

Access to Essential Medicines: Cambodia, 2001

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Strategies for Enhancing Access to Medicines Program
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About SEAM

The Strategies for Enhancing Access to Medicines (SEAM) Program, funded by the Bill & Melinda Gates Foundation, works to improve access to essential medicines and vaccines in the developing world by fostering partnerships between the public and private sectors.

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Acronyms

| | |
|-------|---|
| CMS | Central Medical Store |
| DDF | Department of Drugs and Food [part of Ministry of Health] |
| EDB | Essential Drugs Bureau |
| EDL | essential drugs list |
| GDP | gross domestic product |
| GMP | good manufacturing practice |
| GRET | Groupe de Recherche et d'Échanges Technologiques |
| IDPIG | <i>International Drug Price Indicator Guide</i> |
| MOH | Ministry of Health |
| MSH | Management Sciences for Health |
| NGO | nongovernmental organization |
| NLDQC | National Laboratory for Drug Quality Control |
| ODMS | operational district medical stores |
| PAC | Pharmaceutical Association of Cambodia |
| RACHA | Reproductive and Child Health Alliance |
| SEAM | Strategies for Enhancing Access to Medicines [MSH] |
| USD | U.S. dollar(s) |
| WHO | World Health Organization |

Executive Summary

Cambodia is ranked among the poorest countries in the world, with annual per capita gross domestic product (GDP) of 280 U.S. dollars (USD). Approximately 40 percent of the population lives on less than USD 10 per month. In 2000, Cambodia ranked 136 out of 174 countries in the United Nations Development Programme's 2000 *Human Development Report*, placing it among the least-developed member countries. Cambodia has a striking demographic profile, with 43 percent of the population under the age of 15. Overall, nearly 30 percent of the Cambodian population is nonliterate, and less than one percent has had any education beyond high school.

Cambodia has suffered greatly because of war and internal conflicts. The Pol Pot regime left the country's physical, social, and economic infrastructure severely damaged. The loss of life and population dislocation in the late 1970s, in particular, decimated the education and health care systems. The loss of health care personnel was dramatic and its impact will be felt for many years.

Today, Cambodia's health care services are provided through the public sector, the nongovernmental organization (NGO) community, and a rapidly growing private sector; in fact, the private sector is where Cambodians receive most health care services. It is estimated that 70 percent of providers in the private sector are unregistered. In 1999, the Cambodian Ministry of Health (MOH) published a document entitled *Health Situation Analysis 1998 and Future Direction for Health Development 1999–2003* that described public sector health care services as generally underfunded. It reported that health care workers lack skills, are unmotivated, and receive very low salaries, discouraging them from improving the quality of public services and encouraging them to "unofficially" charge patients for services. The report goes on to state that the resulting low quality of public health care services, together with uncertain fees, forces many Cambodians to self-medicate and seek care from the private sector. Reliance on this generally unregulated private sector resulted in household spending on health care of 11 percent of GDP for the year 2000 and accounted for approximately 80 percent of all health expenditures.

Since 1996, the MOH has undergone an organizational and financial reform known as Health Care System Reform, which strives to improve access through equitable distribution of health care resources. The government is attempting to eliminate access gaps through the creation of operational districts based on population and access criteria. To address geographic access problems associated with unevenly dispersed populations, health centers are being positioned within 5 to 10 kilometers (one to two hours walking distance) of each other. These centers aim to serve an optimal service population of 10,000.

In addition to the reorganization effort, financial management reforms were initiated. The MOH and the Ministry of Economy and Finance jointly approved the Health Financing Charter of 1996, which established the principles governing the introduction of different health care financing programs, including the use of government-approved user fees in public facilities.

Finally, another component of Cambodia's health care system reform is the Human Resource Development Initiative, which strives to define workforce needs and qualifications as well as establish training guidelines.

Significant gaps in access to medicines exist in all sectors, particularly in relation to affordability and quality of products and services. The current system presents patients with an uncoordinated and weakly regulated array of public and private sector health care providers and facilities. Private retail drug outlets are the initial entry points into the Cambodian health care system for a majority of the population. In the private sector, the greatest access issue may be the absence of properly trained drug sellers to provide accurate information and recommendations on drugs of choice and directions for use. While a wide range of pharmaceuticals is available on demand in the private sector, product selection is often made based on the price the consumer is willing to pay rather than the potential efficacy of the product. Dosing and duration of therapy is also more likely to be based on the amount of money the patient is willing to pay rather than what is appropriate. Such drug use practices may exacerbate the development of antibiotic resistance.

An equally important issue is access to quality drug products in Cambodia. A substantial proportion of unregistered drugs of questionable quality are smuggled across the border from neighboring countries. Nearly 10 percent of drug samples tested as part of this assessment were found to be substandard.

Based on the assessment findings, strategies have been formulated to address the most significant access gaps that are amenable to change. By adding structure, control, and innovative behavior modification concepts into the health care system, administrators hope to engage the private sector in meeting public health goals. Although strategies addressing the public sector will also improve access to essential medicines, the private sector has been targeted first to introduce change at the point where most Cambodians seek health care services. It is anticipated that, with the appropriate incentives, improving access to quality pharmaceuticals and services in the private sector will influence subsequent change in the public sector.

There are four main components of the intervention strategy—

- Development and implementation of a performance-based network of pharmacies and drug depots. These retail network outlets would agree to a system of education and certification of drug sellers, who would subscribe and adhere to a set of minimum standards of practice and submit to monitoring of their performance.
- Implementation of a group-purchasing cooperative for network members to provide lower costs for essential drug products of guaranteed quality
- Expansion of the provider network to include other health care providers, including rural health clinics and public facilities, who would agree to subscribe to improved standards of practice and submit to regular performance monitoring
- Creation of innovative community-based health insurance programs, including the expansion of private insurance coverage

This report describes these four components, which are organized into three intervention phases. The overall principle of the intervention strategy is to enhance access in Cambodia by first bringing structure and accountability to both the public and private health care sectors. Taken individually, each recommended intervention would have a limited positive effect on access. However, each is a critical component for supporting the whole, and taken together, they would improve access and address some critical shortcomings of the present system. The proposed interventions were formulated in partnership with the potential implementers and were discussed in detail with the community of involved stakeholders, where they enjoyed widespread support. Present and potential constraints were not considered to pose a serious impediment to intervention implementation. However, implementation of the proposed strategy and the development of an organized and regulated infrastructure to support it would require a long-term commitment of personnel and related resources.

Introduction and Background

In 2000, Management Sciences for Health (MSH) received a grant from the Bill & Melinda Gates Foundation for the Strategies for Enhancing Access to Medicines (SEAM) Program to identify and test innovative approaches that address the lack of access to essential medicines in developing countries. MSH's first steps were to develop plans to increase access to essential medicines, to design a method that could measure the nature and extent of the access problem, and to monitor the impact of programs that aim to improve access. The new SEAM Program collaborated with the World Health Organization (WHO) and more than 40 leading experts to develop a framework for measuring access to medicines, vaccines, and other health commodities. This framework, in turn, served as the basis for SEAM's country programs for development and evaluation.

A SEAM access framework was later discussed at a consultative meeting, jointly sponsored by MSH and WHO, in Ferney-Voltaire, France, on December 11–13, 2000. More than 40 experts from 15 countries participated in the discussions and agreed that access to essential medicines encompasses distinct dimensions that are distinguished by sets of specific relationships. Four dimensions of access and one crosscutting characteristic emerged from the discussions—

- Physical availability: the relationship between the type and quantity of product and service needed and the type and quantity available
- Affordability: the relationship between the products and services and the user's ability to pay for them
- Geographic accessibility: the relationship between the location of the product or service and the location of the potential user of the product or service
- Acceptability (or satisfaction): the fit between the user's and provider's attitudes and expectations about the products and services and the actual characteristics of these products and services
- Quality of products and services, an essential component cutting across all dimensions

After several rounds of internal discussions and consultations with contacts in developing countries and experts from WHO and the World Bank, six countries—Ghana, Tanzania, Cambodia, India (state of Rajasthan), Brazil (state of Minas Gerais), and El Salvador—were chosen to undergo assessments based on the access framework. As with the other selected countries, the criteria for Cambodia included perceived or known significant lack of access to essential medicines, an environment perceived as enabling private sector initiatives, political and economic stability, and potential for collaboration with other MSH and Gates-funded local initiatives.

All assessments were carried out between February and May 2001. Local, private, not-for-profit or academic organizations collaborated with SEAM country teams on the adaptation of data collection instruments, sample selection, data collection, and analysis (see Annex A for more about the methodology used). Once the assessments were completed, the findings were presented at the first annual SEAM Conference, held in Washington, D.C., in November 2001. Countries selected for implementation of proposed interventions were Ghana and Tanzania. El Salvador was selected for limited technical assistance from the SEAM Program.

For Cambodia, data were collected by two teams in Phnom Penh and one team each (see Annex B for a list of team members) in the provinces of Kandal, Battambang, Siem Reab, Kampong Cham, Kampong Thum, Svay Rieng, and Kampong Saom (Sihanoukville). This report presents an in-depth review of the assessment results and recommendations. Cambodia is expected to benefit from participating in the assessment, which includes the SEAM-supported analysis of potential strategies involving local public-private initiatives to enhance access to essential medicines. With this analysis in hand, Cambodia can approach donors and lenders for financial assistance as appropriate.

Country Overview

Geography

Cambodia is situated on the Mekong peninsula in Southeast Asia, bordered by Laos on the north, Thailand on the north and west, and Vietnam on the east and south. The Gulf of Thailand is off the western coast. Cambodia covers an area of 181,040 square kilometers (CIA 2003). The country is primarily a large alluvial plain ringed by mountains and divided naturally by the Tonle Sap River, which flows from northwest to southeast. The northeast and southwestern regions are mountainous and sparsely populated, with rural, difficult-to-reach villages. The country is divided into 24 provinces and municipalities. While the northeastern provinces occupy approximately 30 percent of the land, they account for less than 4 percent of the population (MOH/DPHI 1998). The population is currently concentrated in 10 provinces in and around Phnom Penh.

The climate is governed by two monsoon seasons, November through March and May through October. Average annual temperatures vary from 21°C to 35°C. Highways connecting the capital city of Phnom Penh with other major cities are in generally poor condition and may be unusable during the rainy season, when flooding becomes a major problem.



Source: CIA World Factbook, 2003

Figure 1. Map of Cambodia.

Demographics

The 2000 World Bank estimate of the country's population was 12 million, which reflected an estimated annual population growth of 2.2 percent in 1998; growth was estimated to be 1.6 percent in 2002 (World Bank 2003). The capital city of Phnom Penh alone has a population of almost a million, amounting to approximately 8.5 percent of the total population (MOH 1999a). Furthermore, Phnom Penh, Kampong Cham, Prey Veng, and Kandal provinces together account for over 40 percent of the total population of Cambodia (MOH 1998). In order to gain some perspective on current population figures and distribution, these data should be viewed within the context of Cambodia's recent political and social past.

Between 1975 and 1979, the Pol Pot regime imposed social control on a scale rarely seen. The government began a campaign to forcibly move people out of the cities and into the countryside, attempting a massive reeducation program. Some estimates indicate as many as 25 percent of the seven million people then living in Cambodia were killed during this period. Although much of this killing appeared to be indiscriminate, it did target those associated with earlier governments or the military, and those with more advanced education, including health care personnel. According to the Ministry of Health (MOH), the loss of health care professionals was so extensive that of the 530 physicians in Cambodia in the early 1970s, there remained only about 50 in 1979 (MOH 1999a).

In 1992, a semblance of peace and order was restored to the country. However, this history of repeated conflicts, especially the population dislocation and widespread loss of lives during the Pol Pot years, helps to explain some rather startling recent demographic facts. For example, the *Cambodia National Health Survey 1998* (NIPH, 1999) revealed that only 56 percent of the population was over the age of 15 and only 3.5 percent was over the age of 64. Life expectancy at birth was 52.2 for males and 55.4 for females, and infant mortality was 89.4/1,000 births (MOH 1999a, 1999b; NIS et al. 2000). According to the *Cambodian Demographic and Health Survey 2000*, under-five mortality in the 1995–2000 period was 124.5/1,000 births (NIS et al. 2000).

Social and Economic Development

Cambodia is ranked among the poorest countries in the world, with annual per capita gross domestic product (GDP) of 280 U.S. dollars (USD) (World Bank 2003). Approximately 40 percent of the population lives on less than USD 10 per month. Cambodia ranked 136 out of 174 countries in the 2000 UN *Human Development Report*, placing it among the least developed of the UN member countries (UNDP 2000). In 1998, the difference in the literacy rate for women and men was greater than 20 percent, with a 57 percent literacy rate for women. According to the 2000 *Cambodia Demographic and Health Survey*, among women aged 15 to 49, approximately 28 percent were nonliterate, and only 17 percent had completed a secondary education (NIS 2000). Other reports place the rate of nonliteracy significantly higher, particularly among the poorest quintile of the population (UNDP 2000).

There are indications that overall economic conditions are improving. The annual growth rate for the economy in 1999 was 5 percent and the annual inflation rate was 1.5 percent. However, more than one-third of the population lives below the poverty line, and 90 percent reside in rural areas of the country (World Bank 2002). The growth of the private sector, particularly in Phnom Penh, has led economic recovery. However, continued growth is constrained by the less-than-adequate infrastructure and a developing and unpredictable legal and regulatory framework.

Infrastructure

The damage done during the Pol Pot regime to Cambodia's infrastructure was dramatic, and the country's economic and social infrastructure was dismantled during the quarter-century of Khmer Rouge control. Land mines continue to limit the use of arable land, and much of the population still lacks access to health care, education, safe water, electricity, proper sanitation, and serviceable roads.

Transportation

The most important mode of transportation is by motor vehicle, but the highway system is limited, with paved roads generally connecting the capital only to major cities along the Tonle Sap River and extending down to the southern port city of Kampong Saom. Where paved roads do exist, they are generally in poor condition. In addition, the monsoon season sometimes makes even these roads impossible to travel, and boats are needed to connect the north and south of the country.

It is estimated that in 1997, there were 35,769 kilometers of roads in Cambodia, but only about 11.6 percent were paved (CIA 2003). In rural areas, villages may be inaccessible by road, and transportation for commercial purposes is considered too expensive and time consuming. Even successful businesses that attempt to establish a country presence may require boat or airplane transportation to link services in major cities. These transportation issues present a considerable challenge to the delivery of medical supplies to health care facilities.

Telecommunications

The largest telecommunications company in the country is Mobitel, which estimates there are approximately 21,800 landlines in the country and more than 80,000 mobile cellular phones. Coverage for mobile phones is currently limited to the population centers. In rural villages, where mobile service is nonexistent or considered too expensive, two-way radio service is often used for communication between health care facilities.

In 2000, there were two Internet service providers in Cambodia, and an estimated 10,000 people had Internet connections by 2002 (CIA 2003). The World Bank (2003) estimates that there were 1.5 personal computers for every 1,000 people in 2001.

The Health Sector

The public sector, the nongovernmental organization (NGO) community, and a rapidly developing private sector provide Cambodia's health care services. Cambodians pay out-of-pocket for most types of health care services, including pharmaceuticals. Cultural links to traditional healers remain, and for some, especially in the remote areas, these healers are the first stop in seeking health care.

Health insurance is a relatively new concept in Cambodia. Private health insurance is limited, with approximately six companies in business, each offering coverage to 5,000 people or fewer. Private plans, with generally limited benefits and substantial exclusions, are provided primarily to the expatriate community, employees of embassies, and the executives of foreign-owned and -operated companies. These private health insurance programs are offered by international companies, since there are no solely owned Cambodian insurance companies. There are some prepaid plans (e.g., International SOS) available in Cambodia, but they cover only outpatient services and a specified set of conditions. These too are offered primarily to the expatriate community.

Organization of Health Services

Health care for the majority of Cambodians falls under the mandate of the MOH. In 1995, only 25 percent of the population had access to basic health services (Lo Veasna 2001). In 1996, to improve access to health care services, the Government of Cambodia, in partnership with various international organizations, developed a comprehensive health sector reform program to make basic health care more accessible. Existing public sector administrative units were reorganized into a three-tiered system, resulting in 7 national hospitals, 73 operational district referral hospitals, and 935 public health centers (MOH 1999a). Since the system remains in transition, there are still functioning hospitals and communes that will be phased out or restructured. In 2000, 640 of the planned 935 public health centers were functioning.

Within Cambodia's 24 provinces/municipalities, there are 182 districts, 1,623 communes, and 13,408 villages (MOH 1999a). Each province and district has a health service headed by provincial directors and district health officers, respectively. Traditionally, provinces and districts were defined on an administrative basis, not taking into account population size, resource base, or geographic factors. However, as part of the recent health sector reform, the traditional model has been changed, and health infrastructure distribution is presently based on the criteria of population and accessibility of services. Administrative units have been lumped together to create operational districts, which are supposed to cover a population of approximately 150,000 people (Chuur 1999).

Cambodia does not currently have a public health insurance program along the lines of those that exist in Latin America or northern Africa. Employers with more than 50 employees are legally required to provide health care services on-site. In practice, these services rarely consist of more than a first-aid station. Large employer groups, such as the rubber plantations, provide approximately 15,000 employees and their families with health care services, and parts of the

garment industry (Cambodia's largest industry) also provide in-house health care services to employees (Kak et al. 2000).

Community-Based Health Services

At the local level, commune committees, where one member bears responsibility for health matters within each committee, still exist. The committee is charged with monitoring and evaluating health care services. In addition, the committee elects three health officials—a primary nurse, a primary midwife, and a traditional healer—to serve the community. Traditional birth attendants also function at this local level; however, they are not formally integrated into the public health system. These commune committees are often used to survey the level of current health care services and provide valuable support for community-based care programs.

Private For-Profit Health Services

To supplement their incomes, most of the physicians and other health care personnel working in the public sector also work in the private sector. In September 1999, 382 private practices, clinics, and hospitals (with a total of 400 inpatient beds) were registered, but the MOH estimated that 70 percent of private facilities in the capital were not registered (Taylor Associates 1999). Within the Cambodian health care system, there are both licensed, or registered, facilities and unlicensed, or unregistered, facilities. Unlicensed facilities have actually increased in number. This situation is the result of a legal and regulatory system that is relatively young and lacks the political will to strictly enforce current laws and regulations. Doctors—both generalists and specialists—operate out of their homes, small clinics, and small hospitals. As can be expected, private providers tend to focus on diagnosis and treatment; however, there is some limited provision of family planning (mostly for IUD insertion) and obstetric services. Given that basic resources are not always available at governmental facilities, most Cambodians opt to seek care in the private sector first. One study found that 70 percent of people who had recently been ill first sought care in the private sector; for approximately 57 percent, the first course of action was to purchase medicines (NPHRI 1998).

The private sector also includes the many traditional healers who provide diagnostic and patient care services, as well as distributing both modern drugs and traditional medicines. Traditional healers are well respected and are the entry point for many patients seeking medical care, especially in rural communities.

NGO Health Service Organizations

In 2001, there were 108 international and domestic NGOs working in health in Cambodia. Among the services provided were refugee aid, sight improvement, family planning, basic health care delivery, and HIV/AIDS programs. NGOs had previously worked individually, but collaboration and coordination have increased in recent years. An NGO/MOH coordinating agency, MediCam, acts as an interlocutor for the NGO community and the MOH, while two

committees aim to achieve coordination within the health sector at the national level (Coordinating Committee [CoCom]) and provincial level (Provincial Coordinating Committee [ProCoCom]). In addition, operational districts may “contract in” or “contract out” with the NGO community to provide, support, or manage local public health services (Taylor Associates 1999).

