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Planned and Achieved Outputs in Saudi Health Care System: Reducing the Gap

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Abstract. This paper examines and compares the planned and actual output of the Saudi Arabian health care system during its Fifth Development Plan period (1990-1995). It then analyzes the inputs and the environmental factors available to the system and how these factors may have influenced the performance (process) of the system, and hence the planned output. The investigation reveals that some of the planned outputs were achieved satisfactorily, while others fell short significantly. The possible reasons for the shortcomings have been discussed and recommendations have been put forward to reduce the gap between the planned and the actual outputs of the system.

Introduction

The health sector of any given country can be considered a complete system with its own sets of specific inputs, Conversion processes and outputs. Usually the system also involves information-feedback mechanisms, particularly concerning impact of the output component, so that the system itself can monitor and control its important activities. Some of the information feedback is routine and regular, while, for others, special studies must be developed. One of the major objectives of a health care system is to achieve the highest possible level of output for a given set of inputs and conversion processes, functioning within a particular environment. In fact, the output of a system depends directly on the combined effect of its inputs, therefore, can reveal the strengths and weaknesses of system, including its specific components, and may indicate modifications of the system that will improve performance.

It is possible, therefore, that an analysis of the output of the Saudi Arabian health care system may generate important insights about its various aspects. The major objectives of this study are:

- To study the outputs of the Saudi Arabian health care system during its Fifth Development Plan Period (EDP), i.e. 1990 through 1995.
- To appraise the level of its achievements,
- To assess the possible reasons for shortcomings, if any, and
- To suggest possible measures to improve the output and outcome in the future.

Review of Literature

It is often useful to look at the health care services of a country from the perspective of a complete system, an open system to be exact. Like any complex system, it is composed of a series of multidisciplinary inputs, conversion processes and outputs all interdependent, organized under various sub-systems, and arranged in hierarchical structures. Similarly, health care services must interact regularly with various social, economical, political and physical environments, in order to function effectively [1, p. 34].

Resources that must be supplied to a system in order for it to function are called "inputs". The products of a system are called its "outputs". The activities that take place within the system as it converts inputs into outputs are called the "process" [2, p. 9]. High levels of output can lead to increased "outcome" and thereby "impact", which are the direct and indirect effects, respectively, of the output on the community. An outcome assessment of health programs is necessary to assess the end impact of program processes or administration. Such impact can be assessed both in the long- and short-term [3, p. 186 and pp. 183-184]. The major objective of the immunization sub-system, for example, to reduce the mortality and morbidity from immunizable diseases in the community. As shown in Fig. 1, proper inputs and process in the sub-system will lead to a high level of output of immunization activities, indicated by the number and types of immunizations done and immunization coverage in the population. The outcome of this output will be a reduction in the immunizable diseases in the community, while the impact will be the reduction in overall mortality and morbidity rates.

The fundamental development objective of the health sector in Saudi Arabia has always been to improve the health of its people by providing free but high-quality, comprehensive and universal health care services throughout the Kingdom [4, p. 97]. Consequently, the Saudi government is generously funding and supporting the Ministry of Health (MOH), which develops and implements health plans [4, p. 618]. In order to achieve its goal, the MOH adopted the Primary Health Care (PHC) program in 1980 [5], which has been expended rapidly since then. Under the program, the entire country

is to be covered with a network of PHC centers, supported by secondary- and tertiary-care hospitals, through a chain of referral systems. Each PHC center is charged with providing basic health care services to its target population [6, p. 36]. By the end of the Fourth Development Plan period, the MOH was responsible for about 85% of the health services provided in the country [7, p. 360].

