

-PN-ABS-722 ISN-9060T

** Draft for Discussion **

PHARMACEUTICALS AND FINANCING FOR HEALTH

IN THE '90S:

Strategic Perspectives for Asia and the Near East

Issue Paper Series
IPN Strategy for the 1990s
Asia Near East Bureau
U.S.A.I.D.

*ADD Pp: 6
Page 29*

*Publics in
management
UB*

Jonathan D. Quick and Patricia Foreman
Drug Management Program
Management Sciences for Health

Stalder

16 May 1989

local production

BEST AVAILABLE DOCUMENT

PHARMACEUTICALS AND FINANCING FOR HEALTH IN THE '90S: STRATEGIC PERSPECTIVES FOR ASIA AND THE NEAR EAST

SUMMARY

In 1989 over 6 million infants and children under five in the sixteen Asia-Near East countries will die. A somewhat larger number of older children and adults will also die. At the same time, the countries of the region will spend upwards of US \$ 8 billion on pharmaceuticals. The current situation suggests a fundamental mismatch between public health needs and pharmaceutical resource utilization. This mismatch is characterized by the following observations:

- * Most mortality -- in particular, infant and childhood morbidity -- is preventable or treatable with timely, cost-effective pharmaceuticals;
- * Under-use of pharmaceuticals through failure to obtain early, effective, adequate courses of vaccines and essential drugs is responsible for far more deaths than over-prescribing or mis-prescribing of pharmaceuticals;
- * Treatment of adult discomfort, rather than prevention of infant, child and maternal death drives government pharmaceutical (and health care) expenditures; studies of government pharmaceutical expenditures in Egypt, Indonesia, and Nepal reveal that less than 25 % of government pharmaceutical expenditures -- including expenditures on vaccines -- were directed toward child survival conditions.
- * Annual public sector expenditures for pharmaceuticals are less than one dollar per capita for the six Asia-Near countries for which data are available; in one-third of the countries in the region less than 30 % of the population is believed to have regular access to essential drugs. In another one-third of the countries, only 30 to 60 % of the population has regular access to essential drugs.
- * Private expenditures on pharmaceuticals far surpass public expenditures in most Asia Near-East countries; in each of the six countries for which data are available, except Papua New Guinea, private expenditures are two to eight times greater than government expenditures.

The fundamental mismatch between public health needs and pharmaceutical resource utilization presents a formidable challenge for Asia-Near East health endeavors in the 1990's. Meeting this challenge will require careful consideration of pharmaceutical financing issues as they relate to both the public and the private sectors.

Strategic Opportunities in the Public Sector

In the public sector, pharmaceutical financing strategic opportunities exist to improve allocative efficiency, to increase therapeutic and managerial efficiency, and, where appropriate, to promote revenue generation through pharmaceutical cost-recovery.

Allocative Efficiency -- Analysis of pharmaceutical expenditures for essential drugs, vaccines, and special programs in one country of the region revealed that more money was spent on a single oral antibiotic than on all vaccines

TABLE OF CONTENTS

	<u>Page</u>
THE PROBLEM AND THE CHALLENGE FOR THE 1990s	1
The Under-Utilized Asset: Pharmaceuticals for Prevention and Treatment	2
The Unfulfilled Promise: Public Sector Financing	3
The Neglected Resource: Private Sector Demand	7
The Challenge: Managing Public and Private Resources to Improve Impact	7
 CURRENT CONSTRAINTS AND STRATEGIC OPPORTUNITIES -- PUBLIC SECTOR	 8
Allocative Efficiency	8
Therapeutic and Managerial Efficiency	10
Revenue Generation	19
 CURRENT CONSTRAINTS AND STRATEGIC OPPORTUNITIES -- PRIVATE SECTOR	 24
The Paradox of Managerial Efficiency and Therapeutic Inefficiency	24
Re-Orienting Physicians and Other Prescribers	26
Re-Orienting Pharmacists and Other Drug Sellers	28
Private Sources for Public Health Care	29
Influencing Patient Demand, Expectations, and Drug Use Patterns	29
 REFERENCES	 31

THE PROBLEM AND THE CHALLENGE FOR THE 1990s

In 1989 over 6 million infants and children under five in the sixteen Asia-Near East countries will die. A somewhat larger number of older children and adults will also die. The majority of these deaths will be due to diarrheal diseases, acute respiratory infections, immunizable diseases, tuberculosis, other infectious diseases, and, increasingly, chronic illnesses such as cardiovascular disease -- all conditions which can be prevented or treated with safe, effective vaccines and essential drugs. Diarrheal diseases, acute respiratory infections, and immunizable diseases together account for 80 to 95 % of under-five deaths in the region.

Also during 1989, the countries of the region will spend upwards of US \$ 8 billion on pharmaceuticals (1), at least US \$ 1 billion of which will be spent for public sector drug supplies.* From a health financing perspective, the current situation reflects a fundamental mismatch between public health needs and pharmaceutical resource utilization. This mismatch is characterized by the following observations:

- * Most mortality -- in particular, infant and childhood morbidity -- is preventable or treatable with timely, cost-effective pharmaceuticals;
- * Under-use of pharmaceuticals through failure to obtain early, effective, adequate courses of vaccines and essential drugs is responsible for far more deaths than over-prescribing or mis-prescribing of pharmaceuticals;
- * Public health services provide only a minority portion of health care for the public;
- * Treatment of adult discomfort, rather than prevention of infant, child and maternal death drives government pharmaceutical (and health care) expenditures;
- * Private expenditures on pharmaceuticals far surpass public expenditures in most Asia Near-East countries.

These observations, which are elaborated upon in the following section, form the basis for considering public and private sector constraints and strategic opportunities in the area of pharmaceutical financing.

* Includes all Asian, Near Eastern, and Western Pacific countries (U.S.A.I.D.-assisted as well as non-assisted countries), except China and Japan. Amounts based on ex-factory prices. Public sector portion of total based on known percentages of public and private expenditures is depicted in Figure 2.

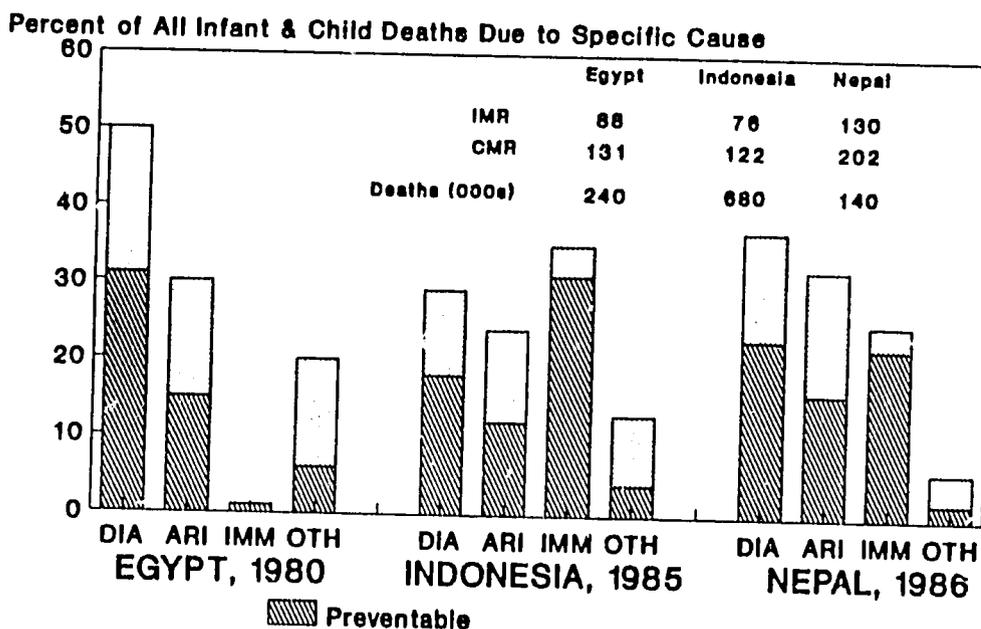
The Under-Utilized Asset: Pharmaceuticals for Prevention and Treatment

Nutrition, sanitation, water supply, and healthy life-style represent fundamental public health strategies aimed at prevention of leading causes of morbidity and mortality. At the same time, vaccines and essential drugs represent safe, effective, economical measures for prevention and treatment of child survival conditions. The pharmaceutical interventions are now well known: oral rehydration and very selectively used antimicrobials for diarrheal disease; immunization and selectively used antibiotics for acute respiratory infection; vaccines and (for the unvaccinated) supportive therapy and treatment of secondary infection for immunizable diseases; vitamin A and other selected vitamins and minerals for nutritional deficiencies; prenatal tetanus toxoid, vitamins and minerals; chemotherapy for malaria and tuberculosis; and so forth.

Figure 1 presents profiles of infant and child deaths by cause for three Asia-Near East countries for which approximate data are available. These countries alone account for an estimated one million under-five deaths per year. It is estimated that 50 to 80 % of these deaths are preventable with timely, effective use of vaccines and essential drugs. The relative importance of diarrheal disease, acute respiratory infection, and immunizable disease varies somewhat from country to country, but -- except in Egypt where immunization coverage is higher and deaths from immunizable disease probably underestimated in these data -- all three are significant contributors to under-five mortality.

Figure 1

Infant and Child Deaths by Cause, Egypt, Indonesia, Nepal



From a public financing perspective, over-prescribing represents a major drain on limited government pharmaceutical resources. Over-prescribing also contributes to improper use of drugs: studies of patient compliance are virtually unanimous in suggesting that the more drugs a patient (or mother) is given, the less likely the patient is to take any of the drugs correctly (28). But from a public health perspective, under-use of pharmaceuticals through failure to be immunized or failure to obtain early, effective, adequate immunization or courses of essential drugs are responsible for far more deaths than over-prescribing of pharmaceuticals. Fatal side-effects from potent, but improperly used modern pharmaceuticals and deaths from resistant strains of bacteria induced by indiscriminate use of antibiotics occur all too often. But far more deaths occur because vaccines are unavailable or because a child with pneumonia does not receive timely, appropriate antibiotic therapy.