Management and Financing of Health Services

The three major sources of funding for health care services in Cambodia are the government, NGOs, and households. By far, the largest financial outlay for health care comes directly from private households. In 1998, up to 28 percent of personal income was spent on health care (NPHRI 1998). The MOH estimated that households accounted for approximately 78 percent of spending on health care services. The remainder was divided between the MOH and private donors. In 2000, the MOH estimated total expenditures for health care services per capita to be USD 36. Of this figure, household expenditures accounted for 80 percent, donors accounted for another 14 percent, and government sources constituted 6 percent.¹ Regarding expenditures for pharmaceuticals, private households accounted for 57 percent, donors for 25 percent, and the MOH for the remaining 18 percent.²

To better understand the high percentage of health care costs borne by individual families, several factors must be considered. Although in principle, the infrastructure of public health care facilities and services exists and reform efforts are under way, the reality is problematic. Despite efforts to rebuild the cadres of health care personnel and improve access to services, there is still a severe shortage of trained medical personnel. Public sector salaries for health care professionals lag significantly behind those of the private sector. Patients who seek care through public facilities find severely limited hours when qualified, trained personnel are available. Since, as noted, medical staff use private sector employment to maintain an adequate income, many public health providers limit their public sector availability and work in the private sector for a significant portion of each day. Public health care facilities are allowed to charge user fees or co-payments for the services offered, which has resulted in improvements in services and availability in some facilities, but anecdotal information suggests that exemption efforts for those unable to pay lag behind. A recent UNICEF report suggests that payment for health care services is a major cause of impoverishment of the population (UNICEF 2000), and Oxfam reported that of lost farms, 44 percent were lost as a result of medical expenses (Oxfam 2000).

Public facilities sometimes do not have medications available, so patients purchase the recommended products in local private pharmacies (NPHRI 1998). When patients bypass public facilities, seek care in the private sector, or choose to self-medicate because of tradition or economic necessity, the individual costs of medical care rise. To cope with the cost of health care, families have two choices: borrow the money from wealthier neighbors or relatives at high interest rates or liquidate family assets, thereby depleting family wealth or future income potential.

¹ Personal communication with Henk Bekedam, WHO Cambodia Health Sector Reform Team Leader, April 2001.

² Personal communication with a representative of the Essential Drugs Bureau, Department of Drugs and Food, April 2001.

The Pharmaceutical Sector

National Drugs Policy

The pharmaceutical sector deteriorated rapidly during the late 1970s under Pol Pot and then underwent significant changes again in the 1990s. Before 1991, the laws and regulations that did exist dated back to abandoned sociopolitical systems. A national drug policy is now in place that addresses drug registration, supply, distribution, quality assurance, rational drug use, and financing. The MOH continues to implement drug policies, but it has been hampered by lack of funding and human resources, as well as by difficulties in enforcing regulations.

Because public sector health care centers operate for limited hours, have limited supplies, and are not always readily accessible geographically, the majority of patients (57 percent) use pharmacies as their first point of entry into the health care system (NPHRI 1998). This figure may actually be higher now with the recent proliferation of licensed and unlicensed pharmacies and drug depots. The MOH is responsible for registering pharmacies and drug depots. As of January 2001, there were 343 private licensed pharmacies, 165 licensed drug depots A, and 384 licensed drug depots B in Cambodia. (Managers in drug depots A and B have different levels of training.) The exact number of unlicensed facilities is unknown due to the fluid nature of the present environment but is estimated at 2,794. The number of pharmacists is listed as 321.

In Cambodia, most pharmaceuticals are imported, but some are manufactured locally. All companies that import pharmaceuticals are legally required to register with the MOH. Approximately 90 companies are registered, but it is estimated that in 2001, only about 14 were active in importing.³ In addition, there are six licensed pharmaceutical manufacturers in Cambodia, but only three are operating. The public sector imports approximately 25 percent of all pharmaceuticals into the country.

The public sector uses a centralized procurement and distribution system that was reorganized in 1996. In this system, orders flow up from public health centers to the operational district medical stores (ODMS); are approved by the provincial health departments; are sent to the Essential Drugs Bureau, where they are consolidated and reviewed; and are then forwarded to the Central Medical Store (CMS). The drugs are procured by a private broker and distributed through the CMS to the ODMS, which then sends them to facilities. In 2001, the broker was Sokimex, one of Cambodia's largest private corporations.

As a part of the health sector reform program, several experimental programs have been put into place to improve public sector performance. In these public-private partnerships, the MOH has contracted with private NGOs to manage public sector facilities. Two districts also conduct decentralized procurement. Several provinces have implemented the MOH "boosting strategy," with assistance from various implementing organizations, to improve public health facility performance and allow greater control over staff and budget at district level.

³ Personal communication with a representative of the Essential Drugs Bureau, Department of Drugs and Food, May 2001.

Health sector financing policy changes have authorized the collection of user fees at public health facilities. Approximately one-half of these fees are used to supplement staff salaries, one percent is sent to the central government, and the balance is retained locally to procure pharmaceuticals and make other necessary improvements. Team visits to several pilot facilities suggest that these strategies have indeed improved the availability of essential medicines. However, it did not appear that appropriate controls are in place to balance the desire for increased revenues through collection of user fees with a review of the appropriateness of the health care provided.

Quality Assurance

Cambodia's national drug policy has two main objectives. The first is to ensure the availability of drugs that are safe and effective and meet minimum quality standards. The second is to provide rational supply and use of drugs throughout the country. Procedures for both the public and private sectors have been established for drug registration, import certification, supplier qualification for tendered products, random inspection and testing of drug imports, random testing of drugs in the marketplace, and licensing/inspection of pharmaceutical manufacturers.

Only products that have been registered by the MOH Department of Drugs and Food (DDF) are authorized to be imported, manufactured, or offered for sale in the retail pharmacy market in the public and private sectors. The procedure for drug registration includes payment of a USD 200 registration fee and a USD 50 laboratory-testing fee, and approval takes an average of three months. This registration process applies to both imported and domestically manufactured products. Once a drug is registered, it may be imported into the country by anyone holding a pharmaceutical import license.

Although regulations and procedures are well defined, lack of enforcement, counterfeiting, and smuggling are significant problems. An ample supply of counterfeit pharmaceuticals can be found in both the legal and illegal markets. A recent MOH study (supported by WHO) discovered that registered drugs account for only 50 percent of all drugs available in the Cambodian market; 13 percent were found to be counterfeit or substandard (CRSCD 2001).

It is difficult to say precisely how many pharmaceutical products overall are present in the Cambodian market. Approximately 5,000 products have been authorized for import. Registration documents have been submitted for 5,681 products; of this number, 2,672 have been officially licensed. However, as long as the documentation submitted is complete, the product can be imported while waiting to be officially licensed or registered. Therefore, the figure of 5,000 does not include all products available in the Cambodian market, only those authorized to be imported. With the lack of enforcement in the private sector and the large number of unlicensed drug sellers, exact numbers of unlicensed and counterfeit drugs are impossible to estimate. Given that approximately 50 percent of the products available are not registered, it is likely that the Cambodian market has more than 10,000 products. Local pharmacists indicated that counterfeit products are readily available throughout the drug delivery system.

Cambodian manufacturers have not attained good manufacturing practice (GMP)⁴ standards, although it is anticipated that the joint-venture manufacturing plant, Cambodia Pharmaceutical Enterprises, will achieve GMP standards in 2010. While drug inspectors regularly inspect licensed pharmacies, importers, wholesalers, and manufacturers, the process is generally limited to cosmetic surveillance, and product quality control is secondary. The actual number of drug product samples taken from the private sector for analysis and testing by the National Laboratory for Drug Quality Control (NLDQC) is small.

The NLDQC tests the quality of drugs submitted to the MOH for registration to ensure that the products are safe and efficacious. The NLDQC is also responsible for ensuring that products meet the specifications and standards defined in international pharmacopoeias, but it has a staff of only 35 for drug testing. Procedures are further compromised because of inadequate funding and a lack of trained personnel. In addition, reference standards are not always available. Lack of funds and communication and logistics problems cause delays in maintaining sufficient stocks of reference standards, resulting in a decreased capacity to monitor drug quality effectively.

Drug quality is perceived as a serious problem in Cambodia. Indeed, drug quality tests conducted during this assessment indicated that overall, nearly 10 percent of the samples were substandard. Drugs at public facilities had a failure rate of 13 percent, followed by those at retail outlets at 9.6 percent. These findings are very similar to those of an MOH study of drugs in the Cambodian market (CRSCD 2001), which found an overall failure rate of 13.5 percent. That study also found that approximately 50 percent of the drug samples collected were unregistered drug products. The failure rate among these unregistered products was 22 percent higher than that of registered products. Both this study and the MOH study found evidence of counterfeit products. Cambodia has no formal system for reporting counterfeits or other problems with products.

The Pharmaceutical Market

The Cambodian pharmaceutical market in 2001 was estimated to be between USD 40 and 50 million.⁵ Pharmaceutical expenditures by the MOH Procurement Unit for the public sector in 2000 were USD 14.2 million.⁶ This represents a substantial increase over procurements in 1993, when the total procurement was only USD 2.7 million, but pharmaceutical expenditures are still widely considered inadequate to meet the needs of public health facilities.

Private For-Profit Sector

Private drug sellers dominate the country's health system and serve as the entry point for medical care for most Cambodians. There are about 3,700 retail drug outlets in Cambodia, of which approximately 75 percent are unlicensed. This phenomenon is the result of a poor distribution

⁴ GMPs are quality requirements applied to the entire pharmaceutical manufacturing process that have been adopted internationally by industry and by WHO. Manufacturers that hope to export products must increasingly adhere to GMP standards (MSH 1997).

⁵ Personal communication, MEGA pharmaceutical distributor, May 2001.

⁶ Personal communication with a representative of the Procurement Unit, MOH, May 2001.

system over the past 30 years, an increase in private income, a lack of access in the public health system, and the potential profit from the sale of both legitimate and counterfeit drug products. While a system of laws and regulations continues to develop, enforcement has not kept pace. Consequently, the number of unlicensed drug outlets is increasing rather than decreasing. The exception to this is in Phnom Penh, where the number of unlicensed outlets have decreased from 400 to 100.

Not only has the number of drug outlets increased, so has the use of drugs, spurred in part by the ability to purchase drugs without a prescription. Cambodians tend to favor self-medication based on recommendations from various sources, including trusted family or community members. Many physicians tend to overprescribe, and patients expect to be treated with multiple drugs; therefore, drug sellers frequently recommend multiple drug therapy.

The three types of legal drug outlets in Cambodia are pharmacies, drug depots A, and drug depots B. These outlets differ by the type of personnel allowed to staff them, as well as by the drug products they can legally sell. A pharmacy is required to have a pharmacist on-site for at least one hour per day. In a drug depot A, a pharmacist assistant is responsible for the facility; in a drug depot B, the manager may be a retired physician, a nurse, or another type of health care practitioner. In practice, however, there is little difference among these outlets in the assortment of drug products sold.

Pharmacists play almost no role in the retail drug distribution market, although there are some exceptions to this in Phnom Penh. A pharmacist's license is required to operate a pharmacy; regulations stipulate that only one pharmacy may be associated with each license. Individuals whose primary qualification is access to the capital required to establish and stock drug outlets own most pharmacies and drug depots, and they often hire family members or shop clerks with little or no formal medical training. They learn how to make recommendations on drug therapy through on-the-job training or trial and error, and their recommendations often encourage overmedicating and the overuse of antibiotics and vitamins.

The Cambodian market is driven by fierce competition based on price. While the trend is certainly to overmedicate, patients often receive drug therapy based on their ability to pay. Patients may be given subtherapeutic dosing because that's all they can afford. The desire for low-cost drugs has also led to the widespread distribution of drugs of questionable quality manufactured in India, Vietnam, South Korea, and Thailand, according to the MOH counterfeit drug study (CRSCD 2001). Consumers may prefer products of known quality manufactured in Europe and the United States, but the considerably higher cost of those drugs limits sales.

NGO Sector (Private Not-for-Profit)

As previously noted, NGOs historically operated independently, but in recent years have increased collaboration through MediCam, an umbrella NGO that supports greater communication and coordination among NGOs and the government, including the MOH. As of May 2000, MediCam had approximately 90 members, and an associate membership category is

available for interested and supportive organizations such as UNICEF and the International Red Cross.

The Public Sector

Selection, Procurement, and Financing

The cost of drugs and medical supplies issued from the CMS to public health facilities has increased rapidly over the past several years. From 1993 to 2000, the cost of supplies received by the CMS has increased by over seven times, reaching approximately USD 14 million in 2000. The contribution for drug procurement from the MOH has also been increasing, but a significant amount of all procurement funds is still provided by a group of international donors. For 2000, the total contribution from the MOH for pharmaceuticals was 18 percent, international donor contribution was 25 percent, and patient out-of-pocket payments amounted to 57 percent of all pharmaceutical expenditures.⁷ With the type of economic, political, and social problems currently experienced by Cambodia, dependence on donors for public sector drug procurement is likely to continue for some time. However, there appears to be a question regarding the commitment of some donor organizations to continue to provide assistance with the procurement of essential drugs. In addition, anecdotal reports suggest that the MOH could realize substantial savings by making the drug logistics system more efficient.

The public sector procurement system is complicated by the presence of many funding agents, procurement agents, and program implementers. The Procurement Unit at the MOH is responsible for procuring drugs using MOH funds. An annual order for drugs and medical supplies based on a list of needs is placed with a single procurement agent, Sokimex. There has been discussion of revising this procedure to an open tender system, but as of 2001, no revisions had been made. Accordingly, the Procurement Unit does not actually undertake procurement; rather, using a Tender Board, it makes supplier selection decisions based on a limited number (usually fewer than three) of quotations per product, all provided by Sokimex. This practice of using Sokimex to provide the few bids for any given product has resulted in product prices above median international prices as listed in the *International Drug Price Indicator Guide* (MSH, 2000). A recent survey undertaken by the Procurement Unit showed that prices paid by the MOH in 2000 were about 14 percent higher than international market prices. On the other hand, it is important to note that Sokimex has reduced prices from 60 percent over market price in 1998–99 and is extending two years of credit for MOH purchases, as MOH is unable to pay cash for deliveries.

The other key procurement issue is product quality. The MOH procures drugs from registered manufacturers, but this is no guarantee that all drugs purchased are of consistently good quality. The absence of systematic postpurchase drug testing, drug quality reporting, and maintenance of reliable supplier performance databases severely hampers the ability of the drug regulatory authority to properly monitor quality. During 2000, the NLDQC tested 40 drug samples for the

⁷ Personal communication with a representative of the Essential Drugs Bureau, Department of Drugs and Food, MOH, April 2001.

MOH Procurement Unit. All samples tested were found to be satisfactory. These results differed from those obtained from drug sampling and testing conducted during this assessment, as well as those of the MOH study (CRSCD 2001). This raises questions regarding either the sampling methodology or the drug testing procedures.

Major donors such as the World Bank, the Asian Development Bank, and a German banking group (KFW) use different procurement methods ranging from direct purchases from UNICEF (in the case of the World Bank) to the use of public tenders (Asian Development Bank funds). Procurements using KFW funds have been conducted through an international open tender by a German consultant.

Distribution

Distribution of pharmaceuticals occurs at three levels in Cambodia: the central (or national) level, the operational district level, and the facility level. At the national level, the CMS plays a vital role in providing drugs, medical supplies, and vaccines to public sector health facilities. The CMS stores and distributes pharmaceuticals and medical supplies to seven national hospitals in Phnom Penh and 67 ODMS throughout Cambodia. The Essential Drugs Bureau of the DDF is performing the vital functions of maintaining a drug consumption database at the ODMS level, estimating annual drug needs, and controlling inventory.

As the value of receipts at the CMS has been increasing since 1994, so has the volume of drugs and medical supplies. To keep up with the increases, a brand-new CMS warehouse with 5,250 square meters of storage space was built in 1999, about 13 kilometers from the Phnom Penh city center. Currently, both the new and old stores are used for storage and distribution. The additional storage capacity is helping the CMS employ good storekeeping practices.

At the time of this SEAM assessment, the CMS employed 40 persons, including five pharmacists. Salaries were very low, with the director, a pharmacist, receiving USD 17.76 per month. UNICEF had been supplementing salaries by paying CMS staff a special allowance ranging from USD 50 to USD 180 per month, depending on the position of the employee. In April 2001, UNICEF reduced these supplemental payments. Despite this reduction, CMS staff continue to perform well. The CMS also maintains a good management information system, despite recent software problems with INVEC-2 (an inventory management package installed by MSH in 1998). In fact, the CMS was the only store that had reliable enough data to perform a total variable cost analysis for this survey.

Once supplies leave the CMS, they are delivered to the ODMS, which are under the supervision of the operational district pharmacist. There, the supplies are separated into lots according to facility, and most facilities obtain their supplies quarterly directly from the ODMS. This system does not function effectively during the rainy season, when supplies must be delivered by boat or the facilities have to wait until roads are once again passable.

During supervisory visits in three Reproductive and Child Health Alliance (RACHA) intervention districts, supervisory personnel review stock levels and can transfer the excess stock

in one district to another that needs it. Although all districts are allowed to transfer stock in such a manner, this is not routinely practiced outside of intervention districts. In addition, although it is relatively easy to transfer stock within a province, there are disincentives to transferring stock among provinces.

In 1998, in response to the findings of a survey of stock levels in public health facilities (RACHA 1998), RACHA initiated training in supply management for health centers and referral hospitals. Since then, training materials have also been developed for operational district pharmacists (MOH 1999b, MOH/DDF 1999a, MOH/DDF 1999b). RACHA also initiated development of a logistics management information system for the Essential Drugs Bureau, but this system is not integrated into the drug management information system of the CMS.

Drug Use

Data collectors surveyed 27 facilities located in eight provinces. Their information and the observations of the SEAM assessment team revealed that the performance of health centers varies widely. Most facilities have good buildings and serious shortcomings, such as shortages of drugs, nonadherence to posted working hours, high absenteeism of health workers, and poor knowledge of health care. Other considerations include the impact stock-outs have on the prescribing habits of physicians. Health center personnel may choose to prescribe what is available. They may also choose to prescribe based on the patient's ability to pay. All these factors negatively affect rational drug use.

It is unclear just how much drug diversion from the public sector to the private sector takes place. Previous reports indicated that the public sector experiences significant leakage, sometimes as much as 60 percent, of drug supplies and other commodities. It is difficult to confirm this definitively based on current data, but there was an approximately 10 percent average difference in availability of tracer products between ODMS and public health centers in the survey sample.

Drug Management Information System

The CMS continues to use the inventory management software program INVEC-2 for most of its information needs, including tracking of issues, receipts, stock balances, and preparation of store issue vouchers. However, software changes appear to have been introduced into INVEC-2, and the CMS can no longer access certain features; for example, it can no longer generate reports or use maximum and minimum stock levels for making decisions regarding what to order and how much to order. The reasons for these problems are unclear, but if they are rectified or if the planned MSH integrated solution for pharmaceutical supply management, Orion, is installed, information processing capacity at the CMS will be greatly improved.

Access to Essential Medicines, Vaccines, and Related Health Commodities

The measures of access to essential medicines and medical supplies presented in this section of the report are based on indicators reflecting important dimensions of access identified at the 2000 joint WHO-MSH meeting on defining and measuring access in Ferney-Voltaire, France.

