AN ANALYSIS OF THE MANAGEMENT INFORMATION SYSTEM OF THE MINISTRY OF HEALTH OF THE SYRIAN ARAB REPUBLIC

SUMMARY REPORT

BY

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I. INTRODUCTION

This report contains a summary and the conclusions of an analysis of the management information system of the Ministry of Health of the Syrian Arab Republic. The details of the analysis will be described in one of several technical reports which will be issued at a later date. The purposes of the analysis were to evaluate the identification, collection, recording, processing, analysis, and use of information in making management decisions in the Ministry; to identify problem areas; and to suggest solutions, which would include, where appropriate, electronic data processing. The basic questions asked in the analysis were (1) What are the major concerns and problems facing top management in the Ministry? (2) What kinds of information does management need to address these problems in an effective way? (3) What is the best way to get this information to management? The focus was not on whether the Ministry of Health should or should not have a computer. This latter issue can only be answered appropriately in the context of the three questions just listed. Approaching the analysis in any other way would have made the computer an <u>end</u> rather than a <u>means</u>. A computer can be a very efficient and appropriate means of processing information. Obtaining one is not and should never be an end in itself.

The analysis involved a detailed examination of the management and information problems of the various directorates and departments of the Ministry using a framework previously developed by the author. In doing the analysis, detailed discussions were held with the Minister, Vice-Ministers, each of the twelve Directors, with selected department heads within the directorates, with the Health Directors of two muhafazats, and with personnel at local clinics. Numerous forms, records, and summaries were examined and cross-checked, both at the Ministry and in the muhafazats. I also met with the Director General of the Central Bureau of Statistics, and with the representatives of several commercial data-processing firms.

In reporting the results of the analysis, I shall proceed in the following way. First, I shall discuss the assumptions and framwork upon which the analysis was based. Secondly, a summary evaluation of management and information problems of the Ministry will be presented. Thirdly, there will be a discussion of some proposed solutions to some of the problems which were indentified.

Fourthly, there will be a discussion of the special problems of the proposed Health Insurance Plan. And finally, there will be the identification of implied data-processing requirements.

II. ASSUMPTION AND FRAMEWORK OF ANALYSIS

The data on which the analysis of this report is based were obtained by asking questions, examining forms, and observing behavior over a fifteen day period. The questions asked, the records examined and the activities observed, were not selected in a random or haphazard way. They were selected and later analyzed in terms of a conceptual framework which makes assumptions and judgments about the nature of management, about the way information can be useful to management, and about the factors (including electronic data processing) which contribute to the usefulness of information. To facilitate an understanding of both the analysis and the recommendations which follow from it, it is important to have a general understanding of this framework. Some of these ideas are quite simple and obvious, others are more complex and subtle. Whatever the case, a list of the important ideas of the framework are listed below in outline form.

A. Assumptions About the Nature of Public Management

1. Government exists to satisfy public needs. The Ministry of Health exists for the purpose of satisfying the health needs of the Syrian people by providing health service programs of both a preventative and a treatment nature.

2. Management is the art of deciding on goals and of assembling and directing people and things to achieve those goals. It involves bridging the gap between where we are and where we want to be. Accordingly, there are four basic tasks for public management:

a. to clarify the needs that are to be met or the problems that are to be solved

What are the priority needs which the Ministry wants to meet? High infant mortality in the first three months? Deaths from communicable disease? Unequal distribution of health services between cities and rural areas?

b. to design programs or projects to meet priority needs

This involves creatively organizing people and resources into implementable projects. In the case high infant mortality, for example, this would involve deciding on which of several different programs or combination of programs seems to have the best chance of being implemented and effective. Training village dayas? More village mid-wives? More clinics? Maternal education? Etc.

c. to control the quality, cost and schedule for carrying out a program

Good management does not stop with a good plan or program design, it begins with one. Murphy's Law, which says, "whatever can go wrong, will go wrong" should be learned well by all planners. If the planned results of program are to look at all like the actual results, the implementation of the program must be controlled. Problems must be identified early and corrective measures taken quickly. This is true for controlling the quality of performance as well as the cost and schedule.

d. <u>to evaluate changes both in needs and performance over time</u>

The health environment is not a static one. Needs, problems, and the effectiveness of programs targeted at them will change over time. Management must monitor these changes and adapt its programs to them.

3. The effectiveness of programs will depend on the quality and quantity of resources (both human and material), and on the quality of the management decisions concerning targeting, designing, and controlling them.

