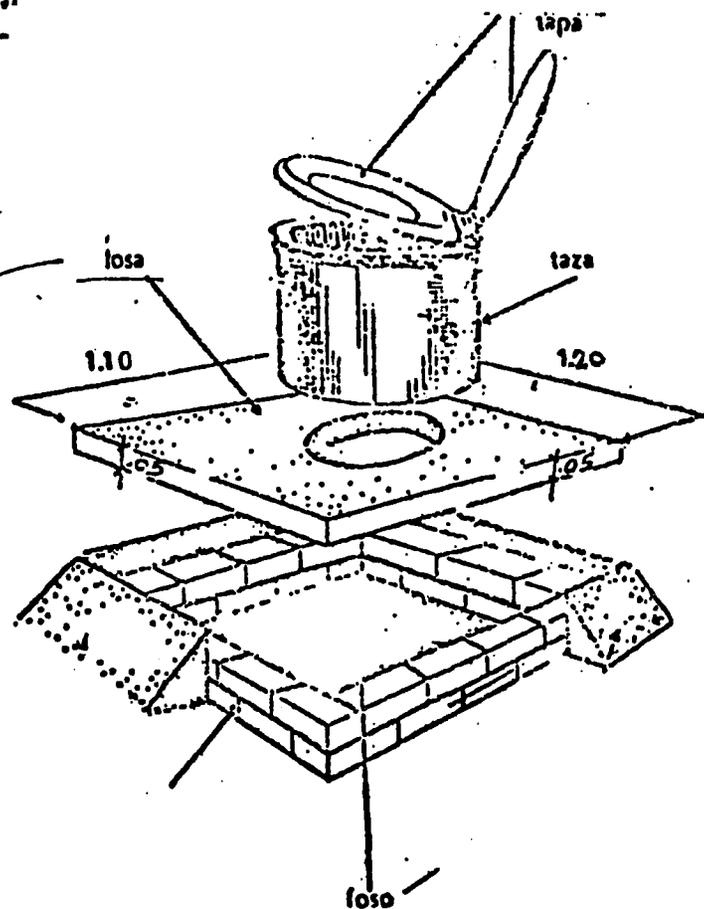
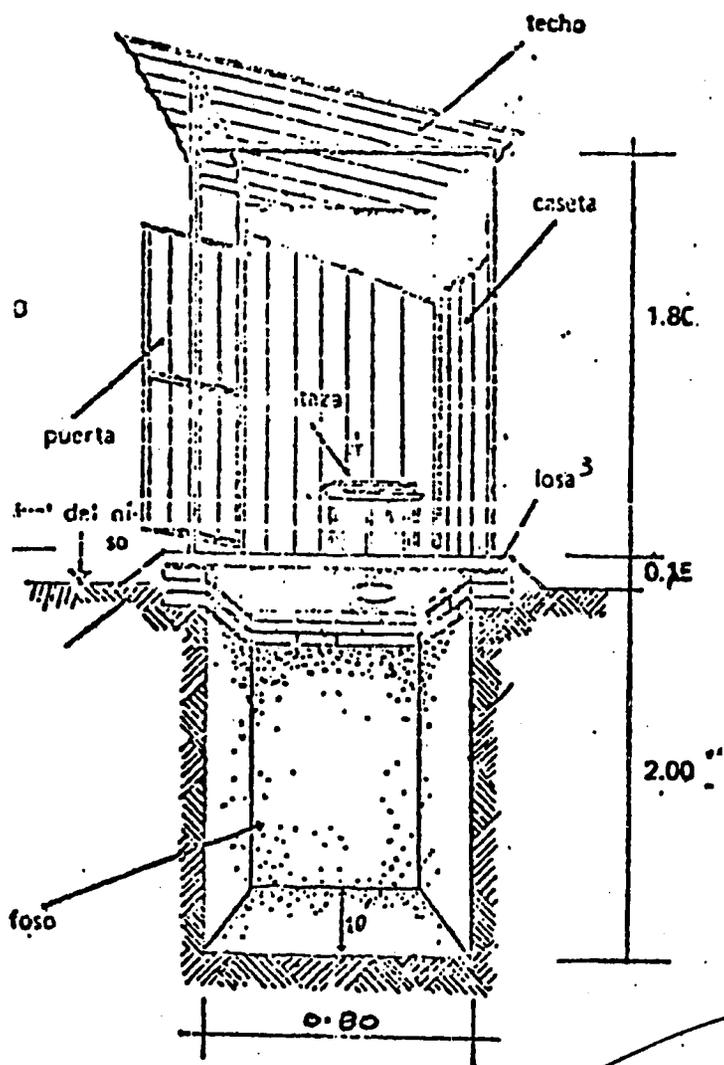


TUB DOMICILIARI  
± 2 Km.

ESQUEMA DE  
BOMBA DE AGUA MANUAL



# ESQUEMA DE LETRINA TÍPICA



DEVELOPMENT OF MINISTRY OF HEALTH VEHICLE AND EQUIPMENT  
REQUIREMENTS FOR CONSTRUCTION COMPONENTS OF THE PROJECT

The equipment and vehicle listing for the construction component of the program (health posts, sub-centers, health centers, latrines, rural aqueducts and hand pump well systems) is based on the following assessments and calculations.

- A. An estimate was made of additional program vehicle/equipment requirements taking into account the number of health posts, sub-centers, health centers to be constructed, wells to be drilled and rural aqueducts constructed over the project period and the geographic dispersal of work in the three health regions. This information is shown in Table G-3/1.1.
- B. An inventory was made of existing MOH equipment currently being utilized on similar construction activities. Also, an assessment was made as to which equipment had to be replaced, which should remain serviceable over the life of the project, and reasonably beyond, and which might be cannibalized. A judgement was made by Ministry officials as to how the existing equipment might best be distributed between the construction components of the new Loan activity. This listing is shown in Table G-3/1.
- C. The deficiency list produced by comparing the requirements for the program with the useful equipment on hand determined the list of equipment to be financed with AID funds. In general, an austere approach was followed. Enough equipment was included to see that each region would be able to do its job within limits of the manpower available to effectively operate and maintain equipment utilized for the project. The list has built into it a fairly high rate of use for most equipment especially vehicles. Except for some specialized items, most equipment will be used on a daily basis. The MOH will have to be careful in scheduling around maintenance and repair downtime, but they have already shown that capability.

INVENTORY AND CONDITION OF EXISTING  
VEHICLES AND EQUIPMENT PROPOSED FOR  
CONSTRUCTION COMPONENTS OF THE PROJECT

| <u>Description</u>   | <u>Qty.</u> | <u>Model</u>   | <u>Condition</u>         |
|--|-------------|--|--------------------------|
| <u>Well Drilling Rigs</u>  | 5           | - Speed Star 71  | Good                     |
| Capable of develop-<br>ing 4 in. and 6 in.<br>wells at depths of<br>100 ft. to 150 ft. | ( 1         | - Speed Star 71  | Bad )                    |
|  | 2           | - Speed Star 55  | Good                     |
|  | 5           | - Speed Star 271   | Fair                     |
|  | ( 2         | - Speed Star 271   | Bad )                    |
|  | 3           | - Bucyrus Erie 20W                                       | Good                     |
|  | 2           | - Bucyrus Erie 20W                                       | Fair                     |
|  | ( 1         | - Bucyrus Erie 20W                                       | Bad )                    |
|  | 6           | - Bucyrus Erie 22W                                       | Good                     |
|  | 4           | - Speed Star 61  | Good                     |
|  | <hr/>       |  |                          |
|  | 27          | = Total units in good<br>to fair operating<br>condition. |                          |
| <u>Dump Trucks</u>   | 2           | - Ford 1970  | Fair                     |
|  | <u>7</u>    | - G.M.C. 1974  | Good                     |
|  | 9           | units  | (Good to Fair Condition) |

| <u>Description</u>                     | <u>Qty.</u> | <u>Model</u>        | <u>Condition</u>         |
|--|-------------|---------------------|--------------------------|
| <u>Flat-Bed Trucks</u>                 | 3 -         | Military 6x6        | Good                     |
|  | 4 -         | G.M.C. 1974         | Good                     |
|  | 1 -         | G.M.C. 1972         | Fair                     |
|  | <u>2 -</u>  | Dodge 1962          | Fair                     |
|  | 10          | units               | (Good to Fair Condition) |
| <u>Low-boy trailer<br/>and tractor</u> | 1 -         | G.M.C. 1968         | Good                     |
|  | <u>1 -</u>  | Great Dane 1974     | Good                     |
|  | 2           | units               | (Good Condition)         |
| <u>Pick-up trucks</u>                  | 6 -         | Military 4x4        | Good                     |
|  | 1 -         | Nissan 1970         | Fair                     |
|  | 1 -         | Ford 1974           | Good                     |
|  | 11 -        | G.M.C. 1974         | Good                     |
|  | 4 -         | Jeep 1975           | Good                     |
|  | 3 -         | Toyota 1970         | Fair                     |
|  | <u>4 -</u>  | Jeep Gladiator 1971 | Fair                     |
|  | 30          | units               | (Good to Fair Condition) |
| <u>Station Wagons</u>                  | 1 -         | Toyota 1970         | Fair                     |
|  | 1 -         | Toyota 1972         | Fair                     |
|  | <u>4 -</u>  | G.M.C. 1974         | Good                     |
|  | 6           | units               | (Good to Fair Condition) |
| <u>Sedan</u>                           | 1           | Chevelle 1974       | Good                     |

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LISTING OF VEHICLE AND EQUIPMENT REQUIREMENTS  
FOR CONSTRUCTION COMPONENTS OF THE PROJECT

| <u>ITEM</u>   | <u>Qty</u> | <u>PURPOSE</u>  | <u>\$</u> |
|---|------------|---|-----------|
| Dump trucks, 5 cu. yd. capacity   | 2          | Assigned to western and Central Regions for utilization in health facility construction activities  | 18,000.00 |
| Flat-bed trucks, 22 ft. platform  | 2          | For use in transporting materials and equipment from depots in Panama City to regional warehouses and rural community construction sites                            | 20,000.00 |
| Pick ups, 3/4 ton capacity, 4 wheel drive   | 10         | Assigned to the three regions for use by supervisory and construction management personnel in project planning, supervision, construction and equipment maintenance | 60,000.00 |
| Station wagon, 4-wheel drive  | 2          | For use by MOH technical staff to coordinate construction planning, implementation and supervision for headquarters in David and Panama City                        | 12,000.00 |
| Military truck, rebuilt army type 6 x 6   | 1          | Utilized to transport well drilling rigs to the various rural community sites   | 10,000.00 |
| Motor-crane, rebuilt, 20-ton (this motor crane is located in Panama City and in need of repair and rebuilding for use in the program) | 1          | After being rebuilt, this motor crane will be utilized in the erection of elevated steel tanks.   | 20,000.00 |
| Well drilling rigs, equipment and spare parts (drilling and fishing tools, wire lines spare engines, etc.)                            | -          | Support community water supply construction activities  | 45,000.00 |
| Drilling, testing wells, pump installation accessories and auxiliary equipment.   | -          | Support community water supply construction activities and pump installation  | 20,000.00 |

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| <u>ITEM</u>   | <u>Qty</u> | <u>PURPOSE</u>  | <u>\$</u>        |
|---|------------|---|------------------|
| Machine shop-tools,<br>maintenance and<br>repair equipment,<br>spare parts inventory<br>for above mentioned<br>project equipment. | -          | Maintenance and repair of project<br>equipment and vehicles | 20,000.00        |
|   |            |   | <hr/>            |
|   |            | Sub-Total .....   | \$225,100.00     |
|   |            | Contingency (12%).....                                      | <u>27,320.00</u> |
|   |            | Total .....   | \$252,420.00     |

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TABLE G-3 / III

EQUIPMENT AND SUPPLIES FOR HEALTH POSTS  
SUB-CENTERS AND HEALTH CENTERS

|   |                  |
|---|------------------|
| 1. <u>HEALTH POSTS (Single Unit):</u>       | <u>\$</u>        |
| Refrigerator                                | 600.00           |
| Medical Furniture                           | 20.00            |
| Office Furniture                            | 468.00           |
| Medical Supplies                            | 235.00           |
| Office Supplies                             | 15.00            |
| Janitor Supplies                            | 27.00            |
| Medical Equipment                           | 435.00           |
| Communication Equipment                     | <u>200.00</u>    |
| TOTAL                                       | <u>\$2000.00</u> |
| 2. <u>HEALTH SUB-CENTERS (Single Unit):</u> |                  |
| Basic costs (as per Health Posts)           | 2000.00          |
| Additional Dental Equipment                 | 1390.00          |
| Additional Dental Instruments               | <u>610.00</u>    |
| TOTAL                                       | <u>\$4000.00</u> |

|   |                  |
|---|------------------|
| 3. <u>RURAL HEALTH CENTERS (SINGLE UNIT):</u> | <u>\$</u>        |
| Refrigerator                                  | 600.00           |
| Medical Furniture                             | 2180.00          |
| Office Furniture                              | 750.00           |
| Medical Supplies                              | 3140.00          |
| Office Supplies                               | 150.00           |
| Janitor Supplies                              | 200.00           |
| Medical Equipment                             | 3840.00          |
| Office Equipment                              | 1350.00          |
| Laboratory Equipment                          | 1790.00          |
| 4 Wheel Drive Vehicle *                       | <u>6000.00</u>   |
| TOTAL   | <u>20,000.00</u> |

\*Vehicle required for MOH Health Center personnel to make visits to remote areas.

4. SUMMARY OF EQUIPMENT AND SUPPLY REQUIREMENTS:

| <u>TOTAL COSTS (Single Unit)</u> | <u>No. of Units</u> | <u>\$</u>            |
|----------------------------------|---------------------|----------------------|
| (Health Posts) \$2,000.00        | 225                 | 450,000.00           |
| (Sub-Centers) 4,000.00           | 14                  | 56,000.00            |
| (Rural Health Centers) 20,000.00 | 4                   | <u>80,000.00</u>     |
| TOTAL                            |                     | <u>\$ 586,000.00</u> |

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5. DEVELOPMENT OF EQUIPMENT AND SUPPLY REQUIREMENTS:

The categorial listing of equipment and supply requirements has been prepared by the Ministry of Health and is based on projected operational needs of the new facilities. In preparing these listings the Ministry used a practical approach which places emphasis on locally manufactured items of furniture and basic office equipment. The procurement of more specialized items of medical furniture, medical equipment and supplies, dental equipment and communications equipment will be in compliance with A.I.D. offshore (or local) procurement regulations and limited to goods and merchandise which meet with loan criteria for source and origin requirements.

Detailed and itemized listings of the items proposed for procurement by the Ministry have been reviewed by USAID technical staff and maximum consideration has been given to the selection of equipment and commodities which will place the least burden on the MOH for maintenance and replacement.

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TENTATIVE PLAN OF EXECUTION

| HEALTH FACILITY           | UNITS        | ~ % COMPLETED ~ |      |      |      |      |
|---------------------------|--------------|-----------------|------|------|------|------|
|                           |              | 1976            | 1977 | 1978 | 1979 | 1980 |
| <u>Health Posts</u>       | <u>225</u>   |                 |      |      |      |      |
| Design                    |              | 30              | 60   | 100  |      |      |
| Construction              |              |                 | 25   | 50   | 75   | 100  |
| <u>Health Sub-Centers</u> | <u>14</u>    |                 |      |      |      |      |
| Design                    |              | 30              | 60   | 100  |      |      |
| Construction              |              |                 | 25   | 50   | 75   | 100  |
| <u>Health Centers</u>     | <u>4</u>     |                 |      |      |      |      |
| Design                    |              | 30              | 60   | 100  |      |      |
| Construction              |              |                 | 25   | 50   | 75   | 100  |
| <u>Rural Aqueducts</u>    | <u>300</u>   |                 |      |      |      |      |
| Equipment                 |              |                 |      | 50   | 100  |      |
| Construction              |              |                 | 25   | 50   | 75   | 100  |
| <u>Hand Pumps</u>         | <u>400</u>   |                 |      |      |      |      |
| Equipment                 |              |                 |      | 50   | 100  |      |
| Construction              |              |                 | 25   | 50   | 75   | 100  |
| <u>Latrines</u>           | <u>13800</u> |                 |      |      |      |      |
| Construction              |              |                 | 25   | 50   | 75   | 100  |

Design = Design, plans, specification and construction site selection  
 Construction = Construction phase  
 Equipment = Acquisition of equipment and vehicles.

GENERAL, MATERNAL, INFANT, NEONATAL, 1 TO 4 YEARS, MORTALITY

IN THE REPUBLIC OF PANAMA 1970-1974

| Province       | <u>General Mortality</u> |       | <u>Maternal Mortality</u> |      | <u>Infant Mortality</u> |       | <u>Neonatal Mortality</u> |      | <u>1 TO 4 YEARS Mortality</u> |      |
|----------------|--------------------------|-------|---------------------------|------|-------------------------|-------|---------------------------|------|-------------------------------|------|
|                | 1970                     | 1974  | 1970                      | 1974 | 1970                    | 1974  | 1970                      | 1974 | 1970                          | 1974 |
| Total          | 10,225                   | 9,001 | 72                        | 43   | 2,156                   | 1,663 | 1,106                     | 889  | 1,400                         | 952  |
| Bocas del Toro | 398                      | 297   | 1                         | 3    | 98                      | 70    | 37                        | 26   | 84                            | 61   |
| Coclé          | 943                      | 663   | 8                         | 3    | 221                     | 144   | 88                        | 80   | 192                           | 77   |
| Colón          | 1,080                    | 1,017 | 8                         | 6    | 220                     | 186   | 107                       | 84   | 133                           | 88   |
| Chiriquí       | 1,802                    | 1,591 | 17                        | 4    | 404                     | 351   | 195                       | 180  | 311                           | 237  |
| Darién         | 188                      | 105   | 4                         | 0    | 59                      | 28    | 20                        | 16   | 42                            | 25   |
| Herrera        | 558                      | 427   | 2                         | 0    | 107                     | 74    | 65                        | 33   | 50                            | 29   |
| Los Santos     | 476                      | 419   | 1                         | 2    | 69                      | 21    | 45                        | 10   | 20                            | 18   |
| Panama         | 3,382                    | 3,170 | 16                        | 15   | 690                     | 545   | 384                       | 349  | 301                           | 158  |
| Veraguas       | 1,398                    | 1,312 | 15                        | 10   | 288                     | 244   | 165                       | 111  | 267                           | 259  |

Source: Estadísticas Vitales de D.E.C.