The Unfulfilled Promise: Public Sector Financing

Despite the promise of free public health services, actual availability and use of government health services in the region has fallen far short of this promise. As a result, public health services provide only a minority portion of health care for the public. Typical of health care utilization patterns are the results of a 1980 household survey in Indonesia (15): on average, 38 % of patients sought treatment from a private practitioner (doctor, nurse, midwife, etc.), 35 % bought modern medicines to treat themselves, 20 % sought care at a government health facility, and 6 % went first to a traditional healer. Data from Nepal, India, and Afghanistan show similar patterns of private and self-care. Even for immunization, where considerable progress has been made in some Asia-Near East countries, coverage for DPT3, polio3, and/or measles is often less than 50 % and sometimes less than 25 % in countries of the Asia-Near East region (9).

While lack of (or inefficient use of) financial resources represents only one factor behind the failure of governments to provide promised health services, it is a significant factor, particularly with respect to pharmaceuticals. Annual public sector expenditures for pharmaceuticals are less than one dollar per capita for the six Asia-Near countries for which data are available (Figure 2). In one-third of the countries in the region less than 30 % of the population is believed to have regular access to essential drugs. In another one-third of the countries, only 30 to 60 % of the population has regular access to essential drugs. A clear majority of the population has regular access to essential in only five countries in the region. (Table 1)

Table 1

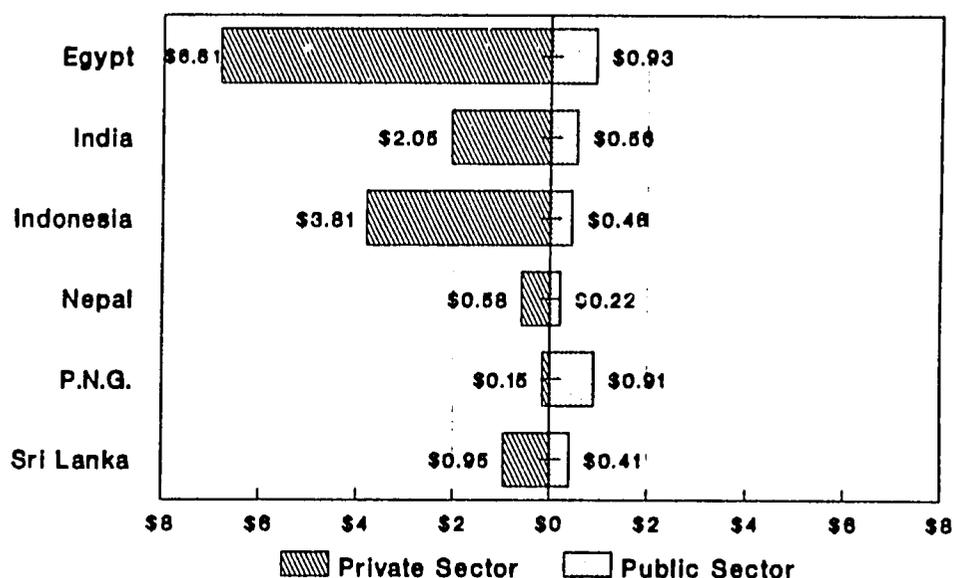
Percent of Population with Regular Access to Essential Drugs

	PERCENT OF POPULATION WITH REGULAR ACCESS TO ESSENTIAL DRUGS		
	Less than 30%	30 - 60%	60 - 90%
NUMBER OF COUNTRIES	6	6	5
PERCENT OF COUNTRIES	35%	35%	30%
Afghanistan	*		
Bangladesh	*		
Gurma	*		
Egypt			*
India			
Indonesia		*	
Jordan			*
Morocco		*	
Nepal	*		
Oman			*
Pakistan		*	
Papua New Guinea			*
Philippines	*		
Sri Lanka			*
Thailand		*	
Tunisia		*	
Turkey		NA	
Yemen		*	

*Adapted from: Ref. (1), Annex 1.

Figure 2

PER CAPITA PHARMACEUTICAL EXPENDITURES Selected Asia-Near East Countries

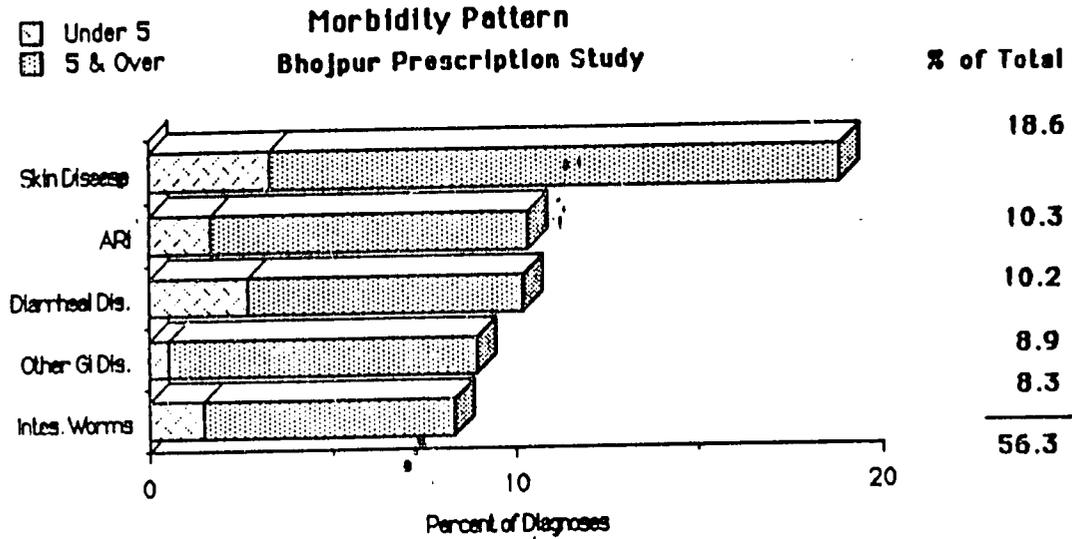


In household surveys, "no drugs" is still a major reason given by people for not going or not taking their child to government health facility. Anecdotal assessment of the adequacy of drug supply based on the number of "months' worth of supply" are received each year from government sources ranges from "three to four months" in Nepal to "nine to ten months" in Indonesia.

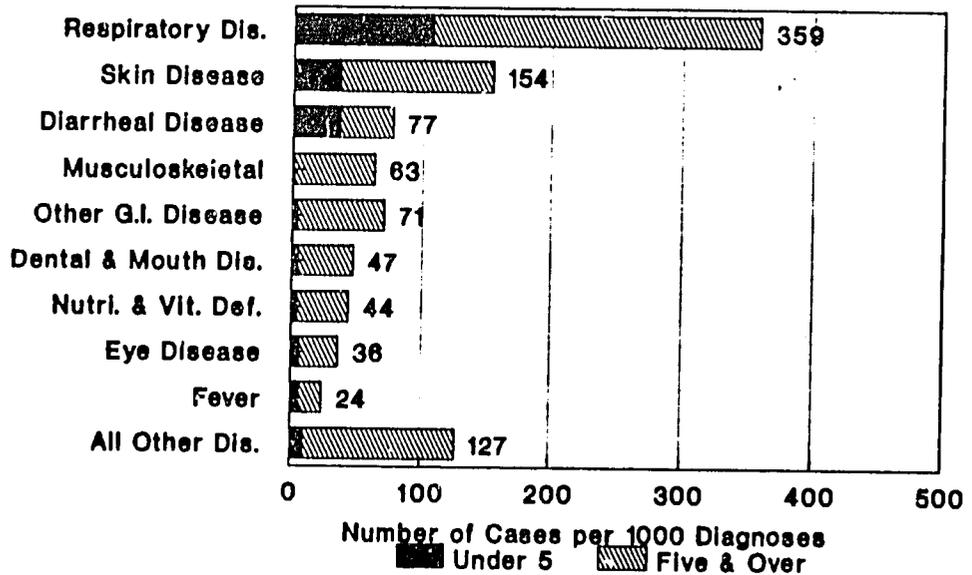
The inadequacy of pharmaceutical resources is compounded by what can be described from a public health perspective as a misdirection of these limited resources. Recent studies of government pharmaceutical expenditures in Egypt (3), Indonesia (5,6), and Nepal (7) revealed that less than 25 % of government pharmaceutical expenditures -- including expenditures on vaccines -- were directed toward child survival conditions. Seventy-five percent of pharmaceutical expenditures were for treatment of older children and adults.

Figure 3

Health Center Morbidity Patterns by Age, Nepal and Indonesia



MORBIDITY PATTERN BY AGE GROUP
E. Java & W. Kalimantan, Indonesia, 1987



Based on total number of diagnoses.

Pharmaceutical expenditures parallel health care utilization patterns. Though diarrheal disease and acute respiratory infections are thought of as child survival conditions, health center utilization data derived directly from clinic records in Nepal and Indonesia confirm that the majority of patients in all major disease categories -- including diarrheal disease and acute respiratory infections -- are adults and older children (Figure 3). Many of the complaints for which these patients seek treatment result from self-limited, nonfatal conditions. In a very real sense, treatment of adult discomfort -- rather than prevention of infant, child and maternal death -- drives government health care expenditures (25).

The Neglected Resource: Private Sector Demand

Private sector demand for pharmaceuticals is clearly demonstrated by the pharmaceutical expenditure data in Figure 2. Based on wholesale prices, annual private expenditures on pharmaceuticals in the region are as high as \$6.81 per capita in Egypt. In each of the six countries for which data are available, except Papua New Guinea, private expenditures are two to eight times greater than government expenditures. These figures represent both a measure of the magnitude of resources potentially available for child survival and other priority health activities and a statement about the value which the general public places on pharmaceutical products.

Unfortunately, as the data presented below indicate, a large percentage of private sector pharmaceutical expenditures are for costly products with limited, if any, therapeutic impact. Private sector demand for pharmaceuticals has clearly been demonstrated in the Asia-Near East region, as in other parts of the world. But this private sector demand must be better channeled toward effective preventive and therapeutic measures if it is to be considered a resource for public health.

The Challenge: Managing Public and Private Resources to Improve Impact

The fundamental mismatch between public health needs and pharmaceutical resource utilization which has just been outlined presents a formidable challenge for Asia-Near East health endeavors in the 1990's. Meeting this challenge will require careful consideration of pharmaceutical financing issues as they relate to both the public and the private sectors.

