

# CHAPTER I

## 1. Introduction

Over the past twenty years, the civil war has left Cambodia with poor public services and infrastructure compared with the rest of the Western Pacific region. Although many frameworks or mechanisms for health development are already in place, the health status of the Cambodian people remains very low among the lowest in the Western Pacific region countries. (Ministry of Health, 1999). One of the important health care services need to solve this problem is disease surveillance. It is well recognized that laboratory based surveillance is far more sensitive and accurate than clinical examination (WHO, 1994). According to Carter (1996), laboratory investigations are an essential part of health care system especially in developing country because of the higher prevalence rate of communicable diseases. Thus, strengthening the laboratories at all levels of health agencies will contribute to the improvement of the health care services and public health.

The availability of appropriate supplies is a prerequisite of good laboratory services. At present, the situation of supplies to the majority of laboratories in Cambodia is considered inappropriate (inadequate, of poor quality, and high cost). The problem of inappropriate laboratory supplies, including the influencing factors will be the issue addressed in this study.

This chapter will identify the problems regarding the supply of reagent and equipment to laboratory services, describe the organizational backgrounds of health laboratory services in the current Cambodian health system, identify the key actors involved in the system, and provide the objective and the scope of the study. Finally, it will describe the organization of the next chapter.

## **2. Problem Statement**

The government budget devoted to the health care sector is insufficient for implementing the health services. From 1995 to 1998, the Ministry of Health (MoH) maximum per capita spending for health operating cost was only 1.6 US\$ (Table 1.1). There were increasing annual laboratory expenditures for purchasing reagent/material (not including equipment) while the total MoH expenditure decreased (Table 1.2). With the budget shortfall being a norm, it should have used cost effective methods; but during this period, there were many reports about the reagent expiring because too much was provided, or they could not be used because of their poor quality. This meant that money for lab services was used ineffectively, a certain amount was wasted through the reagent and consumable laboratory materials that expired.

The evidence of budgetary waste from expiring reagents in three hospitals showed losses of about 12,600 US\$ (Table 1.3), and the prices of the products for laboratories purchased by the MoH are higher than the free market price (see table 4.3). A review

of nine items that were available in the market from the same company showed an average of 28.4% higher cost.

Table 1.1 Ministry of Health Expenditure per Capita

Years	1995	1996	1997	1998
Expenditure	1.03	1.62	1.58	1.08

Sources: MoH Health situation Analysis 1998

Table 1.2: The annual Expenditure of Laboratory Services and MoH Operation Cost

Year	Lab expenditure in US\$	MoH expenditure in US\$	% of lab expenditure of total MoH budget
1996	296,703	15.9M	1.86
1997	1,220,345	14.3M	8.53
1998	780,189	11.3M	6.90
1999	1,078,565	13.7 M	7.87
2000	1,302,122		

Source: 1. MoH procurement unit

2. MOH budget expenditure book

3. MOH public & private partnership project report 2000

Table 1.3. Cost of the Reagents that cannot be used found in three National Hospitals

Hospital name	Budget from the unused reagent
Mother Child Health	5,304 US\$
Phreah Norodam Sihanu	4,973 US\$
Pediatric	2,338 US\$
	12,615 US\$
As % of 2000 budget $12615 / 1,302,122 = 0.97\%$	

Sources : data collection 2001

The amount of waste found in the three hospitals is about 1% of total lab expenditure. This figure is not the serious problem, but if consider on the economic constrain of Cambodia that health personnel receive wag range from 10 to 15 US\$, this amount is enough to pay for about 1,000 of staffs. Moreover, this data was collected from only 7% of the numbers of laboratories (5 of 73 hospitals), therefore, the problem may be more serious problem if in 100 % of laboratories were examined.

There are reports that microscope slides purchased in 1997 and in 1998 around 17,200 boxes of 50 slides were of poor quality. The slides had fungus on the surface making it difficult to see the morphologies of the materials investigated. ( Lab Committee report 1998, 1999 ). Many types of equipment were reported unserviceable because they were of outdated models or in poor condition. Some laboratories receive equipment which cannot be used while many other laboratories have no equipment, not even the most basic one

Expensive equipment such as Spectrophotometer (Cost around 10,000 US\$) in the National Institute of Public Health laboratory (NIPH), supplied by the World Bank (WB), was reported unused due to need of specific and very expensive reagent that the laboratory cannot afford (sub CoCom lab, 1999). Another spectrophotometer supported by Gesellschaft fur Technische Zusammenarbeit Agency [(GTZ) Agency for Technical Cooperation, Germany] to the referral hospital Neik Loueng was reported unserviceable because of technical problems, and lack of electricity (Report of NIPH supervision team, 1997).