4. The quality of management decisions and the persuasiveness with which management can present its decisions to political authorities will also effect its ability to obtain resources.

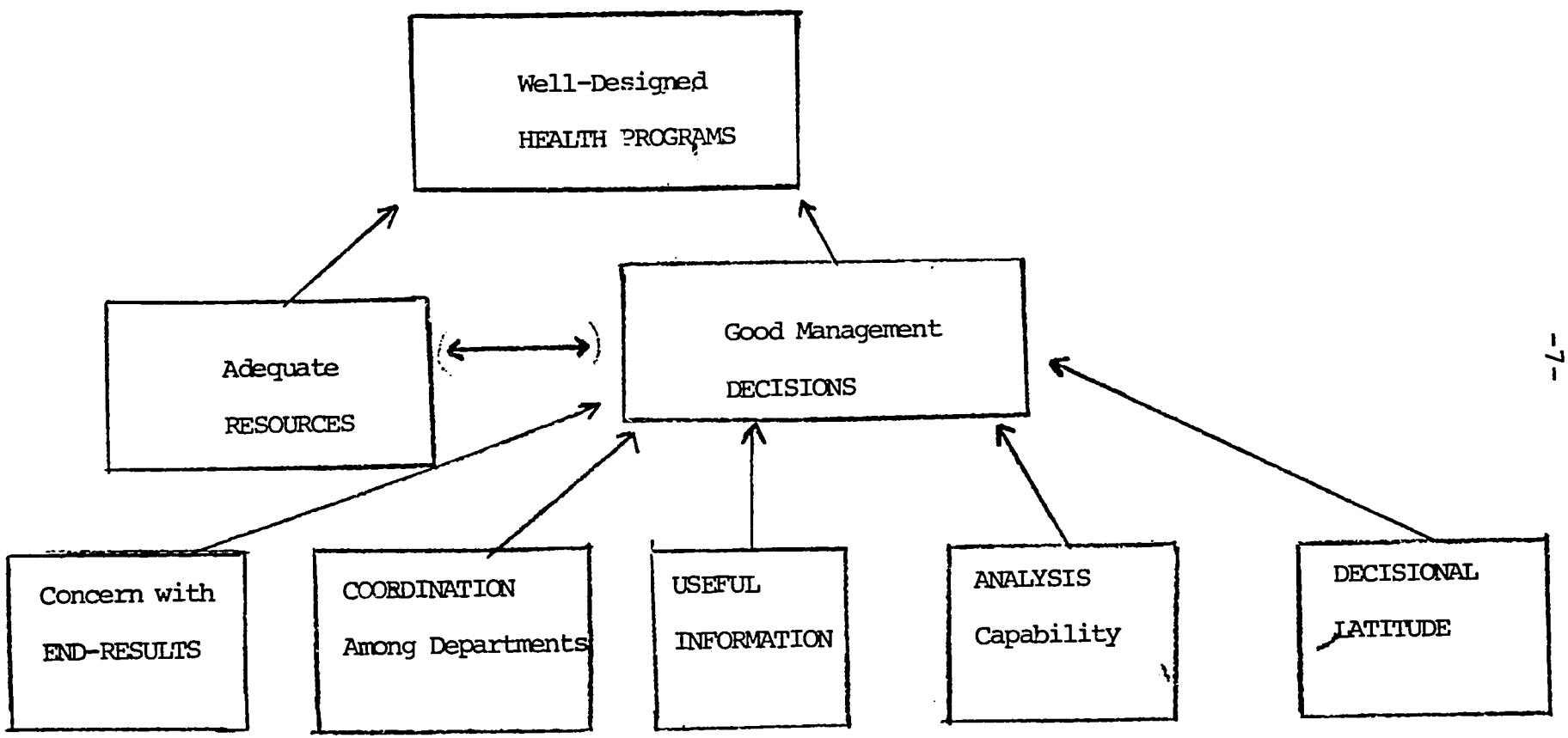
Well-Designed
HEALTH PROGRAMS
Adequate
RESOURCES
Good Management
DECISIONS
Concern with
END-RESULTS
COORDINATION
Among Departments
USEFUL
INFORMATION
ANALYSIS
Capability
DECISIONAL
LATITUDE

Figure 1

B. Assumption About The Role of Information in Manágement Decision

1. Good management in the public sector is dependent on five basic factors:

a. a concern with end-results

Management must concern itself not simply with planning, nor for that matter simply with the details of day-to-day activities. It must focus on end-results (how did the program actually affects the lives of people) and view both planning and day-to-day activities as means to achieving end-results.