In the public sector, pharmaceutical financing strategic opportunities exist to improve allocative efficiency, to increase therapeutic and managerial efficiency, and, where appropriate, to promote revenue generation through pharmaceutical cost-recovery. In the private sector, efforts should be aimed at improving allocative and therapeutic efficiency through behavior change interventions aimed at private practitioners, pharmacists, other drug sellers, and patients. In each potential area of activity, we will briefly describe the current situation and indicate possibilities for U.S.A.I.D. policy and program action.

**CURRENT CONSTRAINTS AND STRATEGIC OPPORTUNITIES --
PUBLIC SECTOR**

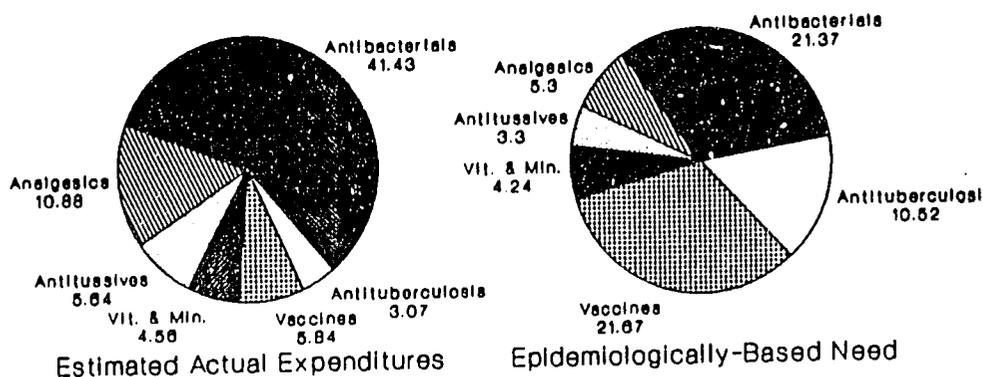
Allocative Efficiency

Achieving allocative efficiency involves targeting public resources toward those activities likely to yield the greatest benefit for the resources expended. Allocative decisions relevant to pharmaceutical financing for child survival and primary health care include, (a) reallocation of budgetary funds to health from other sectors, (b) reallocation within health from another budget category (e.g., staff) to pharmaceuticals, and (c) reallocation of expenditures within the broad category of pharmaceuticals.

Consideration of the first option, reallocation of funds from other sectors, is beyond the scope of this review. Reallocation of funds within the health sector is also generally beyond the scope of this review. It should be noted, however, that in some countries of the region the resource allocation process results in government health facilities which are fully staffed, but because of shortages of drugs, under-utilized. If increasing the effective supply of drugs -- whether through allocation decisions, therapeutic and managerial efficiencies, or revenue generation -- stimulates greater patient utilization with the same health care staff, then the efficiency (i.e., productivity) of the staff has been increased.

Figure 4

**Pharmaceutical Expenditures by Therapeutic Class
Actual vs. Need, Indonesia, 1984-1985**

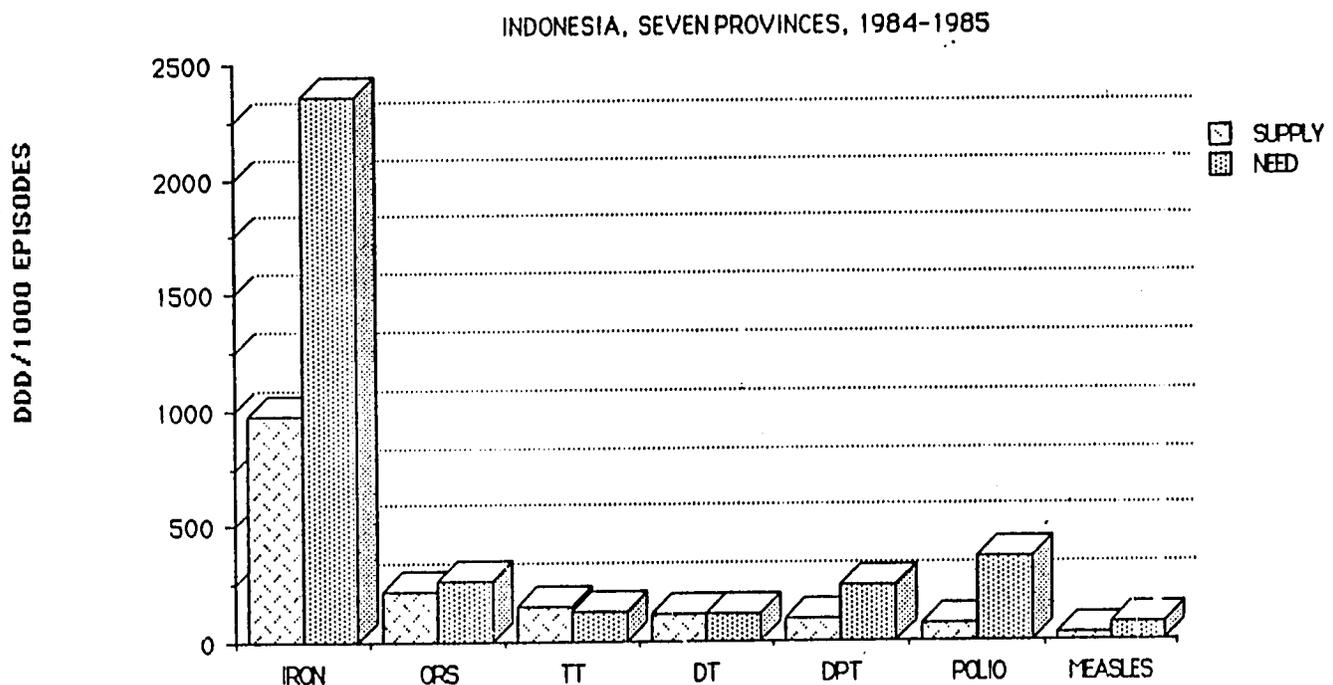


Finally, within the pharmaceutical portion of government spending, there may be considerable room in some countries for improving allocative efficiency. Rarely are all government and donor expenditures on pharmaceutical products, including vaccines and ORS, analyzed together from public health and financial perspectives. When such an analysis is done, the results can reveal significant, albeit unintended, allocative inefficiencies. Opportunities may exist for more efficient allocation of funds among vaccines, highly essential drugs, and less essential drugs.

A recent analysis of pharmaceutical expenditures for essential drugs, vaccines, and special programs in seven provinces of Indonesia, for example, revealed that more money was spent on a single oral antibiotic than on all vaccines combined, and nearly as much was spent on antitussives as on all vaccines combined (5). In this study, pharmaceutical expenditures were compared to epidemiologically-based pharmaceutical need. Figure 4 compares the actual and needed expenditures according to therapeutic class. "Need" was estimated on the basis of standard treatments and prevailing health center epidemiological patterns. This comparison suggests a significant mismatch between public health needs and budgetary allocations. Compared to estimated need, relatively more was being expended on antibacterials, analgesics, and antitussives, while expenditures on vaccines and anti-tuberculosis drugs were proportionately less than needed. Figure 5 compares supply with need for selected child survival problems and highlights the deficiencies resulting from the allocation process.

Figure 5

Pharmaceutical Expenditures vs. Estimated Need for Selected Child Survival Pharmaceuticals



Experience in other countries suggests that the disparity between objective health needs and actual pharmaceutical expenditures in Indonesia represents more the norm than the exception. Expenditures on essential drugs are not routinely evaluated from a public health perspective, and it is even less common for essential drugs, vaccines, and other pharmaceutical expenditures to be analyzed together. However, it would appear that reallocation of expenditures within the broad category of pharmaceuticals indeed has potential as one approach to improved financing. Two specific actions which U.S.A.I.D. could take are,

- (1) Support for systematic analysis of pharmaceutical expenditures, including essential drugs, vaccines, and drugs for special programs such as maternal and child health; and
- (2) Support for Ministry of Health policy reforms which aim to establish systematic, public health-oriented mechanisms for allocating pharmaceutical resources.

It is difficult to estimate precisely the potential impact of efforts to improve the allocation process. Nevertheless, it is reasonable to expect that the therapeutic benefit derived from a given level of expenditure might be increased by 15 to 20 percent simply by improvements in the allocation process.

Therapeutic and- Managerial Efficiency

Though not identified as such, many of the efforts in essential drug programs in recent years have been focussed on activities which are in essence aimed at cost containment. These cost-containment efforts have promoted careful drug selection, effective drug use, wise procurement practices and efficient distribution system. Cost containment through rational drug use and rational drug management should contribute to improved financial management by improving the operating efficiency of the pharmaceutical sector.

Selection of Essential Drugs -- Countries in the Asia-Near East Region have made considerable progress over the last several years in developing and implementing national essential drugs lists. Fourteen of the 17 (83%) countries for which information is available have public sector essential drug lists by generic name. As of late 1987, only three countries were thought to have no current public sector essential drug list. But of the 14 countries that have developed essential drug lists, only 5 reportedly use these lists on a regular basis for drug management.

While there is little evidence to suggest that essential drug lists alone improve therapeutic or financial efficiency, the creation of an essential drug list is a prerequisite to improvements in procurement and drug use. Therefore, it is important to support the development and use of essential drug lists as one of the first steps in improving public sector pharmaceutical financing.

Table 2

Status of Essential Drug Lists,
Asia-Near East

	No List or Outdated List	Public Sector List by Generic Name exists	Public Sector List by Generic Name Exists & Used for Drug Mgmt.
NUMBER OF COUNTRIES	3	9	5
PERCENT OF COUNTRIES	37%	53%	30%
Afghanistan		*	
Bangladesh		*	
Burma		*	
Egypt		*	
India		*	
Indonesia			
Jordan			*
Morocco		*	
Nepal		*	
Oman	*		*
Pakistan		*	
Papua New Guinea			
Philippines		*	*
Sri Lanka			
Thailand			*
Tunisia			*
Turkey		NA	
Yemen		*	

Adapted from: Ref. (1), Annex 1.

Effective Drug Use -- Over the last five years, as public sector essential drug programs have become more effective in supplying drugs, the problems of irrational drug use have become increasingly apparent. Common problems which are therapeutically unsound and financially inefficient include over-use of antibiotics, over-use of injections, and prescription of multiple drugs when one or two drugs would be effective ("polypharmacy").