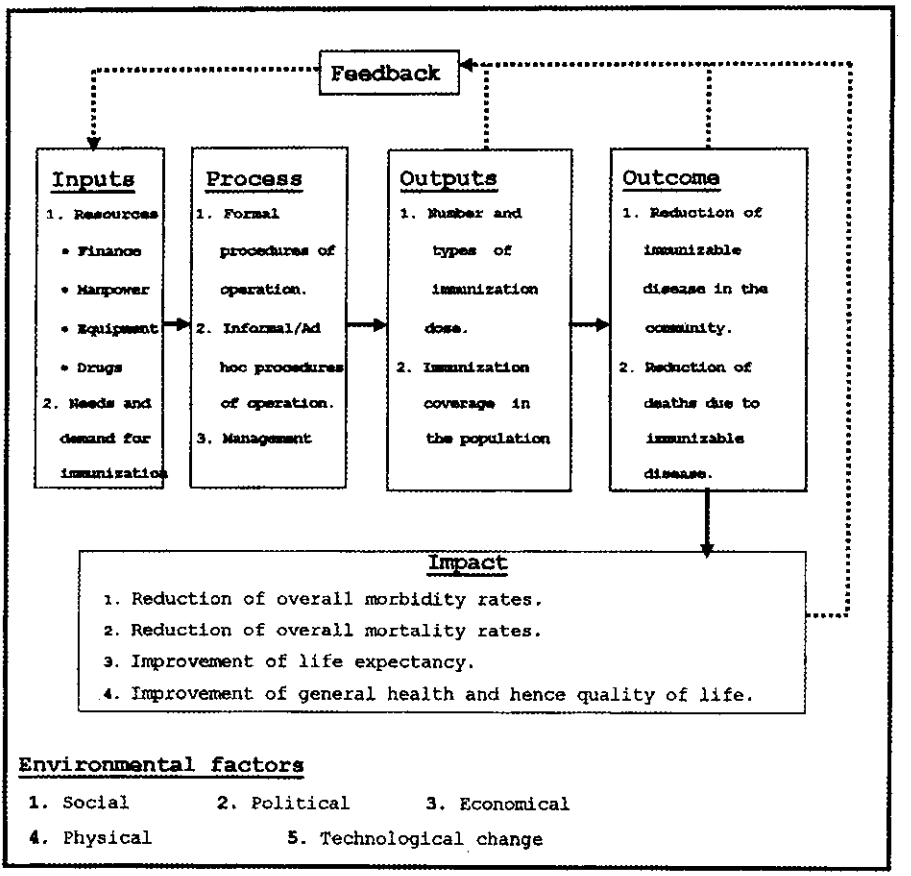

Fig. 1. The immunication sub-system.

Analysis of an entire system or any of its large components seeks to determine how its different components interact with one another and with inputs to the system, and how the system is influenced by its external environment [4, p. 3]. The principal reason a health planner performs assessments is to appraise achievements and

recognize limitation and/or constraints. Assessment is simply defined as a process directed to identify and measure the accurate impact of a specific policy [8].

The literature of program assessment or evaluation includes many models. Among the most common evaluation models are: (1) goal or output-directed evaluation, (2) goal-free evaluation, (3) decision-focused evaluation, (4) utilization-directed evaluation, (5) response evaluation, and (6) advocacy-adversary evaluation [9, pp. 9-10]. Work is currently underway - in many countries such as the United Kingdom, the United States of America, New Zealand, and Australia - to improve public administration and performance and to regain the general public trust in government programs. The work concentrates on developing performance indicators and good information systems and on delegating authority based on responsibility for actual outcomes [10, p. 596]. The current research, obviously, deals with the first type of model.

Methodology

The data used for this study have been abstracted from materials published by the government of Saudi Arabia, particularly the Ministry of Health (MOH) and the Ministry of Planning (MOP). The planned outputs (PO) and the achieved outputs (AO) of the health sector during the Firth Development Plan (FDP) period were identified from the published documents and compared according to major sub-systems. The achievements of each sub-system were categorized according to highly satisfactory, satisfactory and not satisfactory levels. The Mann-Witney test was used for each category in order to test the levels of significance for the differences observed between the planned and achieved outputs. Considering the statistical results and other evidneces, attempts were then maqde to derive logical explanations for the possible shortcomings in the system. Finally, some ideas have been put forward as possible solutions to the shortcomings. It may be mentioned here that because of the use of secondary data in the research, the analysis is limited only to the subsystems that received priority in the governmental publications.

The Planned Outputs (PO) and Achieved Outputs (AO)

In the Fifth Development Plan (FDP) the government makes its health objectives very specific and clear as follows [7, p. 313]:

1. To have universal (100%) access to free comprehensive health care by establishing PHC centers all over the country. This is the key point of the health care system.
2. To improve the hospital bed ratio to 3.35 per 1,000 population.
3. To improve the coverage rate of vaccination against communicable diseases by at least 95%.

4. To have one physician per 500 persons and one nurse and health technician per 225 persons.
5. To expand a computerized health information system.
6. To create 500 new PHC centers.
7. To train 10,645 physicians and nurses, as well as 7,560 health technicians.
8. To apply health quality standards and performance indicators.