Geographic Accessibility

1. *Percentage of households more than 20 kilometers away from a health facility and/or pharmacy*

Numerous impediments to access to quality essential pharmaceuticals exist in Cambodia. Although efforts toward health sector reform are under way, standardization, public oversight, and quality control are clearly lacking within the current system. Access problems differ from one location to another. The Health Sector Reform Program in Cambodia seeks to make basic health care services available within 10 kilometers, or two hours of walking, for the entire population. Whereas in 1995 only 25 percent of the population had access to such care, this percentage had increased to 65 percent by 2000, according to the *Cambodian Demographic and Health Survey* (NIS 2000). As of May 2001, there were 640 operating facilities (935 are planned). There are still disparities in geographic access to health care services, particularly in rural or remote areas. One study of health facility utilization found that in urban and accessible rural areas, 57 percent of children with acute respiratory infections are taken to a health facility, compared with only 21 percent in more remote areas (NIPH 1999); distance may not be the only reason for this, however.

Geographic access is highly correlated with economic status and setting. Poor rural households have farther to travel and lack transportation alternatives, and their areas may have a significant shortage of properly trained medical personnel. Rural health centers may also experience insufficient availability of medical supplies and pharmaceuticals. When pressed, wholesalers and distributors concede that although they indicated that they provided service to the entire country, they actually are unable to deliver to at least five or six provinces in northeast Cambodia and had limited delivery zones in many other provinces. Deliveries of pharmaceuticals and other medical supplies are hampered by lack of infrastructure, poor security, and the prospects of poor economic returns. The population in these areas, while sizable when considered as a whole, is spread out over a relatively large geographic area consisting of many small villages.

Government facilities do exist in these rural provinces. However, public sector health care personnel responsible for procurement acknowledge that they do not depend on the CMS to deliver enough pharmaceutical supplies to meet the needs of the population depending on these facilities. In addition, if efforts to increase the availability of medical personnel in public health

care facilities succeed, there will undoubtedly be an even greater demand for pharmaceuticals and medical supplies.

When drug sellers in the private sector cannot get products delivered, they periodically travel to larger cities, usually Phnom Penh, to obtain the pharmaceuticals. Since the government lacks control over the quality of the products offered in the open market and counterfeit products abound, the quality of these products is suspect. In addition, the transportation costs incurred to obtain these goods for resale in rural communities results in increased retail prices to these communities, yet because of the poorer economic climate in these areas, it may be difficult to recoup these costs by simply raising retail prices. Therefore, it is reasonable to assume that for resale in the rural provinces, less-expensive products of suspect quality would be purchased.

2. *Average number of operating hours per day, by type of facility*

This indicator attempts to determine how much the ability of existing facilities to provide services is limited by the number of hours that they operate, or even by the days or time of the day that they provide services. The data for this indicator was obtained by the SEAM facility survey.

There is a striking difference in the reported number of hours of operation among public, private, and NGO/Mission facilities. Public sector salaries are in the range of USD 15 to USD 20 per month, but the cost of living is approximately USD 80 per month in rural areas and USD 250 in urban areas; consequently, public sector personnel often operate private health facilities to supplement their incomes. As previously noted, this frequently means that public health facilities have reported hours that sound quite reasonable, but their actual hours of operation are generally much shorter. Exceptions occur in demonstration districts, where public sector salaries are being supplemented by outside funding sources or user fees, or in locations where the managers are very dynamic and creative in using financial and other motivators for staff.

Public health facilities are typically open approximately half the number of hours as private facilities, at 6.6 hours per weekday on average. NGO/Mission facilities report nearly 10 hours of weekday operation. Private clinics, hospitals, and pharmacies report the longest hours, with about 11 or 12 hours of operation per day. Only public facilities reported being closed on weekends (Table 1).

Table 1. Average Operating Hours per Day, by Type of Facility

| Operating Hours | Public Facilities (N = 27) | Private Facilities (N = 31) | Licensed Pharmacies (N = 36) | NGO/ Mission Facilities (N = 20) | Unlicensed Pharmacies (N = 9) |
|-----------------------------|---------------------------------------|--|---|---|--|
| Average weekday (Mon.–Fri.) | 6.62 | 11.29 | 12.48 | 9.90 | 12.61 |
| Average weekend (Sat.–Sun.) | 0.00 | 11.72 | 12.48 | 7.70 | 12.61 |

Availability of Medicines and Information

1. Average percentage of a set of unexpired tracer items in stock

The amount of inventory is a key indicator of the functioning of a supply system. Two indicators are used together to measure inventory status. One evaluates the presence of tracer items at the time of data collection; this is determined by an examination of the stock records or by physical inspection. The other evaluates the tendency to be out-of-stock over time. Table 2 lists the percentage of facilities that had the 32 tracer items in stock at the time of assessment. One of the key findings of the assessment was the low availability of tracer drugs in all types of outlets. The greatest availability was found at the ODMS and the least at NGO/Mission hospitals and clinics.

It is important to note that some of the tracer items were not expected to be available at certain facilities. Specifically, it was assumed that the various antibiotics would not be available in the drug depots. The results could have been adjusted to reflect the expected number of items from the tracer list to be available for each type of facility in the indicator denominator. In that case, the proportion of items shown as available would have increased somewhat. However, the tracer list of items was deliberately selected to reflect important public health items that should be available at all times in public health facilities, and therefore, the target measure is 100 percent.

The tracer list included several items that were new to the essential drugs list (EDL) in April 2001, but these items had not yet been procured through the centralized procurement system. They were relatively unavailable in public sector facilities but could be found in NGO and private clinics, pharmacies, and other outlets. When they were available in public facilities, they had been procured with local funds. The time lag between inclusion of these products on the EDL and their appearance in public health centers was approximately 18 months.

The availability of malaria drugs was expected to be lower overall. Malaria is not endemic to the whole country, and survey districts included few endemic areas. However, when the data were adjusted for malaria products and those new to the EDL, the overall availability did not differ significantly.

Table 2. Percentage of Facilities with Tracer Items Available at the Time of Assessment

| Tracer Items | Public Health Centers (N = 27) | NGO/ Mission Clinics/ Hospitals (N = 18) | Private Clinics (N = 33) | Licensed Pharmacies/Drug Depots (N = 20) | Unlicensed Pharmacies (N = 16) | ODMS (N = 20) |
|--|--------------------------------|--|--------------------------|--|--------------------------------|---------------|
| Amoxicilline 250 mg cap | 100.00 | 66.67 | 88.89 | 100.00 | 93.75 | 90.00 |
| Amoxicilline 500 mg cap | 18.52 | 72.22 | 96.30 | 100.00 | 100.00 | 5.00 |
| Amoxicilline powder 125 mg/5 mL | 14.81 | 33.33 | 67.74 | 90.00 | 87.50 | 0.00 |
| Artesunate 50 mg tab | 11.11 | 27.78 | 45.16 | 65.00 | 50.00 | 50.00 |
| Atenolol 50 mg tab | 14.81 | 11.11 | 35.48 | 30.00 | 6.25 | 55.00 |
| Ciprofloxacin 500 mg tab | 59.26 | 77.78 | 96.77 | 100.00 | 93.75 | 95.00 |
| Condoms | 92.59 | 55.56 | 48.39 | 95.00 | 100.00 | 95.00 |
| Co-trimoxazole 400 mg/80 mg tab | 96.30 | 94.44 | 93.55 | 100.00 | 87.50 | 100.00 |
| Doxycycline 100 mg cap | 74.07 | 77.78 | 80.65 | 95.00 | 100.00 | 95.00 |
| Erythromycin 250 mg tab | 81.48 | 88.89 | 90.32 | 100.00 | 100.00 | 85.00 |
| Ferrous sulfate/folic acid 200/0.25 | 88.89 | 61.11 | 48.39 | 73.68 | 68.75 | 100.00 |
| Gloves, latex disposable | 81.48 | 83.33 | 80.65 | 70.00 | 87.50 | 90.00 |
| Hydralazine 25 mg tab | 48.15 | 22.22 | 16.13 | 5.26 | 0.00 | 80.00 |
| Hydrochlorothiazide 50 mg tab | 66.67 | 27.78 | 19.35 | 21.05 | 0.00 | 90.00 |
| Isoniazid 100 mg tab | 29.63 | 22.22 | 25.81 | 40.00 | 18.75 | 95.00 |
| Mebendazole 500 mg tab | 40.74 | 52.94 | 70.97 | 85.00 | 80.00 | 50.00 |
| Medroxyprogesterone acetate | 81.48 | 38.89 | 41.94 | 80.00 | 60.00 | 95.00 |
| Mefloquine 250 mg tab | 55.56 | 38.89 | 32.26 | 40.00 | 37.50 | 85.00 |
| Metronidazole 250 mg tab | 100.00 | 94.44 | 90.32 | 100.00 | 100.00 | 100.00 |
| Oral rehydration salts (1 liter) | 96.30 | 77.78 | 80.65 | 95.00 | 93.75 | 100.00 |
| Paracetamol 500 mg tab | 92.59 | 88.89 | 90.32 | 100.00 | 100.00 | 95.00 |
| Paracetamol syrup 125 mg/5 mL | 12.00 | 44.44 | 64.52 | 85.00 | 75.00 | 0.00 |
| Polyvidone iodine 10% 200 mL | 81.48 | 83.33 | 74.19 | 55.00 | 87.50 | 95.00 |
| Praziquantel 600 mg tab | 0.00 | 16.67 | 6.45 | 5.00 | 0.00 | 5.00 |
| Quinine 250 mg tab | 44.44 | 16.67 | 35.48 | 50.00 | 50.00 | 60.00 |
| Rifampicin/isoniazid 150/100 mg tab | 29.63 | 11.11 | 35.48 | 40.00 | 12.50 | 95.00 |
| Rifampicin 300 mg cap | 25.93 | 16.67 | 38.71 | 50.00 | 68.75 | 5.00 |
| Salbutamol 4 mg tab | 55.56 | 38.89 | 61.29 | 47.37 | 60.00 | 78.95 |
| Syringe, disposable 5 mL | 70.37 | 83.33 | 87.10 | 100.00 | 100.00 | 100.00 |
| Tetracycline 1% ophthalmic ointment | 85.19 | 61.11 | 58.06 | 95.00 | 93.75 | 94.74 |
| Vaccine (DPT) | 53.85 | 16.67 | 6.67 | 5.26 | 6.67 | 31.58 |
| Zidovudine 100 mg cap | 21.74 | 5.88 | 3.33 | 10.53 | 0.00 | 0.00 |
| Average % tracer items in stock | 57.29 | 50.35 | 56.42 | 66.82 | 63.44 | 69.56 |

2. *Average percentage of time out of stock for a set of key items*

As mentioned above, drug availability is typically examined by considering two related indicators. The second measures the length of time that key items were not available and required an examination of the stock-out rates for a period of one year prior to the survey. Reliable and up-to-date inventory records are essential for the calculation of this second indicator. Together, these indicators provide information about not only what items are available but also what the likelihood is of items being available.

The stock-out rates in surveyed facilities over time were surprisingly low (Table 3). There is an unexplained inconsistency when stock-out rates are compared with the availability data presented in Table 2. Although the data showed highest availability of 69 percent in ODMS, the stock-out rate for this type of facility was only 4 percent. For the other types of facilities, stock-out rates ranged from 0 to 3 percent. Other studies have shown stock-out rates of 10 percent to 15 percent across all facilities (RACHA 1998, RACHA 1999). One possible explanation may be that these public health facilities were severely underutilized, resulting in limited stock-outs, even in an underfunded situation. It is also possible that the data were recorded incorrectly, resulting in erroneously low stock-out rates.

Although considerable efforts have been made in selected districts to train district personnel in drug logistics over the past few years, much work remains to be done. Previous reports indicate that the public sector experiences significant leakage of drug supplies and other commodities, sometimes as high as 60 percent. It is difficult to confirm this definitively based on current data, but there was an approximately 10 percent difference in availability of a tracer list of drugs between ODMS and public health centers in the survey sample.

Table 3. Percentage of Time Tracer Items Out of Stock, 2000–2001

| Tracer Items | Public Health Centers (N = 27) | NGO/ Mission Clinics/ Hospitals (N = 18) | Private Clinics (N = 32) | Licensed Pharmacies/ Drug Depots (N = 19) | Unlicensed Pharmacies (N = 16) | ODMS (N = 20) |
|--|--------------------------------|--|--------------------------|---|--------------------------------|---------------|
| Amoxicilline 250 mg cap | 4.46 | 2.24 | 2.42 | 0.22 | 0.33 | 0.41 |
| Amoxicilline 500 mg cap | 24.79 | 0.00 | 0.00 | 0.00 | 0.21 | 49.59 |
| Amoxicilline powder 125 mg/5 mL | 0.00 | 0.27 | 0.00 | 0.00 | 0.10 | N/A |
| Artesunate 50 mg tab | 20.27 | 0.00 | 0.00 | 0.00 | 0.34 | 18.95 |
| Atenolol 50 mg tab | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.30 |
| Ciprofloxacin 500 mg tab | 0.26 | 0.14 | 0.00 | 0.00 | 0.09 | 0.78 |
| Condoms | 5.65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.82 |
| Co-trimoxazole 400 mg/80 mg tab | 0.30 | 1.03 | 0.00 | 0.00 | 0.12 | 0.42 |
| Doxycycline 100 mg cap | 0.44 | 0.00 | 0.00 | 0.00 | 0.00 | 4.49 |
| Erythromycin 250 mg tab | 3.72 | 0.00 | 0.00 | 0.00 | 0.13 | 7.49 |
| Ferrous sulfate/folic acid 200/0.25 | 1.32 | 0.00 | 0.00 | 0.00 | 0.00 | 1.85 |
| Gloves, latex disposable | 2.14 | 0.00 | 0.46 | 0.11 | 0.00 | 3.21 |
| Hydralazine 25 mg tab | 9.80 | 0.00 | 0.00 | 0.00 | N/A | 6.95 |
| Hydrochlorothiazide 50 mg tab | 9.95 | 0.00 | 0.91 | 0.00 | N/A | 1.22 |
| Isoniazid 100 mg tab | 0.00 | 0.00 | 0.00 | 0.59 | 0.00 | 6.82 |
| Mebendazole 500 mg tab | 1.17 | 0.00 | 0.00 | 0.00 | 0.00 | 37.36 |
| Medroxyprogesterone acetate | 0.34 | 0.00 | 0.63 | 0.00 | 0.30 | 0.00 |
| Mefloquine 250 mg tab | 1.30 | 0.00 | 4.93 | 2.35 | 12.79 | 6.53 |
| Metronidazole 250 mg tab | 0.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Oral rehydration salts (1 liter) | 0.23 | 0.63 | 0.00 | 0.00 | 0.20 | 0.00 |
| Paracetamol 500 mg tab | 0.75 | 0.00 | 0.00 | 0.00 | 0.00 | 2.90 |
| Paracetamol syrup 125 mg/5 mL | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | N/A |
| Polyvidone iodine 10% 200 mL | 2.04 | 0.14 | 0.00 | 0.00 | 0.00 | 0.85 |
| Praziquantel 600 mg tab | N/A | 0.00 | 0.00 | 0.00 | N/A | 0.00 |
| Quinine 250 mg tab | 5.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rifampicin/isoniazid 150/100 mg tab | 0.00 | 0.00 | 0.00 | 8.22 | 0.00 | 0.79 |
| Rifampicin 300 mg cap | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 50.00 |
| Salbutamol 4 mg tab | 10.09 | 0.59 | 0.85 | 0.00 | 0.00 | 7.37 |
| Syringe disposable 5 mL | 5.19 | 0.00 | 0.00 | 0.00 | 0.00 | 5.36 |
| Tetracycline 1% ophthalmic ointment | 4.73 | 0.00 | 0.00 | 0.00 | 0.00 | 3.58 |
| Vaccine (DPT) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Zidovudine 100 mg cap | 0.00 | 0.00 | 0.00 | 0.00 | N/A | N/A |
| Average percentage of time items out of stock | 3.18 | 0.21 | 0.28 | 0.17 | 0.31 | 4.25 |

Note: N/A = data not available.

3. *Percentage of prescribed items that are actually dispensed*

The proportion of prescribed items that are dispensed may be used as a proxy estimate for availability of those items at health facilities, although other factors may also affect whether or not products are dispensed. This measure is most meaningful when considered together with inventory availability data. In those facilities that dispense what is prescribed, frequent stock-outs of many items will negatively affect dispensing. Similarly, inventory availability often influences prescribing, in that those drugs that are actually available are the ones that will be prescribed, even if they are not the first choice of therapy. As already noted, if medication is not free, dispensing is likely to be influenced by the ability of the patients to pay for their prescribed medicines.

The information for this indicator was collected in public, private, and NGO facilities. The rate of dispensing prescribed items varied greatly by type of facility (Table 4). The percentage of prescribed drugs that were dispensed is much higher in public health facilities than in NGO/Mission or private facilities. This may be because the public facilities focus on the Minimum Package of Activities drugs, which are supposed to be in stock at all times. Private facilities may not necessarily feel constrained to keep the same stock as public sector facilities. Their lower rate could also be a reflection of increased patient cost. The lower rates at NGO facilities may be a result of the programmatic focus of the donor organization.

Table 4. Dispensing of Prescribed Medicines, by Type of Facility

| | Public | NGO | Private |
|---|--------|-----|---------|
| Prescribed drugs that were actually dispensed (%) | 80 | 54 | 59 |

4. *Percentage of the population that has access to a “valid” or reliable source of information about medicines*

The underlying assumption behind this indicator is that the possibility of rational prescribing increases if prescribers have access to valid information about medicines. Although participants at the WHO-MSH meeting in Ferney-Voltaire did not define *valid*, types of information about drugs can be classified on the basis of their origin and purpose. Traditional pharmacopoeias, for example, offer information about product formulation and little or no therapeutic information. Modern pharmacopoeias contain a lot more therapeutic information along with the pharmacologic information (e.g., *Martindale: The Extra Pharmacopoeia*). Pharmacologic texts (e.g., *Goodman and Gilman’s: The Pharmacological Basis of Therapeutics*, *Remington’s Pharmaceutical Sciences*) and medical compendia contain minimal information about product formulation and a lot of information about factors related to adequate or appropriate prescribing. The pharmaceutical industry generally finances medication dictionaries that contain the information published in the package inserts that they distribute with the medications; these publications are rarely subject to critical review by a legal or professional authority.

In the private sector, the biggest issue may be the absence of properly trained medical personnel at the distribution point where the patient receives the product. Since access to essential drugs means obtaining proper recommendations regarding the drug of choice and getting appropriate directions for use, the current system presents what may be the greatest obstacle to access, in that untrained personnel are providing this information. Private retail drug outlets are the initial entry point into the Cambodian health care system for a majority of the population. The drug sellers in these outlets generally have no formal health care education. Any training they have received has been on-the-job from others without formal training. Therefore, any information provided by the drug seller is questionable. Even if the patient receives the appropriate drug, the related information might not be correct.

In addition, while a wide range of pharmaceuticals is generally available on demand in the private sector, product selection is often based on the price the consumer is willing to pay, rather than the potential efficacy of the product. Dosing and duration of therapy is also often based on the amount of money the patient is willing to pay, so even if the patient receives the proper drug and it is of high quality, an insufficient amount might be dispensed because the patient cannot or will not pay for a proper course of therapy. Therefore, if the wrong drug, strength, or quantity were dispensed, patient information would also be considered wrong.

Current regulations, even if enforced, would not solve the problem. In licensed pharmacies and drug depots, the pharmacist and the pharmacist assistant, respectively, are required to spend only one hour per day in the retail store. In a country where untrained personnel staff both legal and illegal pharmacies, patients lack access to proper assistance with product selection and appropriate use. Since most patients self-medicate before seeking formal medical advice, the lack of properly trained drug sellers at the point where most patients enter the health care system may be the most serious access problem. These untrained drug sellers provide approximately 80 percent of the pharmaceutical products dispensed without a written prescription from a doctor, nurse, or medical assistant.

In the absence of population-based information about availability of sources of drug information, data for this indicator were obtained from simulated clients visiting drug outlets (Table 5) and from exit interviews with patients leaving public and private facilities (Table 6). Therefore, the results for this indicator may not necessarily pertain to the entire population. Generally, all patients received information on dosing but got less information on possible side effects or other problems.