b. coordination among departments and directorates

Most ministries are set up so that no single directorate or department can carry-out a program which effectively meets public needs on its own. An effective program to control a cholera epidemic, for example, will require elements of data collection and identification, quarantine, treatment, immunization, and public education . It will involve various departments of the Central Ministry, the directorates of the muhafazats, local clinics, and special teams.

c. useful information

If management is to make an "informed" decision, it must, by definition, have "information". In the previous example of a cholera epidemic, it needs to have early information on cases and their location, on the type of people involved and on their living and habits. It needs to know about the distribution and characteristics of population in the area or areas involved. It must know about cholera, its methods of spreading through the population, etc.

d. analysis capability

Information of itself will not answer management's questions. It must be organized and refined and analyzed by people who have the requisite technical knowledge and skills.

e. decisional latitude

Finally, if management is to be effective, it must have the power and authority to manage. It must have some latitude to eliminate ineffective programs and to try to design effective ones. If the design of programs is dictated by legislative politics, management must have the information and the skill to argue persuasively to the pertinent political authorities as to what needs to be changed.

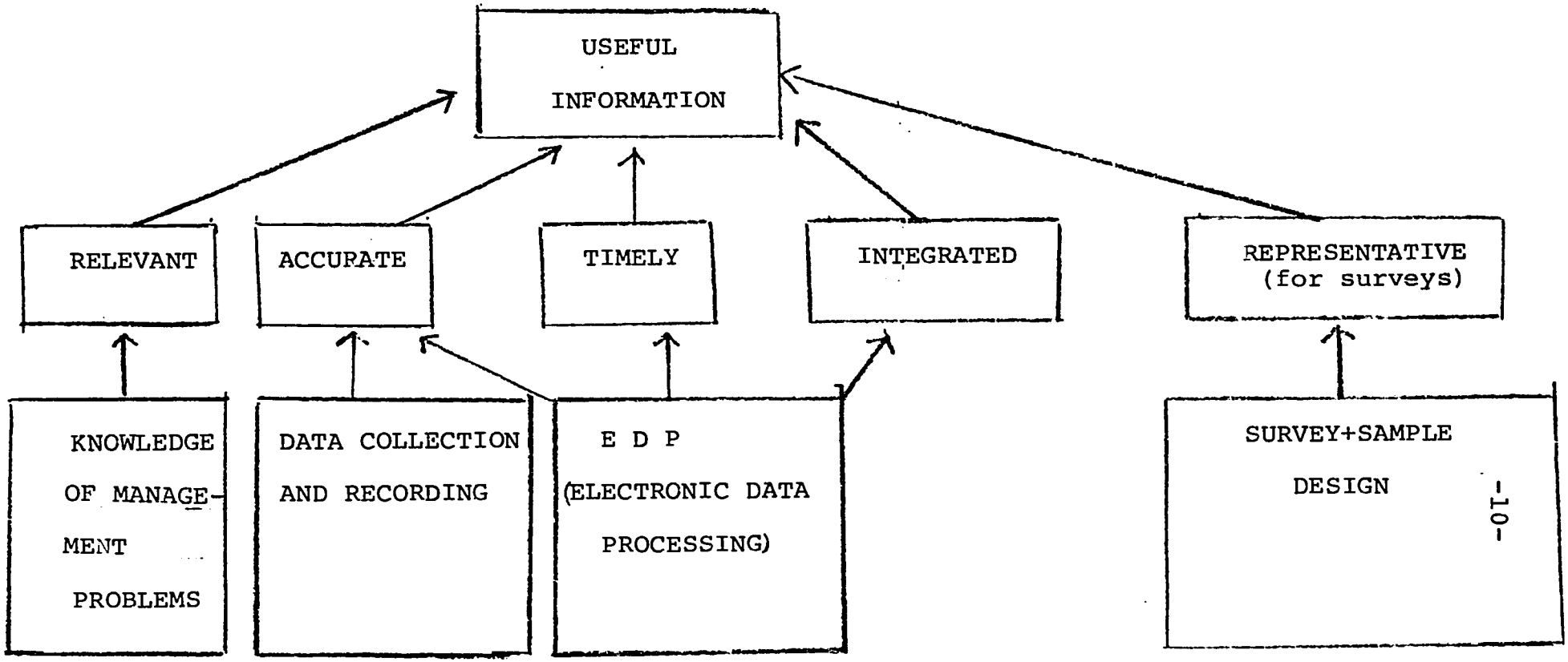
USEFUL INFORMATION
RELEVANT
ACCURATE
TIMELY
INTEGRATED
REPRESENTATIVE (for surveys)
KNOWLEDGE OF MANAGE-MENT PROBLEMS
DATA COLLECTION AND RECORDING
E D P (ELECTRONIC DATA PROCESSING)
SURVEY+SAMPLE DESIGN