Taking the above objectives as the planned outputs (PO) of the health care system, Table 1 compares the achieved outputs (AO), along with the percentage of achievement during the FDP period. As stated above, the table has taken into consideration only those sub-systems that received priority in the government reports. Moreover, several achieved outputs, such as training of health technicians, could not be compared because of lack of published documents.

Table 1. The planned output (PO) and the achieved output (AO) of the Saudi health system (1990-1994)

PO		AO	% achieved
Group 1 (80% + achievement)			
1. Universal access (100%)		98 %	98%
2. Minimum coverage rate of vaccination against:			
- TB	95%	94.1%	99%
- Poliomyelitis	95%	96%	101%
- Measles	95%	94.4%	99.3%
- DPT	95%	96%	101%
- Hepatitis	95%	94.7%	99.7%
3. One physician per 500		1 per 588	85%
Group 2 (60 < 80% achievement)			
1. Hospital bed ratio:			
- 3.35 per 1,000		2.35	70%
2. One nurse per 225		1 per 294	76.5%
Group 3 (< 60% achievement)			
1. One health technician per 225		1 per 540.5	41.6%
2. Opening 500 new PHC centers		51	11.4%
3. Train 10,645 physicians and nurse		6127	57.6%
Not quantifiable POs			
1. Computerized feedback system		Not yet completed	N/A
2. Train 7560 health technicians		N/A	N/A
3. Applying quality standards and performance indicators.		The creation of the "Follow up & Quality Assurance Department"	N/A

Sources:

1. MOP., *The Fifth Development Plan*, 1990-1995, Riyadh, Saudi Arabia.
2. MOH., *The Annual Halth Report*, 1994, Riyadh, Saudi Arabia.

It is evident from Table 1 that the accessibility to health care facilities in Saudi Arabia reached a highly satisfactory estimated level of 98% (as of 1994) during the FDP period [11, p. 298]. Since the general goal of PHC program is "health for all (HFA) by the year 2000", this level of achievement is certainly a promising step.

The high level of accessibility is also reflected in the immunization coverage among children under the age of five years. In 1995, the coverage rate of immunization against each immunizable disease reached a high level of 94% to 96% [12, pp. 22-23]. Therefore, the POs of achieving at least 95% immunization coverage rate against each disease were almost achieved.

The development of physical facilities and human resources for health care, however, presents a slightly different picture for the FDP period. Table 2 shows the actual development of health care facilities in the country during the FDP. Though it shows an increase in the number of health facilities and a strong involvement of the private sector in the development of hospitals, the PO of opening 500 new PHC centers during the FDP was not achieved. Only 57 (11.4%) new PHC centers were opened.

Table 2. The development of health care facilities in the Saudi health system during the FDP period

Type of facility	1990	1995
Hospitals		
• MOH	166	175
• Other governmental sectors	31	36
• Private sector	66	74
Total	263	285
• Bed per 1000 (all sectors)	3.13	2.35
• PHC centers of the MOH	1668	1725

Sources:

1. MOH., *Annual Health Report*, 1990, Riyadh, Saudi Arabia
2. MOH., *Annual Health Report*, 1995, Riyadh, Saudi Arabia

Twenty-two new hospitals were opened during the FDP, yet in 1995 there were 2.35 hospital beds per 1,000 population. This is a decrease of 0.78 beds per 1,000 population from 3.13 beds in 1990 [12, p. 162]. The current patient-bed ratio seems to be reasonable, compared to other developing or transitional countries. It may reflect a kind of redistribution of beds to meet the real distribution of people in the country. Nevertheless, only 70% of the PO to reach 3.35 beds per 1,000 population was achieved during the period.

The achievement in the supply of key human resources for health care, as presented in Table 1., indicates that by the end of FDP period, the physician-population ratio was 1:588 (85% of the PO), that of nurses was 1:294 (76.5% of the PO), while for

health technicians it was 1:540.5 (41.6% of the PO). These figures again suggest that the POs for key manpower were not fully achieved during the FDP period.

Manpower reorientation training reveals that only 57.6% of the PO of training physicians and nurses was achieved. No routine annual statistics are available in the government publications regarding the training of health technicians during 1990-1995, so the level of achievement of the PO for technicians could not be assessed. For the same reasons, the achievements in the expansion of computer facilities and the health information system as well as the application of quality standards and performance indicators also could not be assessed.