Effective laboratory services mostly depend on appropriate reagent supplies, equipment, and manpower. Therefore, WHO (1994) has recommended to all laboratories in developing countries that, it is important to use appropriate equipments and reagents, meaning that, “ use the good quality standard of supplies in all laboratories of the network in the interest of economy, reliability of the results and standardization of the method ”(p.27)

Currently, laboratory services in Cambodia do not meet this principle because there is no standard of supplies regarding equipment, reagent, consumable materials and test methods for all level of labs. In regard to the appropriateness of the supplies for laboratory services this study will considers adequacy, condition and price of equipment and reagent supplies. The problems occurring at the present are related to these three main points, so the current lab supply system is considered inappropriate.

### **3. Impact of the Inappropriate Laboratory Supply**

The quality of laboratory materials, equipments, and reagents is critical to the reliability of test results that is essential for supporting and promoting diagnostic, therapeutic, and proper diseases surveillance with efficiency. The current situation of laboratory services in Cambodia is differences from this concept. Inappropriate lab supplies reduce or negate the effectiveness of lab services performance in supporting curative and preventive care. Low quality of reagents materials and equipment lead to unreliable test results that affect treatment and cause treatment failure. Inadequate supplied lead to unavailability of tests, leaving the physician with no choice and having to provide diagnosis or treatment without laboratory testing; this is inappropriate with the treatment guidelines, so it increases the irrational treatment.

The government prefers to have only one Supplier Company for providing all types of supplies to health sector including laboratory supplies. In general the amount order for the whole country used of lab supplies is provided from several companies and these companies have no agreement to sell their products to MoH. They have to pass through the monopoly supplier of MoH, and of course, this supplier must take benefit by increasing price of product. Therefore, the government will lose a lot of money from purchasing high cost product and communities' need to pays more for the service fee that calculated from the cost of supplies. In addition, the expired reagent over stocking from duplication of supply in some laboratories lead to wasteful and under utilizes of laboratory budget that affect to the development of health services.

## **4. Organizational Background of Health Laboratory**

### **4.1 Brief History of Health Reform**

In 1995, the general health policy in Cambodia required a clinic in each commune, a hospital in each district capital and a provincial hospital in each provincial capital. There were 8 national hospitals, 22 provincial hospitals and 164 district hospitals in the country. A health coverage plan for rationalizing the allocation of health infrastructures, based on the population and geographical access criteria (see appendix A) was initiated in 1996 (MoH, 1997) and is slowly being implemented across the country. Also in 1996 Geographic boundaries for health services were redefined switching to 8 national hospitals and 65 operational districts with 792 health centers. Required standard equipment and activities have been defined according to the level of health facility.

There are three levels in the health system, 1) central or national level, (2) intermediate level (provincial health department), (3) peripheral level (Operational District which consists of referral hospital and health center). The new health system provides two types of activities, Minimum Package of Activities (MPA) for health centers and Complementary Package of Activities (CPA) for referral hospitals (see appendix A). The new system of referral hospitals (RH) and health centers (HC) changes the amount, types and categories of laboratory work. The number of

ต้นฉบับ หน้าขาดหาย



There are additional specific laboratories such as a Quality Control Laboratory for determining the quality of drug, water, or chemical products. The national Institute of Public Health for Research Activities laboratory, Medical School laboratory University Laboratories do not regularly receive supplies from MoH. Some are supported by NGOs and some are autonomous.