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GENERAL, MATERNAL, INFANT, NEONATAL, 1 TO 4 YEARS, MORTALITY RATES

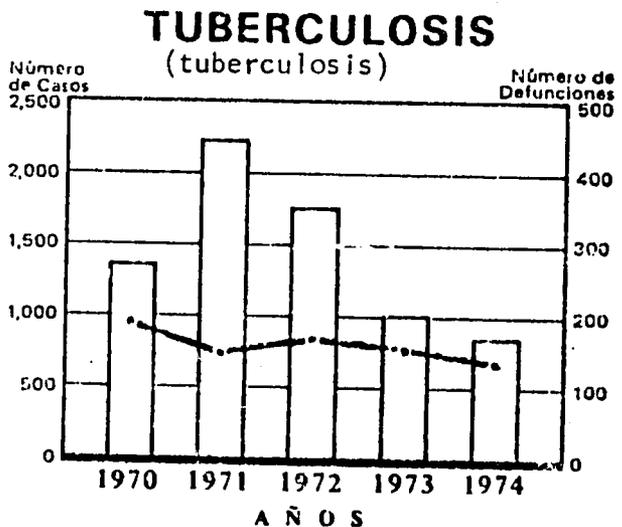
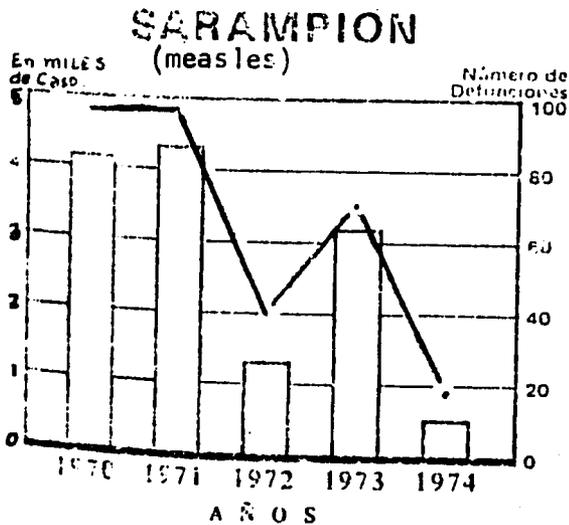
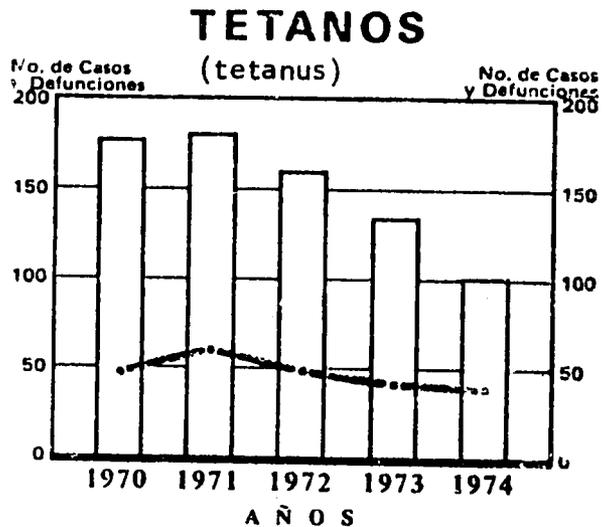
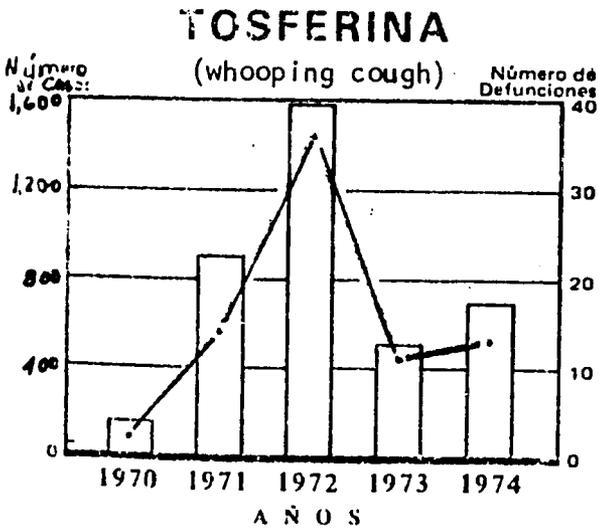
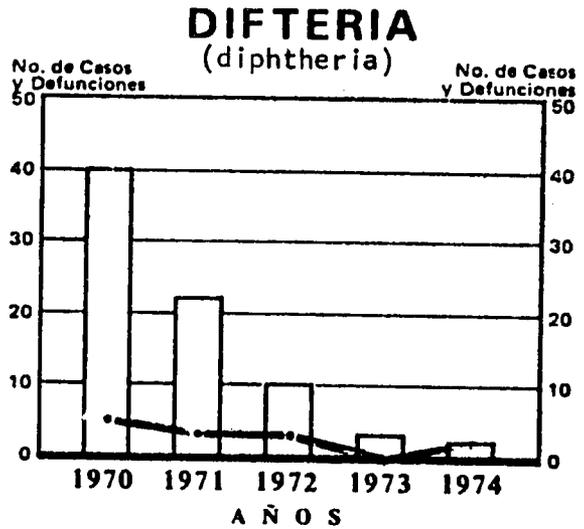
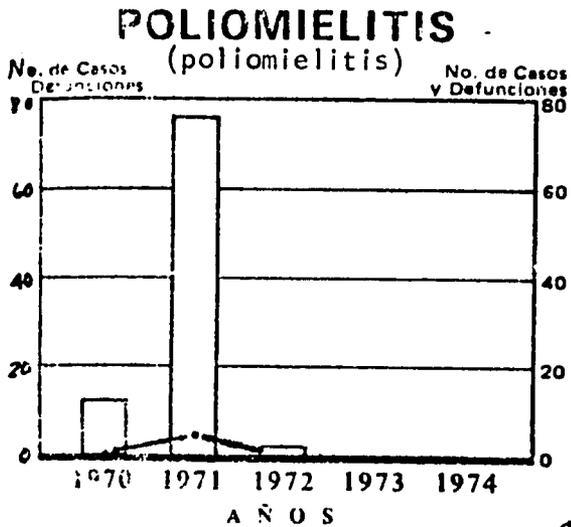
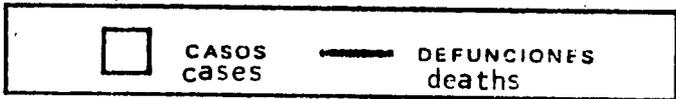
| Province          | General Mortality<br>Rate $\frac{1}{1000}$ |      | Maternal Mortality<br>Rate $\frac{2}{1000}$ |      | Infant Mortality<br>Rate $\frac{2}{1000}$ |      | Neonatal Mortality<br>Rate $\frac{2}{1000}$ |      | 1 to 4 Years Mortality<br>Rate $\frac{2}{1000}$ |      |
|-------------------|--|------|---|------|---|------|---|------|---|------|
|                   | 1970                                       | 1974 | 1970  | 1974 | 1970                                      | 1974 | 1970  | 1974 | 1970  | 1974 |
| Total             | 7.1  | 5.6  | 1.4   | 0.8  | 40.5                                      | 32.9 | 20.8  | 17.6 | 7.5   | 4.6  |
| Bocas del<br>Toro | 9.1  | 6.0  | 0.5   | 1.5  | 52.0                                      | 34.3 | 19.6  | 12.8 | 13.5  | 8.7  |
| Coclé             | 8.0  | 5.1  | 1.6   | 0.7  | 44.6                                      | 35.5 | 17.8  | 19.7 | 11.0  | 3.9  |
| Colón             | 8.0  | 6.8  | 1.6   | 1.3  | 44.6                                      | 39.4 | 21.7  | 17.8 | 7.7   | 4.6  |
| Chiriquí          | 7.6  | 6.1  | 1.9   | 0.5  | 44.6                                      | 40.5 | 21.5  | 20.8 | 9.1   | 6.4  |
| Darién            | 8.3  | 4.4  | 4.3   | 0.0  | 63.6                                      | 46.9 | 21.6  | 26.8 | 11.2  | 6.5  |
| Herrera           | 7.7  | 5.5  | 0.7   | 0.0  | 39.5                                      | 33.4 | 24.0  | 14.9 | 5.4   | 2.9  |
| Los Santos        | 6.6  | 5.7  | 0.4   | 1.2  | 30.2                                      | 13.0 | 19.7  | 6.2  | 2.4   | 2.1  |
| Panamá            | 5.8  | 4.6  | 0.8   | 0.7  | 33.7                                      | 25.6 | 18.7  | 16.4 | 4.4   | 2.0  |
| Veraguas          | 9.2  | 8.0  | 2.5   | 1.9  | 47.3                                      | 45.6 | 27.1  | 20.8 | 12.7  | 11.0 |

per 1,000 inhabitants  
per 1,000 live births  
per 1,000 inhabitants 1-4 years of age

Source : Estadística Vitales, D.E.C.

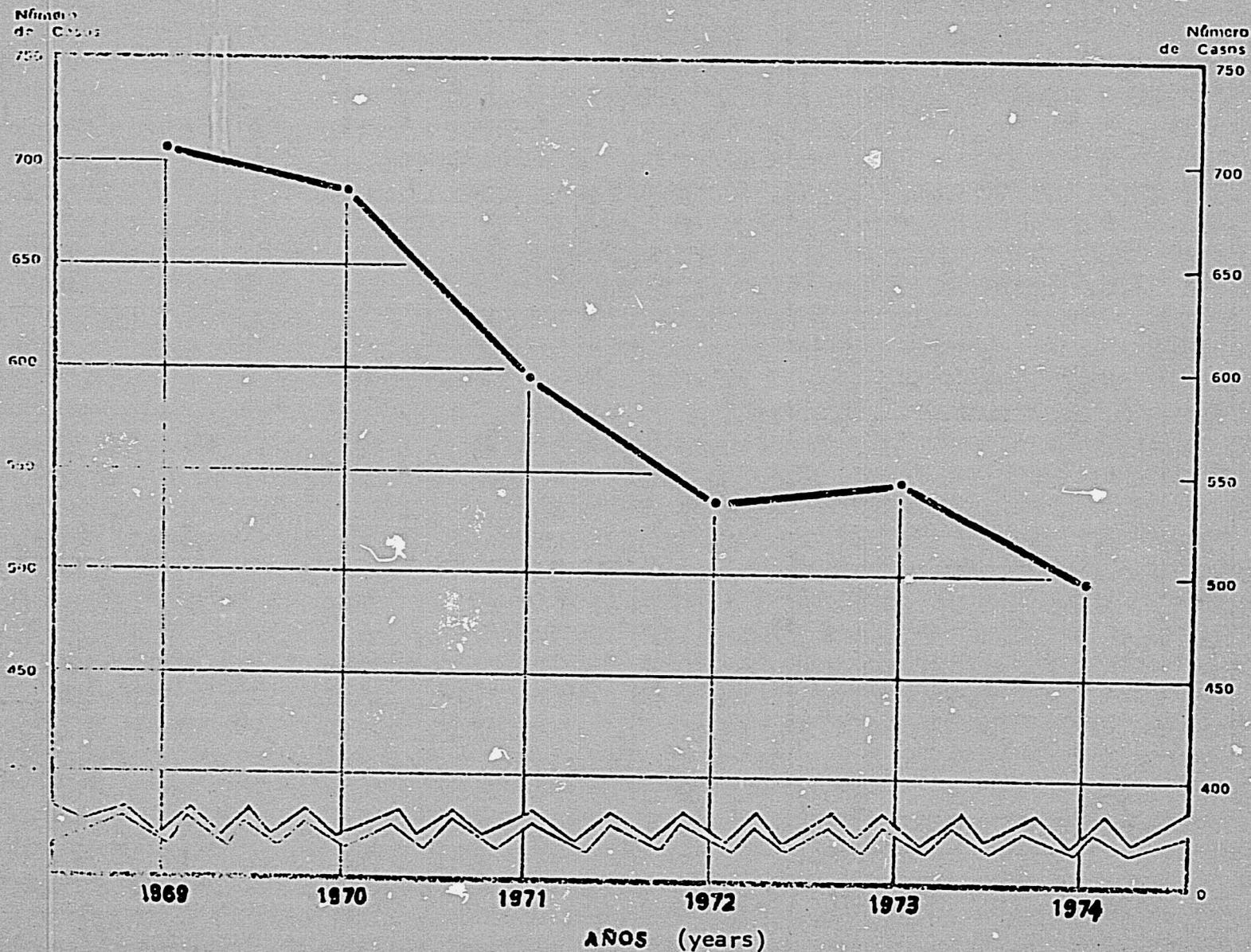
# MORBILIDAD Y MORTALIDAD

1970 - 1974



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MORTALITY RESULTING FROM WATERBORNE DISEASES  
 MORTALIDAD POR ENFERMEDADES DE ORIGEN HIDRICO  
 AÑOS: 1969 - 1974



Source: Memoria que presenta el Ministro de Salud al Presidente de la Republica,  
 Panama, 11 de octubre 1975.

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Number of Practicing Doctors, by Province and  
the Cities of Panama and Colon  
1970 - 1974

|                  | <u>1970</u> |                           | <u>1971</u> |                           | <u>1972</u> |                           | <u>1973</u> |                           | <u>1974</u> |                           |
|------------------|-------------|---------------------------|-------------|---------------------------|-------------|---------------------------|-------------|---------------------------|-------------|---------------------------|
|                  | <u>No.</u>  | <u>Rate</u> <sup>1/</sup> |
| <u>Cities</u>    |             |                           |             |                           |             |                           |             |                           |             |                           |
| Panamá           | 592         | 14.1                      | 646         | 17.8                      | 702         | 18.8                      | 756         | 19.8                      | 814         | 20.7                      |
| Colón            | 50          | 7.4                       | 55          | 8.0                       | 59          | 8.5                       | 64          | 9.1                       | 75          | 10.5                      |
| <u>Provinces</u> | <u>857</u>  | <u>6.3</u>                | <u>1006</u> | <u>7.2</u>                | <u>1070</u> | <u>7.4</u>                | <u>1172</u> | <u>7.8</u>                | <u>1313</u> | <u>8.6</u>                |
| Bocas del Toro   | 12          | 4.0                       | 13          | 4.2                       | 25          | 7.7                       | 35          | 10.4                      | 36          | 10.6                      |
| Coclé            | 27          | 2.3                       | 36          | 3.0                       | 34          | 2.7                       | 39          | 3.0                       | 41          | 3.1                       |
| Colón            | 50          | 4.5                       | 55          | 4.8                       | 59          | 5.0                       | 67          | 5.6                       | 84          | 6.8                       |
| Chiriquí         | 85          | 4.0                       | 111         | 5.1                       | 102         | 4.6                       | 108         | 4.7                       | 140         | 6.0                       |
| Darién           | 4           | 2.2                       | 5           | 2.7                       | 4           | 2.1                       | 4           | 2.1                       | 4           | 2.2                       |
| Herrera          | 22          | 3.0                       | 28          | 3.8                       | 25          | 3.3                       | 26          | 3.4                       | 36          | 4.6                       |
| Los Santos       | 18          | 2.5                       | 26          | 3.6                       | 32          | 4.4                       | 29          | 4.0                       | 27          | 3.7                       |
| Panamá           | 618         | 10.7                      | 700         | 11.6                      | 757         | 12.0                      | 829         | 12.6                      | 898         | 13.1                      |
| Veraguas         | 21          | 1.4                       | 32          | 2.1                       | 32          | 2.1                       | 35          | 2.2                       | 47          | 3.0                       |

<sup>1/</sup> Rate computed on the basis of the number of doctors for each 10,000 inhabitants. Excludes the indigenous population.

Source: Panama en Cifras, Octubre de 1975

NUMBER OF PRACTICING DENTISTS BY PROVINCE AND THECITIES OF PANAMA AND COLON1970 - 1974

|                  | <u>1970</u> |                           | <u>1971</u> |                           | <u>1972</u> |                           | <u>1973</u> |                           | <u>1974</u> |                           |
|------------------|-------------|---------------------------|-------------|---------------------------|-------------|---------------------------|-------------|---------------------------|-------------|---------------------------|
|                  | <u>No.</u>  | <u>Rate</u> <sup>1/</sup> |
| <u>Cities</u>    |             |                           |             |                           |             |                           |             |                           |             |                           |
| Panama           | 93          | 22.2                      | 94          | 25.9                      | 93          | 25.0                      | 100         | 26.2                      | 107         | 27.2                      |
| Colon            | 10          | 14.7                      | 8           | 11.6                      | 4           | 5.7                       | 8           | 11.3                      | 9           | 12.6                      |
| <u>Provinces</u> | <u>164</u>  | <u>12.0</u>               | <u>156</u>  | <u>11.1</u>               | <u>155</u>  | <u>10.7</u>               | <u>187</u>  | <u>12.4</u>               | <u>210</u>  | <u>13.7</u>               |
| Bocas del Toro   | 3           | 10.0                      | 1           | 3.2                       | 4           | 12.4                      | 4           | 11.9                      | 7           | 20.6                      |
| Coclé            | 10          | 8.4                       | 8           | 6.6                       | 8           | 6.4                       | 10          | 7.8                       | 12          | 9.2                       |
| Colón            | 10          | 9.0                       | 8           | 7.0                       | 4           | 3.4                       | 9           | 7.5                       | 10          | 8.1                       |
| Chiriquí         | 19          | 9.0                       | 17          | 7.8                       | 13          | 5.8                       | 19          | 8.4                       | 29          | 12.5                      |
| Darién           | 1           | 5.6                       | 1           | 5.5                       | 1           | 5.3                       | 1           | 5.2                       | 2           | 10.9                      |
| Herrera          | 6           | 8.2                       | 5           | 6.8                       | 6           | 8.0                       | 7           | 9.1                       | 6           | 7.7                       |
| Los Santos       | 7           | 9.7                       | 6           | 8.3                       | 8           | 11.0                      | 11          | 15.1                      | 10          | 13.7                      |
| Panama           | 98          | 16.9                      | 103         | 17.1                      | 104         | 16.5                      | 115         | 17.5                      | 125         | 18.2                      |
| Veraguas         | 10          | 6.7                       | 7           | 4.6                       | 7           | 4.5                       | 11          | 7.0                       | 9           | 5.7                       |

<sup>1/</sup> Rate computed on the basis of the No. of dentists for each 100,000 inhabitants. Excludes the indigenous population.

Source: Panama en Cifras, Octubre de 1975

Number of Practicing Nurses by Province  
and the Cities of Panama and Colon

|                              | 1970        |                          | 1971       |                          | 1972        |                          | 1973        |                          | 1974        |                          |
|------------------------------|-------------|--------------------------|------------|--------------------------|-------------|--------------------------|-------------|--------------------------|-------------|--------------------------|
|                              | <u>No.</u>  | <u>Rate<sup>1/</sup></u> | <u>No.</u> | <u>Rate<sup>1/</sup></u> | <u>No.</u>  | <u>Rate<sup>1/</sup></u> | <u>No.</u>  | <u>Rate<sup>1/</sup></u> | <u>No.</u>  | <u>Rate<sup>1/</sup></u> |
| <u>Cities</u>                |             |                          |            |                          |             |                          |             |                          |             |                          |
| Panama                       | 688         | 16.4                     | 655        | 18.0                     | 781         | 21.0                     | 706         | 18.5                     | 759         | 19.3                     |
| Colon                        | 71          | 10.5                     | 60         | 8.7                      | 55          | 7.9                      | 57          | 8.1                      | 63          | 8.8                      |
| <u>Provinces<sup>2</sup></u> | <u>1012</u> | <u>7.4</u>               | <u>948</u> | <u>6.8</u>               | <u>1059</u> | <u>7.3</u>               | <u>1063</u> | <u>7.7</u>               | <u>1131</u> | <u>7.4</u>               |
| Bocas del Toro               | 15          | 5.0                      | 12         | 3.8                      | 21          | 6.5                      | 35          | 10.4                     | 43          | 12.6                     |
| Coclé                        | 28          | 2.4                      | 20         | 1.6                      | 19          | 1.5                      | 23          | 1.8                      | 21          | 1.6                      |
| Colón                        | 71          | 6.4                      | 60         | 5.3                      | 55          | 4.7                      | 62          | 5.2                      | 65          | 5.3                      |
| Chiriquí                     | 81          | 3.8                      | 79         | 3.6                      | 88          | 4.0                      | 95          | 4.2                      | 108         | 4.7                      |
| Darién                       | 6           | 3.4                      | 6          | 3.3                      | 5           | 2.7                      | 4           | 2.1                      | 3           | 1.6                      |
| Herrera                      | 23          | 3.2                      | 24         | 3.2                      | 19          | 2.5                      | 18          | 2.4                      | 16          | 2.1                      |
| Los Santos                   | 23          | 3.2                      | 18         | 2.5                      | 17          | 2.3                      | 26          | 3.6                      | 19          | 2.6                      |
| Panamá                       | 739         | 12.8                     | 709        | 11.8                     | 818         | 13.0                     | 781         | 11.9                     | 834         | 12.1                     |
| Veraguas                     | 26          | 1.8                      | 20         | 1.3                      | 17          | 1.1                      | 19          | 1.2                      | 22          | 1.4                      |

<sup>1/</sup> Rate computed on the basis of the No. of nurses for each 10,000 inhabitants. Excludes the indigenous population.

Source: Panama en Cifras, Octubre de 1975.

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### PANAMA'S INTEGRATED HEALTH SYSTEM

When the current Government of Panama came to power in 1968, the situation of the health sector was characterized by: (1) a great variety of institutions performing health functions, based on different, and often conflicting policies; (2) the multiplicity of services offered which duplicated work and increased costs; (3) inadequate distribution of services; (4) inadequate use of the services; (5) deficient maintenance of the installations; (6) a low yield of the resources. In conclusion, Panama had an expensive uneconomic system, contradictory in its plans and policies and with a deficient coverage especially in the rural areas.

The Political Constitution of 1972 defines in its articles 103, 104, 107 and 108, the principles that guide the health sector activities of the country, and sets forth a mandate for improving the deficiencies cited above. These Constitutional provisions set as a goal the integration of preventive, curative and rehabilitative medicine and give the communities the duty and the right to participate in the planning, implementation and evaluation of health programs. Finally, Article 107 orders categorically the functional and organic integration of all health institutions of the public sector to execute health activities. However, there still does not exist implementing legislation to regulate particular aspects of the integration process.