Treatment patterns for common primary health problems such as diarrheal disease and acute respiratory infections clearly illustrate the inefficiencies of current drug use patterns. Figure 6 compares diarrheal treatment patterns for Egypt (3), Indonesia (6) and Nepal (7). In Egypt, an average of 2.8 drugs per patient were prescribed for simple diarrhea in children age five and under; in Indonesia the number was 4 drugs per patient, and in Nepal (the poorest of the three) the average was 2.6 drugs per child. In each country, antimicrobials (antibiotics, amoebicides, etc.) were used more commonly than ORS. In Indonesia, vitamins and minerals were dispensed as frequently as ORS, and in Nepal antidiarrheal preparations of various sorts were commonly used.

Figure 6

DIARRHEA TREATMENT PATTERNS, UNDER FIVE
Egypt, Indonesia, Nepal

*ADD
Graph*

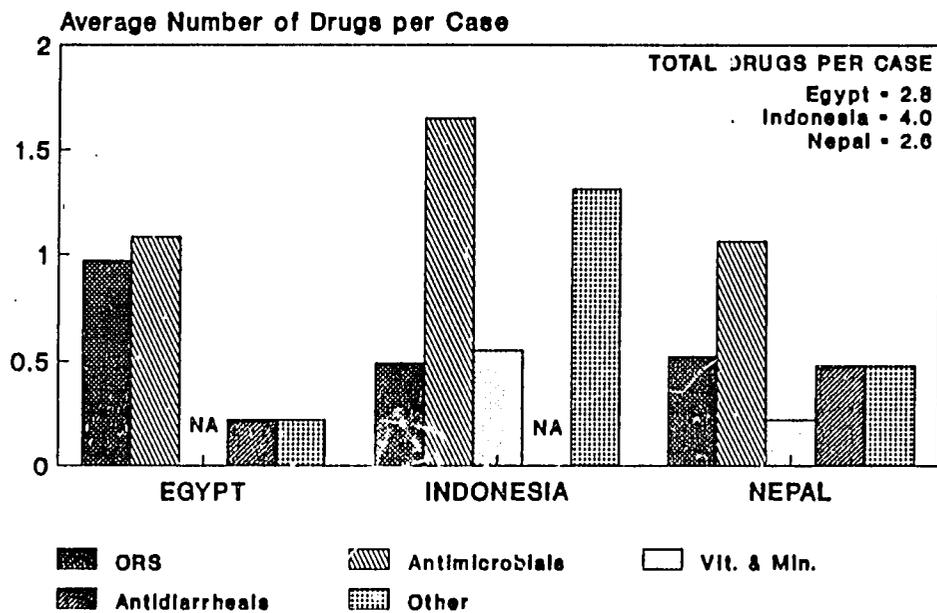
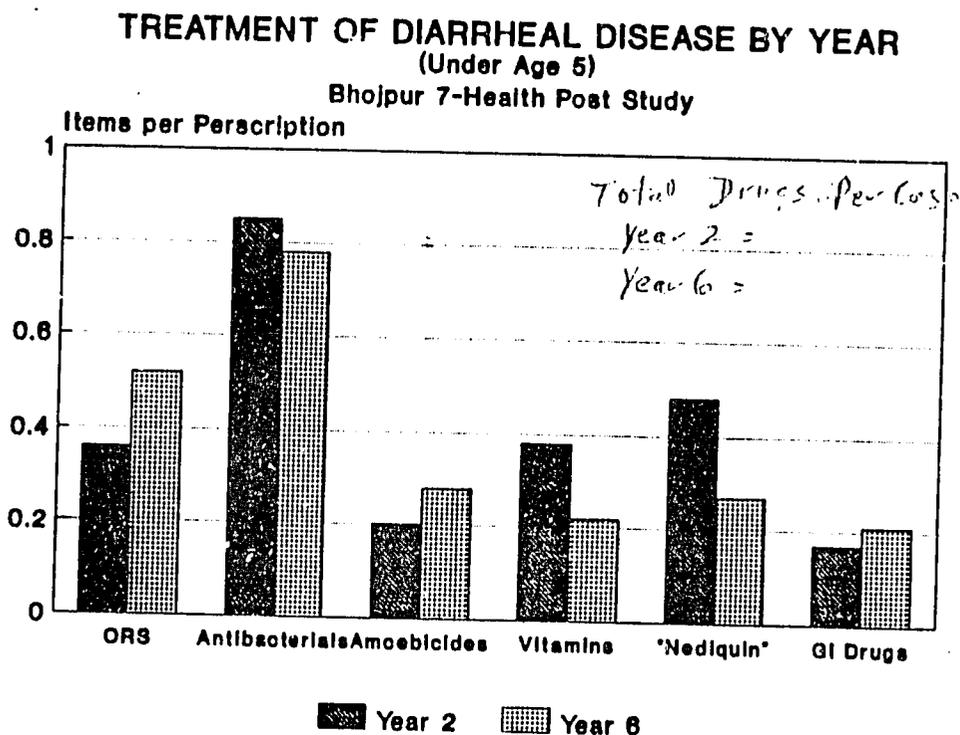


Figure 7 compares treatment of diarrheal disease in children five and under over a five-year interval. During this period use of ORS increased considerably, but changes in antibiotic use were minimal and the overall decrease in the number of drugs per patient (2.85 to 2.55) was also minimal. Thus, there is little to suggest that ORS replaces antibiotics in the treatment of diarrheal disease.

While there are occasional justifications for the use of antibiotics in the treatment of diarrheal disease (perhaps in 20 % of cases), vitamins and minerals, and other products, the seemingly ubiquitous pattern of multi-drug prescription means that the mothers frequently receive three, four, five, six, or sometimes more different drugs for one child. All evidence from studies of patient compliance suggests that the more drugs a patient is given, the less likely the patient is to take any of the drugs correctly. Thus, multi-prescribing for diarrheal disease is not only wasteful, but it risks distracting the parent from properly using the one life-saving product: ORS.

Figure 7



See original report paper & check all numbers against original

The cost impact of antibiotic over-use is shown in Figure 8, which gives the percent breakdown of drug treatment costs for all ages for diarrheal disease and acute upper respiratory infections (URI) in two provinces of Indonesia. In both instances virtually all patients received antibiotics/antimicrobials, despite the fact that not more than 20 % of simple diarrheas or URIs benefit from these drugs. As a result, 60 % of drug treatment costs were for antimicrobials. The frequency of and treatment patterns for diarrheal disease and acute respiratory infection are such that these two conditions together account for 70 % of drug treatment costs for children five and under and 42 % of drug treatment costs for older children and adults (Figure 9). When skin conditions are added, the leading three diagnoses account for 87 % of drug costs for the under fives and 58 % of drug costs for those five and older. These data not only reveal the cost of multi-drug prescribing, but also direct attention toward a relatively small number of diagnostic categories in which most drug expenditures occur -- at least in Indonesia.

Figure 8

TREATMENT COST FOR DIARRHEA & U.R.I.
E. Java & W. Kalimantan, Indonesia, 1987

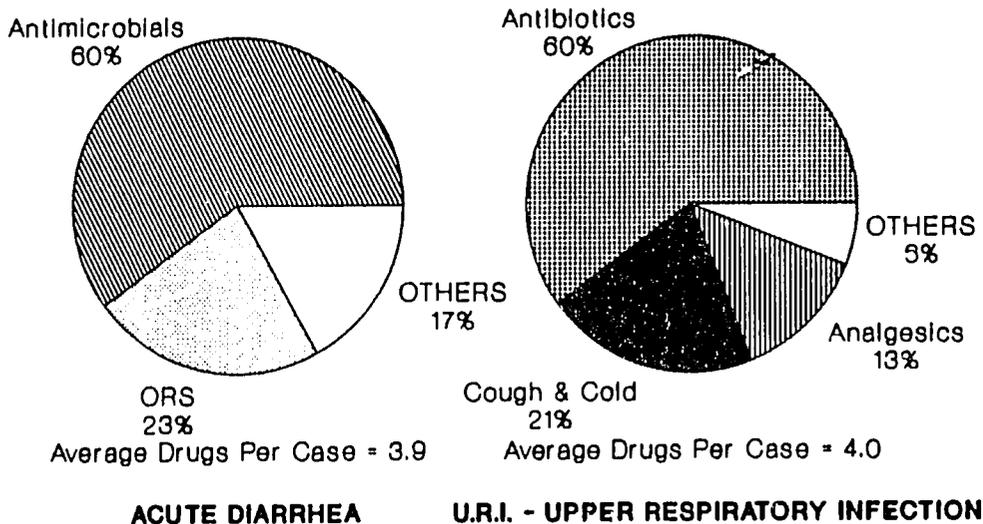
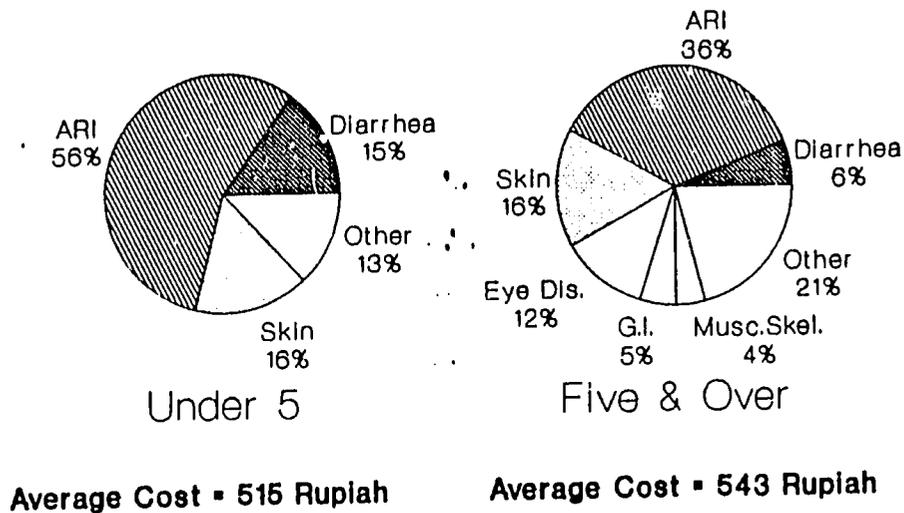