Figure 2

C. Assumptions About Factors Which Make Information Useful

1. There are two basic sources of information for management: operations information and surveys. Operations information pertains to the records that an organization develops and maintains in the process of carrying out its work. They are the records which tell who is doing what activity with what inputs at what time. They describe the characteristics of an organization's people, of its durable and non-durable material resources, and how and when people and resources interact. They can and often do provide records about the status of clients, recipients of beneficiaries of services. Surveys are activities whose sole purpose is to gather information via direct contact with people - the "subjects" or "respondents" of the survey. Surveys can provide information about the attitude and behavioral status of people be they expectant mothers, children, local health personnel, central administrators, or physisians in a muhafazat.

2. Whether it be operations information or surveys, the usefulness of information to management is dependent on five characteristics: relevance, accuracy, timeliness, integratibility, and representativeness.

3. For information to be relevant, it must help management make judgments about the importance of the needs for their programs, about the effectiveness of the outputs (products of services) that they are producing or providing, or about the efficiency of the way the people who work with them or for them combine material resources and technical skills to do their job. What specific information is relevant will depend upon the level of management's knowledge and skills.

4. Accuracy will depend on the method and level of detail with which data are transcribed and recorded. Careful and unambigous recording of data are the bedrock on which the whole information structure of an organization is built. If recording procedures are haphzard and not rigorous, the whole structure of analyzing and dissemenating and using information fails.

5. Unlike in basic scientific research, where completeness of information is much more important than how soon one has access to it. Incomplete information on time is better than perfect information after a decision has been made. The speed with which information needs to be processed and analyzed will, of course, vary considerably, depending on how fast the data itself is changing and how inaccurate the existing data is.

6. Integration refers to the ability or ease with which information from seperate sources can be combined. An example would be the case and extent to which various medical registers could be combined to identify the total number of personnel working in each muhafazat or for that matter in each local clinic within a muhafazat.

7. Representativeness refers in particular to survey data. It refers to the extent to which partial data reflects the larger body from which it is drawn. It refers, for example, to the extent to which information based on a survey of mothers in twenty villages can be used to describe the behavior and attitudes of mothers in other villages. In most cases, representativeness depends upon the adequacy of the way the respondents to the survey were selected or sampled.

D. Assumptions About Electronic Processing of Information

1. The electronic processing of information can be contributed in an important way to making information more useful to management. These ways are as follows:

a. use of the same data more than once

Unlike most other machines which consume their inputs when the machine in run (as when a coke furnace consumes iron and coal), electronic data processing machines can use the same information over and over again. For example, a list of physicians can be used to identify which ones are practicing abroad in what countries and for how long. It can also be used to identify the numbers of various specialists in what muhafazats.

b. combination of data from different sources

Electronic data processing machines make it very easy to combine or "integrate" information from different areas as when payroll lists and equipment inventory lists are combined to determine operating costs for health centers.

c. great speed

Given enough skilled persons and sufficient time, there is virtually no task performed by electronic data processing machines that could not be performed by hand-sorting, calculation, and typing. By being able to sort large files

or registers of information and do hundreds of thousands of calcualtions in seconds, EDP machines can give management summaries and reports in hours that would have taken months to produce by hand.

d. great accuracy

Finally, if the information which is given the computer is reliable and accurate, the computer can do thousands of calculations without making a mistake.

2. Despite their great capabilities, computing machines are only useful to management if certain other conditions are met. These conditions are the following:

a. The information being input into the computer must be reliable and accurate.

b. The computer itself must be instructed or programmed in way that will answer management's questions.

c. The computer must have proper maintenance.

d Management must have a clear idea of how to use the computer carrying out its tasks. If not, the information is processed to no effect.

III. MANAGEMENT INFORMATION IN THE MINISTRY OF HEALTH

This section reports on a "macro" analysis of the management information system of the Ministry of Health. By "macro" is meant that the focus is on the major missions and programs of the Ministry, on the decisions which face management in these areas, and on the information requirements of these decisions. This is contrasted with a "micro" analysis in which the focus is simply on improving day-to-day work decisions at the level of the smallest unit or office as in deciding on the most efficient way to meet the Ministry's duplication and reproduction needs. Data was collected and examined at the micro-level, but it was analyzed and evaluated from the macro-level of the Ministry as a whole.