From this Constitutional definition which orders the integration of institutions of the sector, comes the concept of the Integrated Health System of Panama, which constitutes the effort of the Government for instituting a national health system that includes all the activities of the public institutions and that regulates private medical practice.

The movement toward integration which began in Panama in 1972 was part of a larger movement in Latin America. Beginning about 1960 PAHO, OAS and the Social Security Branch of the International Labor Organization have been proposing coordination or integration of health programs. A 1972 study by Kessler and Roemer, sets forth four levels of such integration ranging from minimal coordination between MOH and CSS, to a National Health Service.<sup>1/</sup>

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<sup>1/</sup> Joseph Kessler and Milton Roemer, "Strengthening Family Planning and Related Health Services in Panama", Consultant's Report, submitted to Amer. Pub. Health Assn., Dec. 1972, p.34.

- 1) Minimal relationship
- 2) Moderate coordination
- 3) Full integration
- 4) A National Health Service for all

The policy decision made by the GOP has been #3 - full integration of programs, with the ultimate outcome expected of pooling all resources under unified direction. It does not go as far as National Health Service for all, in which public sector expenditures would have to increase significantly through increased taxes. This in effect would direct most of the substantial resources being spent in the private sector into the National Health Service.<sup>1/</sup>

Taking into consideration the worldwide lack of experience in the organization of an integrated health service and the difficulties that this change represents, the Government chose the strategy of gradually initiating the process on a regional basis. The process was begun in the Province of Colon, and successively has integrated Veraguas, Bocas del Toro, Herrera and Los Santos and recently Chiriqui. The Government policy is that only when enough experience has been obtained will the full national integration be formalized.

The integration process installed in the Provinces of Colon, Bocas del Toro and Veraguas coincide with the regions that showed the poorest health indicators, had few and badly distributed human resources and materials, and whose services were offered only to a part of the population. In like manner, these populations showed socio-cultural characteristics somewhat different from the rest of the Republic with high levels of illiteracy, poverty and communication difficulties; with large segments of the population living in rural zones in deplorable conditions and with a high degree of dispersion that renders even more difficult the implementation of health services. The administrative responsibility of the new health system is assigned to the Social Security Agency, the economically stronger institution of the sector.

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<sup>1/</sup> Roemer and Kessler, pp. 23-24 conservatively estimated that 1/3 of all health care expenditures (\$22 million of \$66 million) was being spent in the private sector in 1970-71.

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In designating Province Medical Officers for the integrated provinces, the mandates and authorities delegated are the best indication of Government integration policy. The precepts pointed out in these appointments sketch a strategy which may be summarized as follows:

1. The province is defined as the programmatic area of health.
2. Responsibility and authority rest on the Province Medical Officer.
3. The resources of both the MOH and CSS are to be utilized in the development of a single policy" to achieve the integration at the lowest possible cost".
4. Programs are to be developed to meet the needs of the population; "our commitment is with the population"; the system should be adapted to the population and "not the population to the system".
5. The principle of the pyramidal organization is established with primary attention by the health posts; secondary by the health subcenters and centers; third by the rural hospitals and the regional hospital.
6. The system of assistance serves as support for the development of preventive actions avoiding "the conditions that lead a person to become hospitalized".
7. As a means to reach the aforementioned objectives, the participation of organized communities in the health activities is encouraged.
8. The strategy for widening the coverage of the rural areas is based on the preparation of para-professionals. "The preparation of para-medical personnel in remote areas, enables the communities to solve many of their problems".

To summarize, it might be said that the direct purposes of the integration are framed within the following elements:

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1. Compliance with legal mandates and regulatory requirements.
2. Compliance with principles of distributive justice, allowing equal access to services, consistent with the Constitutional declaration of "non-existence of privileges" and with the goal of the Ministry of Health of "Equal Health for All".
3. Extension of the coverage of services to include the marginal sector.
4. Theoretically there has to be a reduction in costs, independently of the fact that there might be an increase in expenses due to an increase in benefits.

Advantage may be taken of the installed facilities that are partially unused. The equipment and facilities of X Rays and operation rooms have never worked to full capacity, the majority of times due to lack of patients and much more when these are widely dispersed. With increasing population load, rationalization of use and increased utility result.

In the Provinces, the Centers of the Social Security Agency were located in the capitals and the insured had to travel large distances to receive benefits. The experience in Azuero (Sept. to Dec. 1975) has shown that the volume of patients in these centers in the Provincial Capitals has been reduced substantially, while an increase has been experienced at those centers at the district levels due to the increase in insured patients using these more convenient facilities and to an increase in the supply of professionals at the district level.

5. Operation of an active system of regionalization with different levels of health attention.

Giving less complex cases to persons trained in health assistance which goes from the health assistant, to the nurse auxiliary, to the nurse, allows the filtering or channelling of consultations, treating each problem with the minimum necessary resources, allowing for the possibility of using the highest level resources at their maximum.

6. Incorporate modern technology and raise professional and labor conditions, granting a permanent stimulus to the personnel, especially, in the medical field.

The elimination of duplication, overlapping and technological waste allows an enlargement of installations, training and equipment, modernizing the services and attracting personnel to the institution, thereby strengthening the professional competence, morale and loyalty of the staff.

Although to a certain extent the operations of the Ministry of Health and the Social Security have common objectives, many differences exist in their functions and objectives. The range of activities of both institutions were established by different laws, and overlap in some cases. Even in the instances of overlap, the legal procedures are different.

One of the fundamental problems of the integration process is to harmonize the methods and comply with the institutional needs. Practical solutions originating at the local level are studied and analyzed, while at the same time, work teams at a national level are studying the implementation of viable models that will cover all the provinces.

At the regional level, financing would be determined by the inputs each of the institutions contributes to the geographical political area comprising each region.

In some cases, the present legislation is very particular; but it is not in accordance with the present situation and represents a major problem in the system. The law defines the sources of financing of the CSS and determines the income for the institution; the funds from the MOH depend basically upon the allocations made in the national budget.

#### Administration

One of the advantages of the establishment of the integrated health system, is to allow the development of a programming system which, together with the resources from the MOH and the CSS, develops plans and programs at the regional level, and in turn is considered within the system as the programming unit.

In the integrated provinces, planning has been carried out in accordance with the pattern set forth in the Bocas del Toro Health Plan prepared in 1973. This plan presents an assessment of the provincial health situation as related to the geographical, economic, social and cultural aspects, and a study of the resources and productivity based on those included in the operational plans of the Province. This plan is based on different planning models, adapted to the environment in order to achieve the objective of the State, "Equal health for all".

The lack of proper information and the difficulty in relating the data obtained to the various objectives which normally would represent problems without solutions, were eliminated by observing the facts directly. The plans resulting from this experience are feasible and, contrary to those prepared at the national level, must be implemented by the planner. Also, the evaluation and supervision of the activities allows for adjustments to be made as development progresses.

The Bocas del Toro plan has served as a model for the regional plans of Herrera, Los Santos, Veraguas and Chiriqui (the last presently in preparation). As a result, in spite of the existing regional autonomy, the plans for development at the provincial level are similar to the planning process at the national level.

Studies on budgetary control will provide information each month, showing the expenses made, commitments required and balances available. These studies have been realized in the integrated areas of Azuero and Veraguas, with MOH as well as CSS personnel. An attempt has been made to combine the procedures and the compilation of data, and to obtain a budgetary balance not to exceed ten days after closing of a determined period of time.

#### Programming the Health Facilities

The investment capacity of the MOH is much lower than that of the CSS. Investment programs in the MOH have been prepared in accordance with the population and the demand, without definite guidelines to determine the type of facility required. This was not the case with the CSS. It must be stated that neither of the two institutions prepared feasibility studies to determine their capacity for investment.

The integrated system by joining the resources, allows for a better utilization and programming of the facility, as shown by the increase and better distribution of the new facilities.

### Data compilation and Processing

Although there is a procedure for gathering administrative information in both institutions, it does not compile all the data necessary quantitatively or qualitatively.

The duality of objectives, methods and procedures makes the task difficult, and constitutes a great constraint for administration.

The establishment of the integrated health system has facilitated the preparation of a data gathering form and procedures to obtain data to comply with the needs of both institutions. This form is presently used throughout the country, i.e., both in the integrated and non-integrated areas. In practice, the forms are complicated, but are being modified as an on going evaluation of their shortcomings is analyzed.

### Documents

The Health Sector Assessment shows that the CSS has a better administrative documents and filing system. For this reason, the integrated areas would benefit by adopting these systems to their requirements.

### Socio-cultural Aspects

Prior to integration a dual health system existed in Panama, with two types of care, differing access, prestige and quality of service--and of course different population groups benefiting. Insured CSS members and beneficiaries, while fewer in number, had a much larger budget. Actual physical barriers within hospitals sometimes existed, dividing insured from non-insured patients. The social stigma of this type of condition, or that of being turned away from a polyclinic because one did not have a CSS card meant equal health for all was far from a reality.

Integration has addressed itself squarely to these issues -- with an expected mixed degree of success and resistance thus far. Making the nearest facility to a population group available to that population, be it insured or not, has greatly improved accessibility and acceptability of services. Evidence from Azuero Region indicates that at least in the short run CSS insured clients receive more benefits from this than the MOH population -- although the popular belief is that the insured bear the brunt of integration costs with little benefits. Insured are now using more services

than ever before, as they can now get the same benefits (especially free drugs) at MOH facilities.

Colon Province has shown a marked increase in the number of facilities available, due to widespread construction after integration. In addition, formerly deteriorated clinics and hospitals of MOH have been restored and made more comparable to CSS status.

The divisive competition for quality or even quantity of physicians and nurses has also been reduced by equalizing their salaries, whereas CSS paid more before integration.

Integration is an on-going process, however, and not accomplished overnight by decree. Resistance to its success can be found among consumers, providers and the institutions involved. Changes in attitude in the community will require education and tolerance. Moving health personnel from under-utilized facilities to new locations, or convincing patients from a community that deliveries must be carried out in one facility and surgery in another, for purpose of specialization and unnecessary duplication, is still being struggled with.

#### Economic Aspects

The above discussion has cited multiple problems associated with the fragmented sector institutions existing before integration. Thus, one of the major purposes of integration of MOH and CSS has been to reduce the economic costs involved, due to duplication of services, uncoordinated planning and budgeting, and other inefficient and ineffective uses of the sector's scarce resources.

During preparation of the assessment, as well as during intensive review for the Health Loan Project Paper, extensive effort has been made by both USAID and GOP to demonstrate these efficiencies. Specific attempts to compare unit costs of services in the two settings has been frustrated by a number of factors however.

Only four provinces, Veraguas, Colon, Cocolé and Herrera were found to be both integrated and have reasonably acceptable and accessible data. However, none of the four provinces had cost data for services before integration -- a malady clearly pointed out in the GOP Assessment and which the government is already addressing. Therefore, a sample area in the Azuero was used for detailed cost studies since both MOH and CSS facility costs at all levels had been elaborated in detail during the integration

process itself, and the PAHO consultant who assisted with setting up the data model there was available to assist with the study. <sup>1/</sup> However, the major results of this effort (See Section on Economic Analysis) are to (1) show the expected impact of total integration on costs and services for medical care from 1975-1985, (2) show the impact of the proposed new program resulting from this loan on total medical care costs, and (3) demonstrate that this program is affordable by the GOP over the long run.

What then can be said about the economic benefits of integration? An attempt to merely combine outpatient visits per year in CSS and MOH clinics after integration to show increases and that the cost/visit goes down, has not been possible. First, the record-keeping of out-patient visits was not the same for CSS and MOH, the former interested in economic costs of a visit, the latter in morbidity data. Second, large discrepancies between province and national level statistics were found. Third, and very important, visits are not really the same thing, as more intensive and specialized personnel in a CSS clinic vs. more generalists in MOH clinics. Finally, as has been noted before, accurate cost/visit data is not available prior to integration, especially for MOH.

We can probably safely conclude that integration does improve over-all quantity of care delivered. While the first year or two of integration is likely to raise costs, the efficiencies should appear more clearly in the long run. This occurs due to much new construction and remodeling, change in personnel and data processing systems, and the new socialization of consumers and providers required. There is also a surge of new demand for services now made more accessible.

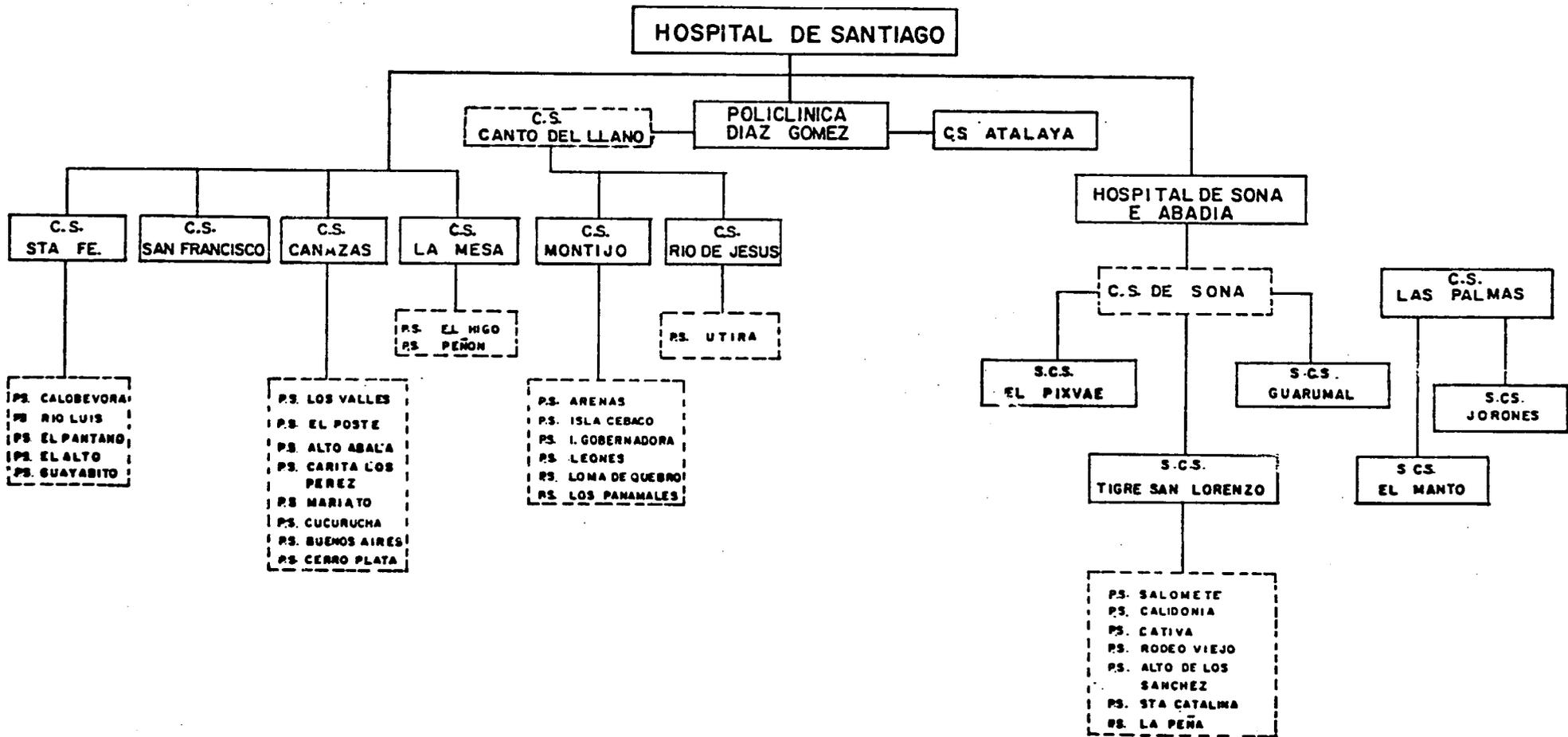
Even in the short run, however, efficiencies of combined purchasing of all drugs, access of provincial planners to the total health resources available, and greater utilization rates of previously underutilized facilities and personnel are clear benefits.

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<sup>1/</sup> Dr. Ivan Videla, Pan American Health Organization consultant to the Ministry of Health of Panama.

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VERAGUAS



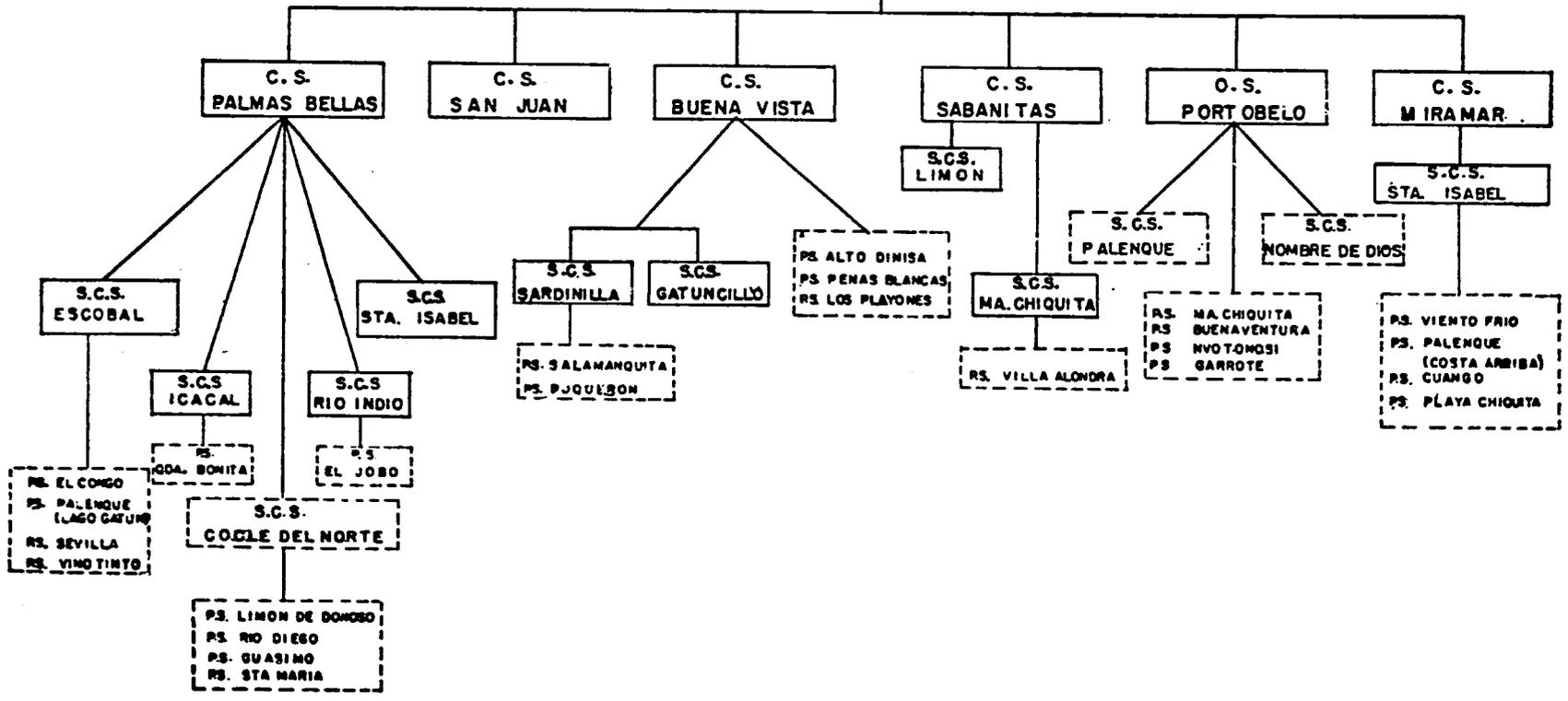
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COLON