Levels of Achievement in Output

Because of the substantial variation observed in the levels of Pos and Aos among the line items in Table 1, it is convenient for further analysis to categorize them according to their levels of achievement. Accordingly, achievement of 80% and above of the Pos is considered a High level; 60% < 80%, Medium level; and below 60%, Low level. Table 3 shows the new categorization of the line items (in Table 1) according to their achievement levels, along with the results of the Mann-whitney tests. It is evident from the table that there is no significant difference between the mean percentage of the AOs and POs among the high-level groups (Mann-whitney Z = −1.2443 and P-value = 0.213) and the medium-level groups (Mann-Whitney Z = −1.633 and p-value = 0.103). But there is a significant difference between the mean percentage of the Aos and Pos among the low-level achievement groups (Mann-Whitney Z = −2.0868 and p-value = 0.037).

Table 3. Mann-Whitney test for measuring the mean differences between the POs and AOs

Categories of achievement levels	Mann-Whitney Z	P-value
Group one		
High level (80% +)	−1.2443	0.2134
Group two		
Medium level (60% < 80%)	−1.633	0.1025
Group three		
Low level (< 60%)	−2.0868	0.0369

In order to understand the possible reasons for the shortcomings in the low- and some extent the medium-level groups, according to the systems theory, attention should be directed to: factors related to the inputs made available to the system; the conversion process of the system; and the environmental factors affecting the system.

The Inputs

Inputs include all resources made available to the system to achieve the POs [13, p. 46]. Usually the top-level administrators and policy makers have direct control over the inputs. The inputs in Saudi Arabian health care system include:

A. Policies and plans: This consists of all policies introduced into the health care system in order to ensure smoothness and effectiveness of daily activities. Inputs also include all strategies, plans and programs developed to achieve the stated health POs. In Saudi Arabian planning and policy decisions are centralized in nature. The major policy of the sector has always been to provide high-quality, comprehensive health care services to the entire Saudi population, free to cost [14, p. 141.].

B. Financial support: The only fund available to the Saudi health care system is the annual budget devoted to it from the general annual budget (GAB). Though the current low oil prices influence the country's total GAB, as shown in Table 4. This indicates a high level of government commitment to achieve its health POs.

Table 4. The general annual budget and the MOH's budget (millions SR)

Year	MOH budget	% of total budget
1984 - 85	10,742.9	4.1%
1994 - 95	8,110.7	5.1%

Source:

1. MOH, *Annual Health Report,* 1985/86, Riyadh, Saudi Arabia.
2. MOH, *Annual Health Report,* 1995, Riyadh, Saudi Arabia.

C. Health care facilities: Facilities available to the system consist of all the PHC centers, secondary- and tertiary-care hospitals and other health providers operating in the system. In 1995 there were 285 private and public hospitals with 41.916 beds, and 1,725 PHC centers, see Table 2. In addition there were 24 health quarantine centers, 11 anti-smoking clinics, 8 medical rehabilitation centers, 5 tuberculosis centers, 5 central laboratories, 18 dental centers and 3 parasitic communicable diseases centers [12, p. 79].

D. Human resources: This includes all staff members- such as physicians, nurses, and allied health personnel- working in the system's health organizations. As shown in Table 5, the number of physicians, nurses, and allied health personnel in all health sectors (private and public) was increased from 24,360; 48,977 and 27,988 respectively, in 1990 to 30,306; 60,736 and 33,047 in 1995 [12, p. 164].

Table 5. Development of human resources in the Saudi health care system (1990/1991 to 1995)

Year	Physicians	Nurses	Allied health personnel
1990/91	24360	48977	27988
1991/92	26151	53867	28290
1992/93	27765	57090	30840
1994	29227	61246	32167
1995	30306	60736	33047

Source: The MOH., *Annual Health Report,* 1995, Riyadh, Saudi Arabia.

E. **Medical technology and equipment:** This encompasses all medical equipment and tools, ranging from advanced equipment to the simplest, made available for the system to enable the staff to perform necessary activities in order to achieve the POs. The country has some of the most advanced medical equipment in several hospitals, such as King Faisal Specialist Hospital and Research Center (KFSH & RC), the Security Forces Hospital, and King Khalid University Hospital. All the PHC centers, secondary- and tertiary-care hospitals are well equipped with required medical tools and technology and an adequate supply of essential drugs.

