INTERNATIONAL HEALTH PROGRAMS

AMERICAN PUBLIC HEALTH ASSOCIATION
International Health Programs
1015 Fifteenth Street, NW
Washington, DC 20005

AN ANALYSIS OF THE PHARMACEUTICAL LOGISTICS SYSTEM IN HONDURAS

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During The Period:
APRIL 6-13, 1981

Supported By The:
U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
(ADSS) AID/DSPE-C-0053

AUTHORIZATION:
Ltr. AID/DS/HEA: 9-7-82
Assgn. No. 583075

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I. INTRODUCTION

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A large proportion of the health care budget in Honduras is allocated for pharmaceuticals. Nevertheless, the majority of the population lacks access to many of the essential drugs that are needed to treat prevalent diseases. Moreover, the limited funds that are available are often ill-spent on ineffective, duplicative, or unacceptably dangerous drugs. Monies frequently are wasted on drugs that are handled and used inappropriately.

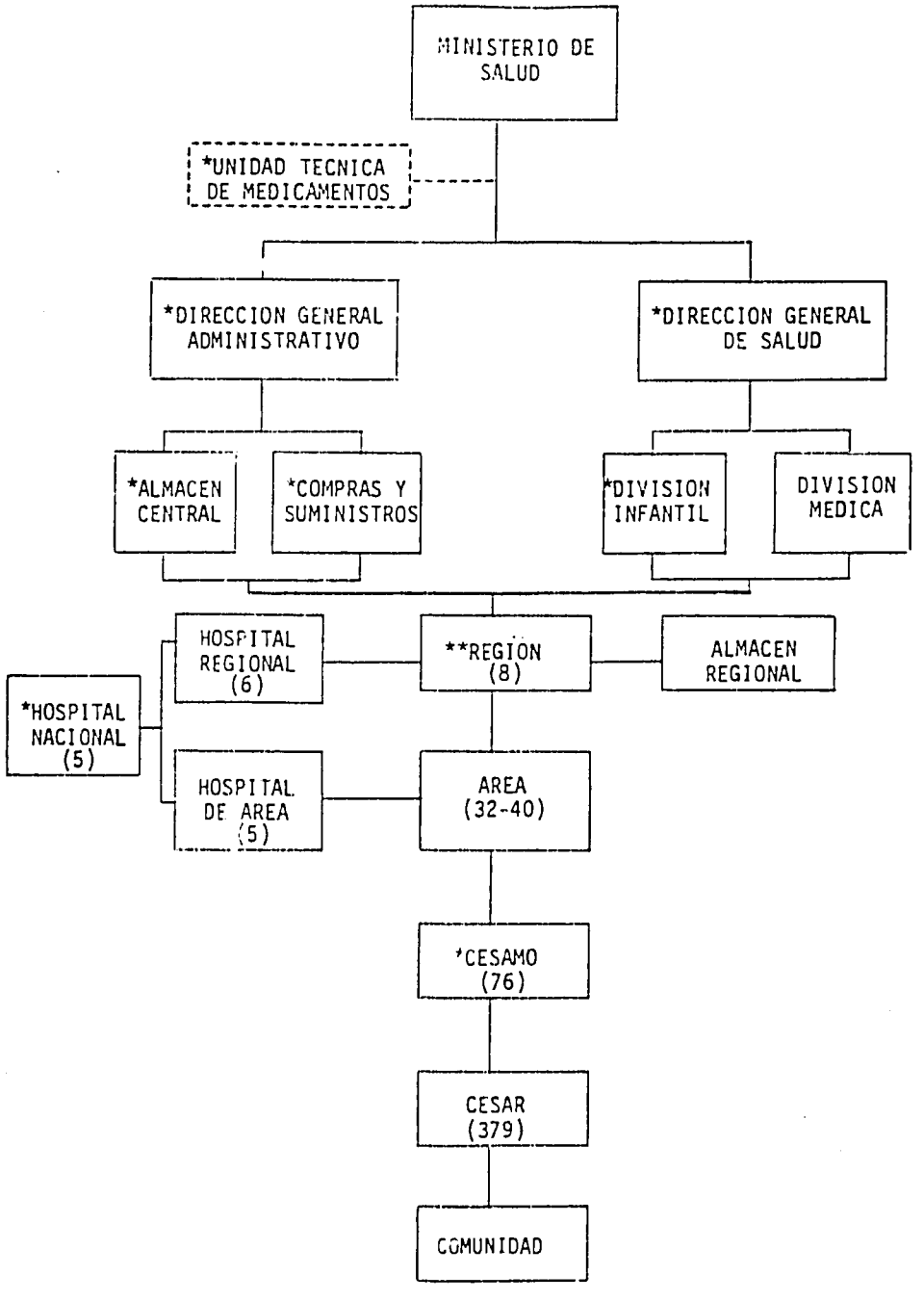
The purpose of this assignment was to investigate, observe, and analyze the pharmaceutical logistics system of the Ministry of Health in Honduras. During the one-week effort, selection, planning, procurement, inventory control, warehousing, distribution, and use of pharmaceuticals were reviewed. The consultant interviewed the key personnel responsible for specific pharmaceutical-related logistics tasks, observed actual procedures and activities, and collected pertinent, available data. Dra. Reyna Suyapa Romero, recently chief, the Unidad Tecnica de Medicamentos, was assigned by the Ministry of Health to facilitate information-gathering activities and to share the results of studies by her unit. Dra. Romero and others graciously cooperated with the consultant.