HOSPITAL  
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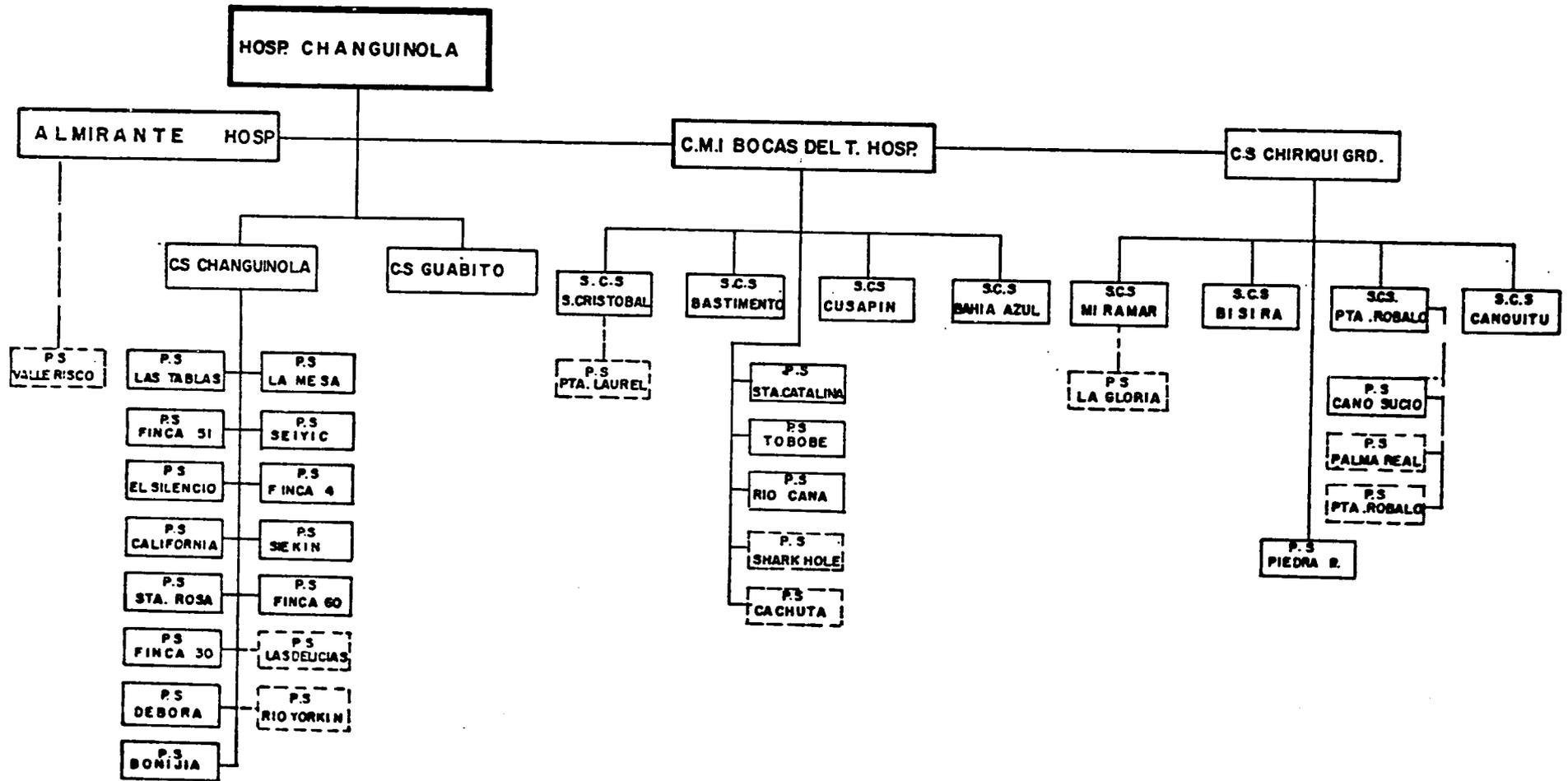
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PROSPERO MELENDEZ



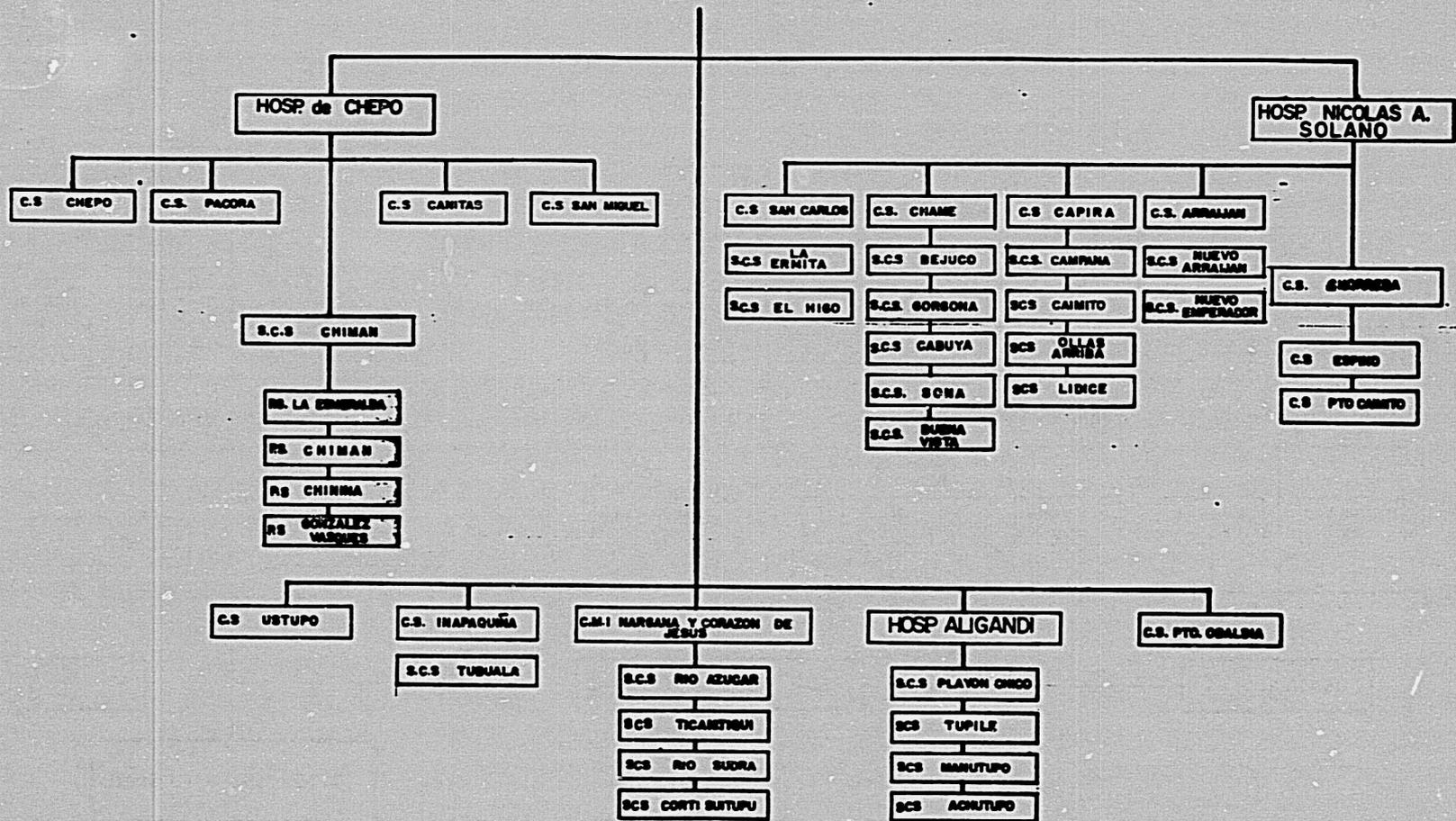
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PROVINCIA DE BOCAS DEL TORO



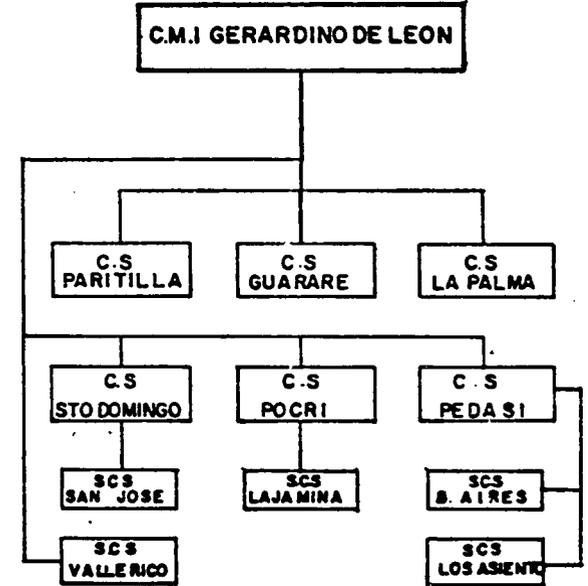
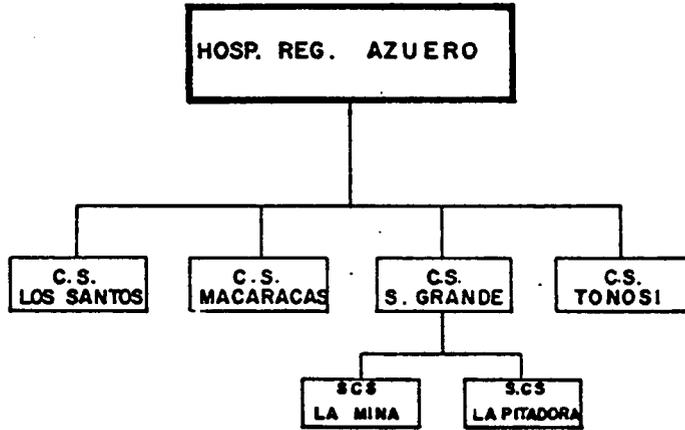
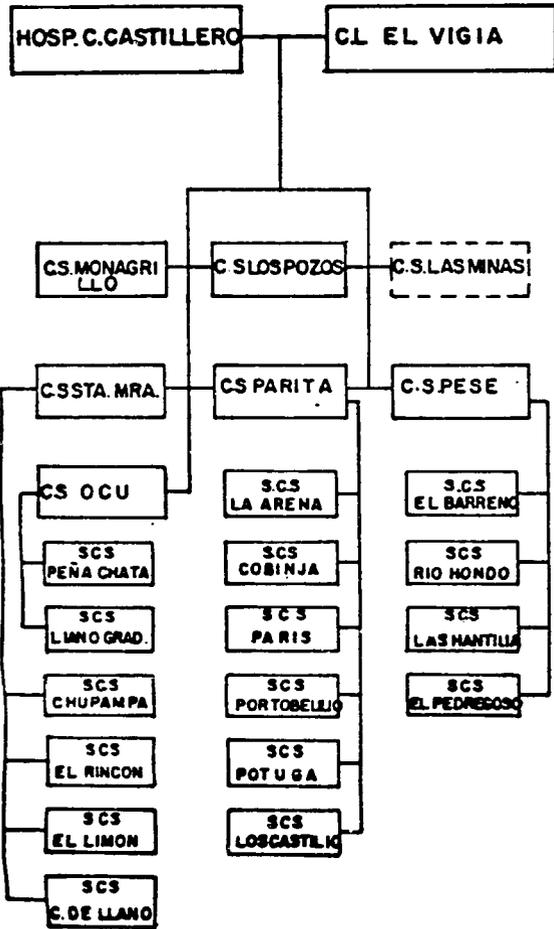
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REGION DE PANAMA



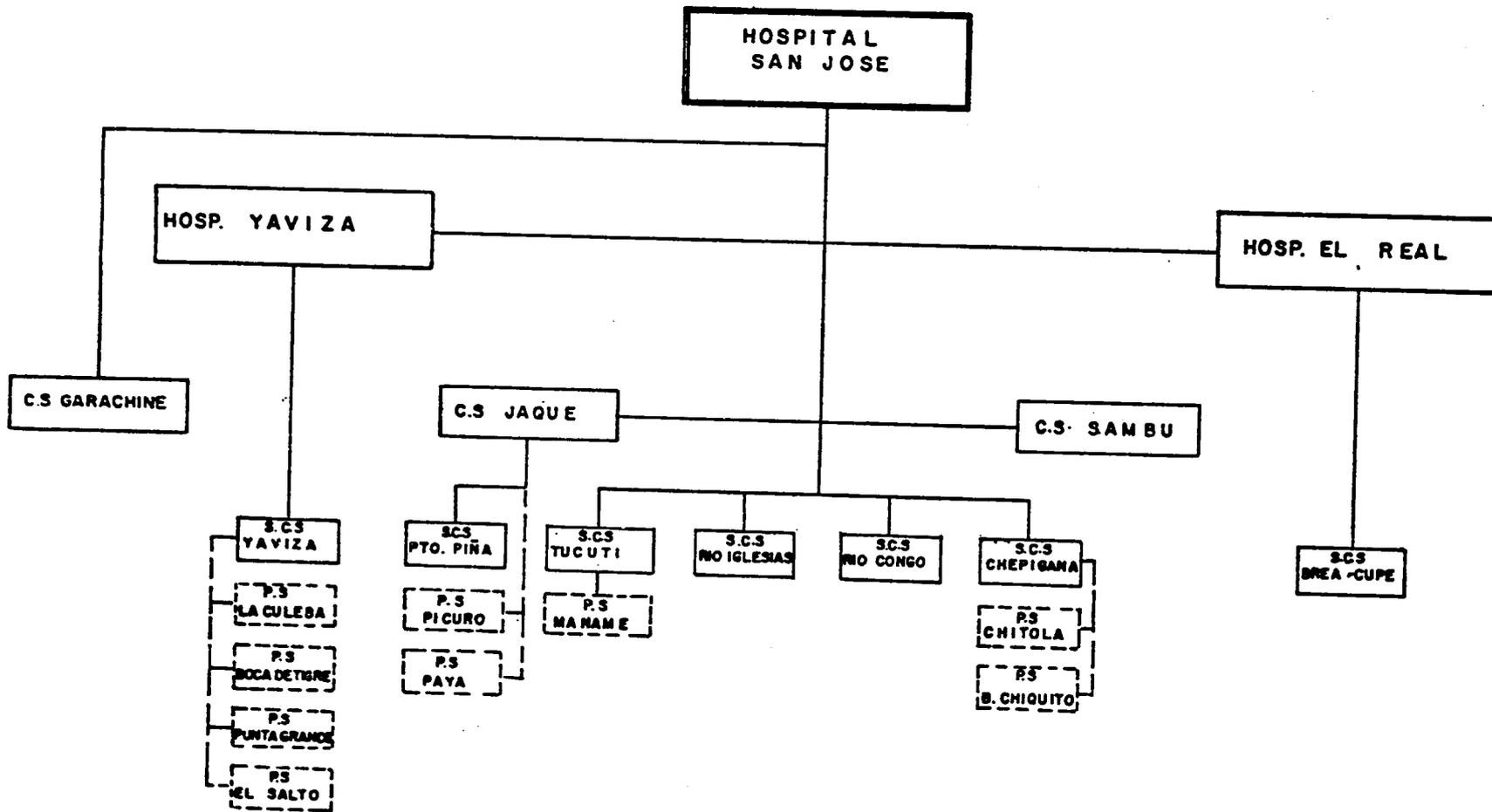
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AREA DE AZUERO



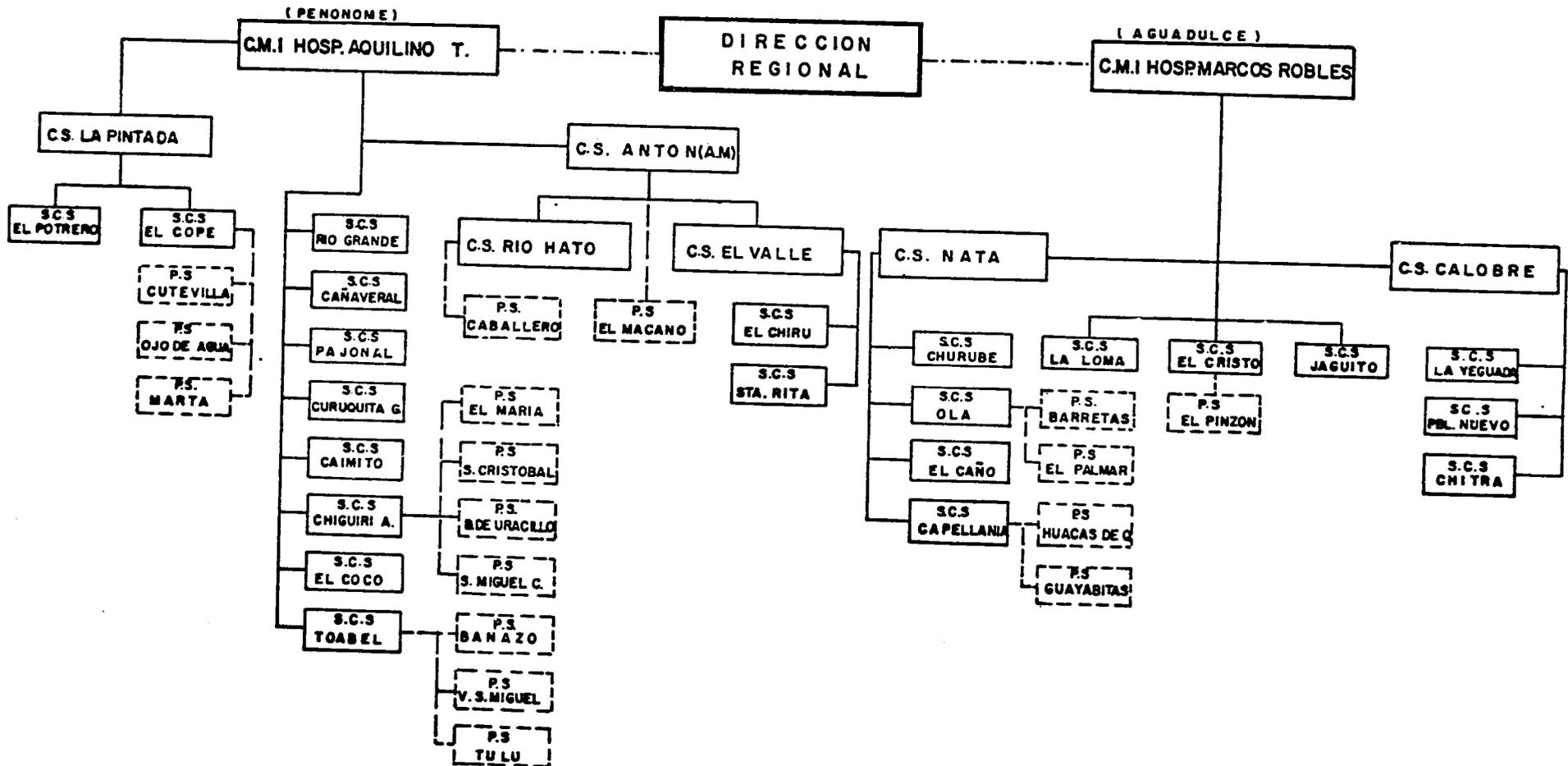
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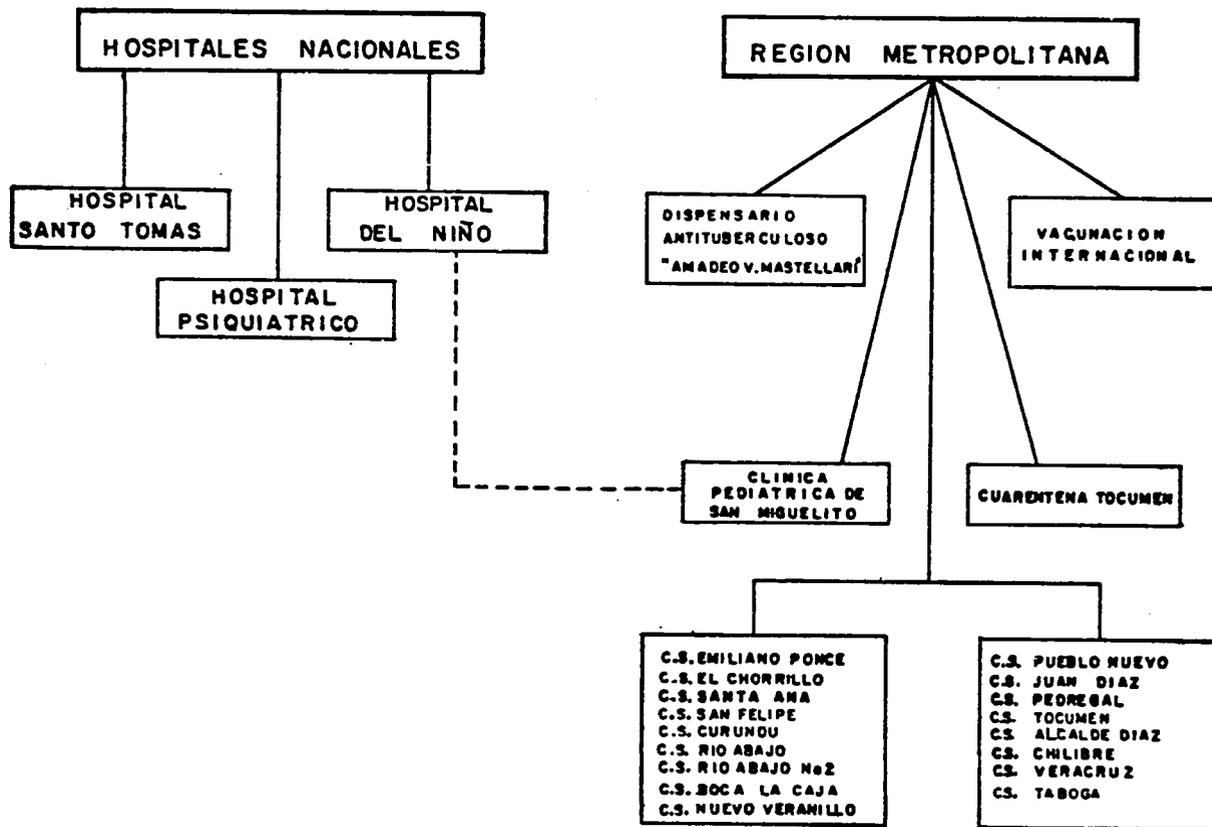
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PROVINCIA DE COCLE