F. **Patients:** All the patients that use the system's health facilities are considered inputs to the health system. From 1990 to 1995 there were over 444 million outpatient visits to all health sectors in the Kingdom. Of these, 72% were to the MOH facilities. Similarly, 64.24% of the over 8.9 million inpatients used MOH hospitals. The average of visits per person during the FDP was 5.7 [12, p. 198 and 206].

G. **Information feedback:** This input consists of all formal methods of data collection and distribution of information to facilitate proper management of the health care system. Although its importance is well realized, most of the feedback procedures are currently performed manually. The MOH is in the process of establishing a computerized health information network system.

The process

The process refers to all technical, organizational and managerial actions taken to achieve the stated POs, as per given policy [3, p. 192]. It requires a sound way of manipulating all environmental and input factors in order to achieve the POs.

The process in the Saudi Arabian health system can be seen as controlled at three basic levels of hierarchy: Central, Regional and Peripheral. Among these, the central

control is the most important, because without the directives or concurrence of this, the other levels cannot take action. Considering the list of POs in Table 1, the initiation and control of process for each item can be distributed under the three tiers as follows:

Central: Hospital bed ration, health manpower ratio, computerized feedback system, and applying quality standards and performance indicators.

Regional: Opening new PHC centers and training health manpower.

Peripheral: Universal accessibility and immunization coverage.

If the above distributions is true, it is clear that the process at the peripheral level has been the most effective during the FDP period. Despite the shortage of PHC centers, health manpower and computerized feedback system as per PO, its AO has almost been achieved. From the same distribution, it seems that the stated process at the central and regional levels have not been as effective as at the periphery. This could be attributed to the fact that the current information feedback system has not yet been computerized. As a result, the information reaches the decision-makers at both regional and central levels late. In fact by the time the information reaches the decision-makers, some of the problems maybe solved by other means. Obviously, such late information may lead (if used) to initiating the wrong plans, and may direct money to useless programs and waste other limited resources. The fact that only 11.4% of the planned 500 PHC centers were opened is an example of the overestimate caused by not providing the decision-makers with the right information about the real health needs at the right time. Finally, we must mention that it is not possible, however, to make a fair assessment about the extent of process at the central and regional levels regarding the stated POs without knowing more detailed facts. It is understandable, however, that unlike the peripheral level, these two levels have numerous other responsibilities to fulfill besides the stated POs.

Environmental Effects

The environmental factors (sometimes referred to as exogenous factors) are those factors that can influence the operation of the health care system and the management of system may not have any direct control over them [13, p. 40]. Environmental factors are important to consider to understand how a system functions. These factors fall into four broad categories: social, political, economical and technical [1, p. 33]

Under the socio-political factors, Saudi Arabian can be considered a large country with a relatively small population. It occupies a land area of 849,4000 m^2 with an estimated population of 17,985,000 [11, p. 299]. It consists of a divers terrain with sandy

deserts and impassable rocky mountains. Its entire native population is Muslim, but there are numerous tribes, each with its sub-cultural variations usually conservative. Population settlements are mostly dispersed. There are also a substantial number of nomadic populations, which are continually on the move in search of food and water for their animal herds. The provision of proper health care services to such a diverse population requires not only a great deal of resources, but also careful planning and implementation.

Fortunately, the political situation in the country is stable. Because of centralized planning, health facilities seem to have developed in a homogenized manner throughout the country. The occurrence of the second Gulf War in 1991, however, may have partially contributed to the non-achievement of some of the POs.

Saudi Arabia is a transitional country with an estimate gross national product (GNP) per capital of $7,240 during the early 1990s [11, p. 298]. The second Gulf War followed by the period of low crude oil prices affected the economy of the country. The general annual budget (GAB) had reduced from 260,000 million Saudi Riyals in 1984/85 to 150,000 million Saudi Riyals in 1994/95 (a reduction of 42.8%). Yet, this big reduction caused a smaller change in the MOH budget (a reduction of 31.4%) for the same year [15, p. 32] [12, p. 78]. This proves that the government showed a firm commitment to achieving the health POs.

The health care system of Saudi Arabia is technologically sound. The continuous economic boost during two decades, i.e. 1970s and 80s, and the sincere intention of the country's leadership led to adopting and establishing good-quality health research centers and health service system [14, p. 3 and 11]. As a result, the technological aspects of the health services can be compared to any developed country of the world.