Figure 1 is a schema of the functional relationship of pertinent units. Other divisions or departments that are not involved directly in pharmaceutical logistics are not pictured. An asterisk denotes where interviews and observations occurred. Additional interviews were conducted at the national pharmaceutical manufacturing plant (PANI) with Dr. Mario Castillo; at Proveeduria with the subproveedor Lic. Heriberto Retes; and at the Department of Biostatistics.

This analysis was not intended to be an in-depth evaluation of the pharmaceutical logistics system. One week was not sufficient time for extensive information-gathering and observation. However, earlier experience in evaluating pharmaceutical logistics systems in developing countries provided insights into the identification of problem areas and possible solutions.

Figure 1

FUNCTIONAL RELATIONSHIP OF PERTINENT UNITS



* Offices visited.

** Only one regional office is illustrated to show functional relationships. A similar relationship exists for other regional offices.

NOTE: The specific number of offices is shown in parentheses.

II. OBSERVATIONS AND FINDINGS

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In general, the problems peculiar to the pharmaceutical logistics system in Honduras are similar to problems in other Central American countries. Specifically, a high proportion of the health care budget is misspent on drugs that are often ineffective, of poor quality, or ill-suited to the country's needs. Drug needs (quantities) are not estimated systematically, and the procurement of drugs is not based on objective criteria. In addition, the warehousing and distribution of drugs are inadequate. Health personnel are either poorly trained or completely untrained to handle and use drugs. All these factors result in significant waste of money and drugs, lack of available, necessary drugs at rural health posts and centers, and decreased effectiveness of primary care.

The following sections contain details on specific observations of key aspects of the system, including selection, planning, procurement, warehousing, distribution, and use.

Selection

The Ministry of Public Health has prepared a list of basic drugs, the Cuadro Basico, for 1981. The choice of drugs appears to be rational. The number of dosage forms (432) is reasonable; 310 drug products are represented. (The WHO's "List of Essential Drugs" includes approximately 200 drug products.) The basic drug list is divided into 62 therapeutic classes, and the drug products are listed by their generic names. Each drug is coded, and a level of use is designated. The drugs that were selected are appropriate for a basic drug list. However, the drug list includes a few combination products of questionable efficacy, some drugs of secondary benefit, and a few duplicative products or dosage forms.

Unidad Tecnica de Medicamentos coordinated the development of the Cuadro Basico. Representatives from the pharmacy and therapeutics committees of the national teaching hospital and two national psychiatric hospitals coordinated a review of the Cuadro Basico by their respective hospital staffs. However, a systematic analysis was not made of morbidity patterns prevalent within the country relative to drug needs.