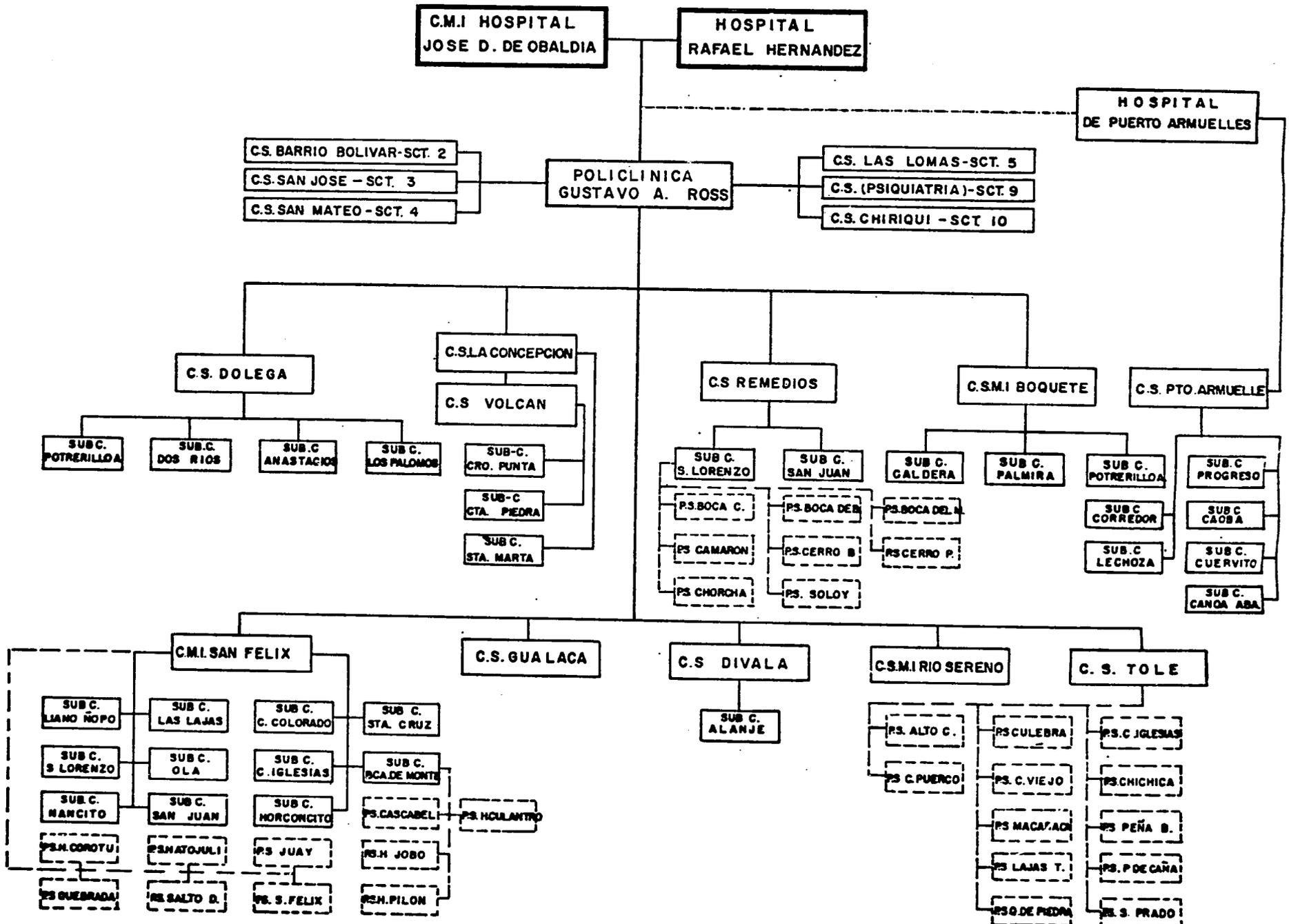


AD

CIUDAD METROPOLITANA



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METHODOLOGY: To develop and evaluate a low cost integrated health care delivery system.

An effective system of health care is one in which specific activities are performed for the patient population in a coordinated manner leading to an improvement in health status of the recipient population. It is useful to view the effectiveness of the health care system in terms of the process of health care and the health outcomes achieved.

The process of health care can be defined as the sequence of major clinical functions. These include primary prevention, screening, diagnostic evaluation, generic therapeutic plan, and on-going management. Within each of the clinical functions are the basic elements of the problem solving process which includes information gathering, assessment, treatment planning, and treatment. When applied to specific health problem objectives, a matrix of clinical functions and the problem solving elements (as in figure 1) describes the scope of direct care activities of the health care system. Standards of care for a given health problem or condition can be placed in the appropriate cells of the matrix and translated into specific tasks. The set of tasks then defines the operational criteria for the system of health care for that health problem. The operational criteria in turn form the basis of the design and evaluation of the health care system.

In order to receive adequate health care, the individuals of the population must receive the appropriate tasks in the correct sequence and at the correct time. Conversely, inappropriate tasks, or tasks out of sequence, or tasks provided too early or too late are not characteristic of an effective health care system. For that segment of the population with access to a major medical facility, the possibility exists to receive tasks sequenced and timed appropriately. However, some studies suggest that access to and utilization of

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major health care facilities does not necessarily result in the provision of adequate health care to more than a fraction of the recipient population. (1)

The traditional approach to developing a system of health care involves training one type of provider (typically the M.D.) in all of the required health care tasks, and supporting him with the necessary equipment and facilities. In short, this approach involves building a system of health care around the physician. However, the cost of training, supporting, and maintaining a physician makes this alternative economically unattractive for scattered rural communities.

More innovative approaches to the design of a system of health care utilize auxiliary health personnel as an extension of the physician. The cost of training, support, and maintenance of the auxiliary health worker is less and thus they can be located in proximity to the rural population. This approach will be utilized in the design of the project, employing a pyramidal structure of the health care team with health auxiliaries forming the foundation of a low cost health care delivery system. As an extension of the physician, the health auxiliaries serve as the portal of entry into the hierarchy of the system.

This approach to providing health care to the rural and marginal populations has the potential to improve access to and utilization of basic health services. However, it also increases the potential for fragmentation and discontinuity of the individual activities that should be assimilated into a coordinated health problem solving process. For this reason, several critical considerations in the design and evaluation of the project deserve elaboration.

A. Utilization of the Auxiliary Health Worker

There is a vast and growing experience in the utilization of auxiliary personnel for the provision of health services. (2-19) Such experience has resulted in a nearly universal acceptance at a subjective level that such programs are successful. However, there have been far fewer instances in which an objective assessment has demonstrated a significant improvement in the health status of the target population. (2-4)

The roles developed for indigenous health workers have been generally of three types. In one role, the paraprofessional performs under the direct and constant supervision of a health professional and the skills learned are applied under close supervision. (5-1) The health worker is directed as to which skill to apply to which patient. That is to say, the structure within which the paraprofessional applies his skills is carefully constructed and controlled by the professional with which he is working. Such a role has generally been successful, and an improvement in health status of the population has been achieved. However, it has been difficult to determine that portion of the improvement that is directly attributable to the health worker.

(8-10)

The paramedical has found a second role in mass campaign activities, in which he is trained to perform a small number of very specific tasks, such as TB screening, immunizations, etc. Even when he is called upon to perform these activities independently, the structure within which he is to work is more explicit. The nature of mass campaigns dictates the performance of a specific task to every member of the target population, usually once, and as soon as is feasible. In most mass campaigns a referral mechanism into the permanent health delivery system has been temporarily reinforced. In this role as well, the para-professional has successfully achieved an impact on health status.

There is considerably less experience with auxiliary health worker in the third role, where he has been utilized in an independent direct patient care capacity, (3)11-14 forming the foundation of the low cost health delivery system. Here, the health worker is equipped with a relatively more disparate set of skills and must independently determine which tasks to perform, for which patients, in which order, at what frequency, etc. The health worker is further given the role of the portal of entry into the hierarchy of the health care system and must perform the triage function of getting certain people into and through other skill levels of the system appropriate to their individual health needs.

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The latter role also has achieved a measure of subjectively determined success, but only a few studies have demonstrated this role to lead to an objectively determined improvement in the health status of the target population. Such studies, (3,13) have emphasized the need to define the specific tasks and the specific task structure within which the skill is to be applied.

#### B. The Need for Task Structure

Training and placing an auxiliary health worker in a health post within the community does not in itself provide the foundation of an integrated system of health care for the recipient community. Regardless of the training received by the auxiliary worker and the variety of specific tasks in which he is competent, there will be a significant number of patients which require additional tasks which cannot be performed at the health post. If there is not a strong functional relationship between the auxiliary at the health post and the next level of the system, then, the system as a whole will not be functioning adequately for those patients. Likewise, if a patient's condition requires (and most do) more than a single task, often separated in time, for adequate care; then the auxiliary must be able to select appropriate tasks and perform them in the correct sequence and at appropriate intervals.

Both situations require that the auxiliary health worker be not only competent in the specific activities of a health care task, but must also be competent in the application of the task structure. The task structure consists of at least the following components:

1. Who performs the task (primary responsibility)?
2. Who monitors task performance (secondary responsibility)?
3. Where is the task performed?
4. When is the task to be performed?
  - a) When to start
  - b) Frequency
  - c) When to stop
5. To whom is the task applied?
  - a) Who is the target population
  - b) Who are (or what are the characteristics of the priority group)

6. What equipment is necessary to perform the task?
7. How are the results of the task to be reported?
8. What additional tasks should follow the performance of this one?

If each parameter has not been addressed in the planning phase and the task structure included in the training of the auxiliaries, it is difficult for the health auxiliary to function effectively as an extension of the health care system.

Consider, for example, the auxiliary health worker who has been trained to make hemoglobin determinations to screen for anemia. Assume that this individual has attained competence in the task and has available at the health post the necessary equipment. By itself, this does not insure that he will do the task for the people who need it the most, or that he will do it at an appropriate interval, or that he will document the results, or that he will be able to perform the tasks appropriate to the outcome of this one. Without the necessary structure defined for his task, he may operate out of the context of the total health care system and in a manner inappropriate to the needs of the patients. However, if the task is defined along with the task structure, as in figure 2, it provides explicit guidelines for the auxiliary health worker, and defines the functional relationship between the auxiliary health worker and the next level of the system.

The tasks and associated task structure form the basis of the curriculum of training for the auxiliary health workers. They provide explicit educational objectives around which the training may be planned and implemented. They also provide performance criteria against which the auxiliary may be monitored and supervised.

### C. Use of Protocols

The effectiveness of auxiliary health workers has been enhanced through the use of explicit protocols designed to guide the health workers' activities in compliance with the standards of care. (2-4, 13, 20-22) Several studies have

shown that nonprofessional health workers are able to provide direct patient care (2-4, 13) with a resulting improvement in the health status of the community. (3)

A reporting system developed by the Indian Health Service (HSA, DHEW) combines a protocol and a reporting form and was designed to meet the following criteria: (2-4, 13).

1. Specify standards of care, expressed as a sequence of explicit tasks
2. Facilitate documentation of results
3. Facilitate monitoring for compliance with standards of care
4. Facilitate the sharing of relevant information among appropriate members of the health care team
5. Facilitate an evaluation of effectiveness of the program

Figure 3 illustrates such a protocol for gastroenteritis in the age group up to 3 years. It makes explicit the standards of information gathering and an assessment mechanism allows the health worker to determine the clinical severity of gastroenteritis by stage. This is accomplished by circling the appropriate response category as the information is gathered. When the required information has been collected, an assessment by stage is made by noting the highest stage with at least one circled response. The treatment plan is explicit for each stage of severity, including appropriate medication, patient education, referral and follow-up. Standards of treatment are specified as age-specific dosages of medication. Figure 4 shows one of the tasks required by this protocol and figures 5-7 illustrate similar protocols for other health problems and age groups.

Such a protocol serves several useful functions. First, it provides explicit guidelines for the health worker by defining the standard of care as a

sequence of tasks. Second, it guides the health worker through the problem solving process for gastroenteritis, through the structure of the tasks, and provides the functional linkages with the rest of the health care system. Third, it is easy for the health worker to document what he has done as a series of circled responses and checked boxes. Fourth, the protocol is easily monitored for compliance with standards. Fifth, staged assessments and documentation of treatment planning provides the basic information necessary to evaluate the impact of the program. Finally, a copy of the protocol accompanies the patient if he is referred to the next level of the system, thus making relevant information available to other members of the health care team.

As the number of health problems becomes too numerous for problem specific reporting forms, a general purpose format can be employed retaining the formats of figure 5-7 as guidelines.

#### D. Integrating Health Auxiliaries into the Health Care System

Standards of care and explicit task structure contribute to a functional integration of health auxiliaries into the system of health care. However, at least three additional key elements are necessary to provide the support required of a health auxiliary manning a health post far removed from the next highest level of care.

The first is a reliable mechanism for communication between the health auxiliary and a clinician who can provide consultation. Regardless of the number of tasks for which the auxiliary is competent and the level of sophistication of the protocols, there will be a significant number of patients whose condition requires diagnostic or treatment planning skills beyond the capabilities of the auxiliary. If a reliable communication mechanism exists, general information gathering protocols can be used by the auxiliary who in

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turn can transmit the information to a higher skill level. This person can then provide the auxiliary with a tentative assessment and treatment plan. Even if a large number of such treatment plans including referral to the next level of the system, such an approach enables the health worker to function as a viable portal of entry into the health care system. This requirement implies more than providing the auxiliary with a telephone or two-way radio. There must also be someone at the other end with the appropriate skills and defined responsibility to provide the necessary support.

The second requirement is a mechanism for monitoring and continuing education of the health auxiliary. The protocols of figures 5-7 are relatively simple to monitor for compliance. The monitoring function also can be expressed as a task with its associated task structure as exemplified in figure 8. Health auxiliaries found in need of a review of task performance can be identified and appropriate additional training provided.

The third requirement is a reliable mechanism for bringing selected patients into contact with the higher skill levels of the system, when required. There are several design alternatives available including transportation services, routine visits to the health posts by consultants, telecommunications, etc.

It is relatively easy to provide basic training and equipment to a health auxiliary and place him in the rural community, as the foundation of a pyramidal health system. However, this alone does not insure that they will function as a component of a health care team or as the portal of entry into an integrated system of health care. Functional coordination of such a system requires defined standards of care, task structure, a reliable communications system, and mechanism of referral of patients into and through the required skill levels. Where existing constraints in communication and transportation are severe, the need for standards of care and task structure becomes critical.

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E. Evaluating the System of Health Care

In recent years, there has been renewed interest in developing strategies to evaluate health care. Most strategies have focused on provider performance and have measured the quality of care in terms of compliance with standards of care (23-25). While this approach is adequate for monitoring specific clinical activities, it does not demonstrate the degree to which individual activities are assimilated into an effective problem solving process nor does it measure the continuity between critical components of care.

The ability to measure the degree to which the components of the health care system (health posts, subcenters, health centers, etc.) are providing the elements of basic health care to the community is critical in the project. The proposed pyramidal structure of the low cost health delivery system is based on the auxiliary health workers as an extension of the system and on their function as a portal of entry into that system. To function effectively, the system of care must coordinate the activities of the various health care providers and facilities in order to provide continuity of basic health care. Therefore an evaluation strategy which focuses on the community and tracks patients into and through the health care system is most appropriate. Such an approach would provide the information necessary to identify and strengthen the weaknesses of the system of care (1,26).

Many investigators have attempted to simplify the evaluation process by examining the care provided for a relatively small group of representative health problems. Kessner (27) has employed the term "tracer disease" for this purpose. The underlying assumption is that the care of patients with tracers is indicative of the overall effectiveness of care. At the present time, there is very little evidence either to support or refute this assumption. This does not mean, however,

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that the strategy of selecting a small group of problems should be abandoned. If highly prevalent diseases are chosen, which account for a significant portion of the system workload, they will be representative by virtue of their impact independent of communities with other health problems.

As described above, the process of health care can be represented by a continuous chain of sequentially related clinical functions. The major elements are primary prevention, case finding, and management. Case finding can be further divided into screening and the diagnostic evaluation and the management function is composed of treatment and follow-up. This sequence of clinical elements is shown in figure 9.

When primary prevention is not completely successful, patients must pass through the entire sequence to achieve clinical success. The rate of passage from one element to the next can be defined as a probability,  $P_n$ . The rate of passage between two points in the system may be the cross product of all intervening transition probabilities as in figure 10. The drop-out rate (or system failure rate) at any point is expressed as  $1-P_n$ .

Landmarks of the flow pattern which can be objectively determined and are considered necessary elements for clinical care can be identified as process indicators. The process indicators can be expressed as transition rates from one process state to the next. Finally, in order to assess health outcome, it is instructive to calculate the rate of transition by the population from key process indicators to an improved health status, and thus identify health outcome indicators. For example, if amoebiasis were selected as a tracer condition, the following might be the indicators selected.

1. Did the patient make contact with the health care facility within the last year?
2. Was a stool exam done within the last year?

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3. If it was positive for amoeba, was an appropriate dosage of atabrine given?
4. If it was positive for amoeba, was the water supply examined for contamination within the last 3 months or next 1 month?
5. Was a stool exam performed after the treatment was completed?

Or if pregnancy were chosen as a tracer condition, indicators similar to the following might be selected.

1. Did the mother receive prenatal education during the pregnancy?
2. Was there a complication of labor and/or delivery (e.g. PROM, prolonged labor, breech presentation)?
3. If there was a complication, was the patient referred to a specialist within 6 hours?
4. Was the patient attended by health personnel during delivery?

Carrying this example a step further, the algorithm in figure 11 could be constructed to collect data from a small random sample of pregnancies. Assuming this was done for a sample of 100 pregnancies and the results shown in figure 11 were obtained, an analysis would be conducted with the following simple computations:

#### PREVENTION

The percent of pregnant women receiving preventive services

$$\frac{(1A)}{(1A) + (1B)} = \frac{80}{80 + 20} = 80\%$$

The percent of deliveries attended by health personell

$$\frac{(2E)}{(2B) + (2D)} = \frac{60}{75 + 10} = 71\%$$

#### REFERRAL

The percentage of referrals made when indicated

$$\frac{(2C)}{(2A)} = \frac{15}{25} = 60\%$$

In order to obtain an indication of the effectiveness of curative health services, an algorithm could be constructed as in figure 12 and data collected on a sample of 200 patients using the sample indicators mentioned above for amoebiasis.