The problem, however, is the extreme shortage of indigenous technical manpower, which the country has not been able to produce within the given time period. In 1995, the proportion of Saudi doctors in the health system (all sectors) was only 16.3%. Saudi made up 15.2% of the nurses and 36.7% for the allied health personnel [12, p. 164]. Moreover, the Saudi physicians, nurses and technicians showed a resistance towards working in PHC centers (only 6.4% for physicians, 29.1% for nurses and 48.2% for allied health personnel) [12, p. 103]. This problem could be more severe in the remote areas. This has forced the MOH to bring physicians, nurses and technicians from outside the country to serve in such centers.

Discussion

In this research an attempt has been make to assess the levels of AOs in the Saudi Arabian health care system during the FDP period. A list of eight POs along with their AOs were identified from the government publications. It is observed that while the POs of universal accessibility and immunization coverage among children have almost been achieved, there are several AOs that have fallen short of the POs significantly. The effect of not achieving some of the POs is expected to cause a negative result on the whole performance of the system and may cause low achievement of other POs.

The minimum achievement occurred in the opening of new PHC centers, recruiting new health technicians, and reorienting training of doctors and nurses. Somewhat satisfactory levels of achievement were seen in the cases of recruiting new nurses, and increasing the number of hospital beds. Regarding the establishment of a computerized feedback system and the application of quality standards and performance indicators, the status is not known because of lack of published statistics.

Overall, the achievements at the peripheral level have been the most successful, in spite of shortages of facilities and manpower as per plan. Because of the lack of updated information, it is not possible to understand the exact reasons for the shortcomings in most of the POs where implementation rested mainly at the higher levels. According to the systems approach, a review of the inputs, process and environment reveals only a few obstacles, such as the Gulf War and too much dependence on foreign technical manpower. Under the circumstances and for a better understanding, it may be worthwhile to undertake a critical review of the POs that resulted in minimal achievements.

The first PO in this group is the opening of 500 new PHC center during the FDP period. These PHC center might have been justified earlier, according to some general calculation of PHC network establishment, to give population universal accessibility. But the specific AO for the period shows that the objective was almost achieved with only about 11% of the planned centers. Their high level of effectiveness was indicated in the immunization coverage among children, which achieved 100% during the same period. Thus the actual requirement for new PHC center may be far less than calculated.

The recruitment of new health technicians was the second important shortcoming during the FDP period, and the reason for this is understandable. The exponential proliferation of medical technology in recent years, not only in number but also in kind, has resulted in an acute shortage of medical technicians throughout the world. Depending on foreign technicians may become unnecessarily expensive and may not be as cost-effective as it has been in the case of hiring expatriate physicians and nurses. On the other hand, training Saudi technicians would be relatively simpler, and it would take much less time than training physicians or nurses. Thus the proper expansion of

training facilities for medical technicians could possibly solve Saudi Arabia's shortage of manpower in this area permanently.

The next in the list of shortcomings is the reorientation training of physicians and nurses, where the achievement has been about 58% of the PO. Under the given circumstances, the achievement itself does not seem bad, but it could have been better with more organized training schedules. Although the MOH required all physicians and nurses working in different government establishments to undergo periodic reorientation training, the response has varied among different institutions, depending on the workload of the staff and the availability of training facilities. This response, however, has been particularly difficult to determine among physicians and nurses working in PHC centers that are located in remote areas of the country and have an excessive workload. Moreover, most of these personnel are expatriates (**Physicians** - Saudi: Non-Saudi is 5.8: 94.2; **Nurses** - Saudi: Non-Saudi is 22.5:77.5) [12, p. 85], who are recruited on a year-to-year contract basis. This kind of arrangement may not have been ideal for the reorientation training from the point of view of the trainers or the trainees.

The expansion of computer facilities and a health information system and the application of quality standards and performance indicators are recent undertakings. By the end of the FDP period neither of the projects had been completed, although several positive steps had been taken. Concerning the information system, for example, the basic step of linking the three levels of health care services was not established and in the majority of health facilities, the feedback procedures continued to be performed manually. On the other hand, regarding the setting up of quality standards for PHC and hospital practices, a separate department for "Follow up and Quality Assurance" was established. The standards were to cover staff performance, health facilities, and health services offered to clients. Because of the very nature of the two POs, however, the exact quantification of the AOs cannot be measured.