From this "macro-perspective", the Ministry of Health has as its general goal, improving the health status of the Syrian people. This involves both disease prevention and effective treatment. The nature of the programs which the Ministry operates in both prevention and treatment will depend in part on the health status and problems of the people, on available resources, and on political preferences for certain kinds of delivery systems rather than others.

While having a comprehensive goal of improving health of the entire population, the scope of the Ministry's activities is quite restricted in several ways. In the area of environmental health, much of the activity of the country is coordinated and directed by other ministries which deal with public works. In the area of treatment, the Ministry operates a system of clinics which treat less than a quarter of the population. This is partly a result of the fact that the military and several other civilian ministries provide medical services to their own employees. But, it is due mostly to the non-use of public services. Despite higher cost for private medical services ($ US 8/visit) most Syrians will use private clinics and hospitals rather than free government-operated services. This non-use of Ministry operated facilities is caused by several factors.

1. The quality of services is generally perceived to be poor. Physicians are part-time, have poor base pay, and usually focus their energy and concern on their more lucrative private practice.

2. There is grossly unequal distribution of health services across urban and rural areas. Most physicians generally prefer the style of living and services of urban areas, as well as the oportunities for greater income from private practice in urban areas.

SOME HEALTH SERVICE DELIVERY PROBLEMS IN SYRIA

بعض الخدمات الصحيه تولد المشاكل في سوريا.