Table 5. Percentage of Simulated Clients Receiving Information

| Information Factor | All | | Licensed Pharmacies and Drug Depots | | Unlicensed Pharmacies | |
|--|-----|-------|-------------------------------------|-------|-----------------------|-------|
| | N | % Yes | N | % Yes | N | % Yes |
| Asked if additional information needed | 36 | 78 | 19 | 74 | 17 | 82 |
| Given instructions to take medication | 36 | 100 | 19 | 100 | 17 | 100 |
| Told about possible problems | 35 | 43 | 19 | 47 | 16 | 38 |
| Given advice on care and treatment for fever | 34 | 74 | 17 | 82 | 17 | 65 |

Table 6. Percentage of Patients Who Received Some Information about Their Medicine, Based on Exit Interviews

| Information Factor | All | | Public Facilities | | NGO/Mission Facilities | |
|--|-----|-------|-------------------|-------|------------------------|-------|
| | N | % Yes | N | % Yes | N | % Yes |
| Told how many times a day to take the medicine | 395 | 99.8 | 262 | 99.6 | 133 | 100 |
| Told how long to take the medicine | 391 | 99.7 | 258 | 99.6 | 134 | 100 |
| Given other information | 155 | 48.4 | 99 | 50.5 | 56 | 44.6 |

Affordability

- Average percentage difference between the most and least expensive prices for a set of tracer items*

This indicator aims to capture the range of price options available to patients and customers. The percentage difference between the prices of specific items sold in a given type of facility is reported in Table 7. Calculations were possible only when data collectors recorded a pair of prices for the item. The difference between the lowest and highest prices was used to calculate the average difference for a group of facilities. When the facility provided only one price, it was not considered in the calculations. If two prices were provided, product choice was indicated. This indicator, therefore, reflects those situations where either product or price options were available to the client. The assumption is that when there are choices, the market is broader and open to more people. Selection, therefore, may be interpreted as a positive sign, even if it is not a direct indicator of affordability.

When interpreting these results, it is important to keep in mind that the sample size is small. In addition, a wide range of values was recorded, which could be the result of the limited sample size but could also be due to errors in data collection or entry. In many cases, however, significant differences are expected between prices of generic and branded products and in the

selection of products expected to be available at the various types of facilities. For example, both the range of items and the range of prices are expected to be greater in the private pharmacies than in the drug depots.

In another measure, the median price difference was calculated between the highest and lowest price for specific products within facilities. Again, the private clinics showed the greatest variability, with a median price difference of 273 percent. This may indicate that prudent purchasing could decrease the unit cost of drug products to make them more affordable.

Table 7. Average Percentage Difference between Lowest and Highest Consumer Prices of Tracer Items by Facility

| Generic Drug Name | Licensed Pharmacies and Drug Depots | | NGO/Mission Hospitals | | ODMS | | Private Clinics | | Unlicensed Pharmacies | | Public Health Centers | |
|-------------------------------------|-------------------------------------|-----------------------|-----------------------|-----------------------|------|-----------------------|-----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | N | Average Difference(%) | N | Average Difference(%) | N | Average Difference(%) | N | Average Difference(%) | N | Average Difference(%) | N | Average Difference(%) |
| Amoxicilline 250 mg cap | 16 | 83 | 1 | — | 11 | 110 | 17 | 100 | 11 | 100 | 11 | 110 |
| Amoxicilline 500 mg cap | 19 | 309 | 3 | 275 | 0 | — | 26 | 96 | 16 | 120 | 0 | — |
| Amoxicilline powder 125 mg/5 mL | 13 | 253 | 0 | — | 0 | — | 11 | 60 | 9 | 100 | 0 | — |
| Artesunate 50 mg tab | 3 | 50 | 1 | 8 | 2 | 50 | 0 | 0 | 1 | 100 | 3 | 27 |
| Atenolol 50 mg tab | 3 | 1000 | 0 | — | 3 | 100 | 3 | 471 | 0 | — | 0 | — |
| Ciprofloxacin 500 mg tab | 18 | 280 | 4 | 100 | 7 | 533 | 22 | 160 | 9 | 271 | 5 | 533 |
| Condoms | 5 | 92 | 2 | 55 | 7 | 41 | 1 | 1,100 | 1 | 200 | 5 | 49 |
| Co-trimoxazole 480 mg tab | 16 | 660 | 3 | 150 | 12 | 32 | 20 | 350 | 12 | 478 | 13 | 19 |
| Doxycycline 100 mg cap | 10 | 317 | 2 | 52 | 6 | 237 | 10 | 200 | 10 | 114 | 3 | 75 |
| Erythromycin 250 mg tab | 12 | 319 | 2 | 63 | 6 | 58 | 9 | 100 | 10 | 186 | 9 | 59 |
| Ferrous sulfate/folic acid 200/0.25 | 3 | 567 | 1 | 100 | 6 | 18 | 1 | 900 | 1 | 100 | 9 | 30 |
| Gloves, latex disposable | 2 | 200 | 1 | 3 | 11 | 225 | 2 | 167 | 5 | 200 | 3 | 11 |
| Hydralazine 25 mg tab | 0 | — | 1 | 50 | 3 | 0 | 0 | 0 | 0 | — | 1 | 25 |
| Hydrochlorothiazide 50 mg tab | 1 | 650 | 1 | 150 | 5 | 31 | 3 | 400 | 0 | — | 1 | 80 |
| Isoniazid 100 mg tab | 4 | 333 | 0 | — | 7 | 23 | 0 | 0 | 0 | — | 0 | — |
| Mebendazole 500 mg tab | 8 | 308 | 0 | — | 1 | 331 | 7 | 1400 | 6 | 83 | 1 | 33 |
| Medroxyprogesterone acetate | 6 | 97 | 1 | 144 | 10 | 12 | 5 | 50 | 3 | 122 | 6 | 15 |
| Mefloquine 250 mg tab | 2 | 92 | 1 | 86 | 6 | 64 | 1 | 167 | 2 | 210 | 1 | 284 |
| Metronidazole 250 mg tab | 16 | 400 | 2 | 900 | 9 | 93 | 16 | 375 | 12 | 298 | 11 | 93 |
| Oral rehydration salts (1 liter) | 7 | 50 | 1 | 7 | 8 | 81 | 4 | 59 | 2 | 33 | 9 | 52 |
| Paracetamol 500 mg tab | 17 | 400 | 2 | 208 | 10 | 88 | 24 | 292 | 15 | 400 | 13 | 135 |
| Paracetamol syrup 125 mg/5 mL | 11 | 550 | 0 | — | 0 | — | 8 | 494 | 8 | 507 | 0 | — |
| Polyvidone iodine 10% 200 mL | 5 | 35 | 1 | 11 | 10 | 97 | 6 | 50 | 2 | 57 | 5 | 51 |
| Praziquantel 600 mg tab | 0 | — | 0 | — | 0 | — | 0 | 0 | 0 | — | 0 | — |

Table continues

Table 7. Average Percentage Difference between Lowest and Highest Consumer Prices of Tracer Items by Facility, continued

| Generic Drug Name | Licensed Pharmacies and Drug Depots | | NGO/Mission Hospitals | | ODMS | | Private Clinics | | Unlicensed Pharmacies | | Public Health Centers | |
|-------------------------------------|-------------------------------------|-----------------------|-----------------------|-----------------------|------|-----------------------|-----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | N | Average Difference(%) | N | Average Difference(%) | N | Average Difference(%) | N | Average Difference(%) | N | Average Difference(%) | N | Average Difference(%) |
| Quinine 250 mg tab | 3 | 25 | 1 | 9 | 5 | 103 | 1 | 100 | 3 | 60 | 3 | 103 |
| Rifampicin/isoniazid 150/100 mg tab | 4 | 38 | 0 | — | 6 | 109 | 0 | 0 | 0 | — | 2 | 115 |
| Rifampicin 300 mg cap | 8 | 149 | 0 | — | 0 | — | 2 | 183 | 3 | 92 | 0 | — |
| Salbutamol 4 mg tab | 5 | 933 | 1 | 4 | 5 | 100 | 3 | 400 | 2 | 94 | 1 | 450 |
| Syringe, disposable 5 mL | 4 | 50 | 1 | 6 | 8 | 75 | 1 | 8 | 3 | 15 | 4 | 115 |
| Tetracycline 1% ophthalmic ointment | 5 | 267 | 1 | 13 | 7 | 230 | 5 | 100 | 3 | 133 | 2 | 230 |
| Vaccine (DPT or DTCoq) | 0 | — | 0 | — | 0 | — | 0 | — | 0 | — | 0 | — |
| Zidovudine 100 mg cap | 0 | — | 0 | — | 0 | — | 0 | — | 0 | — | 0 | — |
| Total Average | — | 304 | — | 114 | — | 114 | — | 243 | — | 170 | — | 117 |
| Total Median | — | 273 | — | 55 | — | 88 | — | 100 | — | 117 | — | 75 |

Note: — = not applicable.

2. *Average percentage difference in lowest prices to customers/patients*

This indicator describes the market from the perspective of the patient as purchaser, and interpretation depends on the context of the market. In a context of little or no competition, the difference between prices might be less than what would be found in a context that promotes competition. A larger difference might be expected in a market that is highly competitive and in which generics compete with brand-name products (Table 8).

When retail prices for a tracer list of drug products were compared for identical products in different types of facilities, a considerable variation was found in the price paid by the consumer. Prices varied the most in private clinics, where there was an average price difference of over 1,000 percent, and varied the least in NGO facilities. While it may be possible to find these products at lower prices by shopping around, this process would pose a significant burden to patients who cannot travel long distances. However, the wide variance in private clinic costs may well be another example of “what the market will bear,” as patients are charged based on their ability to pay.

Specific, limited information regarding affordability was obtained through actual surveys of public and private drug outlets and is detailed elsewhere in this report. Through additional, anecdotal information, patients appear to fall into several categories when their ability to pay for medical care, specifically pharmaceuticals, is examined. A small percentage of the population is able to afford the cost of drug therapy, and they seek more expensive imported products because of the perceived increase in quality and effectiveness. Others seek out the more expensive imported pharmaceuticals but have limited ability to pay for them. Some observers are concerned that patients and their families are selling productive assets in order to pay for health care services, which limits future income and the family’s economic stability. On the other hand, those who are unable to pay for the appropriate drug in the appropriate strength will obtain what they can afford, regardless of what is appropriate.

An example might be in the treatment of malaria. It is generally recognized that there are three distinct levels of drug therapy, depending on your ability to pay. Level one includes effective drugs. Level two is less expensive and includes “semieffective” therapy and lower dosing. Level three includes fake or ineffective therapy. Those unable to pay for proper therapy are forced to choose less effective or ineffective therapy, thereby suffering poor health and wasteful spending.

Table 8. Comparison of Lowest Prices of Tracer Items Charged to Customers by Facility (in Riels)

| Tracer Items | NGO/Mission Clinics and Hospitals | | | | Private Clinics | | | | Licensed Pharmacies and Drug Depots | | | | Unlicensed Pharmacies and Drug Depots | | | |
|-------------------------------------|-----------------------------------|-------|-------|----------------|-----------------|-------|-------|----------------|-------------------------------------|------|-------|----------------|---------------------------------------|-------|-------|----------------|
| | N | Min. | Max. | Avg. Diff. (%) | N | Min. | Max. | Avg. Diff. (%) | N | Min. | Max. | Avg. Diff. (%) | N | Min. | Max. | Avg. Diff. (%) |
| Amoxicilline 250 mg cap | 5 | 16 | 552 | 3,436 | 28 | 15 | 250 | 1,567 | 18 | 59 | 150 | 154 | 15 | 73 | 150 | 106 |
| Amoxicilline 500 mg cap | 6 | 120 | 200 | 67 | 33 | 123 | 850 | 591 | 18 | 110 | 230 | 108 | 16 | 114 | 450 | 294 |
| Amoxicilline powder 125 mg/5 mL | 2 | 1,261 | 3,940 | 213 | 19 | 1,300 | 6,840 | 426 | 16 | 900 | 3,000 | 233 | 11 | 1,100 | 3,500 | 218 |
| Artesunate 50 mg tab | 3 | 335 | 473 | 41 | 12 | 292 | 500 | 71 | 10 | 200 | 500 | 150 | 6 | 292 | 400 | 37 |
| Atenolol 50 mg tab | 1 | 120 | 120 | 0 | 8 | 30 | 350 | 1,067 | 5 | 100 | 130 | 30 | 2 | 120 | 140 | 17 |
| Ciprofloxacin 500 mg tab | 6 | 118 | 2,500 | 2,015 | 33 | 70 | 400 | 471 | 18 | 13 | 250 | 1,823 | 15 | 15 | 300 | 1,900 |
| Condoms | 6 | 4 | 120 | 2,780 | 14 | 39 | 125 | 217 | 16 | 30 | 500 | 1,567 | 13 | 39 | 500 | 1,169 |
| Co-trimoxazole 400 mg/80 mg tab | 7 | 12 | 450 | 3,707 | 30 | 50 | 500 | 900 | 18 | 8 | 200 | 2,400 | 15 | 5 | 200 | 3,900 |
| Doxycycline 100 mg cap | 3 | 47 | 200 | 323 | 26 | 40 | 500 | 1,150 | 17 | 50 | 205 | 310 | 16 | 20 | 200 | 900 |
| Erythromycin 250 mg tab | 7 | 79 | 200 | 154 | 25 | 25 | 350 | 1,300 | 18 | 70 | 250 | 257 | 15 | 20 | 350 | 1,650 |
| Ferrous sulfate/folic acid 200/0.25 | 5 | 8 | 30 | 269 | 10 | 9 | 312 | 3,367 | 9 | 5 | 150 | 2,900 | 12 | 5 | 150 | 2,900 |
| Gloves, latex disposable | 3 | 114 | 567 | 396 | 25 | 110 | 2,000 | 1718 | 10 | 12 | 1,037 | 8,540 | 13 | 100 | 800 | 700 |
| Hydralazine 25 mg tab | 1 | 158 | 158 | 0 | 4 | 100 | 200 | 100 | N/A | — | — | — | 1 | 200 | 200 | 0 |
| Hydrochlorothiazide 50 mg tab | 2 | 16 | 16 | 1 | 4 | 10 | 150 | 1,400 | 3 | 40 | 50 | 25 | N/A | — | — | — |
| Isoniazid 100 mg tab | 1 | 20 | 20 | 0 | 7 | 12 | 100 | 733 | 6 | 3 | 50 | 1,900 | 2 | 12 | 20 | 67 |
| Mebendazole 500 mg tab | 2 | 158 | 250 | 59 | 20 | 50 | 1,500 | 2,900 | 14 | 60 | 1,500 | 2,400 | 12 | 30 | 1,500 | 4,900 |
| Medroxyprogesterone acetate | 4 | 709 | 2,678 | 278 | 12 | 700 | 2,800 | 300 | 11 | 400 | 3,200 | 700 | 9 | 700 | 2,000 | 186 |
| Mefloquine 250 mg tab | 3 | 552 | 800 | 45 | 8 | 80 | 4,000 | 4,900 | 4 | 70 | 1,000 | 1,329 | 3 | 400 | 4,000 | 900 |
| Metronidazole 250 mg tab | 9 | 17 | 100 | 506 | 32 | 20 | 300 | 1,400 | 18 | 32 | 100 | 217 | 16 | 6 | 250 | 4130 |

Access to Essential Medicines, Vaccines, and Related Health Commodities

| Tracer Items | NGO/Mission Clinics and Hospitals | | | | Private Clinics | | | | Licensed Pharmacies and Drug Depots | | | | Unlicensed Pharmacies and Drug Depots | | | |
|--------------------------------------|-----------------------------------|-------|-------|----------------|-----------------|-------|-------|----------------|-------------------------------------|-------|-------|----------------|---------------------------------------|-------|-------|----------------|
| | N | Min. | Max. | Avg. Diff. (%) | N | Min. | Max. | Avg. Diff. (%) | N | Min. | Max. | Avg. Diff. (%) | N | Min. | Max. | Avg. Diff. (%) |
| Oral rehydration salts (1 liter) | 5 | 118 | 310 | 162 | 26 | 40 | 500 | 1,150 | 17 | 50 | 350 | 600 | 13 | 20 | 500 | 2400 |
| Paracetamol 500 mg tab | 8 | 11 | 95 | 764 | 31 | 20 | 221 | 1,020 | 17 | 11 | 150 | 1,264 | 17 | 10 | 180 | 1700 |
| Paracetamol syrup 125 mg/5 mL | 2 | 670 | 1,000 | 49 | 18 | 500 | 5,000 | 900 | 13 | 500 | 1,500 | 200 | 12 | 600 | 1,500 | 150 |
| Polyvidone iodine 10% 200 mL | 5 | 3,250 | 7,000 | 115 | 20 | 1,700 | 9,000 | 429 | 7 | 622 | 6,500 | 945 | 9 | 1,500 | 6,000 | 300 |
| Praziquantel 600 mg tab | N/A | — | — | — | 1 | 1,500 | 1,500 | 0 | 1 | 1,500 | 1,500 | 0 | — | — | — | — |
| Quinine 250 mg tab | 2 | 65 | 70 | 8 | 10 | 70 | 300 | 329 | 10 | 40 | 180 | 350 | 9 | 50 | 100 | 100 |
| Rifampicin/isoniazid 150/100 mg tab | 1 | 79 | 79 | 0 | 7 | 70 | 300 | 329 | 7 | 63 | 270 | 328 | 2 | 100 | 100 | 0 |
| Rifampicin 300 mg cap | 1 | 118 | 118 | 0 | 12 | 150 | 2,500 | 1,567 | 10 | 100 | 350 | 250 | 10 | 200 | 370 | 85 |
| Salbutamol 4 mg tab | 3 | 32 | 100 | 210 | 16 | 10 | 250 | 2,400 | 9 | 32 | 200 | 523 | 9 | 20 | 80 | 300 |
| Syringe, disposable 5 mL | 4 | 120 | 150 | 25 | 27 | 100 | 1,182 | 1082 | 17 | 90 | 400 | 344 | 17 | 114 | 240 | 110 |
| Tetracycline 1% ophthalmic ointment | 3 | 630 | 1,252 | 99 | 17 | 300 | 5,000 | 1,567 | 15 | 300 | 1,500 | 400 | 11 | 197 | 1,500 | 661 |
| Vaccine (DPT) | 2 | 2,832 | 2,833 | 0 | N/A | — | — | — | 1 | 5,500 | 5,500 | 0 | N/A | — | — | — |
| Zidovudine 100 mg cap | N/A | — | — | N/A | 1 | 4,000 | 4,000 | 0 | 1 | 3,500 | 3,500 | 0 | N/A | — | — | — |
| Average Percentage Difference | | | | 524 | | | | 1,140 | | | | 976 | | | | 1,064 |

Note: Min. = minimum, Max. = maximum, Avg. Diff. = average difference, N/A = data not available, — = not applicable.

3. *Average percentage difference between international prices and public sector prices for a set of tracer items*

This well-known indicator is used to evaluate how efficient tender systems are for procurement. The assumption is that resources are always limited, so greater efficiencies should be sought. The motives for reducing expenditures and minimizing costs include being able to use the money saved to provide services to more people or to expand existing services. Procurement is a particularly complex area of drug management. Prudent procurement involves several factors, including the availability of up-to-date information about prices, a reliable supply of products, processes that make optimum use of resources (human and financial), and a system that both the buyer and the purchaser trust.