The Cuadro Basico was published on December 2, 1980, with a limited distribution.

Planning

At this time, an operational inventory-control system is not in place in Honduras. Each health facility has supplied information on the

quantities consumed last year in a base, three-month period. This information, presented in highly variable formats by the health facilities, was sent to the Unidad Tecnica de Medicamentos. Unfortunately, each health facility recorded information on drug consumption in its own way. As a result, the Unidad Tecnica de Medicamentos will have to spend inordinate time merging drug consumption data into an aggregate report on system-wide drug consumption.

Drug quantities for purchases are estimated, based on average quantities of drugs consumed per month during any three-month period. The average monthly figure is multiplied by 12 to calculate annual consumption. This amount is then increased with the addition of a 15 percent growth factor.

Although existing stock in the central warehouse is considered during the procurement process, no attempt is made to determine the quantities of stock in regional and local warehouses. In addition, a morbidity-based estimate of drug need based on disease incidence and prevalence statistics is not calculated. Adjustments are made to account for products that are not included in the Cuadro Basico and for substitution by other drugs. The actual list of drugs and quantities to be purchased is submitted to the Department of Purchasing.

Procurement

Drugs are procured through public bidding. A list of drugs to be purchased is sent to all prospective drug manufacturers or their representatives. It is not clear that specific requirements for the drugs (e.g., shelf-life, product color, package size, etc.) are delineated to the prospective supplier. The bids are accepted at Proveeduria; there, a list of acceptable bidders for each product is prepared.

A committee consisting of a representative from the Proveeduria, the sub-director of public health, the head of the Department of Drug Control, the chief of the Administrative Division, and a physician from the teaching hospital meet to adjudicate the bids. (The committee does not include a representative from the Unidad Tecnica de Medicamentos.) This committee meets and reviews the summary forms submitted by Proveeduria that contain bids from prospective suppliers. The forms specify unit price, total price, delivery time, and product name. The Proveeduria decides whether to enter a prospective supplier's name on the summary form.

During the week-long meeting, suppliers are selected by consensus. Explicit criteria for the selection of suppliers have not been established. However, procurement criteria (quality, cost, and compliance with delivery schedules) are considered--subjectively and inconsistently--during the selection of a pharmaceutical supplier.

The existing procurement law does not establish specific drug procurement policies and regulations. There is no routine quality-control analysis of drug products. Nor does Honduras have a systematic approach to deal with drug returns, defective products, and failure to meet delivery schedules. Some products that were purchased more than a year ago are just now being delivered to customs. Proveeduria is responsible for retrieving drug products from customs and delivering them to the central warehouse. However, this retrieval procedure has presented problems in the past. Some products have been in customs since 1977.

Honduras developed a pharmaceutical laboratory, PANI, in 1962, which is financed by proceeds from the national lottery. In 1974, the laboratory expanded, with support from the Ministry of Health, and purchased sophisticated equipment to perform quality-control analyses and to diversify pharmaceutical production. Currently, the laboratory produces 40 pharmaceuticals--aspirin, ampicillin, chloramphenicol, antihistamines, vitamins, metronidazol, ointments, etc. The laboratory has 33 employees, 4 of whom are pharmaceutical chemists.

The head of the laboratory reports that raw materials are obtained from Hungary and China via Germany. The costs to produce pharmaceuticals have, as a result, decreased significantly. The head of PANI also claims that the costs are two to three times lower than those of other imported products.

The laboratory recently acquired sophisticated quality-control analysis equipment, including a computerized infrared spectrophotometer, a flame photometer, and a gas chromatograph. In addition to low-cost drug production, PANI now has the potential to be a drug-analysis laboratory for the Ministry of Health.

Warehousing and Distribution

The central warehouse contains all the supplies required by the health facilities (drugs, medical supplies, papers, cement, sewage treatment supplies, etc.). The physical structure is in extremely poor condition, and it is not organized well. Because some drugs are not stored at the proper temperature or humidity, decay occurs. Labeling of drug products is inconsistent; some drugs are labeled with their commercial names, others with their generic names. Warehouse personnel are untrained, and frequently they are unable to retrieve requested drug products when given only the generic names. The absence of a trained pharmacist to manage the pharmaceutical department contributes to the suboptimal management of the central warehouse.