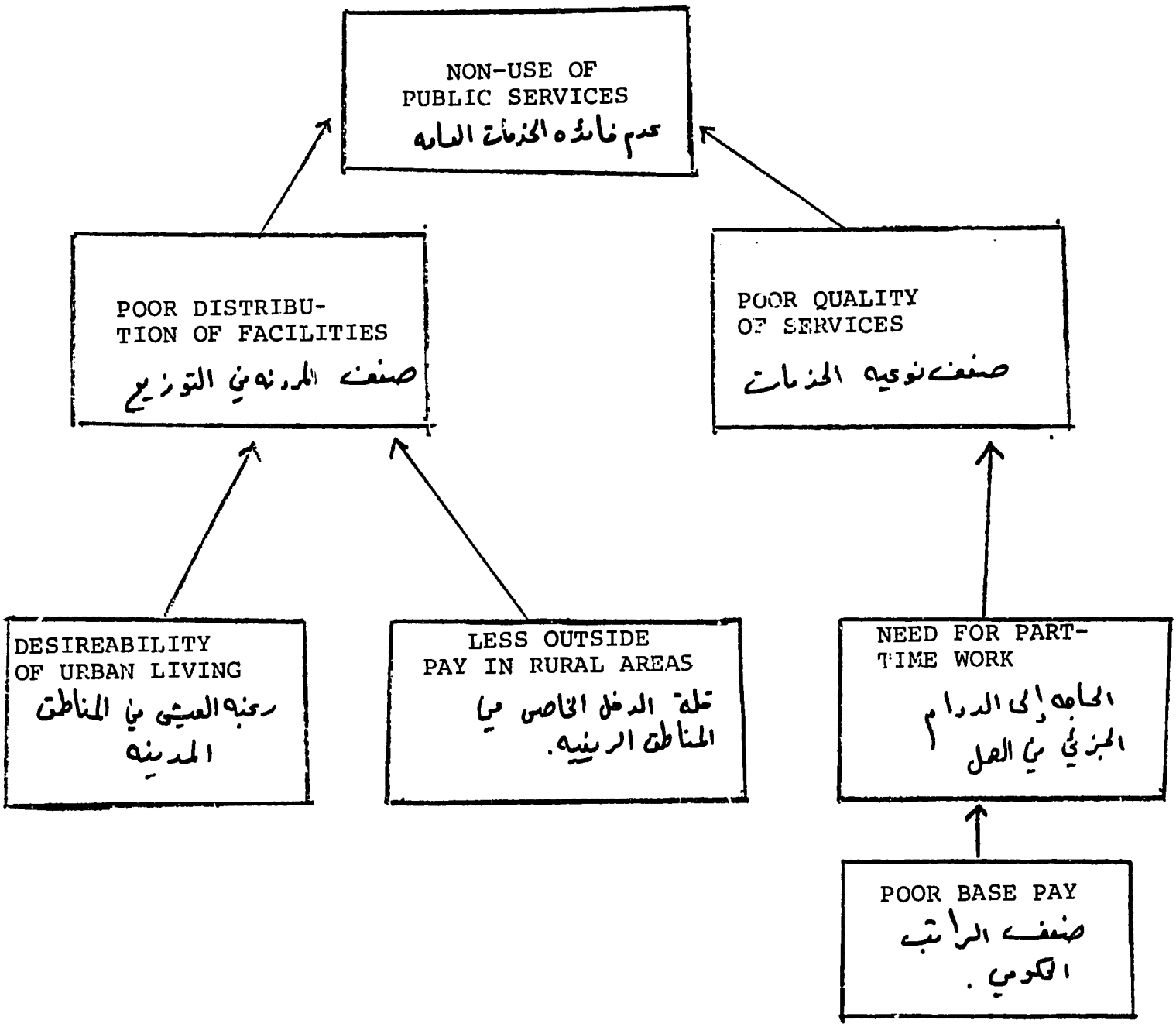

FIGURE 3

If the Ministry of Health is to correct this basic problem of poor service, it will require both more resources and better designed and better controlled programs. These factors in turn are dependent upon better use of better information. To improve the design and targetting of programs, the Ministry must have better information about the health needs, patterns of use, and attitudes toward use of health service of people in different areas. It must know more about the extent and distribution of current services, both public and private. It must know more accurately what it costs to staff and operate clinics of different size and type in different areas of the country. To obtain this information the Ministry in turn must utilize and integrate information from the following sources:

1. From need and use surveys

Which describe the health problems, environmental conditions, and access to and use of health facilities by people in different areas;

2. From national personnel registries

Which show the distribution of health manpower accross both the public and private sector and across the geographical areas of the country;

3. <u>From ministry and muhafazat payroll records</u>

Which show the cost of staffing public clinics and hospitals;

4. <u>From equipment and supply lists;</u>

Which show the non-personnel costs of operating clinics and hospitals.