Public financing of pharmaceuticals is heavily subsidized by donor contributions and has tripled over the past four years. Yet this financing is apparently insufficient to meet demand at the patient level. Public sector medicines are procured through a private intermediary and distributed through a three-tiered supply system to a recently reorganized network of public health centers and hospitals. Although public sector drug acquisition prices are higher than average international prices, they have fallen from 60 percent above average international prices in 1997 to approximately 14 percent above average in the first half of 2001. Another factor is that although the CMS appears well managed, lack of accountability at lower levels has led to significant leakage of public supplies into the private sector.

Table 9. Price Comparison of Cambodian vs. International Drug Prices (USD)

| Generic Drug Name | Average Unit Price | IDPIG Price | Percentage Difference |
|-------------------------------------|--------------------|-------------|-----------------------|
| Amoxicilline 250 mg cap | 0.0184 | 0.0258 | -29 |
| Atenolol 50 mg tab | 0.0097 | 0.0150 | -36 |
| Ciprofloxacin 500 mg tab | 0.3010 | 0.0441 | 583 |
| Condoms | 0.0305 | 0.1190 | -74 |
| Co-trimoxazole 480 mg tab | 0.0089 | 0.0176 | -49 |
| Doxycycline 100 mg cap | 0.0176 | 0.0278 | -37 |
| Erythromycin 250 mg tab | 0.0408 | 0.0469 | -13 |
| Ferrous sulfate/folic acid 200/0.25 | 0.0021 | 0.0043 | -50 |
| Hydralazine 25 mg tab | 0.0134 | 0.0294 | -55 |
| Hydrochlorothiazide 50 mg tab | 0.0030 | 0.0040 | -25 |
| Isoniazid 100 mg tab | 0.0029 | 0.1467 | -98 |
| Medroxyprogesterone acetate | 0.6275 | 2.6381 | -76 |
| Metronidazole 250 mg tab | 0.0043 | 0.0187 | -77 |
| Oral rehydration salts (1 liter) | 0.0514 | 0.1419 | -64 |
| Paracetamol 500 mg tab | 0.0040 | 0.0066 | -39 |
| Salbutamol 4 mg tab | 0.0021 | 0.0057 | -63 |
| Tetracycline 1% ophthalmic ointment | 0.1614 | 0.0575 | 181 |
| Average | — | — | -1 |

Source: SEAM assessment.

Note: IDPIG = International Drug Price Indicator Guide, — = not applicable.

4. *Number of days that a salaried worker needs to work in order to pay for a standard treatment of a tracer condition*

This indicator aims to capture the concept of affordability from the perspective of the patient, and is a variation on one that was introduced at the WHO-MSH Ferney-Voltaire conference. The original indicator was based on the salary of the lowest-paid government worker. (Civil servants were used for this index because there is likely to be reliable published information about their salaries. With this type of information, an index of relative values can be created that can be compared over time both within the same country and with other countries.

In theory, payment for health care should not impose a severe financial burden on households. Patients are required to pay only a consultation fee at public health centers, and the fee covers the pharmaceuticals that they receive. Regulations are also in place to exempt from payment those who cannot afford it. However, there is little incentive to provide such exemptions. As detailed in Table 10, the lowest-paid government worker has to work between 0.26 and 2.99 days to pay for treatment of pediatric acute respiratory pneumonia. Treatment of pediatric dysentery required between 0.91 and 2.89 days of work.

Table 10. Number of Days of Work Required to Purchase a Course of Treatment by Facility

| Illness | NGO/Mission Facilities | Private Facilities | Pharmacies/ Drug Depots | Unlicensed Pharmacies |
|--|------------------------|--------------------|-------------------------|-----------------------|
| Pneumonia (pediatric 1–5 years) | | | | |
| Amoxicilline 250 mg (IMCI) | .26 | 2.99 | .97 | 1.4 |
| Co-trimoxazole 80 mg/400 mg (IMCI) | .91 | 2.89 | .75 | .84 |
| Dysentery (pediatric 1–5 years) | | | | |
| Co-trimoxazole 80 mg/400 mg (IMCI) | .91 | 2.89 | .75 | .84 |

Note: IMCI = Integrated Management of Childhood Illness.

5. *Percentage of the population covered by a risk-sharing, prepayment health insurance scheme*

There are only a few health insurance schemes in Cambodia; they cover less than one percent of the population and tend to cater to the expatriate community.

Acceptability/Satisfaction

The acceptability/satisfaction aspect of health care access addresses responsiveness, which is the term used to describe the performance of health services in the *World Health Report* (WHO 2000). Responsiveness refers to how aspects of the health system relate to the expectations of the public. This concept has two components, one that focuses on respect (respect for human dignity, confidentiality, and patient autonomy) and another that addresses issues of client orientation (punctuality, cleanliness, space, access to social support, and possibility of provider choice).

1. *Number of medicines on the national essential drugs list that are among the best-selling medicines in the private sector*

This information was not available for Cambodia.

2. *Satisfaction with the results of the last visit to a public health facility*

Cultural attitudes toward seeking medical care are a mix in Cambodia—patients will seek traditional as well as modern medicine. Generally, patients first attempt the least expensive self-care, obtaining products directly from drug sellers or traditional medicine shops. Retail outlets are the first point of contact for approximately 70 percent of the population because of their location, cost, availability of drugs, and shorter waiting time. If patients can afford to see a physician, they tend to go to private clinics rather than public health centers. Aside from the limited hours and staffing at some public health centers, some patients may not be able to afford the added expense of transportation if the health center is located some distance from their homes. Few would go to public facilities when mild or moderate illness first strikes. Health

facility utilization surveys indicate that public health facilities are underutilized; they are used in just 20 percent of all illnesses and injuries. If serious conditions are included, this increases to about 30 percent of all cases. Over 60 percent of women who had recently given birth chose not to utilize public health facilities because of distance to the health facility, cost, and lack of drugs, among other reasons.

The attitudes of health care providers themselves also influence cultural acceptability. Through experience, people have learned that the public sector is neither reliable nor free. Also, because public sector health care providers work few hours in their public sector jobs, preferring more lucrative private sector employment, the public health centers may be closed when patients seek care.

Patients may expect to pay for care at the public facility. Changes currently under way to implement a fee-for-service schedule in public facilities and financial incentive programs for medical staff are an attempt to both standardize payment and subsidize staff salaries. In theory, this will entice staff to work full-time in their public sector positions. However, increasing salaries from approximately USD 20 per month to even USD 100 per month still does not compare to the USD 600 to USD 700 per month that some physicians claim to be making at private clinics. These “new deal” schemes may also be increasing the cost of the public sector health care system, which may continue to find itself with inadequate pharmaceutical stores and understaffed facilities. If patients find that fee-for-service does not improve access to medical care and pharmaceuticals, the changes may further damage trust in the public sector and drive patients further into the unregulated private sector.

Quality of Products and Services

1. Percentage of tracer drugs sampled from facilities that fail quality testing

This indicator required that samples of tracer items be collected in facilities from each sector. Using a systematic random sample technique to ensure even distribution of products across sectors, 132 samples of 14 different products were drawn. Samples were submitted to a U.S. firm located in Baltimore, University Pharmaceutical of Maryland, Inc., for tests of the labeled strength.

Drug quality is perceived as a serious problem in Cambodia. Test results indicated that overall, 12.4 percent of the samples failed the assay test. Public facilities had a slightly higher failure rate of 13 percent, followed by retail outlets at 9.6 percent and NGOs at 7.7 percent. In 5 of the 14 different products tested, at least one sample was found to be substandard (Figure 2).

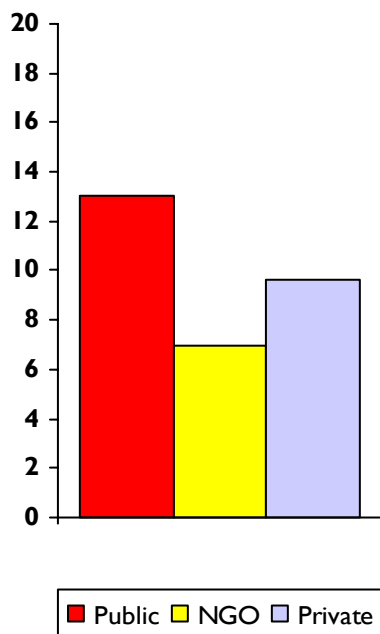


Figure 2. Percentage of tracer samples found to be substandard by sector.

These findings are similar to those of a recent MOH study of drugs in the Cambodian market (CRSCD 2001). Preliminary results of that study found an overall failure rate of 13.5 percent. The study also found that approximately 50 percent of the samples collected were unregistered drug products. These products had a 22 percent failure rate, much higher than registered products. Both studies found evidence of counterfeit products.

2. *Existence of a national EDL and standard treatment guidelines published within the past five years*

This indicator provides evidence to support the MOH’s current and ongoing concern for the rational use and management of drugs, which are important factors for the delivery of quality care and services. An EDL was published in 2001 and the most recent standard treatment guidelines were published in 1997.

3. *Percentage of facilities with a copy of the EDL*

All of the public health centers surveyed had copies of the latest EDL. Private facilities, including pharmacies, clinics, and hospitals, seldom had the list available (Table 11).

Table 11. Percentage of Facilities with an EDL Available

| Criterion | Public Health Centers (N = 27) | NGO Clinics (N = 20) | Private Clinics and Hospitals (N = 31) | ODMS (N = 21) | Pharmacies (N = 9) |
|---|--------------------------------|----------------------|--|---------------|--------------------|
| Percentage of facilities with a copy of the latest Essential Drugs List | 100 | 40 | 16 | 62 | 0 |

4. *Percentage of treatments that conform to standard treatment guidelines*

It was not possible to calculate this indicator. However, a simple analysis of the quality of prescriptions was done, and records of patient encounters were reviewed in each of the clinical facilities visited. The results are presented in Table 12.

Table 12. Selected Prescribing Indicators

| Prescribing and Dispensing Indicators | MOH | NGO | Private |
|--|-----|-----|---------|
| Number of drugs per encounter | 2.0 | 2.5 | 3.8 |
| Percentage drugs prescribed by generic name | 90 | 77 | 42 |
| Percentage prescribed drugs on EDL | 97 | 82 | 58 |
| Percentage encounters prescribed selected drug groups | | | |
| Percentage antibiotics | 56 | 51 | 64 |
| Percentage vitamins and tonics | 37 | 30 | 41 |
| Percentage oral and parenteral steroids | 1 | 1 | 5 |
| Percentage prescribed drugs that were actually dispensed | 80 | 54 | 59 |

Several indicators of pharmaceutical service quality suggest that there is room for improvement in this area. The prescription analysis found that patients were prescribed an average of 3.8 products per encounter in private facilities, almost twice the number as in public health centers. Prescribing by generic drug name and prescribing products that are listed on the EDL were most common in public health centers and least common in private facilities.

One measure of prescribing quality is the percentage of cases in which antibiotics were prescribed or recommended. In Cambodian public and private health facilities, antibiotics were prescribed in at least half of all cases. About one-third of all cases also received vitamins and tonics. Unfortunately, this practice wastes precious resources on nonessential drug products and increases the potential of drug resistance.

In private facilities, oral and parenteral steroids were prescribed in 5 percent of cases, a higher rate than would be anticipated. Other studies have found even higher rates of steroid use.

5. *Percentage of patients who know how to take their medicines*

Another measure of the quality of services is the amount of drug information that the patient receives when counseled by the dispenser. In exit interviews at public health centers and NGO/Mission facilities, consumers reported that personnel provided them with information on the purpose and duration of treatment in almost all cases, and told them the name of the medication about three-quarters of the time (Table 13). These high rates may reflect the fact that Cambodian patients tend to visit health care providers when their illnesses are moderate to severe or when self-treatment has failed. Patients might be expected, therefore, to associate the medication with the condition that was sufficiently serious to prompt their visit to the facility. Furthermore, if the consumer received sufficient medication to complete a course of therapy, the duration of treatment would be more evident.

Only about half of the respondents could report both the name and purpose of the drug or any additional information about the medication. This low rate may indicate that patients are not receiving sufficient counseling about how to use drugs properly or that the information is not delivered in an effective manner. That fewer than half of the consumers received additional information about the drug may reflect the dispenser’s lack of formal training.

Table 13. Information on Medicines Provided to Patients by Providers, Based on Exit Interviews

| Criteria | All | | Public Facilities | | NGO Facilities | |
|--|-----|-------|-------------------|-------|----------------|-------|
| | N | % Yes | N | % Yes | N | % Yes |
| Patients who answered positively to the following indicators— | | | | | | |
| 1. The name of medicine is reported | 393 | 78 | 265 | 75 | 128 | 86 |
| 2. Purpose of medicine is reported | 381 | 97 | 261 | 96 | 120 | 98 |
| 3. Duration of treatment is reported | 392 | 100 | 258 | 100 | 134 | 100 |
| 4. Additional information on drug is reported | 155 | 48 | 99 | 51 | 56 | 45 |
| 5. Indicators 1–4 (all of the above) | 407 | 11 | 272 | 11 | 135 | 10 |
| Patients who answered that they knew the name and purpose of the drug | 408 | 53 | 273 | 43 | 135 | 73 |

During simulated purchases in retail outlets, consumers reported receiving instructions on how to take the medication in all cases. This measure may be deceiving, however, because the assessors knew that something was said, but they were not sure of the content or the quality of the information received. Similarly, the attendants asked the simulated client for additional information in three-quarters of the cases, but it is not known if the information requested was appropriate or helpful. Clearly, additional information about possible side effects or other problems with the medication was provided in a minority of cases. Other studies have shown that recall of information provided by a health worker tends to decrease rather rapidly following a visit to a health facility, so the percentage of patients who say they received additional information may be expected to be lower.

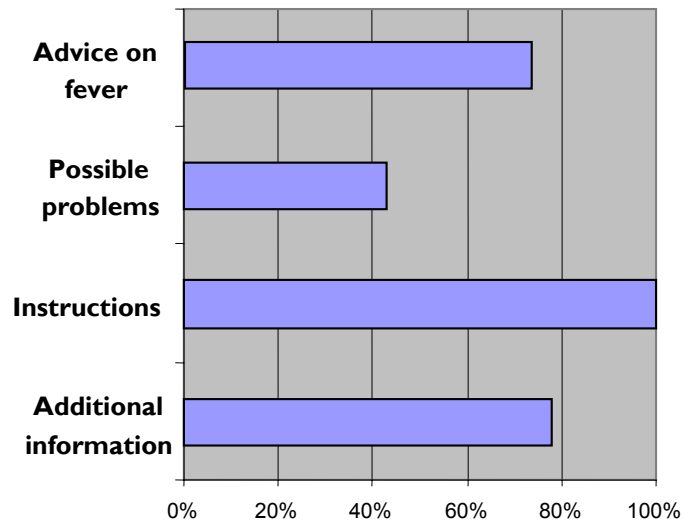


Figure 3. Percentage of simulated clients receiving information from drug sellers.

Strategy Formation Principles

The overall principle of the intervention strategy is to address deficiencies in health care access in relation to the depth of the problem and its effect upon the poor and vulnerable. The primary goal is to bring structure and accountability to both the public and private health care sectors. Currently, the Cambodian health care system presents patients with an uncoordinated and seemingly unregulated array of public and private sector health care providers and facilities. Public and private resources are not necessarily linked to positive patient outcomes. Questions concerning availability, quality, effectiveness of treatment, and cost of care must be addressed through a comprehensive, broad-based strategy. Taken individually, the recommended interventions will have a limited positive effect on access. However, each item adds a critical component in support of the whole, and taken together, they will go a long way toward improving access and addressing the critical shortcomings of the present system.

Presently, at minimum, the following issues must be addressed—

- Well-trained personnel are needed to staff public health care facilities. There must be adequate quantities of medical supplies and drugs on hand, with mechanisms in place to obtain additional supplies without unnecessary delay in emergencies. Health care personnel should receive appropriate, competitive salaries and should be full-time employees, available to serve patients either at the facility or through appropriate outreach programs.
- Both the public and private sectors should be encouraged to take advantage of current educational programming available through national, regional, and local NGO initiatives.
- Current financial incentives to prescribers and dispensers, which lead to overprescribing and inappropriate selection of drug products, must be redirected toward the rational use of quality drug products.
- The quality of drug products must be ensured through proper governmental oversight, and patients must be able to have confidence that products received from both the public and private sectors are not adulterated or counterfeit.
- Patients must be educated regarding the proper selection of qualified health care providers, pharmacies, or drug depots and must learn about the proper selection and use of drugs, obtained with or without a prescription.
- To start controlling health care costs, community-based health insurance schemes should be encouraged, thus sharing risks among a broader base of the population.

- Properly designed and managed private insurance programs should be encouraged so that more insurance products are available for the general public as well as major employer groups.
- Geographical access to health care providers, facilities, services, and products must be improved in the rural communities.

The potential for addressing geographic accessibility in rural areas and affordability throughout the health care system is constrained by the ability to influence the national marketplace. However, significant impact could be achieved by creating a pharmacy network driven by the private sector and by a corresponding group-purchasing cooperative. By introducing cooperative agreements between providers in the private sector and those in the public and NGO communities, a system of drug procurement could be created to improve efficiency, increase quality (through product standards for all co-op purchases), and decrease cost (through quantity purchase negotiation). The adoption of practice standards as a minimum requirement for participation in the pharmacy network/group-purchasing cooperative lays the groundwork for introducing financial incentives for improved professional performance.

To increase geographical access, several other problems have to be addressed. For commercial outlets to be viable, population density must be sufficient to support minimum sales volume. In addition, the country's infrastructure must be able to support the travel and communication needs of various health care providers. Although it will not be able to address the needs of every rural community, a pharmacy network could help support creative models of health service delivery. Furthermore, the decreased cost of goods sold through the group-purchasing cooperative offers the potential for decreasing the overhead of rural drug sellers, who should be offered practical incentives for lowering their retail prices for drugs and medical supplies.

By expanding private and community-based health insurance schemes, risk is shared among various population groups. In urban areas, large employers should be encouraged to offer health care programs that create risk-sharing pools. These employee groups spread the risk of health care costs among large populations, meaning individuals requiring health care services are not faced with unmanageable costs, resulting in loss of family resources. The employer benefits from increased worker health and decreased loss of worker productivity. Community-based risk sharing programs offer similar advantages for rural populations, and family assets that are sources of income (e.g., farms and livestock) are less likely to be depleted when health care services are needed.

The quality of drug products must be ensured through proper governmental oversight so that patients can have confidence that products received from both the public and private sectors are not substandard, adulterated, or counterfeit. Establishing reliable and monitored supply sources will support quality assurance in the private sector. To introduce sound procurement management principles, including recognized standards of quality, a cooperative purchasing program is needed. Individually, drug sellers have neither the expertise nor the financial resources to improve quality and price, but by working together and making additional collaborative agreements, they can influence both the private and public sectors.

The development of a pharmacy network should have at its core professional education and public marketing programs that serve to educate the community. The public must learn to recognize the value of quality products and the therapeutic value of rational drug use. More customers will then seek out those drug sellers who are knowledgeable regarding common treatment of illness and who also offer quality drug products.

Selected Interventions and Expected Impact on Access Gaps

The proposed intervention strategy for Cambodia is based on the findings and principles discussed throughout this paper. As agreed upon by local stakeholders, this strategy includes interrelated elements, each of which represents an essential step necessary to bring structure and control to a system that currently lacks proper enforcement of governmental laws and regulations.

The proposed SEAM Cambodia country strategy has three major phases—

Phase I: Implementation of a phasing-in process whereby retail outlets would develop and implement a performance-based network of pharmacies and drug depots. These retail outlets would agree to a system to educate and certify drug sellers, subscribe to and follow a set of minimum standards of practice, and submit to monitoring of their performance. An enabling network would implement a group-purchasing cooperative to provide lower costs for essential drug products of guaranteed quality.