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If this were done and the results shown in figure 12 were obtained, the following analysis would be performed:

**SCREENING:**

What percentage of the community was appropriately screened?  $\frac{(2A)}{(1A) + (1B)} = \frac{50}{200} = 25\%$

What percentage of those utilizing the health system were screened?  $\frac{(2A)}{(1A)} = \frac{50}{100} = 50\%$

**TREATMENT:**

What percentage of patients with diagnosed amoebiasis were treated?  $\frac{(4A)}{(3B)} = \frac{30}{40} = 75\%$

**FOLLOW-UP:**

What percentage of patients who had amoebiasis were followed-up?  $\frac{(5A)}{(3B)} = \frac{5}{40} = 12\%$

What percentage of patients who were treated for amoebiasis were followed-up?  $\frac{(5A)}{(4A)} = \frac{5}{30} = 17\%$

**GENERAL:**

What percentage of the community received all necessary health services?  $\frac{(3A) + (5A)}{(1A) + (1B)} = \frac{10 + 5}{200} = 8\%$

What percentage of those who utilized the facility received all necessary health services?  $\frac{(3A) + (5A)}{(1A)} = \frac{10 + 5}{100} = 15\%$

**ENVIRONMENTAL:**

What percentage of patients with amoebiasis had their water supply examined?  $\frac{(4C)}{(3B)} = \frac{30}{40} = 75\%$

What percentage of patients with amoebiasis and an impure water source received potable water within 1 month?  $\frac{(4H)}{(4F)} = \frac{10}{20} = 50\%$

The tracers and indicators can be designed to provide information on the delivery of health services at any level of detail desired. They can further be constructed to highlight any particular element of the process of health care

(e.g. primary prevention, casefinding, treatment, referral, etc.). As a group, the tracer conditions should reflect a variety of health conditions such as acute or chronic, pediatric or adult, medical or surgical, well-patient care or emergency care, and at the same time should accurately reflect the priority health needs identified in the planning process. The major requirements of the indicators is that they be considered necessary elements of health care and that they be reasonably easy to collect at the time of evaluation.

To determine the improvement in the health status of the population that results from the system of health care, the health status indicators used in the health sector analysis would be appropriate. To this could be added specific morbidity rates for those health problems used as tracer conditions. Comparison of health status indicators periodically over time provide a measure of improvement in the health status of the population.

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F. specific Methodologic Components

The major elements of the methodology employed in this project and their functional relationships are illustrated in figure 13. As each component is addressed, it provides input into one or more subsequent components and in turn each component receives required input from a previous component.

1. Selection of Health Post Sites: Site selection for an initial 225 health posts will be made on the following criteria:

- a) Size of population which would have access to the facility
- b) Health status and magnitude of health needs of the population
- c) Capabilities and constraints of transportation and communication with the referral facility
- d) Growth potential of the community

2. Identification of Priority Health Problems of the Area: From data available in the health sector assessment and other sources, a set of priority health problems will be identified as a function of:

- a) Impact on the community in terms of pain, suffering, and disability
- b) Impact on the community as an obstacle to community development
- c) State of the art to prevent or effectively treat
- d) Degree to which health auxiliary can play a significant role
- e) Estimation of the potential to reduce the impact of the problem

3. Define Relevant Clinical Functions for Each Problem: A decision will be made as to which of the clinical functions are to receive emphasis for each problem.

The major criteria of this decision will be:

- a) state of the art of the clinical function
- b) degree to which health auxiliary can provide that function
- c) cost and availability of supporting equipment needed to perform clinical function
- d) Requirements of that function in terms of other health services (e.g. for the clinical function of screening).

4. Identify Local Constraints for Communication and Transportation: In the most generic sense, the health post is an extension of the health care system ~~extended~~ into the rural community. The "umbilical cord" linking the health post to the health center must provide the basic function of providing to the individual patient those skills required to meet his health needs. This can be accomplished in part through communication and transportation and to an extent the ability to support the health auxiliary will be a function of communication and transportation potential.
5. Establish Standards of care for priority health problems: The essential elements of clinical care for each priority health problem will be defined. Each standard will be considered in each of its three dimensions:
1. What is the action required for health care?
  2. Who is the target population and appropriate high risk group?
  3. What is the appropriate timing sequence? (cont.)

of the standard (e.g. where is it due and at what intervals is it to be repeated )?

The specific standards will be of a level of complexity appropriate to:

- a) The potential capability of the health auxiliary.
- b) The anticipated acceptance of the community of various intervention strategies.
- c) Communication and transportation constraints
- d) Constraints due to cost and availability of medical equipment and supplies.
- e) Availability of highly sophisticated health skills (e.g. at the health center).

6. Translate standards of care into explicit tasks: Each action implied in the standards will be defined in specific tasks. The tasks will be examined to select those which are appropriate for the health auxiliary.

7. Define task structure: For each task selected for the health auxiliary, the parameters of task structure will be defined. These include:

- a) Who performs the task (primary responsibility)?
- b) Who monitors task performance (secondary responsibility)?
- c) Where is the task performed?
- d) When is the task to be performed?
  - a) When to start
  - b) Frequency
  - c) When to stop
- e) To whom is the task applied?
  - a) Who is the target population
  - b) Who are (or what are the characteristics of the priority group)
- f) What equipment is necessary to perform the task?
- h) What additional tasks should follow the performance of this one?

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8. Design mechanism of communications and transportation: Having previously identified the existing constraints on communication and transportation and from the requirements for each, which are the output of component 7, a design decision will be made regarding the mechanism of communication and transportation to be employed to link the health post to the health center.
9. Identify Material Requirements for Health Post: The task structure of component 8 will specify the drugs and equipment necessary for the health auxiliary to provide the defined direct health care. To this list will be added the equipment necessary for preparation and maintenance of the facility. For example, if a task requires minor surgical instruments, then certain other equipment will be necessary for resterilization of the instruments.
10. Develop Problem Solving Protocols: In order to guide the health auxiliary through the problem solving process, explicit protocols (reporting format) will be developed to meet the following design criteria.
  - a) Specify standards of care, expressed as a sequence of explicit tasks
  - b) Facilitate documentation of results
  - c) Facilitate monitoring for compliance with standards of care
  - d) Facilitate the sharing of relevant information among appropriate members of the health care team
  - e) Facilitate the evaluation of the effectiveness of the program
11. Design Reporting System for Health Post: The protocols designed in component 10 will serve a part of the function of documentation of the health status of the community. In addition, further attention will be given to the basic information requirements to serve the following functions:
  - a) Surveillance of the health status of the community
  - b) Administrative reports required by the MOH (personnel, drug utilization, etc.)
  - c) Assessment of the effectiveness of the health post as an extension of the system of care
  - d) Documentation of the health needs of the individual patients.

12. Develop Monitoring Tasks: As a function of the task structure developed in component 7, simple monitoring tasks will be developed for the individuals (usually the MD at the referral health center) who are charged with the responsibility of supervising the health auxiliary. The task structure will also be identified and will serve as the basis for the training required of the supervisor.

13. Design Training Curricula and Provide Training: The outputs of components 7 and 10 define the educational objectives of the training for the auxiliary health workers. A curriculae of training will be designed to achieve the objectives. It is estimated at this time that the training will require approximately 6 to 8 months and will take place over the course of one year.

In like manner, outputs from component 12 will be utilized to define a curriculum for the supervisor of the health auxiliary. It is estimated at this time that such training would require approximately two weeks. Other training needs will be identified such as the training required for those individuals responsible for the training of the health auxiliary, and the training required for the professionals who will provide clinical support for the health auxiliary.

14. Select Tracer Health Problems for Evaluation: In general the evaluation process will be directed toward three basic questions:

- a) Are preventive, diagnostic, therapeutic, and follow-up services being provided to the community?
- b) Are the clinical elements of care related in a logical and sequential manner?
- c) What are the major weaknesses in the system of health care?

Tracer diseases or health conditions will be selected for evaluation on the following criteria:

- a) They should be relatively well defined and easy to diagnose.
- b) They should be relatively prevalent in the community.
- c) As a group they should account for a significant proportion of the system workload.
- d) They should have a definite functional impact on the community.
- e) They should be predictably influenced by defined modes of health care
- f) As a group they should cover a wide clinical range (adults/ pediatric, acute/chronic, medical/surgical, etc.)
- g) As a group they should cover both prevention and remedial care.

15. Define Indicators of Process and Health Outcome: Standards of care, which are the benchmarks of the effectiveness of health care, will be translated into audit questions. These indicators serve as the actual measure of the effectiveness of health care. Process indicators will be selected with the following criteria:

- a) must be considered a necessary clinical element to achieve an acceptable health outcome.
- b) must be amenable to objective measurement or quantification and easily abstractable from the existing record system.
- c) must be an element of health care which is routinely documented by the provider of health services.
- d) must be amenable to quantification from the entire population or a relevant sample

Health outcome indicators will be identified which reflect changes in the health status of the community. To be acceptable as an outcome indicator, a measure of health status must be aggregated for a relevant sample of the population with the following criteria:

- a) must be a direct measure of health status. Indirect measures, such as abatement of signs and symptoms or provision of specific treatments are acceptable only when precise relationships between the indirect measure and ultimate health status are well documented.

- b) must be amenable to objective measurement or quantification and easily abstractable from available records.
  - c) must be sensitive enough to detect relatively small but significant changes in the health status of the population.
  - d) must be sensitive to changes in health status that are due to changes in health care.;
16. Design data collection protocol: An algorithm will be constructed for the collection of data for each tracer condition.
17. Select Population Samples and Relevant time Frames:
18. Train data Collectors:
19. Collect Data;
20. Analyze Data: The evaluation methodology is sufficiently basic in concept to allow a relatively simple analysis. The transition rates between critical elements of the process of care is expressed as a proportion. The transition rates will characterize the flow of patients through the defined process of care. In some instances this will provide information regarding utilization of facilities, performance of specific provider/disciplines, and the degree to which different facilities (e.g. health posts and health centers) perform their clinical functions in a coordinated and sequential manner.
21. Interpret Data to Identify Weakness in the System of Care:  
The standards of care (component 5) represent the manner in which the system is designed to operate. Flow patterns of patients through the process and facilities of care (component 20) characterize the manner in which the system is actually operating. Major drop-out patterns in the flow patients represent disparities between system design and system operation. The method of selecting the tracer conditions and the indicators of process and health outcome allows the weaknesses of the system to be characterized

functionally (e.g. prevention, screening, follow-up, referral, etc.)

22. Design Action Steps: Where system weaknesses have been identified, specific actions steps will be formulated to improve system performance. The nature of a tracer methodology is to focus on specific health problems in the evaluation phase. However, action steps intended to strengthen system weaknesses should not be directed only at the specific tracer disease. For example if one of the tracers is an acute illness and an identified system weakness is a delay in a time-critical referral, this aspect of the referral mechanism should be bolstered generically rather than only for that specific problem.

In formulating action steps, simplicity will be stressed, as expensive solutions to drop-out patterns is not a characteristic of a low cost health care delivery system. Attention will be particularly directed toward the tasks and task structure of the health aides. Previous experience has indicated that significant improvements in health care can be achieved by subtle modifications<sup>in</sup> the tasks and task structure of the health auxiliaries (1-3, 13).

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### References

1. Shorr GJ and Nutting PA. An evaluation of the continuity ambulatory care, Med care (in press).
2. Nutting PA, Shorr C.I. and Berg LE, "Reduction in Respiratory infection morbidity by community health representatives, Office Research and Development, Indian Health Service, Tucson, Ariz. ( in preparation)...
3. Nutting PA, Shorr C.I. and Berg LE, Process and outcome measures of tribal health workers in direct patient care, in Advanced Medical Systems: Issues and Challenges, Flagle CO (Ed.), Sympocia Specialists, Miami, 1975.
4. Nutting, PA, CR Strotz, GI Shorr and LE Berg: Reduction in gastroenteritis morbidity in high risk infants. Pediatrics, 55:354, Mar. 75.
5. Conn, RH: Using health education aides in counseling pregnant women. Pub Health Rep 83:979-82, Nov. 68.
6. Fry, J, JB Dillane and MM Connolly: The evolution of a health team: A successful general practitioner - health visitor association. Brit Med J 1:181-183, Jan. 65.
7. Mariner, A. Use of Red Cross volunteers in the school health program. J. Sch. Health 41:428-9, Oct. 71.
8. Frankenburg, WK, A. Goldstein, A Chabot, Camp, BM and M Fitch: Training the indigenous non-professional: The screening technician. J. Pediat 77:564-570, Oct. 70.
9. Stewart, JC and WR Hood: Using workers from "hard core" areas to increase immunization levels. Pub. Health Rep. 85:177-84, Feb. 70.
10. Chase, HP, LB Larson, DM Massoth, DL Martin and MM Niernberg: Effectiveness of nutrition aides in a migrant population. Am J. Clin Nutr. 26:849-57, Aug. 73.
11. Martin, GL and IM Newman: The costs and effects of a student health-aide program. J Am Coll Health Assoc. 21:237-40, Feb. 73.

12. Urich, RB: Tribal community health representatives of the Indian Health Service. Pub. Health Rep. 84:965-70, Nov. 69.
13. Nutting, PA, JC Reed and GI Shorr: Use of non-health professionals for minor acute problems of the school age child Amer. J. Dis. Children, 129:816-819, July 1975.
14. Eneboe, P: The village medical aides - Alaska's unsung, unlicensed and unprotected physicians. Alaska Med 124-27, Apr. 71.
15. Harrison, TJ: Training for village health aides in the Kotzebue area of Alaska. Pub. Health Rep. 80:565-72, Jul. 65.
16. Shook, DC: Alaska native community health aide training. Alaska Med. 62-63, Jun 69.
17. Deuschle, KW: Training and use of medical auxiliaries in a Navajo community. Pub. Health Rep. 78:461-9, Jun. 63
18. Cauffman, JG, WA Wingert, DB Friedman, EA Wurberton and B. Hanes: Community health aides: How effective are they? Am J. Public Health 60:1904-08, Oct. 70.
19. Torrey, EF, D. Smith and H. Wise: The family health worker revisited: A five-year follow-up. Am J. Public Health 63:71-74, Jan. 73
20. Komaroff, AC, WL Black, M. Flatley, RH Knopp, B. Reitten and H. Sherman: Protocols for physician assistants: management of diabetes and hypertension. N. Engl. J. Med. 290:307-312, Feb. 74.
21. Sox, HC, CH Sox and RK Tomkins: The training of physician's assistants: The use of a clinical algorithm system for patient care, audit of performance and education. N. Engl. J. Med. 288:818, Apr. 73.
22. Hirschhorn, N, JH Lamstein, RW O'Connor and A. Kestorton: Logical flow charts to train and guide health auxiliaries in the treatment of children's diarrhea, unpublished.

23. Brooke, RH, Quality of care assessment: a comparison of five methods of peer review, DHEW, HRA, HSMHA, National Center for Health Services Research, DHEW Pub. No. HRS-74-3100, Washington, D.C., 1973.
24. Donabedian, A. Guide to medical care administration, Vol II: Medical Acre Appraisal - Quality and Utilization, American Public Health Association, New York, 1969.
25. Lembche, PA, Evolution of the medical audit, JAMA, 199:111, 1967.
26. Shorr GI, Nutting PA, and Berg LE, Quality appraisal of ambulatory patient care, Office Research and Development, IHS, HSA, DHEW, June, 1975.
27. Kessner DM, Assessing Health Quality - The case for tracers, New Engl. J. Med., 288:189, 1973.

PROBLEM SOLVING ELEMENTS

| <u>CLINICAL FUNCTION</u> |                              | INFORMATION GATHERING                           | ASSESSMENT | TREATMENT PLANNING | TREATMENT |
|--------------------------|------------------------------|---|------------|--------------------|-----------|
|                          | PRIMARY PREVENTION           |   |            |                    |           |
|                          | SCREENING                    | ← See Figure 2 for Example of task for anemia → |            |                    |           |
|                          | DIAGNOSTIC EVALUATION        |   |            |                    |           |
|                          | GENERIC THERAPEUTIC PLANNING |   |            |                    |           |
|                          | ON-GOING MANAGEMENT          |   |            |                    |           |

**FIGURE 1:** Problem space for direct care activities of the Health Care System

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**TASK TITLE:** Screening (Anemia): Info. gathering, assessment, treatment plan

**PRIMARY RESPONSIBILITY:** AUXILIARY HEALTH WORKER

**SECONDARY RESPONSIBILITY:** PHYSICIAN AT HEALTH CENTER

**LOCATION:** Health Post

**TIMING:** Children Pregnancy  
Begin: 1 year of age Begin: 1st Trimester  
Frequency: Yearly Frequency: Once  
Stop: 5 years of age

**TARGET POPULATION:** Children Age 1 - 5 years & Pregnant Women

Priority Group: Children: Age 1 - 2 years

Pregnancy: Gravida 0 or 1

**EQUIPMENT:** Hemoglobinometer  
Lancet  
Capillary Tube  
Alcohol  
Cotton Ball

**DOCUMENTATION:** Recording Format

**TASK SEQUENCE:** Hqb 10.5 gm % \_\_\_\_ repeat as routine  
Hqb 8-10.5 gm % \_\_\_\_ perform Task B  
Hqb 8 gm % \_\_\_\_ refer to sub-center

**ACTION STEPS:**

1. Swab finger tip with alcohol (need in children less than 1 year of age)
2. Make sharp puncture wound with lancet
3. Hold limb in dependent position
4. Fill capillary tube
5. etc.
6. etc.

**FIGURE 2:** Example of Task and Task Structure for Anemia: Screening/information gathering assessment, and treatment planning.

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COMMUNITY HEALTH REPRESENTATIVE PROGRAM  
PAPAGO GASTROENTERITIS CONTROL

Age:  Babies up to 3 years old

Height: \_\_\_\_\_ Weight: \_\_\_\_\_

| INFORMATION GATHERING  |   | <input type="checkbox"/> 72 HOUR FOLLOW-UP   |          | <input type="checkbox"/> 1 DAY FOLLOW-UP |  | Stage 1 | Stage 2   | Stage 3   | Stage 4    |
|--|---|--|----------|--|--|---------|-----------|-----------|------------|
| SUBJECTIVE   | Is the baby less than 3 months old?   | NO   |          |  |  |         |           | YES       |            |
|  | What is the baby's risk level? <input type="checkbox"/> Average <input type="checkbox"/> High |  |          |  |  |         |           |           |            |
|  | Is the diarrhea <input type="checkbox"/> Mucousy? <input type="checkbox"/> Liquid?            |  |          |  |  |         |           |           |            |
|  | Mucousy diarrhea - for how many days?   | 1-4  |          |  |  | 5-7     |           | Over 7    |            |
|  | Mucousy diarrhea - how many in the last 6 hours?  | 1-3  |          |  |  | 4-6     |           | Over 5    |            |
|  | Liquid diarrhea - for how many days?  | 1  |          |  |  | 2       |           | Over 2    |            |
|  | Liquid diarrhea - how many in the last 6 hours?   | 1  |          |  |  | 2-3     |           | Over 3    |            |
|  | Is there blood in the diarrhea?   | NO   |          |  |  |         |           | YES       |            |
|  | Is there mucus in the diarrhea?   | NO   |          |  |  | YES     |           |           |            |
|  | Is the baby vomiting?   | NO   |          |  |  | YES     |           |           |            |
|  | For how many days?  | 1  |          |  |  | 2       |           | Over 2    |            |
|  | How many times in the last 6 hours?   | 1  |          |  |  | 2       |           | Over 2    |            |
|  | Can the baby keep down clear fluids?  | YES  |          |  |  |         |           | NO        |            |
|  | Is the baby urinating a normal amount?  | YES  |          |  |  |         |           | Decreased |            |
|  | OBJECTIVE   | Rectal temperature   | 98°-102° |  |  |         | 102°-103° |           | Over 103°  |
| Making tears when crying   |   | YES  |          |  |  |         |           | Decreased | NO         |
| Soft stool (floriditate)   |   | NORMAL   |          |  |  |         |           |           | FALLEN     |
| Lining of mouth  |   | MOIST  |          |  |  |         |           |           | Dry/Sticky |
| Eyes look sunken in  |   | NO   |          |  |  |         |           |           | YES        |
| Skin tenting   | NO  |  |          |  |  |         |           | YES       |            |
| ASSESSMENT   |   | TREATMENT PLAN   |          | 1st                                      | HIS CODE   |         |           |           |            |
| <input type="checkbox"/> Well baby<br><input type="checkbox"/> Diarrhea, Stage 1<br><input type="checkbox"/> Diarrhea, Stage 2<br><input type="checkbox"/> Average Risk<br><input type="checkbox"/> High Risk<br><input type="checkbox"/> Diarrhea, Stage 3<br><input type="checkbox"/> Diarrhea, Stage 4  |   | Treatment as below, follow-up tomorrow<br><br>Treatment as below, follow-up tomorrow<br>Give electrolyte solution and refer to clinic<br>Give electrolyte solution and refer to clinic right away<br>Give electrolyte solution and refer to hospital |          |  | 01 Y00.5<br>01 009.1<br><br>01 008.1<br>01 006.1<br>01 008.1<br>01 008.1 |         |           |           |            |
| TREATMENT  |   |  |          |  | RX 971008  |         |           |           |            |
| <input type="checkbox"/> Instruct mother in treatment of diarrhea<br>1. Nothing by mouth for 2 hours.<br>2. Give clear fluids or electrolyte, <b>BUT NO MILK OR FOOD FOR 24 HOURS.</b><br>3. Give half-strength milk for 24 hours, then regular diet if diarrhea is better.  |   |  |          |  | RX 286191 062<br>RX 286191 062<br>RX 286191 062<br>RX 280715 262         |         |           |           |            |
| <input type="checkbox"/> 0-6 months: liquid aspirin (Acetaminophen) 0.3 cc every 4 hours<br><input type="checkbox"/> 6-12 months: liquid aspirin (Acetaminophen) 0.6 cc every 4 hours<br><input type="checkbox"/> 12-18 months: liquid aspirin (Acetaminophen) 0.9cc every 4 hours<br><input type="checkbox"/> 18 mo.-3 yr: baby aspirin, 1 pill for each year of age every 4 hours<br><input type="checkbox"/> Individual education task A<br><input type="checkbox"/> Electrolyte solution and instructions how to use: # of bottles: ___ OGE-Sol ___ Pedialyte<br><input type="checkbox"/> Stool culture or rectal swab<br><input type="checkbox"/> Refer to clinic or hospital |   |  |          |  | RX 971001<br>RX 400691<br>LA 08042                                       |         |           |           |            |
| IDENTIFICATION   |   | 393  |          |  | Signed: _____ CHR (800)  |         |           |           |            |
| NAME: _____<br>B-date: _____ AGE: _____ SEX: _____<br>RESIDENCE: _____<br>LOCATION OF ENCOUNTER: _____<br>DATE: _____  |   |  |          |  | Reviewed: _____ CHR Supervisor   |         |           |           |            |
| FORM POC '872  |   |  |          |  |  |         |           |           |            |

FIGURE 3: Problem solving protocol for Gastroenteritis for age group 0-3 years.