معلومات لأجل برنامج
أفضل للخدمات الصحية

INFORMATION FOR BETTER
HEALTH SERVICE PROGRAMMS

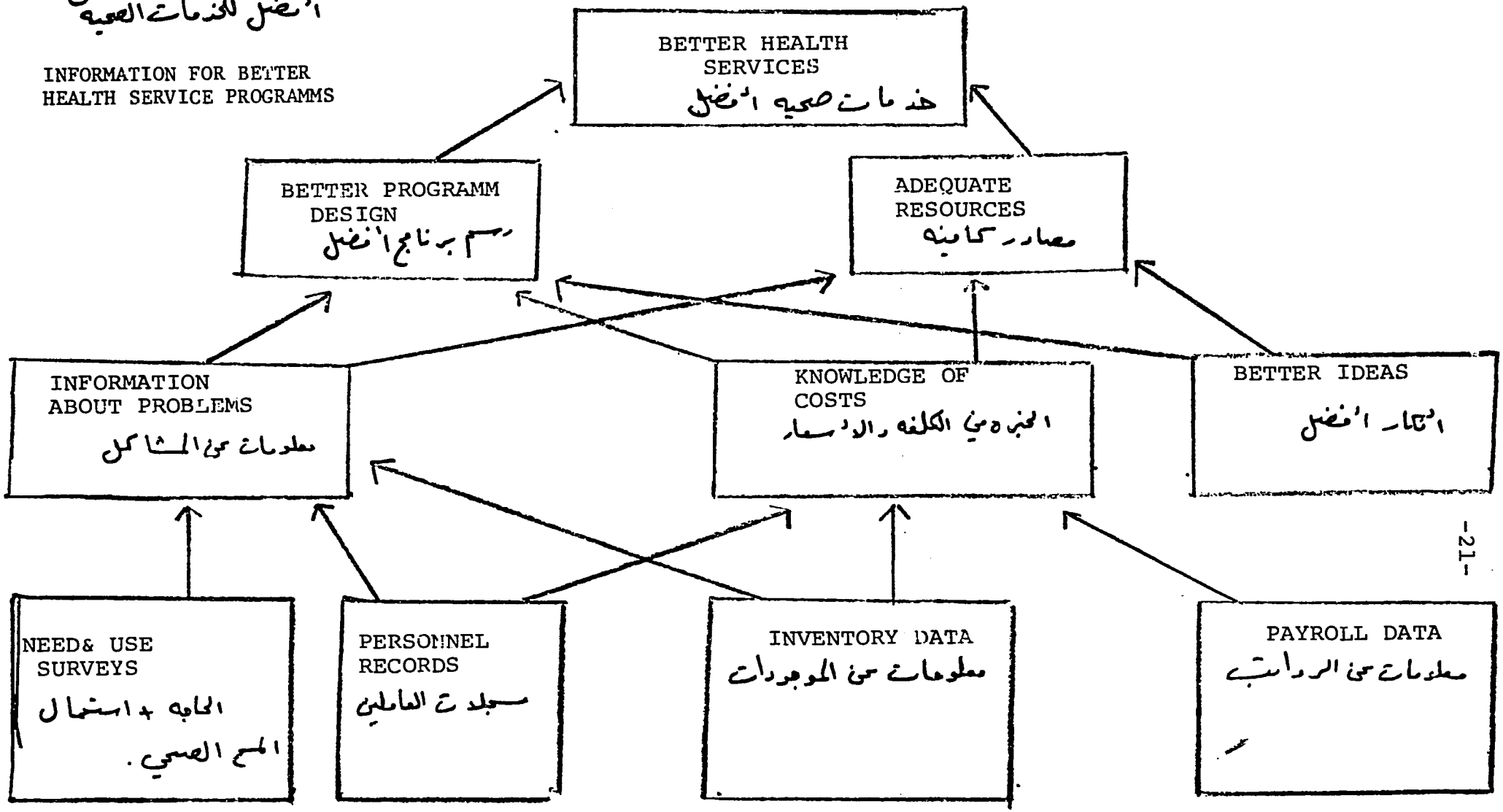

FIGURE 4

Information in these basic areas is indispensable for identifying the exact nature of the distribution and use of current Minitry facilities as well as their costs of operation. Without this information it is impossible for the Ministry to accurately evaluate the performance of its present delivery system or to intelligently direct efforts at improvement. Therefore, these areas must be of priority in any attempt to improve management information in the Ministry. These areas were focused on in doing the directorate-by-directorate examinations of both day-to-day operations and routine recording of data.

For each directorate, information presently being recorded and processedwas evaluated with respect to the criteria of relevance, accuracy, timeliness, integratibility, and representativeness. Day-to-day activities were examined with a view to ascertaining if additional useful information might be gathered or processed, or whether present information ought to be gathered or processed differently. Recommendations based on this examination are summarized in the next section.

IV. SUMMARY OF RECOMMENDATIONS

The directorate-by-directorate analysis identified dozens of ways that more and better information was needed move and could be generated in the Ministry. Attempting to move in each of these ways at once is beyond the capacity of the Ministry and would guarantee immobility rather than going forward. Therefore, a limited set of recommendations, which are achievable and manageable, and which are based on the priority areas identified above, are put forward. These recommendation are described below.

1. <u>the status and distribution of health personnel</u>

To identify the location and status of health personnel in the country, the Ministry keeps lists (registers) of all health personnel in the country. There are separate lists for each major category of skilled person: physicians, nurses, mid-wifes, pharmacists, etc. The lists are in journal format, i.e., they are chronological lists based on time of entry. The lists are recorded properly but are nevertheless basically inaccurate because of the failure to update them properly. To remedy this situation, the Ministry should petition for a law requiring the annual registry of all medical personnel at the Office

of the Director of Health of the Muhafazat. These more comprehensive lists ought then to be computer processed. This would allow the data to be pulled out in different ways: for example, for physicians, by skill of specialization, and by muhafazat.

2. Personnel costs for public health services

The monthly payroll of the Ministry is currently computed by hand. The thousands of tedious calculations that go into computing monthly salaries, hourly wages, and benefits are done with reasonable accuracy. However, little or no useful summarization is done for management. The payroll for the Ministry, and eventually for health personnel in the muhafazats, ought to be computerized. This would not only increase the efficiency with which the payroll is produced, more importantly, it would generate high priority management information. It would for the first time let upper management in the Ministry know how much it costs to staff various hospitals and clinics, to provide programs such as the Extended Program in Immunization.

3. Equipment and Supply lists

The present equipment inventory lists of the Ministry are not updated frequently enough to provide an accurate description of what equipment is located where, its age, condition of repair, cost, etc. Minor changes in recording procedure, together with computerization of the lists, would allow for the first time an accurate description of the equipment and supply status of all operating units of the Ministry.

4. Budget and cost control

Combining computerized payroll and equipment information with monthly and year-to-date budget information would make possible a level of cost accounting and control which is not presently possible. Budget and costs could be easily listed and summaried by general ledger codes, or by program or by physical operating unit, depending on the control problems which concern management at any given time.