Figure 9

DRUG COSTS BY DIAGNOSIS E. Java & W. Kalimantan, Indonesia, 1987



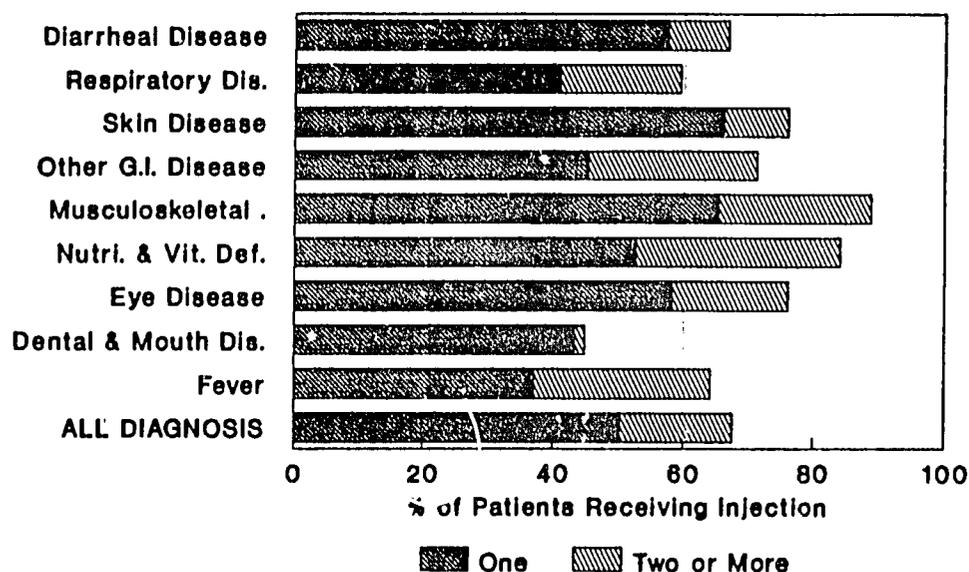
In addition to multi-drug prescribing and over-use of antibiotics, another common drug use problem is over-use of injections. To many people injections are synonymous with the power of modern medicine. The desire for treatment by injection is still widespread in many countries of the Asia-Near East and other regions. In Indonesia and Nepal, this expectation is reflected in the observation that one in every four drugs prescribed is an injectable. Figure 10 compares injection use among the nine major disease categories which account for over 90 % of health center visits. It is striking that for all but dental and mouth disease, over fifty percent of patients received one or more injections and that for six of the nine categories, two-thirds of patients received one or more injections. Over 80 % of patients with musculoskeletal conditions -- often treated with an analgesic injection -- and nutritional and vitamin deficiency -- treated with injectable vitamins -- were given one or more injections.

The pattern of over-prescribing, over-use of antibiotics, and frequent use of injections is illustrated here primarily with data from Indonesia, but these problems are reportedly common throughout the region. Improvement of drug use patterns, therefore, presents another potentially fruitful method for improving operating efficiency in the pharmaceutical area.

Efforts to promote improved use of pharmaceuticals can be grouping into the following three categories:

Figure 10

INJECTION USE BY DIAGNOSIS E. Java & W. Kalimantan, Indonesia, 1987



Single diagnosis cases only.

- (1) **Educational** strategies, which seek to change prescriber, dispenser, or patient drug use through persuasion and provision of information. Techniques include in-service training, printed materials such as newsletters, and face-to-face "public health detailing."
- (2) **Managerial** strategies, which try to improve drug use patterns by structuring decisions. Examples of managerial approaches include essential drug lists, procurement analysis with feedback to providers, and standard treatment schedules.
- (3) **Regulatory** strategies, which attempt to change behavior by restricting decisions. Banning unsafe drugs, prescribing restrictions by level of training, and limits on the number of drugs prescribed or dispensed per patient are examples of regulatory approaches. (20)

With respect to educational strategies, well-documented experience with changing prescribing practices in developed countries and limited experience with changing drug use patterns in developing countries suggests that simply providing accurate printed information has no impact on prescribing behavior (19,20). At the same time, the cost-effective impact of educational programs based on face-to-face interactions or targeted feedback has been demonstrated in a variety of settings (21,22). For example, face-to-face "public health detailing" of selective drug use messages has been shown to save US \$2.00 for every \$1.00 invested in the program (21). Of note is that the observed level of saving occurred in the U.S., where the personnel costs of interventions are high compared to the relative drug costs.

Public sector efforts to promote rational drug use in the region include, among others, the following:

- development of standard treatments in Papua New Guinea, Nepal, Pakistan, Democratic Yemen, and Indonesia;
- development of patient education flipcharts and posters in Bangladesh;
- recent workshops on rational drug use in Egypt, India, and Indonesia; and,
- withdrawal of hazardous drugs from the market in numerous countries.

In sum, current public sector drug use patterns suggest considerable therapeutic and financial inefficiency. At the same time, a variety of techniques exist for promoting more effective, economical drug use.

Wise Procurement Practices -- A major determinant of total pharmaceutical costs for the public sector is clearly the unit cost paid for each drug. Table 3 summarizes the status of public drug procurement in the region as of late 1987. According to this assessment, at least one-third of the U.S.A.I.D.-assisted countries in the region and perhaps as many as two-thirds of the countries could achieve significant savings through more efficient procurement practices.

Production capability in the region has grown steadily, and at present all but two or three of the U.S.A.I.D.-assisted Asia-Near East countries have at least the capacity to produce drugs from imported pharmaceutical chemicals (1). Indonesia and Egypt have the capacity to produce many of the necessary pharmaceutical chemicals themselves, but only India has research capability to develop new chemical entities. Many countries in the region, including Nepal, Bangladesh, and Indonesia, have governmental or quasi-governmental pharmaceutical production units. Local production capability notwithstanding, recent price comparisons for Indonesia (5) and Nepal (7) indicate that the prices paid by these two governments were comparable to, but not significantly lower than world market prices.

To accurately determine the potential savings to governments from more efficient pharmaceutical procurement, it would be necessary to undertake detailed price comparisons in each country. Available data and experiences with improving pharmaceutical procurement in specific projects, however, suggest that some countries could reduce prices by 20 % and perhaps even 25 %. Actions to improve procurement efficiency could include support for improving the operating efficiency of publicly owned pharmaceutical manufacturing facilities and institution of measures which increase competition among government suppliers, while maintaining service reliability and drug quality (29).

Table 3
Essential Drug Procurement and Distribution

Distribution

	P R O C U R E M E N T			P R O C U R E M E N T S Y S T E M		
	Direct or Negotiated PRICES HIGH	Tender from Multiple sources PRICES MODERATE	Tender from Multiple Sources PRICES LOW	Deficient	Moderate	Good
NUMBER OF COUNTRIES	5	6	5	6	8	3
PERCENT OF COUNTRIES	31%	38%	31%	35%	47%	18%
Afghanistan	*			*		
Bangladesh		*		*		
Burma		*		*		
Egypt	*				*	
India	*	NA			*	

Indonesia			*		*	
Jordan			*		*	
Morocco		*			*	
Nepal	*			*		
Oman		*			*	

Pakistan		*			*	
Papua New Guinea			*			*
Philippines	*			*		
Sri Lanka			*			*
Thailand			*			*

Tunisia		*			*	
Turkey		NA			NA	
Yemen	*			*		

Adapted from: Ref. (1), Annex 1.

Efficient Distribution Systems -- Financial resources and procurement efficiency are important determinants of drug availability at individual health facilities. Efficient storage, inventory control, and transport are also important determinants of the availability of pharmaceuticals and the proportion of pharmaceuticals which are lost through deterioration, expiration, or for other reasons. Some of the countries in the region are managing distribution quite efficiently, while others continue to face considerable natural and operation obstacles.

Strengthening basic supply management functions is an important on-going activity which often falls in the scope of U.S.A.I.D.-supported child survival, primary health care, and health financing projects. Improvements in storage, inventory control, and transport management can all contribute to more reliable availability of pharmaceuticals. Other specific options include the following:

- * Increased reliance on private sector distribution capacity; in Indonesia, for example, procurement contracts specify that suppliers deliver drugs directly to the regency (district) level, thus avoiding the cost and potential inefficiencies of managing national and provincial central medical stores and the vehicle fleet which would be required to transport drugs from one storage point to the next;
- * Selective use of current "kit system" concepts to prepack standard quantities of individual drugs for use at individual health facilities; basic health workers in Afghanistan and health posts in Nepal are already supplied through the kit system; while there are many settings in which the kit system is not appropriate, current concepts about the kit system make it an attractive and more flexible method for improving distribution efficiency in selected areas.

Revenue Generation

Revenue generation for pharmaceuticals is the third major financing mechanism available to the public sector. Cost recovery through revolving drug funds, other forms of drug sales, or community drug cooperatives has already been implemented in parts of Thailand, Nepal, India, Bangladesh, and the Philippines. In Thailand, for example, the Ministry of Public Health has been helping communities set up drug funds since 1978.