Phase II: Expansion of the provider network to include other health care providers, including those at rural health clinics and public facilities, who would agree to subscribe to improved standards of practice and submit to regular performance monitoring.

Phase III: Creation of innovative community-based health insurance schemes and the expansion of private insurance coverage.

Phase I. Creation of a Performance-Based Network of Pharmacies and Implementation of a Group-Purchasing Cooperative

The greatest access issue may rest with the absence of properly trained medical personnel at the point where most patients enter the health care system. It is here that an initial diagnosis may be made and therapy started. Services will probably be provided by a drug seller who has no formal training and minimal on-the-job experience. The patient has no way of knowing whether the pharmaceuticals purchased are appropriate or of good quality. The incentive for most untrained drug sellers is to recommend those products with the highest profit margin, such as brand-name products or counterfeit products that can be sold at premium retail prices. The drug seller has little incentive to turn away the business. When the patient's financial resources are limited, therapy is determined through the selection of a product and quantity compatible with the

patient/purchaser’s ability to pay. Rarely, it would appear, is the patient referred to a local public or private clinic in order to obtain a physician’s diagnosis and corresponding prescription(s).

Subobjectives to address the main access gaps are—

- Increased availability of trained drug sellers
- Promotion of rational drug use concepts and strategies
- Innovative drug distribution models for use in rural communities

These subobjectives can be achieved by—

- Changing the financial “drivers” in the system to encourage drug sellers to join a performance-based pharmacy network
- Introducing business management expertise, including information technology, into retail drug outlets
- Promoting behavior modification among drug sellers to move them toward rational drug use

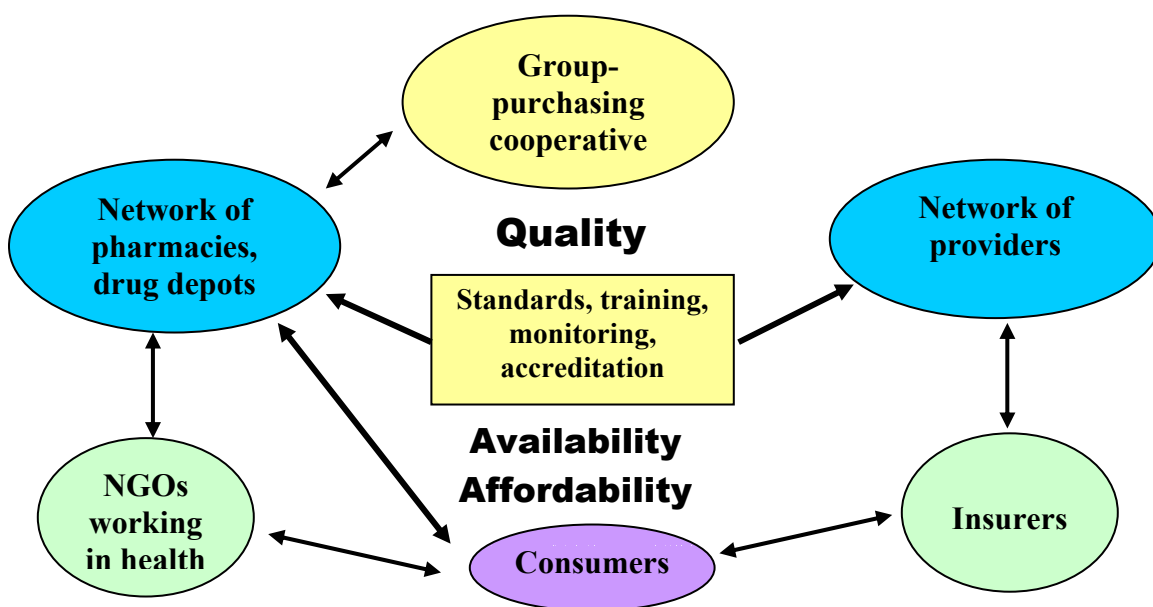


Figure 4. SEAM potential country strategy.

The creation of a multilevel, performance-based network of pharmacies and drug depots is recommended. The intent is to create a “branded” or recognizable network of drug dispensers, including pharmacies, drug depots, and eventually rural health clinics, health care centers, and

private clinics, that would subscribe to quality standards, undergo regular network audits, and practice oversight. This network would increase access to quality, affordable products through a group-purchasing cooperative that enabled each network participant to benefit from discounted pricing and from assurance that all products purchased through the centralized procurement program met predetermined quality standards. Patients using these pharmacies would receive high-quality “co-op products” and improved patient education through a formal training program offered to all pharmacists and drug sellers in the network. This educational effort would include an accreditation or certification process and would eventually become the minimum standard required of all network drug sellers. Geographic access would be improved through network participation in the rural areas and through new delivery models, which may include a system of traveling rural health workers, franchised rural health clinics, or new health care programs created by NGOs.

This proposed network of pharmacies, drug depots, and other health care providers would require an administrative arm responsible for ongoing development and management functions. Since Cambodia is in the early stages of development and lacks a sophisticated public or private third-party-payer health care system, a complex pharmacy benefits management company would appear to be impractical and unnecessary at this time. Therefore, the present challenge is to determine whether there is a local organization with the interest and resources necessary to assume responsibility for the creation of this multilevel performance-based network.

The most logical partner organization appears to be the Pharmaceutical Association of Cambodia (PAC). As the professional association for pharmacies, this organization has expressed an interest in advancing professional practice standards, improving the delivery of pharmacy products and services, and eliminating unlicensed drug outlets. However, these unlicensed outlets can only be shut down if there is a perceived and real difference in the quality of services and products provided by the legal pharmacies. The association does appear to take a realistic view of the drug depots, recognizing that they have a role in the delivery of limited pharmacy services. PAC supports training drug sellers so they are more knowledgeable about the products dispensed and their appropriate use. What is not clear is whether the association has the ability and political will to implement a program to provide immediate oversight and control of network providers. PAC expressed support for the goals of this proposed strategy and indicated a willingness to collaborate in this effort.

In order to address the main access gaps of availability, affordability, quality of drug products, and increased access to knowledgeable drug sellers, the subobjectives are to—

- Improve drug sourcing to achieve better prices, higher quality products, and more reliable supply service
- Promote rational drug use concepts and strategies to improve drug use
- Create new delivery models for use in underserved areas (ensuring geographical access)
- Improve information flow for better forecasting and stock management and fewer stock-outs

- Establish “brand identity” products and services that assure minimum quality control standards

These subobjectives would be achieved by having PAC establish a pharmacy network and group-purchasing cooperative. Management functions would include—

- Contracting for pharmacy services
- Creating new delivery models in underserved areas (ensuring geographical access)
- Developing professional standards and best pharmacy practice guidelines
- Controlling and enforcing network standards and best practice guidelines
- Creating and delivering educational programming for health care providers and patients (ensuring access to proper prescribing, product selection, and patient education)
- Accrediting or certifying network providers
- Establishing and marketing a quality brand identity for the network
- Contracting with NGOs, private insurance companies, and other third-party payers
- Coordinating group purchasing by network, select, and non-network drug outlets (ensuring access to high-quality, affordable drugs)
- Establishing quality control standards and auditing for compliance (ensuring access to quality products and decreasing the use of counterfeits)
- Assisting with business management of network outlets in order to ensure financial stability and affordable pricing
- Creating operations manuals in order to ensure uniform compliance with performance standards
- Supporting more efficient operations and greater oversight of network drug outlets through information technology

Contracting for Pharmacy Services and Creating New Delivery Models in Underserved Areas

No legal statute requires pharmacies or drug depots to join the proposed performance-based network. In Cambodia, pharmacists must spend only one hour per day in the licensed pharmacies, which are not owned directly by the pharmacist. (The law requires full-time presence of pharmacists in the facilities where they are responsible, and there has been pressure from the MOH to implement it. However, due to the low salaries of pharmacists, PAC intervened, and the MOH agreed to a temporary requirement of at least one hour.)

Professional pressure to participate in a network of providers offering increased access to high-quality products and services does not exist. Current regulations intended to improve access to trained medical personnel in pharmacies are not enforced, and most pharmacies are unlicensed. The creation of the multilevel, performance-based network is an attempt to introduce order, control, and trust where it currently does not exist; therefore, the ability to enter into contracts with a sufficient number of pharmacies and drug depots is in question. Without the support of an organization such as PAC, chances for success are greatly limited. The ability to succeed will depend on strong in-country support, a dedicated network management staff, intensive technical assistance, and realistic financial incentives for network pharmacy and drug depot owners.

Professional service contracts must be developed that state the requirements for the network's professional standards and best practice guidelines. These standards and guidelines will evolve over time, but the basic principles to improve access to products and services are already clear. The contract must also define the responsibilities the network management organization has to the participating providers. These responsibilities include, but are not limited to—

- Training and monitoring providers
- Certifying or accrediting providers
- Developing a pooled procurement system to ensure access to quality products and best prices
- Developing business management and information technology resources for network participants
- Establishing a quality brand identity and aggressive marketing of the network
- Obtaining access to private and future government third-party-payer programs
- Obtaining access to NGO-sponsored third-party-payer programs

In order to address the problems associated with health care resources that are less than adequate in the more rural areas of the country, new delivery models seem to be needed. Current population centers tend to be located along the central waterways. Population groups are clustered in certain rural areas, but the country does not have a system of roads or alternative transportation for ready access. Local traditional healers serve some of these communities, while others may have traveling health workers. The challenge is to provide these rural communities with both quality pharmaceuticals and properly trained health care workers. Clearly, a variety of new delivery models should be considered. For example, some communities may be large enough to support franchised rural health clinics. These clinics would have properly trained personnel and operate dispensaries with adequate supplies of essential drugs; all drug products would meet predetermined quality control standards. The franchise concept is discussed in detail in other SEAM documents (available upon request).

Finally, individual network providers could expand their private sector businesses by developing outreach programs for the more rural communities. Currently, small entrepreneurs from rural

areas make visits to Phnom Penh to purchase supplies for resale in their communities. Progressive distributors are reluctant to service these areas with deliveries; because the individual orders are small and delivery costs high, there is simply too little profit to be realized. If, however, the network management company was able to consolidate small orders into a larger area-wide purchase representing multiple communities, delivery costs could be decreased and large-purchase discounts obtained. Once again, implementing these options would require further analysis of the current health care needs and resources in sparsely populated areas.

Developing Professional Standards and Best Pharmacy Practice Guidelines

A critical first step in establishing a performance-based network of providers is the development of professional standards and best pharmacy practice guidelines. This should be accomplished with specific country intervention goals clearly in mind. In Cambodia, the goal of this network would be to establish quality standards of care at the point where the majority of patients enter the health care system. For most patients, the point of entry is the private retail drug distribution outlet; for others, it is the public sector health care centers. Currently, the quality of care at these two entry points depends entirely on the characteristics of the personnel providing services. In the public sector, there are minimal standards set by the government. However, many of these health care centers have greatly limited hours of operation and are staffed with medical personnel who have limited knowledge of rational drug therapy and minimal access to pharmaceutical supplies. In the private sector, personnel with no formal medical training usually staff retail drug outlets.

Professional standards must be established that will improve access to properly trained personnel and increase the availability of high-quality pharmaceutical products. The organization responsible for network management should develop these professional standards in association with PAC and the MOH. Developing more aggressive standards and guidelines may be a significant obstacle in a country with limited controls on health care workers; however, this is a voluntary network of providers, with no government oversight or controlling authority to approve standards exceeding the minimal legal requirements. It is not the purpose of this paper to detail all of the criteria for pharmacies or drug depots to participate in this performance-based network. However, professional practice standards and best practice guidelines would include principles such as—

- Strict adherence to treatment protocols for a limited number of diseases
- Compliance with minimal patient record-keeping
- Agreement to have a properly trained drug seller available during agreed-upon hours of operation

Standards should also be established regarding the business operation of each drug distribution outlet, primarily intended to support the best pharmacy practice guidelines and to distinguish the network drug outlets from their counterparts by providing a unique branded identity. For example, one of the benefits available to the pharmacy or drug depot owner through participation in this network is the pooled procurement program. An essential standard of the business

operation for each network pharmacy and drug depot should be that only high-quality products are stocked. To ensure compliance with this standard, the network management company will implement an audit process to confirm that all network outlets are dispensing only unadulterated, quality products.

Professional and business practice guidelines should be established gradually, so as not to delay implementation or discourage participation. Training drug sellers, for example, should be an ongoing process that will eventually result in providing the patient with increasingly better access to general health care information and assistance in appropriate selection and use of pharmaceuticals.

In general, certain standards and guidelines should be established before the provider network is developed, whereas others could be developed and implemented over time. Establishing minimal patient-specific data at the retail site could begin by identifying patients enrolled in specific third-party-payer programs, a new concept in Cambodia. However, some private insurance companies are already contracting with private pharmacies and clinics to provide services for enrollees. These providers are required to capture some claim-related data on specific patients. This concept would be expanded to include incentives to capture data on specific diseases or courses of therapy. The rather new concept of tracking specific transaction data and perhaps specific disease-related data would appear to be a natural link to community-based care programs.

Enforcing Network Standards and Best Pharmacy Practice Guidelines

To ensure that network providers comply with standards, the network management organization must establish an audit team capable of monitoring provider activities, both centrally and through on-site inspections. Both business and professional service activities as they are outlined in the provider contract would be monitored.

A network of providers offering competitively priced, high-quality products would attract a number of third-party payers. Private insurance programs, NGOs, and major employers offering employee health benefits would all see the advantages of this exclusive network of pharmacies and drug depots. In addition to quality products at competitive prices, the network offers drug sellers who have received at least entry-level health care training. Perhaps of greatest importance to third-party payers would be the network management company's continual oversight of contracted providers. The network could also begin to capture data that could be used to track utilization and gradually improve the rational use of drug therapy, contributing to the ultimate goals: increasing access to high-quality, affordable products and improving the rational use of drugs.

In a country where there is limited control of the drug distribution system and where enforcement of existing laws and regulations is almost nonexistent, proper network management becomes the only viable quality control mechanism in either the public or private sector. It will clearly be a major challenge to organize a network of providers, especially because working together and trusting competitors is not common in Cambodia. It will be an even greater

challenge to get potential network providers to agree to follow a higher standard of service and to commit to an ongoing training program. Requiring a record-keeping system will also be a significant obstacle to overcome, although this appears to be an attractive incentive to providers. To overcome these obstacles, the performance-based network must offer enough rewards to the providers, including financial incentives for both pharmacy and drug depot owners. Tying financial consequences to appropriate performance and adherence to network principles is one of the most powerful incentives that could be applied to encourage rational use and improve access.

The network management company must ensure compliance on the part of all providers. Enforcement of network standards and best pharmacy practice guidelines would be a continual process, requiring a well-trained audit staff with the necessary resources to monitor each participant on-site and provide additional training when necessary. This staff must also have the authority and political will to remove noncompliant pharmacies and drug depots from the network as a last resort.

Creating and Delivering Educational Programs for Health Care Providers and Patients

Educational programs should be developed with local resources. A standardized curriculum should guide local personnel in long-distance training that does not require people to travel out of their local area or take time away from their jobs. This paper cannot address all the creative approaches to training, but one example should suffice. Current regulations in Cambodia require the pharmacist to train pharmacy drug sellers, which is why the responsible pharmacist is required to spend at least one hour per day in the pharmacy. Although this regulation is not enforced, it does offer an opportunity to take advantage of current laws. If the organization responsible for network management was able to furnish the pharmacist with proper training materials and require their use as a term of the contract governing network participation, the pharmacist could train drug sellers at the pharmacy. Meanwhile, the pharmacist would be complying with the requirement to spend one hour in the pharmacy. Training materials could be presented as part of a competency-based program, and the training program would provide guidance in the measurement of training effectiveness and student competency. There are various extant NGO-sponsored training programs that may be appropriate for the network management company to use, while also providing an ideal opportunity to forge alliances among the various NGOs working in-country and gaining further support for this new initiative.

Current training programs, while effective, have not had a dynamic impact on overall patient care. Training should be directed toward the person responsible for the initial selection of drug therapy; the drug seller is generally the first person the patient sees when entering the health care system.

Educational programs should begin with the drug seller and gradually encompass the pharmacist, physician, medical assistant, nursing staff, and patients. In addition, the network management company should be prepared to initiate or support social marketing programs aimed at the general population. Community-based care programs also offer opportunities to educate the public on proper selection of health care providers and the rational selection and use of pharmaceuticals.

Accrediting and Certifying Network Providers

The person who actually provides the care must be ultimate target of any training and subsequent accreditation or certification process. In order to improve access to appropriate and rational drug use in the all-too-common situation where the patient purchases the medication without proper diagnosis and prescribing by a trained physician, educational programs must be directed toward the drug sellers. The general population should be informed about seeking and finding competent drug sellers, and the public should have some way to ascertain a drug seller's level of competence. We propose that even though the network pharmacies and drug depots will be identified through some easily recognized branding system, individual drug sellers should also be recognized through a voluntary system of accreditation or certification.

Marketing efforts on behalf of network pharmacies and drug depots would educate the public on how to recognize network drug outlets. Drug sellers should also be given recognition for their educational accomplishments. The ultimate goal of the marketing campaign would be to make the general public aware that network drug outlets are a place where only quality products are sold and where the drug sellers have received at least a minimal level of basic education.

Establishing and Marketing a Quality Brand Identity for the Network

Several complex questions arise when considering the totality of functions required of the network management organization—

- Is it possible to obtain enough cooperation among current pharmacy and drug depot owners to begin to put together even a limited number of drug outlets?
- Is there enough incentive on the part of owners to change a system that currently has few if any controls and that already appears to offer acceptable return on investment for the owners?
- Is there any incentive that would overcome suspicion of outsiders proposing new business models?
- Can independent owners be persuaded to allow an outside organization to monitor and control their businesses?

If there is any chance for success in improving access to quality products and services through this cooperative approach to pharmacy services, it must lie in an ability to clearly brand these pharmacies and drug depots as uniquely offering high-quality, competitively priced products and reliable patient education.

A limited number of pharmacies in Phnom Penh have earned a reputation for selling quality products. Individuals interviewed in both the public and private sectors have indicated that they would go to one of these pharmacies for a product that was neither counterfeit nor of substandard quality. The proposed network must strive for brand recognition that suggests a similarly

superior reputation. Patients in Cambodia most often select their pharmacy or drug depot based on location and familiarity with the owner. While familiarity does not ensure quality products or services, it does indicate that the public is making a conscious effort to differentiate between drug outlets and offers an indication that public education and marketing programs should be successful.

Marketing a brand identity for the proposed network must also be directed to those third parties responsible for the delivery or payment of some health care services. Private insurance companies, NGOs, and major employers should be contacted with a clear message describing the advantages available to patients when selecting network providers. These organizations may also choose to link their present service providers to the network in order to improve competency, increase their ability to purchase quality products, and improve their ability to influence rational drug use.

Coordinating Group-Purchasing Activities by Network and Select Non-Network Drug Outlets

Currently, drug outlets (pharmacies, drug depots, and drug wholesalers) are operated as distinct, independent purchasers of pharmaceuticals. Purchasing on a daily basis, in small quantities, is not only inefficient but also costly. While this frequent-purchase method may keep inventories low, these low inventories may be composed of high-priced products. In addition, attempts to control quality at either the point of purchase by the drug outlet or after the product is introduced to the drug vendor's inventory are limited or simply nonexistent. By developing a system in which quality and cost are prime considerations, the network would create a greater degree of confidence in the potential effectiveness of their pharmaceutical products and should also be able to offer the public products that are more affordable.

The proposed network management company should form a buying group in order to negotiate large-volume purchases and additional services from distributors and manufacturers. This pooled procurement system would enable network and select non-network drug outlets alike to participate. The network management company would be free to negotiate reduced purchase prices and additional value-added services on behalf of the buying group. The network management company would also establish a quality assurance program so that any distributor or manufacturer can participate as an approved vendor.