The fact that the computerized health information system is not yet completed slows the process of achieving the POs. Paradoxically, it has been of little use to the FDP planning process, which was its essential function. In fact, it becomes evident from the above facts that the major shortcoming achieving the POs has probably been inaccurate planning, owing to insufficient information.

Recommendations

From the above discussion it is clear that there are significant gaps between the POs and the AOs in the Saudi Arabian Health Care System. It is practically impossible to achieve 100% of the POs under any given system where numerous factors interact with one another and influence the outcome. Nevertheless, attention should be directed to reduce the gap as much as possible within the system. Based on the results of this

study it becomes obvious that lack of a proper information base in the Saudi Arabian health care system has resulted in inadequate planning, for which many of the POs could not be achieved. Planning should always be based on accurate, current information to be effective and reduce uncertainties. Information systems exist in organizations in order to achieve objectives, to plan and control their process and operations, to help deal with uncertainty, and to adopt to change or, indeed, initiate change [16, p. 136].

The first priority for reducing the gap between POs and AOs , therefore, should establish a comprehensive and efficient computerized health information network in the system. The budget devoted for this purpose should be increased substantially to automate and link all PHC centers, hospitals, and MOH central headquarters. The information system must include health, managerial and financial data about the health care system. This step alone could reduce the gap significantly and reduce or eliminate the burden of manual paper work, which is usually time consuming and often inaccurate. A computerized system would enable the MOH to plan according and would assure updated information about the community health problems and needs.

The proper organization of the planning process should preferably follow the hierarchical structure of the organizational system. It should begin at the peripheral level, followed by the regional level and finalized at the central level. The personnel at the peripheral levels are most familiar with the multidimensional problems of the community. Therefore, their suggestions of probable solutions to problems can be very valuable. To ensure periodic planning exercises, a specific portion of funds and time of key personnel should be set aside.

In order to facilitate the process of future evaluation of the system's performance, the POs must be stated in clear, measurable terms and a regular evaluation process must be performed. Cost-benefit analysis (CBA) may be used to compare the monetary cost of a project with its expected benefits, and also to compare proposed projects. An alternative to CBA is the cost-effectiveness analysis (CEA), which may also be needed to choose programs that could achieve the maximum value of the objectives for a given level of costs, or minimize value of the objectives for a given level of costs, or minimize costs for a given level of output.

Health manpower development of the Saudi population must receive high priority. This can have numerous positive benefits, such as reducing costs of health care and unnecessary dependence on foreign manpower. Attention should be given, preferably, to the production of mid-level professionals, such as health technicians, medical assistants, and other paramedical personnel. Properly trained, these types of personnel are easier and cheaper to produce, can perform PHC duties efficiently, are culturally accepted, and are not lost from the sector. Because the dominant diseases in the community are infectious and parasitic in nature, appropriate technology is readily

available to combat these health problems. Results from both the developed and developing countries have shown that with proper training and close supervision by a physician, these personnel can really deliver high quality services.

Routine reorientation training of existing personnel should be given a higher priority in order to maintain the quality health services and improve efficiency. Proper training never brings any loss to system. Finally, a specific percentage of the health budget must be determined and assigned for the PHC programs.

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مخرجات النظام الصحي السعودي المخططة والمحققة: تقليل الفارق

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ملخص البحث. تهدف هذه المقالة إلى دراسة المخرجات الفعلية (المحققة) للنظام الصحي السعودي عند نهاية خطة التنمية الخامسة (١٩٩٠ - ١٩٩٥م)، ومقارنتها بالمخرجات المخططة عند بداية خطة التنمية الخامسة لمعرفة نسبة ما تحقق منها. بعد ذلك تم التركيز على تحليل كل من المدخلات المتوافرة للنظام والعوامل البيئية التي أثرت على أداء النظام الصحي السعودي وبالتالي على تحقيق المخرجات المخططة.

أوضحت هذه الدراسة أن بعض المخرجات التي خطط لتحقيقها قد تحققت بشكل مرض، بينما لم يتحقق بعضها الآخر بشكل لافت للنظر. تناقش هذه الدراسة الأسباب التي يعتقد أنها أثرت على أداء النظام الصحي السعودي، كما أنها تقدم بعض التوصيات اللازمة للتغلب على أوجه القصور في أداء النظام.