There is no efficient system for requisitioning drugs. Non-standardized order forms are submitted by health facilities. The requisitions vary

from one health facility to another. Trade and generic names are used inconsistently on the forms. Rural health facilities can bypass the regional warehouse and request drugs directly from the central warehouse. Controls on the frequencies of orders are nonexistent. Some facilities request drugs every three months, and others whenever they run out of a particular drug. Furthermore, there is no system for identifying drugs that are not being requested or which are about to expire and incorporating this information into the procurement and distribution process. Large quantities of drugs may not be requested for years because personnel in the field do not know they exist. In addition, regional warehouses, hospitals, and health center stockrooms lack information on inventory status and use. Individual physicians or nurses often are unaware that products are available in their hospital stockrooms, and hospitals and health centers are uninformed about products available in the regional and central warehouses.

Although the Unidad Tecnica de Medicamentos has assigned appropriate levels of use to each drug product, these levels are not considered in the distribution process. Hence, drugs for which extensive knowledge is required often are sent to community or rural health posts where health care auxiliaries are not qualified to administer them. As a result, pharmaceuticals are used either inappropriately (hazardously) or not at all, and subsequently wasted.

The distribution of drugs to health facilities is unorganized and inefficient. The central warehouse sporadically sends a truck to rural areas. Frequently, drugs are left behind because the truck is filled with cement and sewage treatment supplies. The primary means of drug distribution often is accomplished by individual health facilities that send one of their personnel to pick up their drug order. This poses problems when vehicles or gasoline is unavailable. Road conditions in rural areas are extremely poor, and some are passable only during the dry season.

Use

Rational drug usage is the most critical component of a developing country's pharmaceutical logistics system. When drugs are misused, the patient's condition often is prolonged or worsens. The misuse of drugs can translate into the expenditure of millions of dollars for remedial physician or hospital services to overcome the ill effects of improper drug therapy.

Health care personnel in Honduras are not well trained to handle and use drugs. Even physicians have difficulty keeping up with all the new developments in the area of pharmaceuticals. The absence of simple, concise, objective information on the drugs available to the nurse, auxiliary

nurse, or physician to aid in prescription and administration contributes to the general problems of inappropriate drug use.

Drugs often are not used for appropriate indications. The dosages are either inadequate or excessive. The duration of treatment is either too long or too short. Contraindications and potential adverse effects are not known and are not considered routinely before a particular drug is used. For example, one hospital spent more than $20,000 on a high-cost antibiotic that is seldom the drug of first choice in any infection and which often contributes to the emergence of drug-resistant bacterial strains.

III. RECOMMENDATIONS

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Two easily implementable plans can be used to resolve immediately some of the more critical pharmaceutical logistics problems in Honduras. The first plan concerns the supply and use of drugs at rural primary health care facilities. It involves the development of morbidity-based lists of drugs and quantities required for use by the community, health posts, and health centers. In this approach, the region-specific lists would be a basis for assembling packages of drugs in appropriate quantities for routine shipment to each facility. In addition, therapeutic guides would be developed for health personnel at all levels. These guides, tailored to specific local needs, would specify drugs of choice for prevalent conditions, recommend dosages for children and adults, give the duration of treatment, and present contraindications, precautions, and adverse effects.

The second plan addresses the problems associated with the lack of standardized drug orders, inventory control, and prescription forms. Preprinted forms should be designed for all health personnel who procure, requisition, receive, and dispense pharmaceuticals. With standardized forms drug needs can be estimated more easily, drug orders can be filled, and inventory and security can be controlled. Once the forms are standardized, health personnel should be trained in their proper use. In the long run, if these functions are standardized, the procedural burdens placed on health care providers will be reduced.

A number of other recommendations that require varying degrees of financial and political support follow.