By necessity, the buying group would begin on a small scale. Participation should then be built up to the point where the network has an advantage in negotiating fees and services with distributors and manufacturers. The network management company requires certain resources and personnel to handle duties associated with these new functions—

- Establishing a product list (essential drugs list)
- Negotiating pricing
- Negotiating terms of payment on behalf of the buying group

- Negotiating services available to member pharmacies and drug depots, such as delivery
- Creating a list of approved suppliers
- Establishing certifiable quality standards for drug purchases and storage in individual pharmacies and depots
- Implementing a quality assurance team to audit both suppliers and network retail outlets

One advantage of allowing non-network outlets such as NGOs to participate in this buying group is that the group will be bigger, and the overall size of the group will determine its negotiating power. In addition, the ultimate goal is to improve access to affordable, quality products in the retail environment. Since this component of a network provides a major incentive for participating in it, it is imperative that some distinction be made between network and non-network members of the buying group. This could result in two levels of discount pricing or some other fee-based requirement for non-network participants.

The network management company would not function as a wholesaler or distributor, nor would it function in the same capacity as the CMS. For example, in a pooled procurement system, the network management company would be responsible for storage and distribution; however, it should be encouraged to address several other access problems that pharmacies and drug depots have. Current inventories of essential drugs may include level one, level two, and level three quality products. Patients sometimes receive less-than-optimal drug therapy, in essence wasting their money, because that's all they can afford. The network should actively monitor participating outlets, insisting on removal of all substandard and counterfeit products. The network management company may also suggest a competitive markup or fee-based system to avoid having the negotiated, reduced cost of products result only in increased profits for the pharmacy or drug depot owner. The intent of the network as it relates to pooled procurement is to decrease retail costs for the clients, while also making the pharmacy and drug depot more competitive in the marketplace. Once again, the network would bring control and oversight where it is currently missing.

Assisting with Business Management of Network Outlets to Ensure Financial Stability and Affordable Pricing

Perhaps the greatest change in the management of individual network pharmacies would occur once it is recognized that improved business practices include increased reliance on some sort of record-keeping system. Currently, there are almost no written records kept on sales. There is a tendency to keep old purchase records and copies of invoices from distributors, but even these are discarded after the final bills are paid or after they are used to compare recent pricing among various distributors.

The lack of simple accounting systems may result from a conscious effort to limit information regarding the business operation, or it may be an effect of limited business training of the storeowner or manager. Regardless, changing current practices must be a gradual process that is

clearly justified and reasonable. Change must be seen as having an immediate, positive impact on the network participant's business. Therefore, the priority would be those specific components of a record-keeping system that are essential to efficient operations, and only those that can be easily justified and have an immediate impact on the success of the network participants would be incorporated. The record-keeping system should be—

- Simple to use
- Flexible and adaptable for continuous improvement of network management tools
- Inexpensive to operate and maintain
- Efficient and not intrusive on the pharmacy owner's desire to protect confidential information
- Convenient for the network management company to access and evaluate

Initially, the information collected would be restricted to that portion of the business most closely associated with the access issues discussed in this SEAM survey report. This restriction will help prevent some of the anticipated resistance from storeowners or managers. As an example, network pharmacies and depots would be required to purchase specific essential drugs through the cooperative buying group to ensure that quality standards are met and that only the brand purchased through the co-op would be sold. Thus, the public would be assured that when purchasing a drug like amoxicilline from network pharmacies, the product dispensed would not be adulterated, counterfeit, or of suspect quality. However, while inventories of these essential drugs would have been purchased through the co-op, the pharmacy could continue to stock other drug items not on the EDL. Simplicity would be achieved by requiring pharmacies and depots to track only those products purchased through the buying co-op.

In addition to keeping records on inventory purchases and sales, pharmacies and drug depots would be required to record certain utilization data. Information such as the quantity dispensed, days' supply, and retail price would assist the network management company in assessing that drugs are being used properly and that standard treatment protocols are being followed. Flexibility in the design of both manual and computer systems would allow for future use of additional data fields. This flexibility would accommodate the requirements that third-party payers—both governmental and private insurers—might someday have as well as the increased monitoring of prescribers, dispensers, and patients that would accompany a third-party system.

The development of these business management instruments would begin to offer assurance that—

- Network participants will maintain financial stability and profitability
- Patients will have access to quality pharmaceutical products
- Retail pricing will be reasonable and competitive
- Patients will receive appropriate advice on rational drug use
- Products will be recommended according to published standard treatment guidelines

Designing information systems and management tools that have a broad application for use by both health care clinics and retail drug outlets would result in an efficient and seamless approach to improved access throughout the drug distribution system.

Establishing Operations Manuals to Ensure Uniform Compliance with Performance Standards

The individual internal operations of each network participant would remain relatively unchanged during the initial phase of network development. However, the network concept does require a certain amount of standardization. For example, certain business practices would be standardized, such as buying essential drugs through the co-op. In addition, the actual physical appearance of network pharmacies and other drug distribution businesses, such as the Franchised Rural Health Clinics, would now include common signage to assist with public education and marketing programs. Common inventory displays designed to promote the recognition of network health care facilities might also be standard.

As a result, even though each privately owned business would retain certain unique characteristics, the public would be able to differentiate between network and non-network drug outlets because there would be some common physical characteristics that brand the network store. In addition to distinct physical characteristics, clearly defined professional standards must be implemented and maintained. The principles of improved access to information from trained drug sellers and drug product quality assurance cannot be compromised. Pharmacy and drug depot owners must accept that in order to participate in this performance-based network, they would be asked to serve a variety of constituencies in addition to their customers or patients. As a member of the performance-based network, they would be required to serve the network management company and eventually the third-party payer, whether private or public.

For this proposed network to have any impact on access, the network management company must ensure that the network is truly performance-based and therefore in control of the—

- Quality of products and services
- Costs associated with the wholesale purchase of pharmaceuticals
- Affordability of pharmaceuticals at the retail level through competitive pricing and the promotion of insurance or risk-sharing, community-based programs
- Availability of pharmaceutical products and services in currently underserved areas
- Rational use of drug products

These expectations, related performance standards, and measurement instruments must be clearly and precisely articulated. Network participants should understand not only what is expected of them and their employees but also how performance standards are to be incorporated into their current business operations. They also need to know how they will be continually supported,

monitored, and evaluated by the network management company. All of this will be initiated through a comprehensive operations plan and an accompanying manual.

The operations manual would become a valuable education tool as pharmacy and drug depot owners study the characteristics associated with successful operations management. Owners would gradually improve their businesses while increasing their communities' access to more affordable, high-quality pharmaceuticals. The operations manual would be a continually evolving work in progress, providing critical information on business topics ranging from purchasing to inventory management, record-keeping, and personnel management.

This operations manual would be the workbook by which privately owned network drug distribution outlets begin to develop mutually beneficial common business practices. The development of these common characteristics would also allow the network management company to establish community-based health education and marketing programs.

Supporting Network Drug Outlets Through the Use of Information Technology

To implement these recommendations would require an extensive oversight process, including physical audits as well as ongoing data analysis. This oversight can be accomplished in a timely and cost-effective manner only through the introduction of information systems that can be used in even the most rural settings. Currently, Cambodia has a very limited capacity for this technology in both the public and private health care sectors. Some computerization does exist in the public sector, but it is generally used for tracking inventory. While current inventory levels and records of regional distribution are available, analytical reports are limited, resulting in the absence of information that would help personnel make informed rather than intuitive decisions about supply management. Private sector pharmacies, drug depots, clinics, and hospitals have not yet seen the need to introduce computerization. Little desire or necessity exists to collect either community-wide or patient-specific data. Where data is collected manually, there appears to be no attempt to utilize this information for either medical or business-related purposes.

Most pharmacies and other retail drug outlets are run on a day-to-day basis, with decisions being made out of convenience rather than analysis of data regarding previous business activities. Inventory is usually selected on the basis of presentations by traveling salesmen and is dominated by the "daily price specials," rather than by proper inventory management techniques or anticipated community health needs. Few if any records are kept to analyze appropriate profit margins. Long-range planning to increase business or diversify profit lines appears to be limited or nonexistent. Nor is there concern regarding ways to decrease operating costs while maintaining profitability and growth. Storeowners generally do not judge quality from one manufacturer or distributor to another, and product purchase decisions appear to be driven by cost and the availability of short-term credit.

Since patients currently depend on drug sellers to help them choose a product for the symptoms they present with, it is reasonable to assume that available inventory might outweigh other, more appropriate, factors. In some situations, standard treatment guidelines become secondary to the amount of money the patient has to spend. However, drug seller behavior should begin to change

with the introduction of information systems that collect data and disseminate information between the network providers and network management personnel.

Initially, it will be important to link all network participants to the centralized management organization so that management personnel can begin to better understand the business practices of each pharmacy and drug outlet. Questions concerning inventory levels, stock turnover, pricing, product selection, and product substitution can be analyzed and appropriate recommendations formulated. This process is the first step toward ensuring that each provider has in stock the necessary quantity of appropriate quality products to meet the unique needs of their patients and the community as a whole.

Maintaining inventory also means managing proper cash flow. The introduction of information technology will help network management personnel develop business-related educational tools. The business aspect of network management must support the development of a profitable and sustainable private sector drug distribution system. In Cambodia, where most people begin treatment through self-medication and purchase pharmaceuticals through the private sector, access issues focus on the continued availability of these private pharmacies and drug depots with trained personnel and quality assured products. Network management activities must have a balanced approach between supporting business-related activities and improving rational drug use.

Simple point-of-service systems can help store owners use appropriate business practices to improve their profitability, financial stability, and competitiveness. Such a system is also a vehicle by which even limited training directed toward drug sellers can be effective in promoting rational drug use. This may be the only way that the network management company will be able to efficiently establish the necessary structure, oversight, and control to confirm compliance with best practice guidelines and network participation requirements. Finally, the introduction of health systems technology opens the door for an integrated approach that emphasizes measuring and managing health care provider and patient behaviors and eventually results in patient wellness, disease prevention, and optimal treatment.

Phase II. Development of a Performance-Based Network of Health Service Providers

The second phase of activity begins by expanding the performance-based network to include additional service providers, including those in the public sector and NGOs. While the development of a pharmacy retail drug outlet network will improve access, a broad-based network of providers is preferable for achieving the subobjectives of—

- Creating a model of drug distribution that includes quality control mechanisms, cost-effective purchasing strategies, and inventory management
- Promoting rational drug use concepts and strategies across a broad spectrum of the health care delivery system

- Increasing access to trained drug dispensers throughout the country (urban and rural)

The access gap to properly trained personnel and high-quality drug products will remain a problem unless the proposed strategies are extended throughout the health care system. Strategies for expansion of the network could result in—

- Development of a system of accreditation/certification of drug sellers throughout the country that recognizes education and competency
- Establishment of recognized minimum standards of practice for drug distribution professionals
- Implementation of standardized patient education programs throughout the country
- Access to quality drug products in each province, distributed through recognized service providers

Partners for the second-phase strategy would begin with the help of PAC and the Medical Association of Cambodia. It is envisioned that once the success of the initial phase is realized, the public sector would lend support and additional partnerships would be formed within the NGO community through the assistance of their umbrella organization, MediCam.

Phase III. Creation and Promotion of Health Insurance Schemes

Cambodia currently lacks a comprehensive plan for either public or private sector health insurance coverage. The general population is suspicious of any program that advocates setting aside financial resources with the promise that these resources will be available to pay for future, undetermined health care needs. Current public sector health care programs offer limited services, and what was once considered free health care offered through a system of community-based health care centers is now rapidly converting to a fee-for-service system. Today in Cambodia, the general population usually prefers to enter the health care system through the private sector. Because Cambodians do not have a formal safety umbrella, public or private, to protect them from the escalating costs associated with health care services, it is not surprising that health care expenses account for 28 percent of household income.

This access gap to affordable health care would be addressed by creating community-based, employer-based, and/or NGO-based risk-sharing pools for expenses related to health care. The creation of innovative community-based health insurance schemes and the expansion of private insurance coverage would emphasize the following subobjectives—

- Creation of a risk-sharing pool that spreads financial risk over a larger population than immediate family and friends
- Increased employer contributions to health care costs

In addition, private insurance companies would be encouraged to expand health care offerings, promote wellness behaviors, and properly manage and promote rational use of drugs.

In the private sector, there are approximately six multinational or foreign companies offering health insurance coverage, which is marketed to a small, select group of expatriates or employees of foreign government organizations, NGOs, or privately owned foreign corporations. These insurance companies generally have 5,000 to 6,000 enrollees in their health care plan. Current laws require certain employers to offer specific health care benefits, and private insurance companies have approached major employers regarding coverage for their employees. To date, most employers have handled work-related health claims through company-run health care clinics or first-aid stations. Private insurance company representatives who were interviewed indicated that health care coverage was considered a convenience and a marketing tool. There was little interest in controlling or modifying the coverage limitations. Few claims were ever reviewed for appropriateness, and fewer still were ever questioned or rejected. Because contracting by insurance companies with specific health care providers is a rather new phenomenon, and these contracts are very loosely constructed, only now are health care providers beginning to experience requirements for proper claims submission and other related data collection.

The promotion of community-based risk-sharing schemes offers an opportunity to educate the public regarding the advantages of insurance programs, such as reducing the risk that families will have to liquidate income-generating assets to pay for basic health care services. Still, the development of community-based insurance schemes will not be an easy task. The targeted populations have few assets available to set aside as a protection against future, unknown health care needs. The average Cambodian raises cash as needed for health care and may depend on contributions from extended family members to pay for services, pharmaceuticals, and other necessary medical supplies. With limited financial resources, proposed insurance schemes would not generate sufficient income to cover even the most basic of services and probably would not attract large numbers of participants. Therefore, goals must be modest, and financial support must be external and not dependent on enrollment. The immediate goals would be 1) to educate the public regarding the advantages of risk sharing and 2) to create trust within the community that insurance schemes can provide a degree of financial protection should the need for health care services arise in the future. Once this is accomplished, a market for more comprehensive risk-sharing programs can develop.

Cambodia presents several potential areas of focus relative to the idea of risk sharing. One area concerns the employers who provide very basic health care services at the work site, sometimes nothing more than a first-aid station in the workplace. Clearly, employers and employee organizations could both benefit from a more comprehensive health care program, with services like wellness and disease-prevention programs forming the basis for focusing attention on the health care needs of a community of workers. Between employee programs, public health programs, and private insurance companies, limited insurance products could be developed with costs shared by all interested parties.

NGOs have recognized the need to assist in the development of localized risk-sharing programs. Groupe de Recherche et d'Échanges Technologiques (GRET) sponsors one such model program

with a very limited micro-insurance offering. After evaluating the initial program, GRET is preparing to enter the next phase, which will expand the coverage area and the benefit plan design. Opportunities to work with GRET and other NGOs with similar interests are many, providing the potential to expand the current program geographically and demographically and in terms of coverage. By introducing new concepts—such a partnership with local physicians, nurses, and pharmacists or utilization management techniques for health care services—these programs can expand on the services offered. Creating insurance products with more visible benefits will assist current education and marketing efforts.

While recognizing that any support provided to the private sector would translate into increased access for the population as a whole, efforts to promote community-based health care insurance schemes should not be confined to the private sector. Working with the public sector provides the opportunity to offer creatively designed public or public-private sector insurance initiatives. Appropriately designed and managed community-based health insurance schemes can be the means to expand health care services, thus improving access for entire communities, even for individuals with limited income. When the community as a whole participates, financial contributions are spread out over an extended period and are shared by the sick and the healthy. Increased financial resources for health care services can be used to increase quality of care and promote accessibility. Furthermore, community participation and a new emphasis on partnerships with health care providers should enhance efficiency, accountability, and quality of care. The organization and delivery of health care can be allowed to develop and change to meet the recognized needs of the community. Outreach programs created with the active participation of village residents are more likely to succeed.

Community-based health insurance schemes include—

- Innovative financing—such as community credit, revolving funds to purchase pharmaceuticals through a local network pharmacy or directly through the proposed buying co-op—to be dispensed through new rural health care delivery models
- The development of different types of prepayment schemes, including cash, barter, or service-in-kind

When examining possible innovative community-based health insurance schemes, all initiatives should be considered in broad terms, not just as financing mechanisms. Although these innovations are growing in importance, they are not universally defined but are instead adapted to the specific communities they serve. The goal should always be to promote an integrated health management delivery system that manages and measures the behavior of both providers and patients with the outcome objective of achieving optimum patient wellness, disease prevention, and treatment. Properly structured, the health care delivery system achieves this goal through an integration of resources and the efficient use of products and services. Adding financial resources without introducing accountability and control into the system would be a wasted effort, and long-term success would be doubtful.

Any community-based health insurance scheme would be introduced in consultation with governmental agencies and partners. Private health care insurance mechanisms would be developed with several large employers and insurers. The SEAM Program would play a

facilitating role between interested parties, and technical assistance could focus on rational use of covered pharmaceuticals and the development of appropriate management information strategies, claims submissions, and costing formulary lists.

Public and Private Sector Support

The proposed interventions have been formulated in partnership with the potential implementing partners and have been discussed in detail with involved stakeholders; these interventions have widespread support in the public and private sectors, represented by the MOH and PAC, respectively. The *National Charter on Health Financing in the Kingdom of Cambodia* (MOH 1996) specifically states that “the MOH will consider, and where feasible, test other public subsidy options that might include voucher schemes, franchising of services, and other subsidized private delivery of health care.”

The proposed interventions represent an approach that would first be piloted and then phased in to include all components. Some pilot locations in the private sector expressed a willingness both to participate and to dedicate human and financial resources. In the first phase of implementation of the pharmacy network, members would receive technical assistance in business and drug management, recognition for adherence to higher quality standards, and the benefit of a campaign to promote consumer awareness of the need for high-quality pharmacy services. The group-purchasing program would lower the cost of quality pharmaceuticals, allowing for reduced retail prices. Ideally, lower profit margins would be offset by increased volume. In the second and third phases, the program would be expanded, and technical assistance would include community-based programming, including health care financing schemes designed to spread risk throughout large patient population groups.

Possible Constraints

There are at least four possible constraints on the ultimate success of the proposed intervention—

- While Cambodia has attempted to develop and implement comprehensive health sector reform, including a number of innovative public-private partnerships to deliver quality health care services, these efforts have not been as uniformly successful as hoped. A culture of sporadic enforcement of existing regulations has limited the success of various programs. This history of regulation without enforcement will be a challenge to the principles of change incorporated into the pharmacy network concept.
- The present high turnover of drug sellers must be stabilized in order for training to have a meaningful and lasting positive impact on pharmacy services.
- There is a substantial potential conflict between the principles of rational drug use and the loss of real income from the sale of unnecessary and/or counterfeit drugs.

- The positive incentives associated with network participation must be sufficient to overcome mere profit motives, and there must be an ability to effectively monitor and enforce adherence to network standards.

The Role of MSH

MSH would have a multifaceted role in the realization of the proposed strategies, primarily through providing assistance in various general areas, including strategic planning and policy development, as well as in more specific technical areas, such as pharmacy network development, pharmacy benefits management, training, the development of incentives, quality assurance, procurement strategies, and rational drug use. MSH would also serve as a troubleshooting resource and coordination facilitator. Overall, these proposed strategies are best viewed as a modest start. At the beginning, these initiatives would be pilot programs that require initial investment and subsidy and would not be self-sustaining. The ability to be self-sustaining could subsequently be achieved with growth of membership providing revenues from the sale of quality pharmaceuticals and the collection of other fees.