**TASK CODE:** TASK A - Info. gathering/Assessment: Gastroenteritis

**PRIMARY RESPONSIBILITY:** COMMUNITY HEALTH REPRESENTATIVE

**SECONDARY RESPONSIBILITY:** CHR SUPERVISOR

**LOCATION:** Patient's Home

**TIMING:** Once when patient is sick

**TARGET POPULATION:** Children Age 0-3 years

**PRIORITY GROUP:** Children Age 0-1 year

**EQUIPMENT:** Thermometer

**DOCUMENTATION:** Reporting Form

**TASK SEQUENCE:** Stage I: Tasks B,C,H

Stage II: Tasks B,C,H

Stage III: Tasks D,E

Stage IV: Tasks D,F

**ACTION STEPS:**

1. Gather the following information:

- Is the baby less than 3 months old?
- Is the diarrhea \_\_\_ Mushy? \_\_\_ Liquid?
- Mushy diarrhea - for how many days?
- Mushy diarrhea - how many in the last 6 hrs.?
- Liquid diarrhea - for how many days?
- Liquid diarrhea - how many in the last 6 hrs.?
- Is there blood in the diarrhea?
- Is there mucous in the diarrhea?
- Is the baby vomiting?
- For how many days?
- How many times in last 6 hrs.?
- Can the baby keep down clear fluids?
- Is the baby urinating a normal amount?

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2. Take rectal temperature
3. Check for tenting, fontanelle, lining of the month
4. Check for tenting of the skin
5. Record items 1-4 on protocol by circling the appropriate response categories
6. Determine the patients stage by noting the highest stage with even one circled response
7. Document staged assessment on recording protocol

**FIGURE 4: Task and Task Structure for Gastroenteritis (Age 0-3 years) information gathering assessment**

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COMMUNITY HEALTH REPRESENTATIVE PROGRAM  
PAPAGO GASTROENTERITIS CONTROL

Age: 3 years and over

| INFORMATION GATHERING                          |  | <input type="checkbox"/> 24 hour follow-up | STAGE 1    | STAGE 2  | STAGE 3   | STAGE 4   |
|--|--|--|------------|----------|-----------|-----------|
| <b>SUBJECTIVE:</b>                             |  | <input type="checkbox"/> 5 day follow-up   |            |          |           |           |
| How many days have you had diarrhea?           |  |  | 0-2        | 3-5      | Over 5    |           |
| How many times in the last 6 hours?            |  |  | 0-3        | 4-6      | Over 6    |           |
| Is there blood in the diarrhea?                |  |  | No         |          | Yes       |           |
| Are you vomiting?                              |  |  | No         | Yes      |           |           |
| Are you able to keep anything in your stomach? |  |  | Yes        |          | No        |           |
| Do you feel real weak?                         |  |  | No         | Yes      |           |           |
| Have you been urinating normal amounts?        |  |  | Yes        |          |           | Decreased |
| <b>OBJECTIVE:</b>                              |  |  |            |          |           |           |
| Temperature                                    |  |  | Under 101° | 101-102° | Over 102° |           |

| ASSESSMENT                                  | TREATMENT PLAN                        | HIS CODE |
|---|---------------------------------------|----------|
| <input type="checkbox"/> WELL PATIENT       |                                       |          |
| <input type="checkbox"/> Diarrhea - Stage 1 | Treat as below                        | 01 Y00.9 |
| <input type="checkbox"/> Diarrhea - Stage 2 | Treat as below and follow-up tomorrow | 01 009.1 |
| <input type="checkbox"/> Diarrhea - Stage 3 | Refer to clinic                       | 01 009.1 |
| <input type="checkbox"/> Diarrhea - Stage 4 | Refer to clinic                       | 01 009.1 |
| <input type="checkbox"/>                    |                                       | 01 009.1 |
| <input type="checkbox"/>                    |                                       |          |

| TREATMENT   | HIS CODE      |
|---|---------------|
| <input type="checkbox"/> Encourage patient to drink a lot of fluids                                   |               |
| <b>Aspirin for fever:</b> (Not more than 4 pills in 4 hours)  |               |
| <input type="checkbox"/> 3-4 yrs. old - baby aspirin - 1 pill for each year of age, give every 4 hrs. | RX 280715 162 |
| <input type="checkbox"/> 5-9 yrs. old - 1 adult aspirin tablet every 4 hrs.                           | RX 280712 162 |
| <input type="checkbox"/> Over 9 yrs. old - 2 adult aspirin tablets every 4 hrs.                       | RX 280712 262 |
| <b>Acetate:</b>   |               |
| <input type="checkbox"/> 3-5 yrs. old - 1 tablespoonful after each loose stool                        | RX 560391 9-1 |
| <input type="checkbox"/> 6-9 yrs. old - 2 tablespoonful after each loose stool                        | RX 560391 9-1 |
| <input type="checkbox"/> 10-15 yrs. old - 4 tablespoonful after each loose stool                      | RX 560391 9-1 |
| <input type="checkbox"/> Over 15 yrs. old - 6 tablespoonful after each loose stool                    | RX 560391 9-1 |
| <input type="checkbox"/> Stool culture or rectal swab   | LA 05042      |
| <input type="checkbox"/> Refer to clinic or hospital  |               |
| <input type="checkbox"/> PATIENT REFUSED  |               |
| <input type="checkbox"/> PATIENT REFUSED  |               |
| <input type="checkbox"/>  |               |
| <input type="checkbox"/>  |               |
| <input type="checkbox"/>  |               |

|                        |                        |
|------------------------|------------------------|
| IDENTIFICATION         | 353                    |
| NAME: Last First Mid   |                        |
| B-Job: AGE: SEX:       | REVIEWED: CHR (800)    |
| ID-NO:                 | SIGNED: CHR Supervisor |
| RESIDENCE:             |                        |
| LOCATION OF ENCOUNTER: |                        |
| DATE:                  |                        |
| Form: POC2673          |                        |

FIGURE 7: Problem solving protocol for gastroenteritis in age group over 3 years.

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**TASK CODE:** SUPERVISORY FOR COMMUNITY HEALTH REPRESENTATIVES

**PRIMARY RESPONSIBILITY:** CHR SUPERVISOR

**SECONDARY RESPONSIBILITY:** CHR DIRECTOR

**LOCATION:**

**TIMING:** Weekly

**TARGET POPULATION:** An CHR's

**PRIORITY GROUP:** CHR's with recent problems of performance

**EQUIPMENT:** None

**DOCUMENTATION:** Report verbally to CHR Director

**TASK SEQUENCE:** If performance not adequate, do Tasks S-1 and S-2

**ACTION STEPS:**

1. Review CHR reporting format and check:
  - a) Were all items of information gathered?
  - b) Was correct assessment made?
  - c) Were required subsequent tasks performed?
2. Assess performance of each CHR
3. If performance not acceptable, begin tasks of continuing education

**FIGURE 8:** Supervising tasks for monitoring performance of CHR in management of Gastroenteritis.

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- Clinical Elements
- ◇ Decisions Points
- Special Instructions
- ⬡ Outcomes

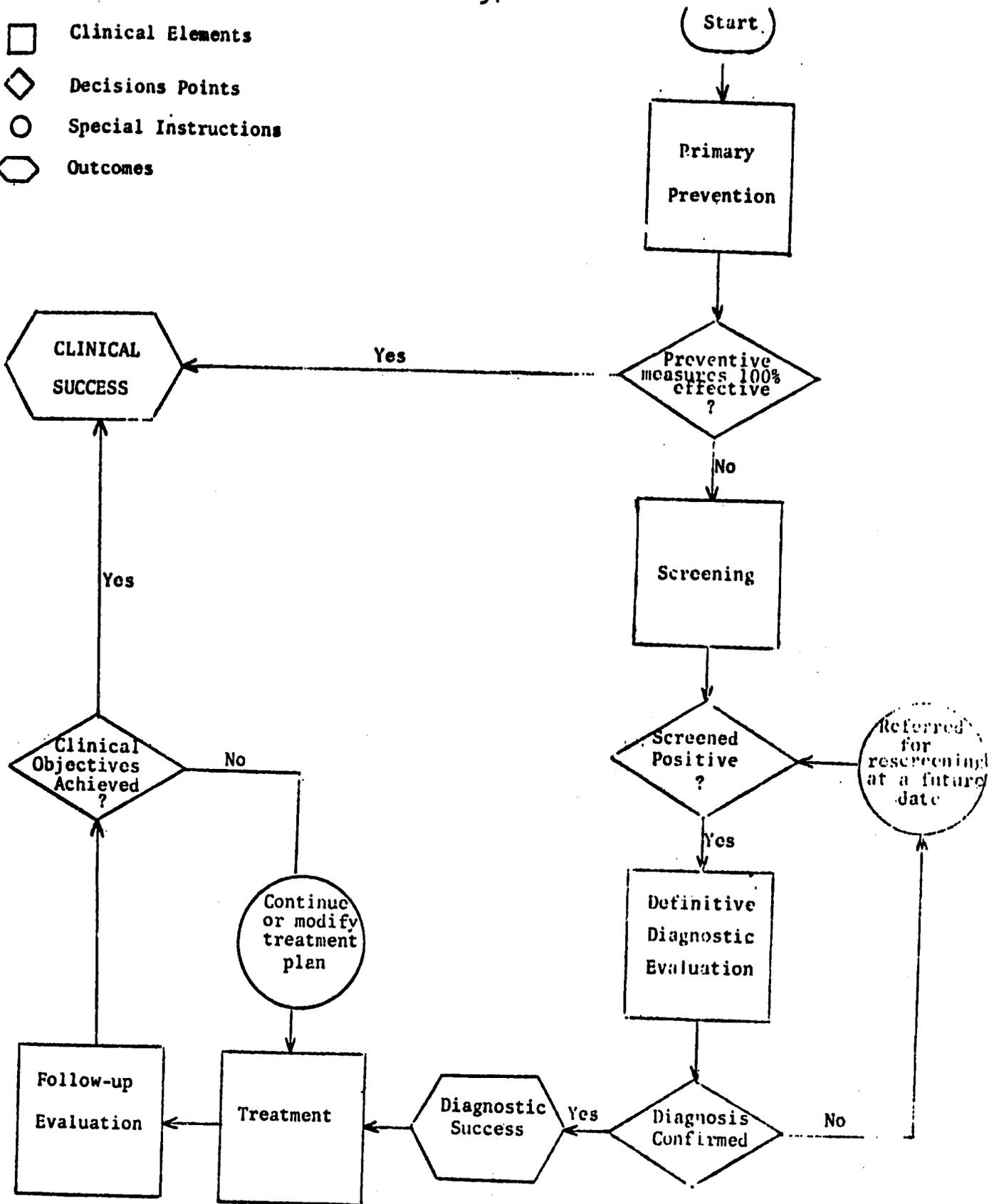
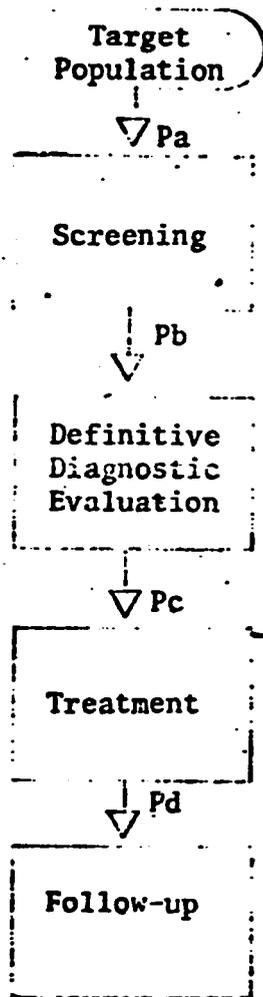


Figure 9: The Process of Health Care

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$P_a$  = Probability of being screened

$P_b$  = If screened positive, probability of receiving a definitive diagnostic workup.

$P_c$  = If diagnosis confirmed, probability of receiving adequate therapy.

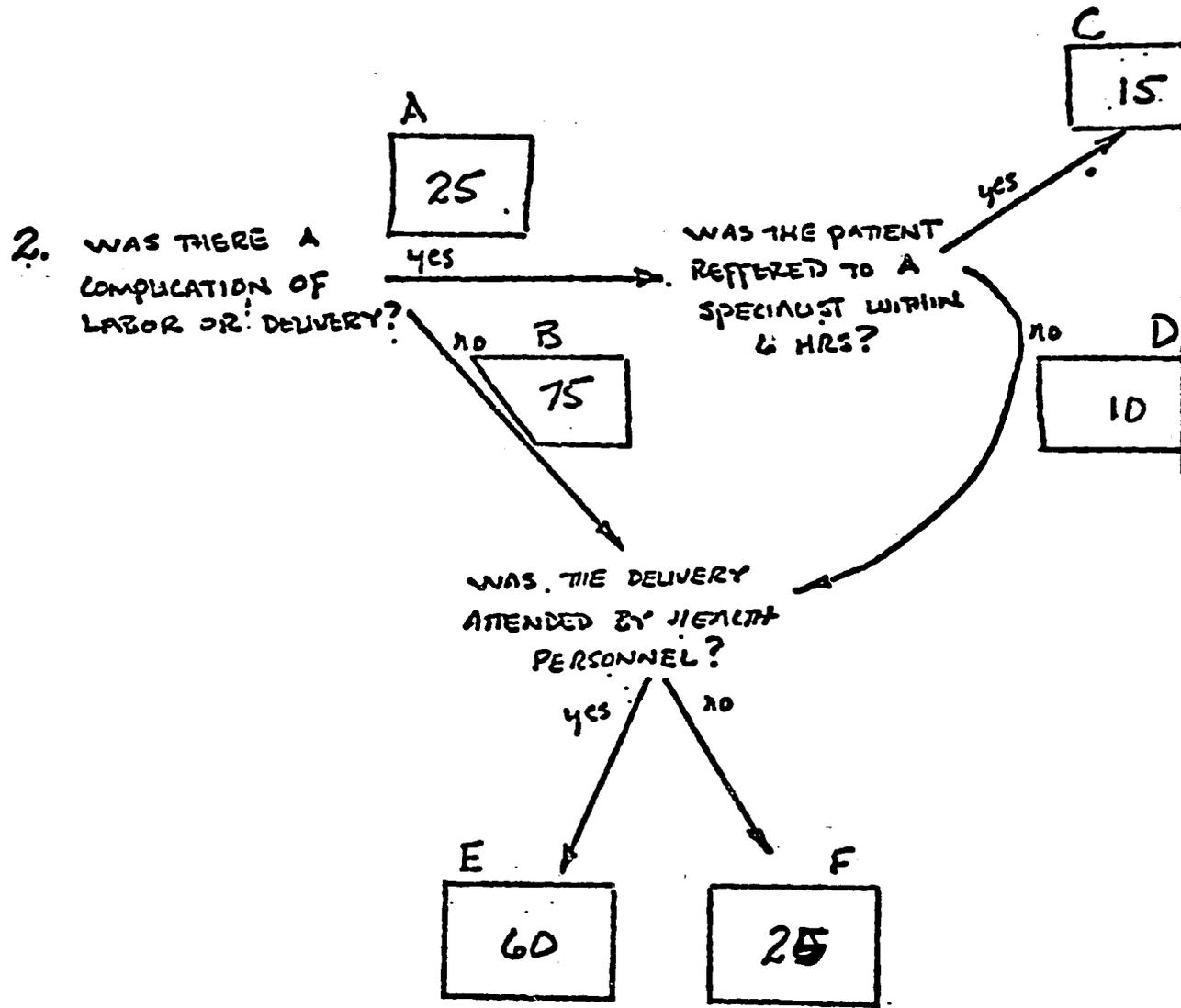
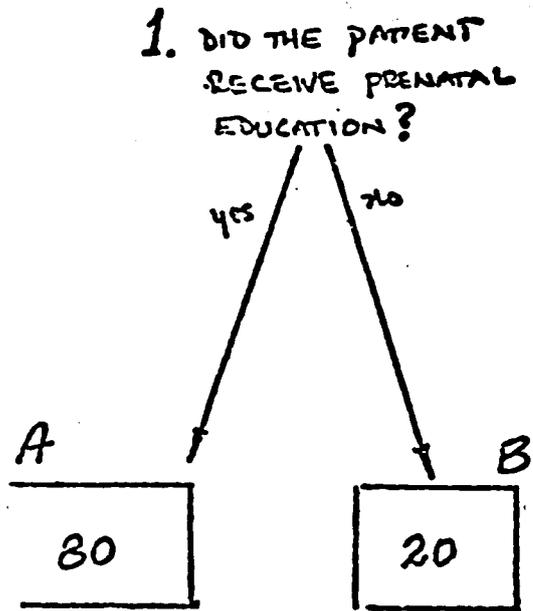
$P_d$  = If treated, probability of being followed up.

tot = Probability of passage through the entire chain  
 =  $(P_a) (P_b) (P_c) (P_d)$

FIGURE 10

TRANSITIONAL PROBABILITIES AS INDICATORS OF CONTINUITY

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FIGURE 11: <sup>Example</sup> A Data Collection Protocol For prenatal Care