1. Formalize and support the Unidad Tecnica de Medicamentos.

   This unit should be independent of the Division Administrativo and Division de Salud, but it should serve both divisions in a technical and regulatory capacity. The unit should perform the following functions:

   --update the Cuadro Basico;

   -analyze statistics on the consumption of drug products and prevalent morbidities;

   --recommend quantities of drugs to be purchased annually;

   --develop treatment standards;

--perform drug-utilization-review studies;

--standardize and update forms (order, inventory, and prescription forms);

--supervise and train all personnel who handle drugs;

--supervise drug suppliers' performance; and

--coordinate special studies on drugs.

2. Design a computerized drug-inventory-control system to encompass all levels.

It is easy to design a computerized drug-inventory control. Many micro- and mini-processors are available to handle drug-inventory control. In fact, several systems offer the flexibility of inputting data onto a cassette or diskette for processing by a centralized computer. Computerizing the drug inventory will facilitate drug control, ordering, and review of use.

3. Define objective criteria for updating the Cuadro Basico.

The annual updating of the Cuadro Basico should be consistent. A rational approach to drug selection requires the use of criteria to evaluate efficacy, toxicity, existence of less costly equivalents, cost-benefit ratios, etc. The selection of drugs should be based on a review of morbidity prevalence rates.

4. Design a decision matrix for drug procurement.

The selection of drug suppliers should be based on explicit objective criteria that define product specifications, drug quality, delivery considerations, cost, and earlier performance.

5. Analyze the existing law governing procurement and, if necessary, revise that law to accommodate the specific needs of drug procurement.

Typically, procurement laws are designed to meet the needs of government purchasing of all kinds of products, and often they do not contain necessary provisions to deal with the peculiarities of drug procurement. The existing procurement law in Honduras should be analyzed to determine whether or not it should be revised.

6. Assist PANI (the national laboratory) in expanding its pharmaceutical line in concert with national drug procurement priorities.

PANI has the potential to produce a larger number of pharmaceutical products. If PANI expands its pharmaceutical line, it should do so by manufacturing high-priority pharmaceuticals.

7. Develop a system of quality-control analysis for products with narrow therapeutic and toxic ranges.

Drugs with narrow therapeutic and toxic ranges require strict quality-control analysis. To reduce the overwhelming burden of performing quality-control analysis on all drugs, priorities can be established initially for those drugs with narrow therapeutic and toxic ranges. A logical choice to perform the quality-control analysis would be the PANI quality-control laboratory.

8. Organize the central warehouse by using simple operating procedures.

Drugs should be stored at appropriate temperatures and humidity levels. Drugs should be organized by either generic name or code, or both. Procedures for initial receipt, inspection, storage, retrieval, control, and distribution of drugs must be developed.

9. Develop a system to use morbidity statistics to determine drug needs.

Local health care personnel must be trained to accurately record and report morbidity statistics. Ministry personnel should be trained to analyze these morbidity statistics and to incorporate the findings into the drug-procurement process.

10. Conduct drug-use and cost analyses.

Programs designed to improve drug selection, storage, and use should be analyzed to determine their impact on administrative and supply costs. In addition, high-cost and toxic drugs (and the personnel who provide them) should be identified, and an educational program on their use, costs, etc., should then be implemented.

Appendix

DIRECTORY OF PERSONS INTERVIEWED

Ministerio de Salud Publica y Asistencia Social

Dr. Anibal Villatoro V., Director General de Salud

Dr. Juan de Dios Paredes, Sub-Director General de Salud

Dra. Reyna Suyapa Romero, Jefe, Unidad Tecnica de Medicamentos

Lic. Erasto Elvir Rubio, Jefe, Direccion de Administracion

Lic. Lesbia, Almacen Central

P.M. Arely Paz Gomez, Bioestadisticas

Alba Argentina Portillo, Departamento de Compras

Proveeduria General de la Republica

Lic. Heriberto Retes, Subproveedor

Laboratorio del Patronato Nacional de la Infancia

Dr. Mario Castillo

Hospital Escuela

Dr. D.E. Baires, Almacen y Farmacia de Salas

Dra. Juarez, Jefe, Farmacia