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Annex A: Assessment Methodology

The methodology used to collect information for this study, which uses an indicator-based approach to assessing pharmaceutical management, has become standardized in recent years by the WHO Action Program on Essential Drugs, MSH's Drug Management Program, the Harvard Drug Policy Research Group, the WHO Action Programme on Essential Drugs, the International Network for Rational Use of Drugs (INRUD), and the Pan American Health Organization (PAHO). The approach requires that a sample of different sites be visited to obtain qualitative and quantitative data from facilities, processes, and officials.

Survey Timetable and Resources

The first component involved data collection in eight selected provinces. The task of collecting data was subcontracted to PAC and took place over a period of about three weeks. Initially, much time was spent with Mr. Yim Yann, President of PAC, and Dr. Chroeng Sohkan, Director of the Essential Drugs Bureau (EDB), making key decisions on specific provinces to be surveyed, selection of tracer products, type and number of health facilities to be surveyed in each province, questions to be included in various data collection instruments, and other administrative procedures connected with the survey. Then data collectors, supervisors, and PAC Team Leaders were provided with three days of training on data collection methodologies, including the use of various questionnaires and data collection forms for different types of health facilities and drug shops. During training sessions conducted by the SEAM team, there was much discussion regarding the suitability and interpretation of certain questions included in the questionnaires. Based on feedback received from data collectors and their supervisors regarding conditions prevailing in the field, many questions were modified. Final questionnaires in English were translated into Khmer by PAC and distributed to all data collectors.

The second component of the survey involved collection of data and information by the SEAM team on the pharmaceutical sector in Cambodia, covering both the private and public sectors. SEAM team members utilized many information sources and methods for data gathering, including published data and interviews with persons from a variety of organizations, such as the MOH and its agencies, banks, drug manufacturing companies, private pharmacies, drug seller shops, wholesaling and distributing companies, and private sector institutions; persons attached to private, public, and NGO sectors involved in health were also interviewed. The objectives were to assess private sector interest, willingness, and capacity to participate in alternative options to improve public sector drug procurement, storage, and distribution; and to explore private sector retail alternatives, such as pharmacy franchises geared toward public health needs. A list of persons interviewed is included in Annex C.

A limited list of tracer items is a practical tool for quickly assessing the status of drug supply for key items. The indicator drug list should include drugs that are commonly used, cover a range of key therapeutic categories, are available at all levels of the health care system, include a range of

dosage forms, and include products used by vertical programs important to the study. It was decided to use a tracer list of 32 products that included drugs, medical supplies, vaccines, and family planning materials. This list of tracer products was also used in other availability surveys, such as several by RACHA (1998, 1999). Typical products required for treating important health conditions prevailing in the country were chosen, and their availability at different types of public and private facilities selected for the survey was measured. Following is the list of tracer products selected for survey in association with the DDF and PAC.

List of Indicator Items

Amoxicilline 250 mg cap
Amoxicilline 500 mg cap
Amoxicilline powder 125 mg/5 mL
Artesunate 50 mg tab
Atenolol 50 mg tab
Ciprofloxacin 500 mg tab
Condoms
Co-trimoxazole 480 mg tab
Doxycycline 100 mg cap
Erythromycin 250 mg tab
Ferrous sulfate/folic acid 200/0.25
Gloves, latex disposable
Hydralazine 25 mg tab
Hydrochlorothiazide 50 mg tab
Isoniazid 100 mg tab
Mebendazole 500 mg tab
Medroxyprogesterone acetate
Mefloquine 250 mg tab
Metronidazole 250 mg tab
Oral rehydration salts (1 liter)
Paracetamol 500 mg tab
Paracetamol syrup 125 mg/5 mL
Polyvidone iodine 10% 200 mL
Praziquantel 600 mg tab
Quinine 250 mg tab
Rifampicin 300 mg cap
Rifampicin/isoniazid 150/100 mg tab
Salbutamol 4 mg tab
Syringe, disposable 5 mL
Tetracycline 1% ophthalmic ointment
Vaccine (DPT or DTCoq)
Zidovudine 100 mg cap

Sample Selection

Cambodia consists of 24 provinces and municipalities. Due to lack of time and resources, it was not possible to undertake the survey in all provinces. In consultation with the EDB and PAC, eight provinces were selected for survey—

- Phnom Penh
- Battambang
- Siem Reab
- Kampong Saom
- Kampong Cham
- Kampong Thum
- Svay Rieng
- Kandal

These survey provinces were not selected on the basis of any statistical sampling method but rather on a basis of convenience, taking into account certain constraints imposed by the general study design. For example, it would have been desirable to include remote provinces such as Rotanah Kiri and Mondol Kiri, where access to drugs is seen as a considerable problem. However, these provinces have only a limited number of facilities of a given type, and would have provided less than the minimum sample size required for each type of facility to be surveyed. Nonetheless, the eight provinces selected for survey can reasonably represent the current state of access to medicines in Cambodia.

After the survey provinces were selected, the type and number of facilities of each type to be surveyed within a given province were determined. These decisions were largely based on SEAM general guidelines used worldwide, with the addition of certain types of facilities found specifically in Cambodia. The following types of facilities were studied in all eight provinces surveyed—

- ODMS⁸
- Public health centers
- Licensed private pharmacies
- Unlicensed private pharmacies
- Private drug depots A and B
- NGO/Mission hospitals
- NGO/Mission clinics
- Private hospitals, outpatient department
- Private clinics, outpatient department

It was necessary to decide on the number of facilities of each type to be surveyed within a given province in order to capture a sufficient sample size for each type of facility and ensure that data collectors could comfortably handle the resulting workload within the number of days allocated

⁸ Cambodia has 71 ODMS, which receive drugs from the CMS located in Phnom Penh. The ODMS, in turn, distribute supplies to other public health facilities such as hospitals and health centers.

for fieldwork. Accordingly, the following types and numbers of facilities of each type were surveyed in all provinces. This amounted to surveying 16 facilities within a given province and 144 facilities within all eight provinces surveyed.

Table 1. Facilities Surveyed

| Facility Type | No. per Province | Total Surveyed |
|-------------------------------|------------------|----------------|
| ODMS | 3 | 27 |
| Public health centers | 3 | 27 |
| Licensed private pharmacies | 1 | 9 |
| Unlicensed private pharmacies | 2 | 18 |
| Private drug depots A and B | 1 | 9 |
| NGO/Mission hospitals | 1 | 9 |
| NGO/Mission clinics | 2 | 18 |
| Private hospitals | 1 | 9 |
| Private clinics | 2 | 18 |
| Total | 16 | 144 |

Urban/Rural Mix

Data collectors were instructed to keep a proper balance between urban and rural locations when selecting facilities to be surveyed. Since rural facilities may pose different access problems within any province, the rural-to-urban facility mix was kept at a 65 (rural) to 35 (urban) ratio. A rural location is defined as one located at least 15 kilometers from the provincial capital. Adherence to the defined ratio prevented the tendency to concentrate the survey around the provincial center.

The task of undertaking the field survey in eight provinces was contracted out to PAC. A team consisting of 18 pharmacists engaged by PAC for data collection performed the field survey. Two data collectors were assigned to each of the seven provinces excluding Phnom Penh. Due to the relatively large population of Phnom Penh, two teams of two data collectors were assigned to cover this area.

PAC also employed a team of four supervisors who traveled to each of the eight selected provinces. The supervisors provided guidance to data collectors during the survey. In addition, six other team leaders were engaged to assist the SEAM team with the general organization of the survey, deal with administrative issues, direct operations from Phnom Penh, monitor the survey progress, supervise data entry, and prepare a survey report.

Before proceeding to the field, the 18 data collectors, four supervisors, and six team leaders were provided with three days of training. This training was held May 1–3, 2001, at the Sunway Hotel in Phnom Penh. The SEAM team provided the training, with contents translated into Khmer.

Many modifications had to be made to the questionnaires to reflect actual field conditions. The training also included a trial survey undertaken by data collectors in Phnom Penh on May 3, 2001. After this trial, data collectors made a presentation of their findings. This session proved to be very useful, as it provided an opportunity to discuss data collection problems experienced in the field and how best to deal with them.

Teams of data collectors left Phnom Penh on May 6 for their respective provinces and returned on May 17, 2001. On May 18, a full day was spent reviewing the data and drug samples brought back by data collectors from the provinces. Although it was not possible to go through all questionnaires in detail for errors and omissions, many obvious errors, shortcomings, and dubious instances of data capture were identified and rectified. In addition, drug samples purchased by data collectors in the provinces were identified with correct drug names, specifications, and other information required for testing in the United States.

Annex B: Cambodian Team

Team Leaders

| | |
|----------------|---|
| Yim Yann | President of the Pharmaceutical Association of Cambodia (PAC) |
| Chroeng Sokhan | Vice-Director, Department of Drugs and Food (DDF) |
| Ty Kim Suor | Pharmacist, Chief of Essential Drugs Bureau (EDB), DDF |
| Kov Bun Tor | Pharmacist, Deputy-Chief, EDB, DDF |
| Kiev Sochealy | Pharmacist, EDB, DDF |
| Duong Dary | Medical Assistant, EDB, DDF |

Supervisory Team

| | |
|----------------|--|
| Sim Buth Sakun | Pharmacist, Deputy-Chief of Drug Registration Bureau |
| Mam Boravann | Pharmacist, EDB, DDF |
| Lim Ratanak | Pharmacist, Drug Controller, DDF |
| Ouch Sam | Pharmacist, Municipality Health Department |

Field Staff

| | |
|-----------------|---|
| Tep Keila | Pharmacist, EDB, DDF |
| Kong Panha | Pharmacist, Drug Regulation Bureau, DDF |
| Huot Seng Thong | Pharmacist, Pharmaceutical Trade and Narcotics Bureau |
| Korm Saroeun | Pharmacist, EDB, DDF |
| Ouk Kan Kosal | Pharmacist, Supervisor, EDB, DDF |
| Buoy Ponhata | Pharmacist, Municipality Health Department |
| Peou Chanthy | Pharmacist, Municipality Health Department |
| Sum Serei | Pharmacist, Municipality Health Department |
| Pan Chroeng | Pharmacist, Municipality Health Department |
| Nop Nan | Pharmacist, Municipality Health Department |
| Mao Dareth | Pharmacist, Municipality Health Department |
| Keo Kosal | Pharmacist, Municipality Health Department |
| Nhem Sonn | Pharmacist, Teacher at the Faculty of Pharmacy |
| Suon Rasy | Pharmacist, Supervisor, EDB, DDF |
| Ouk Sovann | Pharmacist, Drug Regulation Bureau, DDF |
| Mey Sopheak | Pharmacist, Drug Registration Bureau, DDF |
| Van Mony | Pharmacist, EDB, DDF |
| Cheng Sun Kaing | National Center for Traditional Medicines |

Note: All pharmacists are members of PAC.

Annex C: List of Key Persons Interviewed

| Last Name | First Name | Title | Company |
|--------------------|-------------------|--|--|
| Sam | Vuthy | Pharmacist | |
| Taweechai | Wootianusorn | General Manager | Asia Insurance (Cambodia) |
| Yingpong | Bhokanandh | Assistant General Manager | Asia Insurance (Cambodia) |
| Bhokanandh | Yingpong | Assistant General Manager | Asia Insurance (Cambodia) |
| Ing Siv | Heng | Director | Battambang Women's AIDS Project |
| Kannarath, MD | Chheng | Epidemiologist | Bayon Translation & Interpretation Service |
| Seak Chhay, MD | Chap | Health System Development | Bayon Translation & Interpretation Service |
| Sodara, MD | Chan | Epidemiologist | Bayon Translation & Interpretation Service |
| Heng, MD Professor | Tay Kry | Director | Calmette Hospital |
| Phay | John | Country Director | Cambodia Family Development Services |
| Hout | Sarim | Director & Deputy General Manager | Cambodia Pharmaceutical Enterprise |
| Peou | Puth Siha | Pharmacist, Director & Vice General Manager | Cambodia Pharmaceutical Enterprise |
| Sar | Chamroeun | Pharmacist, Deputy Manager of Production Dept. | Cambodia Pharmaceutical Enterprise |
| Chiv | Bunthy | Executive Director | Cambodian Health Committee |
| Sok | Thim | Adviser to Executive Director | Cambodian Health Committee |
| Samedy | M. Y. | Professor Secretary General | Cambodian Red Cross |

| Last Name | First Name | Title | Company |
|----------------------|-------------------|---|--|
| Dara | Khlok | Staff | Council of Ministers, Office of Dept. of Nongovernmental Organizations and Human Right Affairs |
| Bury | Louise | Consultant | European Commission |
| Garcia | Roberto | European Co-Director, Malaria Control Programme in Cambodia, Lao PDR, Vietnam, Cambodia Project | European Commission |
| Ros, MD, DLSHTM, MSc | Seyha | Coordinator, Social Marketing Programme, National Malaria Programme | European Commission |
| Channy | Omh | Director of Technical Bureau | Faculty of Pharmacy |
| Youk | Chamroeunrith | Operations Manager | Forte Insurance |
| Le Roy | Pascale | Health Insurance Project, Project Manager | GRET |
| Rudolf | Schumacher | Family Health Specialist | GSP Health Systems Consultants |
| Chhom | Rada | Project Management Assistant | German Technical Cooperation Agency (GTZ) |
| Sandeep | Majundar | Director Healol (Cambodia) | Healol Pharmaceuticals Imp. Exp. Co., Ltd. |
| Paoletti | Mark | Consultant | International Monetary Fund (IMF) |
| Uth | Virak | Sales Executive | Indochine Insurance |
| Tyrninoksa | Seija | Head of Delegation | International Federation of Red Cross & Red Crescent Societies |
| Felsing | Daniel | Sales & Marketing Director | International SOS (Cambodia) Ptc. Ltd. |
| Fine | Anne | Clinic Manager | International SOS (Cambodia) Ptc. Ltd. |

Annex C: List of Key Persons Interviewed

| Last Name | First Name | Title | Company |
|---------------------|-------------------|--|--|
| Onozaki, MD, MPH | Ikushi | Chief Adviser, CENAT/ JICA National Tuberculosis Control Program | Japan International Cooperation Agency (JICA) |
| Saito | Kinuko | Project Coordinator | JICA |
| Vanny | Prok | Staff | Khemara |
| Heang | Sokhun | Director | Khunaco Import Export Co. Ltd. |
| Hem | Vutha | Vice Director | Khunaco Import Export Co. Ltd. |
| Leang | Kim Kim | Associated Project Coordinator | Lutheran World Service Cambodia Program |
| Chetra | Keo | Officer | Ministry of Planning |
| Tucker | Kathy | | Maryknoll Project for AIDS Education/Home Care |
| Hong, Pharm.D. | Chhy | Medical supply, Médecins Sans Frontières Holland- Belgium | Médecins Sans Frontières (MSF) |
| Laing | Ly | General Manager | Medical Supply Co. |
| Frys | Jean-Francois | Executive Director | MediCam |
| Sridhar | S. | Country Representative | Mega Products Ltd. |
| Rath | Sa Rath | Chief of Insurance Office | Ministry of Economy and Finance; Dept. of Financial Industry |
| Un | Taing Im | First Deputy Director in Charge of Insurance Industry | Ministry of Economy and Finance; Dept. of Financial Industry |
| Sophea | Nop | Office Administrator | Mobitel |
| Sprung | Sam-Ath Him | Sales Manager | Mobitel |
| Chea | Chhiv Srong | Director, CMS | MOH |
| Chroeng | Sokhan | Clinical Pharmacist, DDF | MOH |
| Hok | Chantheasy | Head of Procurement, Project Coordination Unit | MOH |

Access to Essential Medicines: Cambodia

| Last Name | First Name | Title | Company |
|------------------|-------------------|---|-------------------------|
| Huot | M. Heng | Pharmacist | MOH |
| Khonn, MD | Sau Sok | President, Cambodian Medical Association, Assistant Secretary of Health | MOH |
| Kimsour | Ty | Pharmacist | MOH |
| Kouch | Virya | Drug Registration Bureau | MOH |
| Kov | Bun Tor | EDB, DDF | MOH |
| Lo Veasna | Kiry | Dept. of Planning, Health Information Systems | MOH |
| Lor | Khun Hak | Chief of Administration Office, CMS | MOH |
| Mom | Boravann | EDB | MOH |
| Naron | Prem | Head of Inspection, DDF | MOH |
| Nong, MD | Sao Kry | Vice Director, National Malaria Centre | MOH |
| Phyrun, MD | Ung | Secretary of State | MOH |
| Piset, MD | Rainjsy | Director, Preventive Care | MOH |
| Sokea | Va | Pharmacist, EDB | MOH |
| Vilavann, Mrs. | Khuon | Pharmacist Specialist | MOH |
| Virya | Kouch | Pharmacist | MOH |
| Sith | Peang | Chief of Administration, Office of Communicable Diseases Control | MOH |
| Mam | Boravann | Pharmacist | MOH, EDB, Supply Unit |
| | Jonathan | Officer, Malaria Project, An-long Veng | MSF |
| Tia | Phalla | Secretary General | National AIDS Authority |

Annex C: List of Key Persons Interviewed

| Last Name | First Name | Title | Company |
|-----------------------|-------------------|--|--|
| Socheat | Lor | Vice Rector | National Institute of Management |
| Ly, MD | Heng Thay | Deputy Chief of Training Office | National Institute of Public Health (NIPH) |
| Phat, MD | So | Vice Director of Epidemiology and Disease Control Unit | NIPH |
| Em | Wanaroth | Health Education Project Coordinator | New Humanities |
| Srimaungboon, BS, MPH | Hara | Program Manager Cambodia | Program for Appropriate Technologies in Health (PATH), Mekong Region |
| Tan | Keat Chong | General Manager | PCCS Garments Ltd. |
| Yim | Yann | Immediate Past President | PAC |
| Deidrick | John | Country Representative | Population Services International (PSI) |
| Carlson | Judy | Reproductive Health Adviser | RACHA |
| Lun | Borithy | Logistics Adviser | RACHA |
| Sedtha | Chin | Member, Logistics Supervisory Team | RACHA |
| Sturgis | Richard | Program Manager | RACHA |
| Chhay | Nay | General Manager | Roussel Cambodge |
| Attwood | Stephen | Molecular Ecology scientist | The Natural History Museum, London, UK |
| Poirot | Etienne P. | Project Officer HIV/AIDS | UNICEF |
| Ung | Vanny | Senior Project Assistant—Health | United Nations Children’s Fund (UNICEF) |
| Mamlouk | Maria | Program Officer (temporary) | U.S. Agency for International Development (USAID) |
| Bradshaw | Lois | Program Development Officer | USAID/Cambodia |

Access to Essential Medicines: Cambodia

| Last Name | First Name | Title | Company |
|------------------|-------------------|--|-----------------|
| Chak, MD | Chantha | Project Management Specialist, Office of Health/Humanitarian Assistance | USAID/Cambodia |
| Levitt | Daniel M. | Population Fellow, Office of Public Health | USAID/Cambodia |
| Ngudup | Paljor | Maternal and Child Health Adviser, Office of Public Health | USAID/ Cambodia |
| Barreneche | Oscar | HIV/AIDS and Blood Safety Program | WHO |
| Bekedam | Henk | Team Leader Health Sector Reform Project | WHO |
| Hoyer | Stefan | Medical Officer for Malaria Control | WHO |
| Kim, MD | Sovann Yadany | Medical Officer for Malaria and Dengue | WHO |
| Messervy | Pamela | Programme Management Officer | WHO |
| Pigott | Bill | WHO Representative in Cambodia | WHO |
| von Xylander, MD | Severin | Medical Officer, Child and Adolescent Health & Development | WHO |
| Godwin | Peter | Adviser to Cambodia's National Center for HIV/AIDS, Dermatology and STD (NCHADS) | World Bank |