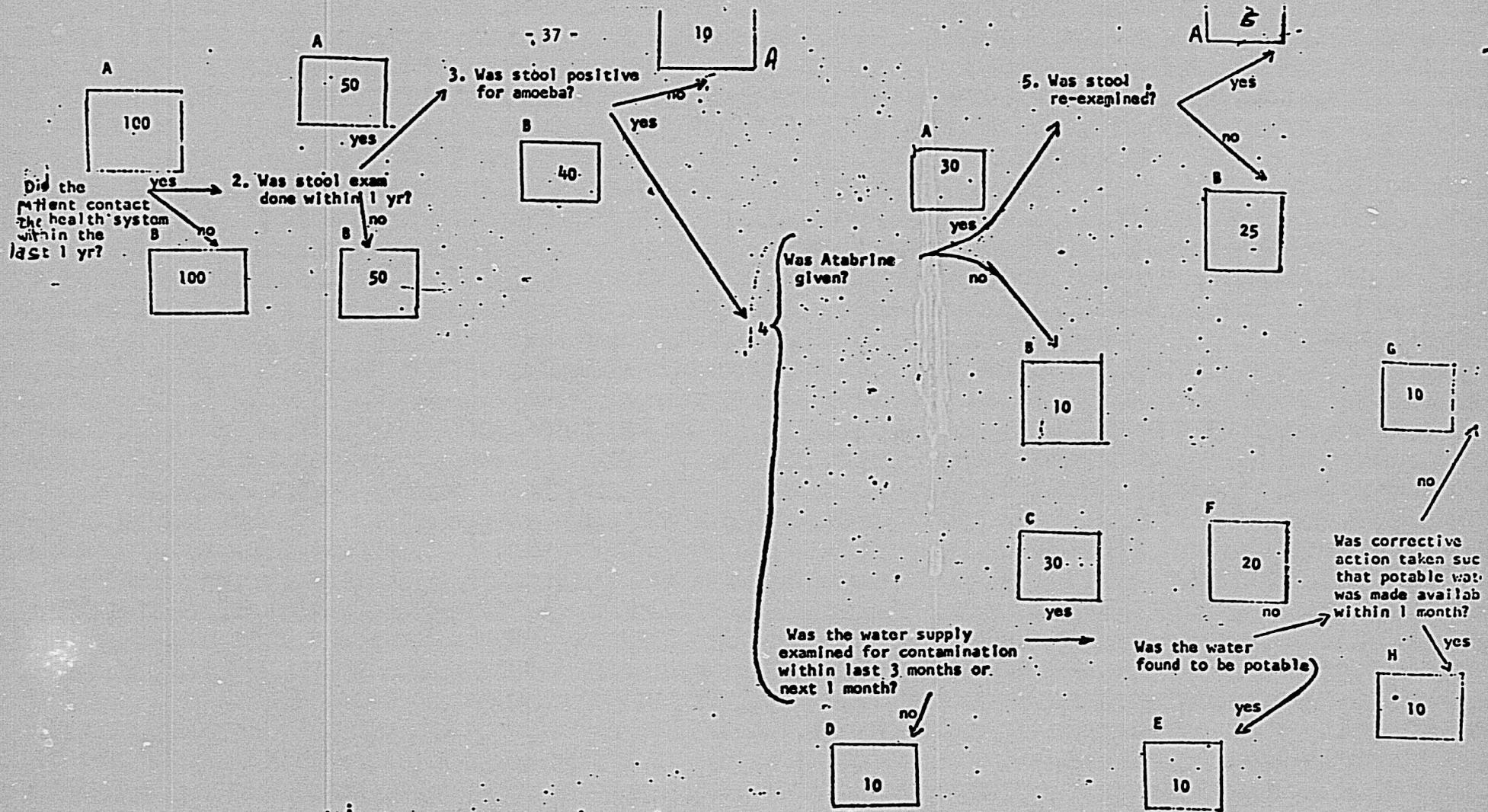


Figure 12: Example Data Collection Protocol for Amishiasis

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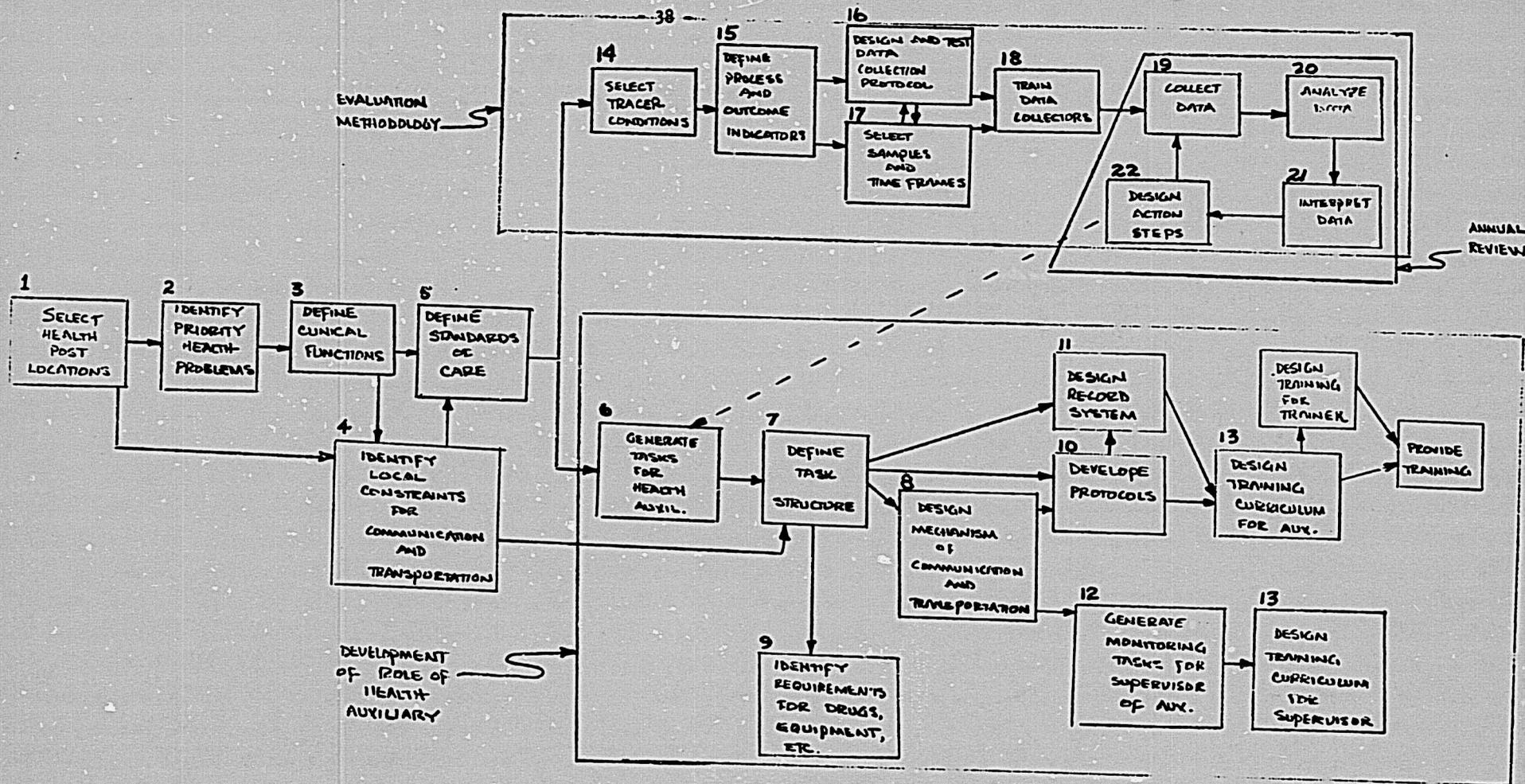


FIGURE 13: FUNCTIONAL ANALYSIS OF THE MAJOR COMPONENTS OF THE METHODOLOGY

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### DRAFT PROJECT DESCRIPTION

A major obstacle to the attainment of the goal "Equal Health for All" in Panama is the demographic dispersion of the population. The largest concentrations of population are in Panama City and secondary urban centers throughout the country. Similarly the largest concentration of health care resources and personnel are in the urban centers. In order to improve the health status of the rural Panamanian people, to provide health care resources to the marginal population in an efficient fashion, the Government of Panama has developed an integrated low-cost public health delivery system. The Rural Health Delivery System Project, jointly financed by the Government of Panama and AID will help provide for the marginal population effective, accessible health services in three areas: (1) preventive and curative health care; (2) environmental sanitation; and (3) nutrition. The purpose of the loan is not only to make these services available to rural Panamanians, but to insure that the Ministry of Health and the Social Security Agency (both currently providing health care services) are able to operate the system in the most efficient and effective manner possible.

As conceived by the MOH and CSS, the integrated public health delivery system will be pyramidal in structure, comprised in descending order or centralization of the following:

1. national, regional, and specialized hospitals
2. health centers
3. health sub-centers
4. health posts

The activities funded under the project, however, will take place at the local levels of the hierarchy. Trained health assistants will deliver both primary health care and coordinate the environmental and nutrition segments of the project, encouraging the community to participate in "preventive self-care" and serving as local community leaders. Each health assistant will be supervised by a physician located in the regional health center, who will also supervise the sanitary technician(s) and nutritionist working in the health center and sub-centers under his purview. Residents of marginal communities then will have easy accessibility to the health assistant, who will provide MCH care, including deliveries, first-aid, vaccinations, and family planning. Trained essentially in primary health care, the health assistants will be for rural Panamanians the initial

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point of entry into a referral system encompassing progressively more specialized and sophisticated health services. At the community level, then, the various project components will most directly provide the marginal population with access to an integrated system of public health services.

The essential components of the Rural Health Delivery System Project are:

1. The Health Care Component

- a. 225 health posts constructed in marginal communities or clusters of communities with a total population of approximately 500 inhabitants. Often providing services to adjacent communities (depending on local topography, available transportation, etc.), the posts will be basic structures (approximately 41 square meters divided into 2 rooms) maintained by the community, providing a base of operation for the local health assistant. Construction will be phased over the 4 years of the project to coincide with the training of health assistants and the construction of health centers and sub-centers.
- b. 14 health sub-centers, constructed in rural areas and staffed by a full-time nurse auxiliary and a part-time sanitary inspector, assisted periodically by visiting personnel from the supervising health center. The health sub-centers will augment the population covered currently by a total of 105 sub-centers that exist throughout Panama, and will each serve a minimum population base of 2,000 people.
- c. 4 rural health centers, constructed in 4 areas tentatively determined, each serving a population of 15,000 to 20,000 people. Each health center will have a waiting room, medical and dental examination rooms, pharmacy, laboratory, emergency treatment area, sanitary inspector's office, and administrative offices. Personnel at the health center will have supervisory and training responsibilities for the health post and center staffs.
- d. 300 health assistants trained (in a 12-month curriculum including seminars and practical work) in the delivery of primary and community health care, referral procedures, community development, etc. They

will staff the health posts and provide local health care services for the marginal communities included in the project.

- e. 200 nurse auxiliaries trained in a 9 month program at the provincial level and assigned to rural sub-centers and provincial hospitals to perform more traditional tasks (where they will be the presiding staff members).
  - f. 20 sanitary technicians trained to supervise rural environmental sanitation conditions.
  - g. 10 - 15 M.P.H. graduates: Provincial medical directors and other key administrative personnel will receive graduate-level training in public health to increase their managerial and administrative effectiveness in the public health system.
  - h. Joint U.S./third country and MOH/CSS counterpart management and administrative team will provide technical assistance, as required, to facilitate the further integration of the MOH and CSS at the provincial and national levels.
2. The Environmental Sanitation Component
- a. 300 rural aqueducts, constructed over the four year period, to serve rural communities with potable water. Each aqueduct will consist of a drilled well, an elevated storage tank, and about 6,000 linear feet of 2" main. Service lines connected with private yard faucets will provide water to individual homes.
  - b. 400 hand-pumped wells will be installed in smaller rural population centers of 50 to 100 inhabitants.
  - c. 13,800 latrines will be constructed as the most feasible way of providing individual village households with a means of safe excreta disposal. The basic units will consist of a latrine house on a concrete pad with a seat.
3. The Nutrition Component
- a. 46 community gardens, in addition to those currently existing will be established. The garden projects are intended to encourage more annual plantings and

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the growing - and consumption - of new vegetable foods. In order to guarantee a higher rate of success of the gardens than was achieved in the past, stricter criteria have been established by the government. Thus, gardens will be established only in communities with a functioning Community Health Committee, Agricultural Club, Production Cooperative, or other similar community organization; where at least 5 hectares of land suitable for agriculture are available (of which at least 3 hectares is near an irrigation source); where at least 15 families will participate, etc.

- b. 75 small animal projects, mainly poultry projects, will complement the community gardens in many rural areas. Where poultry projects are initiated, the Government will provide 500 baby chicks, feed, vaccine, technical assistance, etc. to begin the project. The projects will usually be operated by women. Once egg production begins, 50% of the production will be sold to generate operating funds; the remainder will be consumed by the participants.

### Project Execution

Because of the large contribution to this project that must be provided by the communities, it is fair to say that the MOH and CSS will share the responsibility for the project's execution with the individual communities. The MOH will assist the communities in the environmental sanitation and nutrition components of the project, while the CSS, MOH and the local communities will work together to implement the health care component. The implementation of the planning, design, and construction phases of the rural health delivery system (health posts, health centers and sub-centers, water supply projects, community gardens and small animal projects) will be based on procedures established during the MOH's previous experience with similar projects.

Evaluation procedures will include a survey to ascertain baseline data and subsequent follow-up studies at one or two year intervals. INCAP will aid the MOH in conducting longitudinal surveys to determine the impact of the project on selected communities. The performance of the health assistants and auxiliaries will be monitored by the provincial medical supervisors and evaluated by the MOH. The MOH's research unit (Dirección de Docencia e Investigación) will play a major role in assessing the impact of the total project.

LOAN AUTHORIZATION

A.I.D. Loan No. 525-U-045 A

For: PANAMA - Rural Health Delivery System

Provided From: Section 104 Population Planning and Health

Pursuant to the authority vested in the Administrator, Agency for International Development ("A.I.D.") by the Foreign Assistance Act of 1961, as amended, ("The Act") and the delegations of authority issued thereunder, I hereby authorize the establishment of a loan ("Loan") pursuant to Section 104 of the Act, and in furtherance of the Alliance for Progress, to the Government of Panama ("Borrower") of not to exceed six million United States dollars (\$6,000,000) to assist in financing the United States dollar and local currency costs of a project to institutionalize an improved integrated public health delivery system to provide basic preventive and curative health care services to and improved environmental sanitation conditions for the rural segments of the Panamanian population ("Project"). The Loan shall be subject to the following terms and conditions:

1. Interest and Terms of Repayment

Borrower shall repay the Loan to A.I.D. in United States dollars within forty (40) years from the date of the first disbursement under the Loan, including a grace period of not to exceed ten (10) years. Borrower shall pay to A.I.D. in United States dollars interest at the rate of two percent (2%) per annum during the grace period and three percent (3%) per annum thereafter on the outstanding disbursed balance of the Loan and unpaid interest.

2. Other Terms and Conditions

- A. Except for ocean shipping, goods and services financed under the Loan shall have their source and origin in Panama or countries included in A.I.D. Geographic Code 941, provided, however, that marine insurance may be financed under the Loan only if it is obtained on a competitive basis, and any claims thereunder are payable in freely convertible currencies. Ocean shipping financed under the Loan shall be procured in any

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country included in A.I.D. Geographic Code 941, not including Panama.

- B. United States dollars utilized under the Loan to finance local currency costs shall be made available pursuant to procedures satisfactory to A.I.D.
- C. Prior to issuance of any commitment documents or any disbursements under the Loan, Borrower shall furnish to A.I.D., in form and substance satisfactory to A.I.D.:
  - (i) An opinion of the Procurador General of Panama that the agreement has been duly authorized and/or ratified by and executed on behalf of the Government of Panama and that it constitutes a valid and legally binding obligation of the Government of Panama in accordance with all of its terms.
  - (ii) A statement of the names of the persons holding or acting as representatives of the Government of Panama for purposes of the Loan and a specimen signature of each person specified in such statement.
  - (iii) Evidence that Borrower has appointed a Project Coordinator, with authority and responsibility for coordinating all aspects of the Project.
- D. Prior to the issuance of any commitment document or any disbursements under the Loan for construction, Borrower shall furnish to A.I.D. in form and substance satisfactory to A.I.D.:
  - (i) criteria for selecting the locations for health posts, health sub-centers, and health centers, and
  - (ii) standard designs and specifications for health posts, health sub-centers, health centers and related equipment.
- E. Prior to the issuance of any commitment document or any disbursements under the Loan for training of health assistants, Borrower shall furnish to A.I.D., in form and substance satisfactory to A.I.D., a plan

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for training, supervising, and evaluating health assistants, including a training curriculum.

- F. Prior to the issuance of any commitment document or any disbursements under the Loan for training of public health personnel other than health assistants, Borrower shall furnish to A.I.D. in form and substance satisfactory to A.I.D. a training plan setting forth, but not limited to, the nature and duration of such training.
- G. Prior to the issuance of any commitment document or any disbursements under the Loan for the remodeling of any health unit, Borrower shall furnish to A.I.D. in form and substance satisfactory to A.I.D. plans and specifications for that unit.
- H. Borrower shall covenant to conduct annual evaluations of the Project with A.I.D. during disbursement of the Loan.
- I. This Loan shall be subject to such other terms and conditions as A.I.D. may deem advisable.

\_\_\_\_\_  
Administrator

\_\_\_\_\_  
Date

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LOAN AUTHORIZATION

A.I.D. Loan No. 525-U-045 B

For: PANAMA - Rural Health Delivery System

Provided From: Section 104 Population Planning and Health

Pursuant to the authority vested in the Administrator, Agency for International Development ("A.I.D.") by the Foreign Assistance Act of 1961, as amended, ("The Act") and the delegations of authority issued thereunder, I hereby authorize the establishment of a loan ("Loan") pursuant to Section 104 of the Act, and in furtherance of the Alliance for Progress, to the Government of Panama ("Borrower") of not to exceed three million five hundred thousand United States dollars (\$3,500,000) to assist in financing the United States dollar and local currency costs of a project to institutionalize an improved integrated public health delivery system to provide basic preventive and curative health care services to and improved environmental sanitation conditions for the rural segments of the Panamanian population ("Project"). The Loan shall be considered an addition to A.I.D. Loan No. 525-U-045 A and administered jointly with it and shall be subject to the following terms and conditions:

1. Interest and Terms of Repayment

Borrower shall repay the Loan to A.I.D. in United States dollars within forty (40) years from the date of the first disbursement under the Loan, including a grace period of not to exceed ten (10) years. Borrower shall pay to A.I.D. in United States dollars interest at the rate of two percent (2%) per annum during the grace period and three percent (3%) per annum thereafter on the outstanding disbursed balance of the Loan and unpaid interest.

2. Other Terms and Conditions

A. Except for ocean shipping, goods and services financed under the Loan shall have their source and origin in Panama or countries included in A.I.D. Geographic Code 941, provided, however, that marine insurance may be financed under the Loan only if it is obtained on a competitive basis, and any claims thereunder are payable in freely convertible currencies. Ocean shipping financed under the Loan shall be procured in any

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- country included in A.I.D. Geographic Code 941, not including Panama.
- B. United States dollars utilized under the Loan to finance local currency costs shall be made available pursuant to procedures satisfactory to A.I.D.
- C. Prior to issuance of any commitment documents or any disbursements under the Loan, Borrower shall furnish to A.I.D., in form and substance satisfactory to A.I.D.
- (i) An opinion of the Procurador General of Panama that the agreement has been duly authorized and/or ratified by and executed on behalf of the Government of Panama and that it constitutes a valid and legally binding obligation of the Government of Panama in accordance with all of its terms.
  - (ii) A statement of the names of the persons holding or acting as representatives of the Government of Panama for purposes of the Loan and a specimen signature of each person specified in such statement.
  - (iii) Evidence that Borrower has appointed a Project Coordinator, with authority and responsibility for coordinating all aspects of the Project.
- D. Prior to the issuance of any commitment document or any disbursements under the Loan for construction, Borrower shall furnish to A.I.D. in form and substance satisfactory to A.I.D.:
- (i) criteria for selecting the locations for health posts, health sub-centers, and health centers, and
  - (ii) standard designs and specifications for health posts, health sub-centers, health centers and related equipment.
- E. Prior to the issuance of any commitment document or any disbursements under the Loan for training of health assistants, Borrower shall furnish to A.I.D., in form and substance satisfactory to A.I.D., a plan

for training, supervising, and evaluating health assistants, including a training curriculum.

- F. Prior to the issuance of any commitment document or any disbursements under the Loan for training of public health personnel other than health assistants, Borrower shall furnish to A.I.D. in form and substance satisfactory to A.I.D. a training plan setting forth, but not limited to, the nature and duration of such training.
- G. Prior to the issuance of any commitment document or any disbursements under the Loan for the remodeling of any health unit, Borrower shall furnish to A.I.D. in form and substance satisfactory to A.I.D. plans and specifications for that unit.
- H. Borrower shall covenant to conduct annual evaluations of the Project with A.I.D. during disbursement of the Loan.
- I. This Loan shall be subject to such other terms and conditions as A.I.D. may deem advisable.

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Administrator

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Date

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