5. Need and use surveys

The household survey currently being conducted provides valuable information about the need for and use

of health services. It ought to be continued with minor modifications:

a) After the first year, the survey need only be done semi-annually, instead of quartely. (For the content of the survey, management needs knowledge of base data and long term trends rather than information on seasonal variations).

b) With minor modifications in the sampling procedure, the survey can be scaled down in terms of the number of recipients with little loss in representativeness.

c) The group currently conducting the present survey, could be used effectively to conduct additional one shot surveys targeted at special groups of users (e.g., health insurance system members) or providers (physicians, midwives, etc.).

V. HEALTH INSURANCE

In addition to the management and information needs of the Ministry of Health, an examination was also made of the new national Health Insurance Plan. In effect, the proposed health insurance system is an alternative health delivery system that will initially run parallel to and then eventually replace the current system provided by the Ministry of Health. It is a most intersting experiment in that its designers are cognizant of many of the problems plagueing the current public health service delivery system: non-use of services, poor quality control, part-time employment, and lack of financial incentive to work in rural areas.

The health insurance system is a most ambitions endeavor, not only in conception and design, but in magnitude. Even the first stage will involve over 170,000 workers and their families, over 100 clinics, over 1000 staff, thousands pieces of equipment and large amounts of consumable supplies. If this ambitious project is to succeed costs, schedule, and quality must be rigidly controlled. In this regard, electronic data processing can play a role similar to that which was advocated for the Ministry of Health.

More specifically, electronic data processing ought to be used in conjunction with the proposed health insurance system in the following ways:

1. Personnel cost control

Because of the necessity of controlling salary and wage costs closely and at various levels, the payroll of the health insurance system ought to be computerized.

2. Equipment and inventory control

Material equipment and supply lists also ought to be computerized, as proposed above, for the Ministry.

3. Budget control

Budget control must be at the level of the individual cost center (clinics). The ability to operate at this level of detail and to aggregate up to higher levels (muhafazat) will require computerization.

4. Schedule control

If the health insurance program is to have any chance of meeting its ambitious schedule, thousands of activities will have to be coordinated. Given the brief time-span and shortage of middle-level management personnel, computerized manipulation of a schedule of these activities will greatly assist competent and conscientious management in trying to stay on schedule.

5. Surveys

There will also be a need for electronic data processing of the user and worker surveys which must be done if the management of the insurance system is the identity and respond to problems quickly.

In terms of the medical records of the clients of the health insurance system, this can be done most efficiently at the level of the individual clinic. A duplicate patient-visit form would allow one copy to be kept in each patient file, and the other to be kept in a chronological file as a journal of each clinic's daily activities. For information on health status and treatment procedures, etc., only a small number of these forms need be randomly and periodically selected.

VI. DATA PROCESSING REQUIREMENTS

Several recommendations have been made above as to how the selective and limited use of electronic data processing can increase the usefulness of management information both in the Ministry of Health and also for the proposed Health Insurance Plan. If data processing is to be used effectively, three conditions must be met. First, the data processing equipment itself must be adequate to do the required processing. Secondly, the programs or sets of tasks which the computer is instructed to do must be flexible enough to meet management's changing needs. And thirdly, and most importantly, management must itself understand how different kinds of files on which it has information can be combined and used in different ways to help it solve its planning, programming, and control problems. A word on each of these is in order.

A. Hardware

In terms of hardware, to do the jobs outlined above, the following hardware is minimally required:

1. a 64,000 character-memoray computer, processor, programmable in the BASIC language,

2. a 60 character per second printer

3. a 10,000,000 character disk storage unit

4. a video displayunit or console

5. a key-to-disk data-entry unit (particularly if information is to be entered both for health insurance and for Ministry of Health activities.)

These items must be maintainable locally. The total cost of their purchase would be approximately 250,000 L.S.

B. Software

In terms of software, what is required is a generalized data-entry and reporting package Such a package would allow someone without programming experience to set up files, enter data, update it, retrieve it, do calculations on it, and format it into specialized management reports. Most significantly, reports could be changed without reprogramming. Also, a critical path schedule package would be needed for the health insurance system, and a small simple statistical analysis package for the surveys.

Costs would be around 60,000 L.S. for the reporting package; 30,000 L.S. for the scheduling package; and 1000 L.S. for the statistical package.

C. Management Support

If electronic data processing is to function effectively, the third leg of the tripod must also be in place. It is imperative that additional management assistance be sought in the area of information processing and use, particularly in relation to cost and schedule control.