Of the roughly 50,000 villages in Thailand, about 26,000 have established revolving drug funds. Of these, more than 85 % generate positive net revenue. While some of the more successful drug funds have added non-drug and luxury items to their stocks, they nevertheless continue to supply essential drugs at reasonable prices under community management. (30)(31)

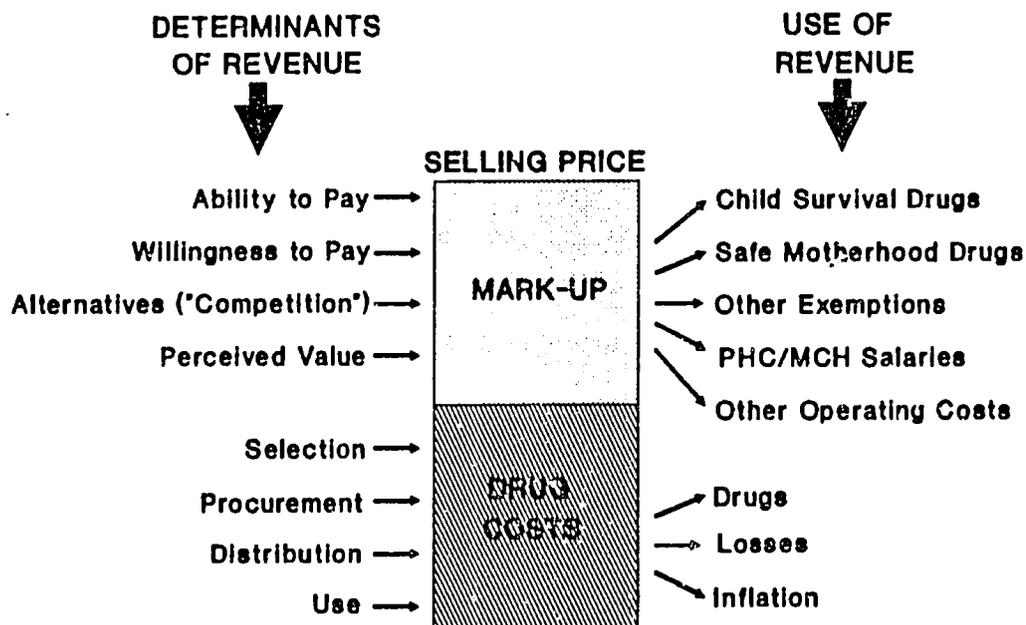
For at least ten years private voluntary agencies in Nepal, often working through government health facilities, have attempted a variety of cost-recovery measures. Revolving drug funds have been one frequently used mechanism for revenue generation. Experimentation with revolving drug funds over an eight-year period in at least five districts indicates that managerial feasibility has been demonstrated, but only under conditions of substantial donor-supported or PVO supervision; and political feasibility in the form of community acceptance has been established, but only with

nominal drug fees. As of 1987, however, economic feasibility, even with partial self-sufficiency as the cost-recovery objective, had yet to be demonstrated convincingly. (7)

Issues related to various mechanisms for revenue generation have been well-described (10)(11)(12). A recent U.S.A.I.D.-supported review of pharmaceutical cost recovery (23) concluded that experiences to date suggest that (1) in many circumstances patients are willing to pay prices which cover at least the full cost of drugs; community-based funds can succeed where local commitment exists, (2) though patients are willing to pay for drugs, significant price increases can dissuade patients from health services, (3) mechanisms do exist to protect target groups, (4) tension between financial goals and public health goals is both inevitable and necessary, and (5) lack of financial management skills and accountability commonly undermine drug funds.

Figure 11

Cost-Recovery Potential Determined by Patients & Costs -- Not by Policy

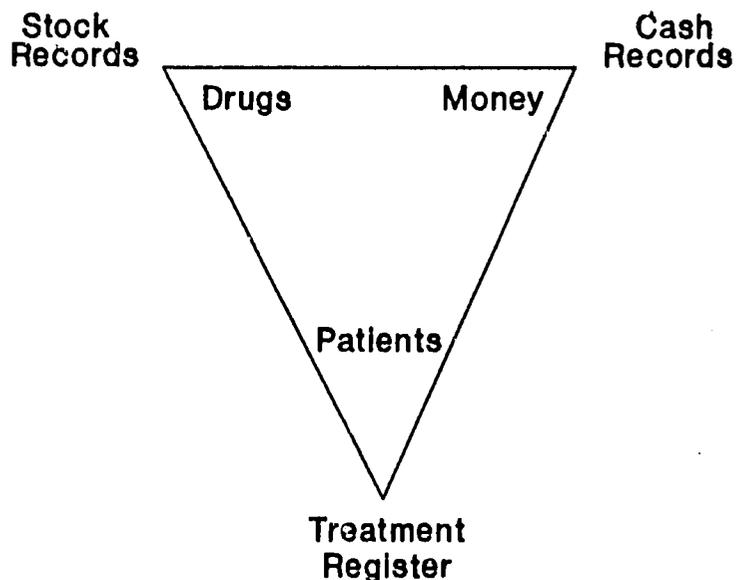


At the same time, experience to date with public sector pharmaceutical cost recovery has not provided sufficient information to tell us, (1) if large-scale cost recovery distorts health care utilization patterns, (2) whether most governments can manage national cost recovery programs, (3) whether drug fees are generally more successful than service fees, prepayment, or other forms of resource mobilization, (4) if cost recovery at the primary care level should be initiated without or before hospital cost recovery, or (5) what are financial expectations for cost recovery in different countries.

Thus, it appears that cost recovery potential, financial management requirements, impact on patients, and issues of equity are important considerations in pharmaceutical cost recovery. Figure 11 outlines the factors which determine the cost recovery potential of revolving drug funds. The net revenue is determined by the mark-up -- simply the difference between the replacement cost of drugs and the selling price. The replacement cost of drugs will, of course, be determined by factors such as selection, procurement, distribution and use. Contrary to the approach taken in some public programs, the mark-up cannot be determined by policy, but empirically based on factors such as ability to pay, willingness to pay, prices for alternative sources of drugs, and the perceived value of drugs.

Figure 12

The Health Center Revolving Drug Fund Accountability Triangle



FOR SUSTAINABILITY WITHOUT SUBSIDY:

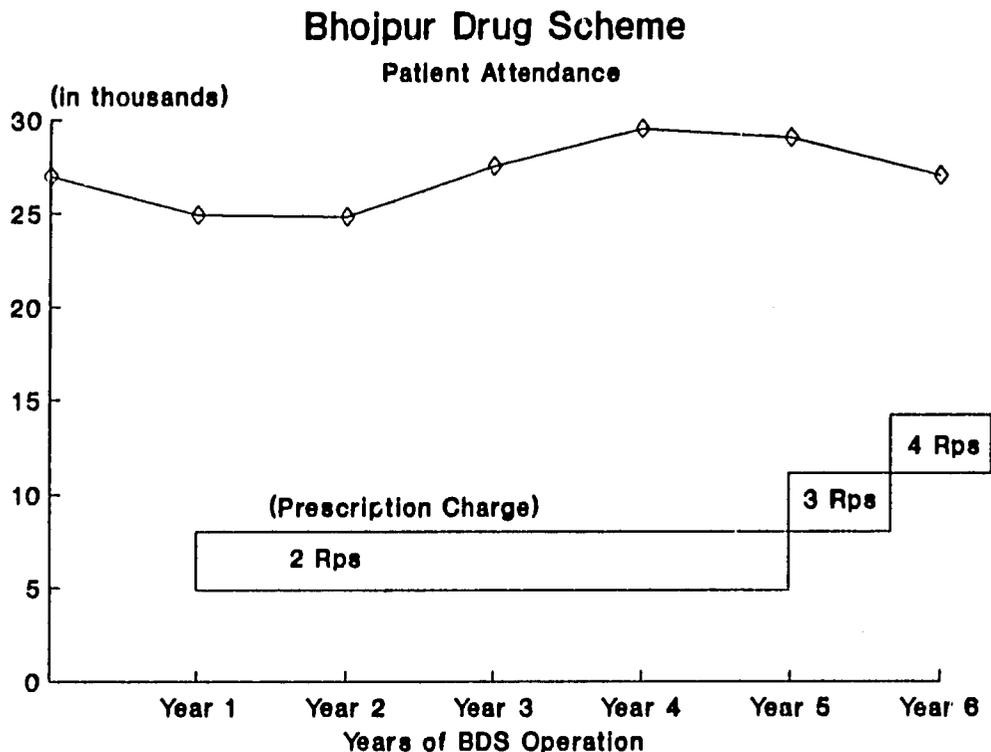
Patients Treated = Money Collected
 Money Collected = Drugs Dispensed
 Drugs Dispensed = Patients Treated

From

The administrative requirements of operating a revolving drug fund are much greater than those of operating a "free" system. Figure 12 depicts the "accountability triangle" for the health center level. It is evident that cost recovery requires new control mechanisms, greater supervision, and considerably more investment in human resources development.

Another important consideration is the impact on patient use of health facilities. The review of pharmaceutical cost recovery experiences cited above (23) notes that available program documentation frequently fails to report adequately on patient impact. Figure 13 demonstrates the impact of drug fees and increases in drug fees on patient attendances in the Bhojpur district of Nepal. The pattern suggests a fall in attendances with price increases, followed by a slow recovery. But the prices charged in this district represented only a fracture of the replacement cost of all drugs used. In addition, simple utilization statistics do not reflect changes in patient mix such as decreased utilization by women or children. It is important, therefore, for pharmaceutical cost recovery programs to track not only the total number of patient contacts, but also the pattern of utilization to assure that target groups are not being dissuaded from seeking care.

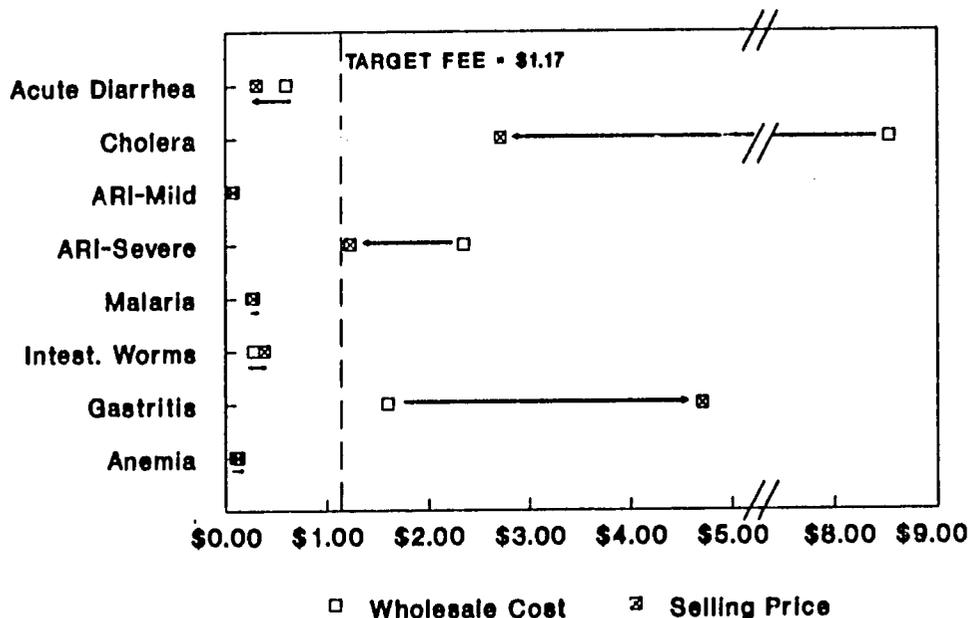
Figure 13



Finally, a major issue for pharmaceutical cost recovery programs is equity. Various mechanisms exist for exemptions and cross-subsidies aimed at protecting the target populations and keeping the most essential drugs affordable. A recent analysis based on health care utilization data, health center morbidity patterns, and drug prices from Indonesia suggests that it is feasible to establish a pricing mechanism which factors in local ability to pay, the relative cost of drugs, the health impact of individual drugs, and the needs of target populations (27). Figure 14 demonstrates the impact of such an approach on the selling price for typical courses-of-therapy for selected common illnesses. In effect, surcharges on popular, but less essential drugs such as symptomatic treatments for acute respiratory infections and antacids for gastric upset would allow prices to be reduced for treatment of potentially serious conditions such as acute diarrhea, cholera, and severe acute respiratory infections.

Figure 14

Wholesale Cost versus Selling Price by Illness



Lancet Ref

Though there are clearly reasons to pursue revolving drug funds and other pharmaceutical revenue generation schemes with caution, there are also good reasons to consider these mechanisms one set of options in the broader framework of financing alternatives for primary health care. U.S.A.I.D. can play important roles in helping countries to develop an analytic framework for considering drug financing alternatives, in working to evaluate the health impact and financial impact of existing revenue generation schemes, and in assisting countries to implement successful revenue-generating schemes if and when they are adopted.

CURRENT CONSTRAINTS AND STRATEGIC OPPORTUNITIES -- PRIVATE SECTOR

The role of the private sector in providing pharmaceuticals can be considered from the public health perspective, the regulatory perspective, the retail sector development perspective, or the industrial sector development perspective. The nature of the discussion and the policy options to be considered will be quite different, depending on which of these perspectives one takes. Here we are focussing on the public health perspective: how can private expenditures on pharmaceuticals be channeled to achieve child survival, safe motherhood, and other public health objectives?

The pharmaceutical expenditure data in Figure 2 suggests that, in one sense, cost-shifting through private expenditures for pharmaceuticals already exists in most countries in the region; private expenditures on pharmaceuticals far surpass public expenditures. Beyond the mere magnitude of expenditure, however, is the question of therapeutic effectiveness.

The Paradox of Managerial Efficiency and Therapeutic Inefficiency

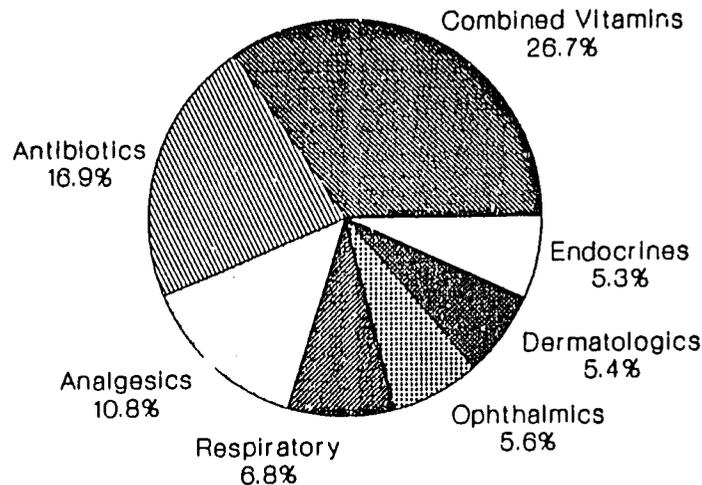
In 1987 drug retailers in the hills of Nepal were asked what treatments they would recommend for diarrhea, cough, fever, and other common complaints (18). Not surprisingly, antibiotics were recommended five times more often than oral rehydration products for simple diarrhea. In fact, 40 % of all recommendations for diarrhea, dysentery, fever, cough, and scabies were for antibiotics. In Egypt, a recent study of private sector prescribing found the same pattern of multi-drug prescriptions and over-use of antibiotics for many common conditions in infants and children (3). An analysis of the entire Egyptian pharmaceutical market revealed that over 25 % of total sales were for combination vitamin products. Vaccines accounted for less than 1 % of total expenditures for all pharmaceutical products. (Figure 15)

These and other studies suggest the following observations about private pharmaceutical expenditures in most Asia-Near East countries:

- * with few exceptions (e.g. Papua New Guinea), 70 to 90 % of pharmaceutical expenditures occur in the private sector;
- * household surveys indicate that patients frequently go directly to pharmacists and other sellers of drugs to buy potent Western medicines; thus many, if not most, pharmaceutical expenditures are made without trained consultation;

Figure 15

Pharmaceutical Expenditures by Therapeutic Category
Egypt, Public and Private, 1985-1986



Private Sector Expenditure = 88% of Total Expenditure

- * large amounts are spent on "low yield" products (e.g., elaborate vitamin-mineral combinations) and often for sub-therapeutic doses;
- * strong economic incentives operate at the point of prescription and the point of purchase;
- * little regulatory control of the prescribing and dispensing process is possible in many countries.

The net result of these observations is that, from a public health perspective, a great deal of money is spent for relatively little therapeutic benefit. While the private sector may be managerially efficient, there is much to suggest that it is therapeutically quite inefficient.

With the exception of contraceptive retail sales, social marketing of oral rehydration therapy, and isolated examples of other efforts to promote effective drug use, alternatives for promoting therapeutically effective as well as economically efficient use of private sector pharmaceutical resources remain largely unexplored. Several options exist, including re-orienting physicians and other prescribers, re-orienting pharmacists and other sellers of drugs, and influencing patient demand.

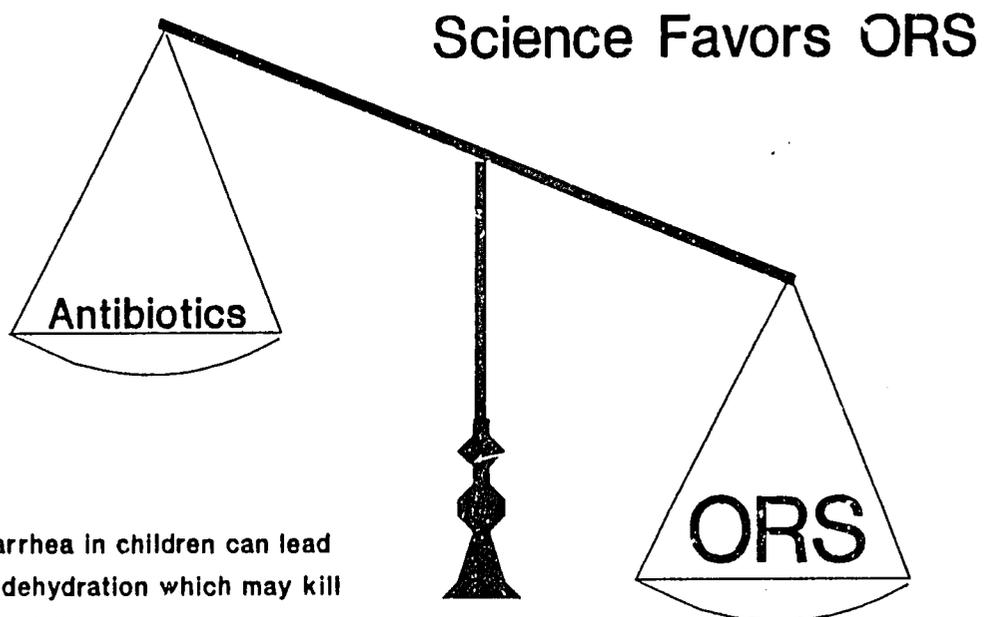
Re-Orienting Physicians and Other Prescribers

Constraints on and strategies for improving prescribing accuracy were considered above in the section on Effective Drug Use. Each of the three strategy lists -- educational, managerial, and regulatory strategies -- can be applied in the public sector. Table 4 lists many of the specific interventions which have been tried within each of the three areas.

In general, passive educational approaches which depend simply on providing written material -- however accurate and credible the source -- have been demonstrated not to have a measurable impact on drug use patterns. More focussed techniques such as feedback based on providers' own prescription patterns and face-to-face education (as frequently done by drug company "detailers"). These techniques depend on certain prescribing behavior change principles, including (1) beginning with an understanding of why the prescriber uses the drugs he or she currently does, (2) developing concise messages, (3) communicating messages clearly, (4) cited credible information sources, (5) anticipating counter-arguments, and (6) reinforcing messages to the extent possible.

Figure 16 illustrates how messages about oral rehydration and the use of antibiotics might be presented to physicians, nurses, and other health care providers.

Figure 16



Diarrhea in children can lead to dehydration which may kill the child.

ORS can correct dehydration; antibiotics cannot.

Table 4

OVERVIEW OF STRATEGIES TO IMPROVE DRUG USE

1. EDUCATIONAL -- Provide information

Ref. Come

Training

- Formal Education (pre-service)
- Informal Education (in-service)

Print-Only Approaches

- o Clinical Literature
- o Newsletters
- o Formulary and Therapeutics Manuals
- o Illustrated Materials with Headlines (Fliers, Leaflets)

Face-to-Face Approaches

- o Counseling at Point of Dispensing
- o Group Lectures & Seminars
- o Ongoing Clinical Consultations
- o One-on-One Public Health "Detailing"
- o Community Gatherings

Media Approaches

- o Posters
- o Sound Trucks
- o Radio
- o Television

2. MANAGERIAL -- Structure decisions

Selection & Procurement

- Essential Drug Lists
- Morbidity-Based Quantification
- Consumption Analysis ("Audits") plus "Feedback" to Providers.

Prescribing & Dispensing

- Structured Drug Order Forms
- Standard Diagnostic & Treatment Guidelines
- Course-of-Therapy Packaging
- Effective Labeling -- complete, symbolic

Financing

- Pricing in Drug Revolving Funds
- Patient Cost-Sharing (e.g. \$0.20 per prescription)
- Capitation

3. REGULATORY -- Restrict decisions

Prescribing Controls

- Banning Unsafe Drugs
- Level-of-Use Prescribing Restrictions
- Required Consultations or Justifications
- Automatic Stop Orders

Dispensing Controls

- Limits on Number of Different Drugs per Patient (eg, "3 drug rule")
- Limits on Quantities of Each Drug (eg., "3 day rule")

Re-Orienting Pharmacists and Other Drug Sellers

Since a large percent of private sector pharmaceutical expenditures are made through direct purchase from pharmacists and other sellers of drugs, it is reasonable to ask whether the dispensing patterns of these practitioners can be re-oriented to better serve public health objectives.

Evidence from contraceptive retail sales suggests that some improve is possible. For several common child survival and maternal health conditions, there is reason to believe that a small set of dispensing and referral messages could be developed which are both sound from a public health perspective and profitable from a retailer's perspective. Examples would include:

- * Diarrheal disease -- when a full line of ORS products are available, there can be profit in ORS; vitamins aimed at locally prevalent childhood deficiencies could be considered; dispensing of antibacterials could be "unmarketed"; and basic guidelines could be taught for identifying and referring the small number of patients who cannot be safely treated by the druggist.
- * Acute respiratory illness -- again, it is at least worth testing the hypothesis that a set of safe and effective, but still profitable dispensing and patient referral guidelines can be developed and conveyed to drug sellers.
- * Prenatal care -- maternal anemia remains a major preventable risk factor for neonatal and maternal mortality in many countries, while an undocumented number of birth defects are undoubtedly attributable to lack of caution in prenatal use of drugs; can drug sellers be taught a basic set of guidelines which suggest which drugs (primarily vitamin-mineral preparations) are the best source of "profit in pregnancy" and which drugs should, by every effort, be avoided?

The political, educational, economic, and organizational constraints in re-orienting pharmacists and other sellers of drugs are indeed formidable. Yet the potential benefits of improving the therapeutic efficiency of literally billions of dollars of private sector investments in pharmaceuticals are also great. There are some examples of private sector efforts which are at least encouraging. In Nepal, for example, a long-standing UNICEF-supported program for retailer education is regularly conducted by the Ministry of Health and attracts large numbers of paying participants. Training is experientially-based and geared to the conditions under which the participants work. It is unfortunate, however, that much of the curriculum is geared toward preventing the negative (eg., avoiding serious, but rare complications of individual drugs), rather than promoting the positive aspects of pharmaceutical use. Nevertheless, the popularity and longevity of the program suggest that, at least in Nepal, a practical vehicle for re-orienting pharmacists and drug sellers does exist.

Data from Egypt also suggest that private sector promotion of child survival strategies such as oral rehydration can be successful. While ORS has not pushed antibiotics and antidiarrheals from the market, as many had hoped, it has become a widely selling item in private pharmacies.

Private Sources for Public Health Care

A World Bank review of the private delivery of public services (2) identifies a number of successful efforts to deliver health services through private channels. Such options clearly apply to interventions beyond pharmaceuticals. But standard pharmaceutical approaches to conditions such as diarrheal disease, acute respiratory infection, and prenatal care can be communicated to private providers of health care. To the extent that pharmaceuticals are then supplied by these health providers, the burden on government may be reduced.

Influencing Patient Demand, Expectations, and Drug Use Patterns

As with efforts to involve private pharmacists and drug sellers, attempts to influence patterns of patient demand and behavior have focussed primarily on family planning and use of oral rehydration therapy. Efforts to promote use of ORS in Egypt have been particularly successful. In recent years consumer groups have begun efforts to educate the public more generally on issues of rational drug use. In India, for example, a provocative series of posters have been disseminated to warn patients of the hazards of drug use. In Bangladesh and elsewhere efforts have been made to improve patient use of drugs. These efforts often rely on communicating basic concepts of drug use which can have a significant impact on patient expectations and the cost of meeting those expectations. Examples of concepts which patient education programs attempt to convey are:

- * Many drugs on a prescription do not necessarily mean good treatment.
- * Tablets and capsules are safer and sometimes even more effective than injections.
- * Drugs do not cure all problems. The right food, cleanliness, rest, and exercise are equally important -- and for some problems better.

As with attempts to re-orient prescribers and dispensers, the potential effectiveness and the cost of changing patient demand and expectations is largely unknown. Yet any effort to obtain greater public health benefit from private expenditures is likely to fail without practical, demonstrably effective means of influencing the ultimate consumer.

REFERENCES

1. World Health Organization. The World Drug Situation. Geneva: World Health Organization (1988).
2. Roth, Gabriel. The Private Provision of Public Services in Developing Countries. Washington: Oxford University Press/World Bank: EDI Series in Economic Development (1987).
3. Badr, Amira. Egypt Drug Study: Child Survival Pharmaceuticals. Arlington, VA: USAID/JSI REACH Project (October, 1987).
4. USAID/Egypt. Interim Evaluation: Control of Diarrheal Diseases Project (#263-0137). Washington: USAID (February, 1987).
5. Management Sciences for Health, in collaboration with Yayasan Indonesia Sejahtera and Ministry of Health/Indonesia. Child Survival Pharmaceuticals in Indonesia: Opportunities for Therapeutic and Economic Efficiencies in Pharmaceutical Supply and Use. Boston: Management Sciences for Health (December, 1987).
6. Management Sciences for Health, in collaboration with Yayasan Indonesia Sejahtera and Ministry of Health/Indonesia. Where Does the Tetracycline Go? Health Center Prescribing and Child Survival in East Java and West Kalimantan, Indonesia. Boston: Management Sciences for Health (October, 1988).
7. Management Sciences for Health, in collaboration with New Era, Nepal, HMG Department of Drug Administration, Britain Nepal Medical Trust, Institute of Medicine Tribhuvan University. Child Survival Pharmaceuticals in Nepal: Opportunities for Expanded Supply and Improved Use of Pharmaceuticals. Boston: Management Sciences for Health (July, 1988).
8. World Bank. World Development Report 1988. Washington: Oxford University Press/World Bank (1988).
9. UNICEF. The State of the World's Children 1988. New York: Oxford University Press/UNICEF (1988).
10. Griffin, Charles. User Charges for Health Care in Principle and Practice. Washington: World Bank: EDI Seminar Paper #37 (1988).
11. World Health Organization/Drug Action Programme. Financing Essential Drugs: Report of a WHO Workshop (Harare, Zimbabwe, March 14-18, 1988). Geneva: World Health Organization (1988).
12. American Public Health Association. Community Financing of Primary Health Care. Washington: American Public Health Association (1982).

REFERENCES -- continued

13. Population Reports/Family Planning Programs. "Contraceptive Social Marketing: Lessons from Experience." Baltimore, MD: Population Information Program, Johns Hopkins University, Series 1, #30 (July-August 1985).
14. SCRIP. "Pharma Manufacture and Formulation in the Commonwealth." Richmond, Surrey, UK: SCRIP No. 1121, pp. 16-17 (July 21, 1986).
15. Budiarmo, L.R., J. Putrali, Muchtaruddin. Report on Household Health Survey 1980. Jakarta, Indonesia: R.I. Department of Health, Agency for Health Research and Development, Center for Health Ecological Research (1980).
16. Nichter, M. "From Aralu to ORS: Sinhalese Perceptions of Digestion, Diarrhea, and Dehydration." *Social Sciences and Medicine*, Vol. 27, pp. 39-52 (1988).
17. Cross, P. N., M.A. Huff, J.D. Quick, and J.A. Bates. "Revolving Drug Funds: Conducting Business in the Public Sector." *Social Science and Medicine*, Vol. 22, No. 3, pp. 335-343 (1986).
18. New Era. Private Sector Pharmaceuticals Study. New Era, Kathmandu, Nepal, January, 1988 (unpublished study).
19. Soumerai, S.B. "Factors Influencing Prescribing." *Aust. J. Hosp. Pharm.*, Vol. 18, No. 3 (Suppl.) (1988).
20. Soumerai, S., J. Quick, J. Avorn, and Y. Tawfik. "Changing the Unchangeable: Principles and Experiences in Improving Prescribing Accuracy." *World Pediatrics and Child Care*, 3, pp. 287-291 (1987).
21. Soumerai, S., and J. Avorn. "Economic and Policy Analysis of University-Based Drug 'Detailing.'" *Medical Care*, Vol. 24, pp. 313-321 (1986).
22. Ray, W. A., W. Schaffner, and C. F. Federspiel. "Persistence of Improvement in Antibiotic Prescribing in Office Practice." *JAMA*, Vol. 253, pp. 1774-1776 (1985).
23. Blakney, R.B., J.I. Litvack, and J.D. Quick. What Experience Tells Us: Pharmaceutical Cost Recovery for Child Survival and Safe Motherhood. Paper for USAID. Boston: Management Sciences for Health (March 1989).
24. Management Sciences for Health. The Drug Estimation and Monitoring System: A Computer Program for Planning, Budgeting, and Monitoring Pharmaceutical Procurement and Use. Prepared for World Health Organization. Boston: Management Sciences for Health (October 1988).
25. Quick, J.D., D. Ross-Degnan, Dr. Bimo, B. Santoso, Pong Tengko, P. Foreman, and P. Dawson. "Why Scabies Kills: Pharmaceutical Misallocations and Child Survival." Boston: Poster Presentation at American Health Association Meeting (November 15, 1988).

REFERENCES -- continued

26. Hogerzeil, H.V., G. Walker, A. Sallami, and G. Fernando. "Impact of an Essential Drugs Programme on Availability and Rational Use of Drugs." *The Lancet*, pp. 141-142 (January 21, 1989).
27. Litvack, J., D.S. Shepard, and J.D. Quick. Setting the Price of Health: Implementing National Health Objectives through Drug Pricing Policy. Cambridge, MA: Harvard University Institute for International Development, Development Discussion Paper No. 285 (March, 1989).
28. Haynes, R.B., et al. Compliance in Health Care. Baltimore, MD: Johns Hopkins University Press (1979).
29. Huff-Rousselle, M. Public Tendering for Pharmaceuticals in the English-Speaking Caribbean: Barbados, Jamaica, and the OECS Countries. St. Lucia, West Indies: Management Sciences for Health (December, 1988).
30. Myers, C.N. Thailand's Community Finance Experiments: Experience and Prospects. In *Health Care Financing: Regional Seminar on Health Care Financing.* Manila: Asian Development Bank (1987).
31. World Health Organization. Review of Drug Programme in Thailand: Report of a WHO Mission. Geneva: WHO (1986).
32. "Philippines: Generics Act and the New Drug Policy." *The Lancet*, p. 716 (April 1, 1989).