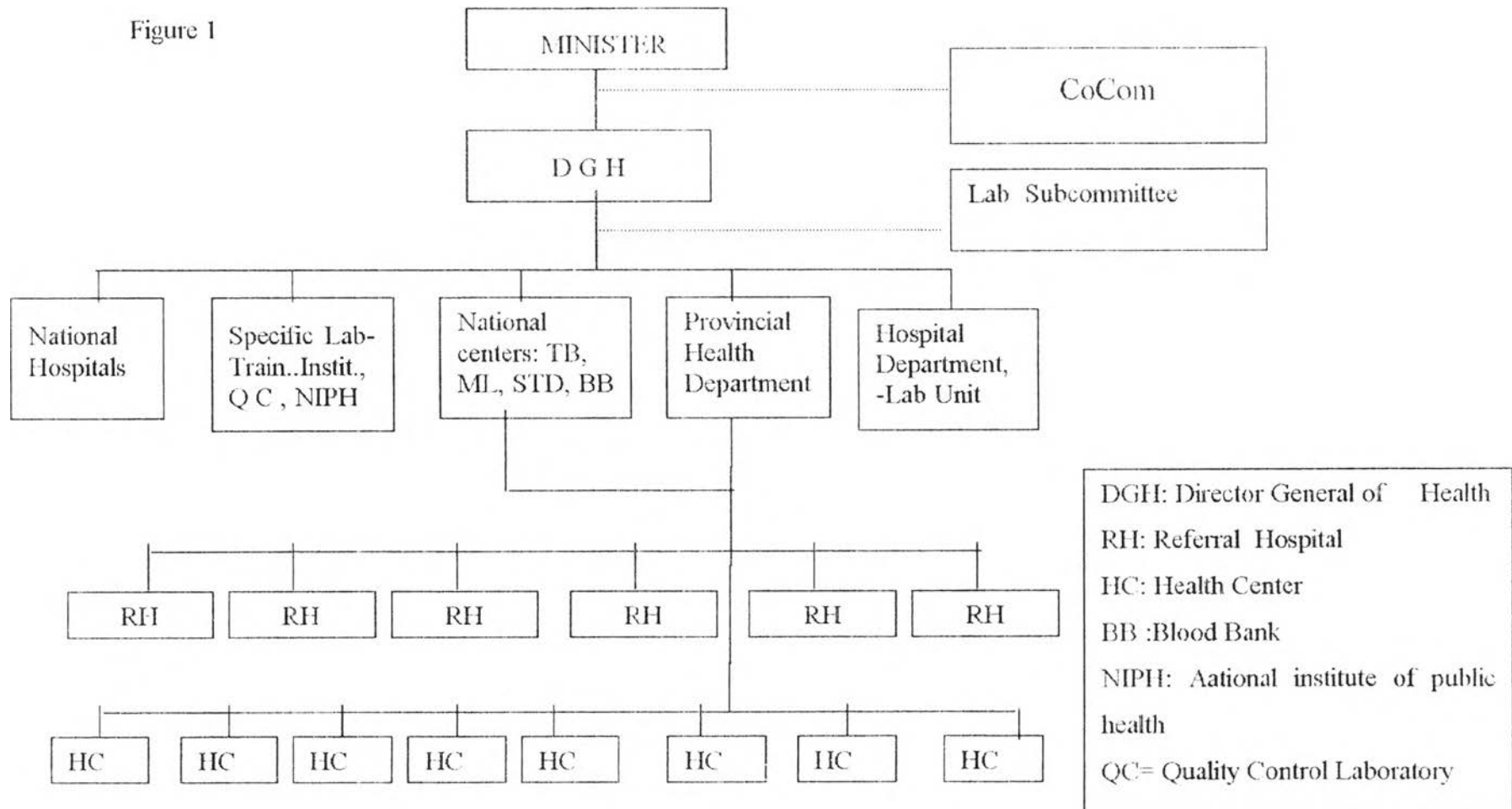
GPLs perform activities at National Hospitals (NH) and RHs. Each laboratory works independently. There is no referral system for quality control. The MoH has not yet determined any policy or guideline for quality control of laboratory services and the National Laboratory Reference Center works only for public health research and in services training. Moreover, NHs are also RHs according to the new health coverage plan.

The NPL has a network for all levels of the health structure, HC, RH, and NH. The HC can act as a sentinel and play an important role in providing diseases information for public health interest. However, each program focuses on a particular disease. Due to economic constraints, the MoH is not able to provide separate laboratory facilities for both programs at the referral hospital or National Hospital. The NPL activities for specific diseases are closely linked with the functions of the hospital so the GPL and NPL are working together in the same laboratory. In this case, one RH normally receives supplies from three programs (TB, ML, GP) or four if it also belongs to an Sexual Transmitted Diseases network.

Some national programs occasionally provide incentives to the staff who work for the program, but not other staff in the same laboratory. This often causes conflicts among the staff due to unequal incentives, and makes the relationship in the performance of services worse. Figure 1 is the organization structure of laboratory services in Cambodia.

## Organization Structure of Laboratory Services

Figure 1



### **4.3 Current Situation of Laboratory Supply**

In general, the NPL receives supplies from two sources, first is from MoH, and the second is from donors (NGOs) or lending agency such as WB. Officially, the National Programs are under the authority of the Director General of Health. In practice, they operate the activities semi-autonomously in a vertical process. The NPLs collaborate with donors to develop the supply system to all networks in independently isolation from the MoH system because the donors interested to support only NPLs, and provide the budget directly to the NPLs no need to inform the MoH. Supply plans, distribution, training, and monitoring are controlled from the central level head quarter.

The financial resources for GPL generally come from the MoH, but some hospitals have the user-fee system to aid in obtaining MOH supplies (not all hospitals have this system because it is a pilot project of MoH). Few laboratories get support from international organizations. The laboratories that get support from donors have more reagents, material, and equipment than those that have no support. The availability and accuracy of test performance is high (for example in the Mother, Child Health Hospital). Staffs have trained with techniques following international lab technical advisors. New technology and expensive methods of testing are partly introduced by this way.

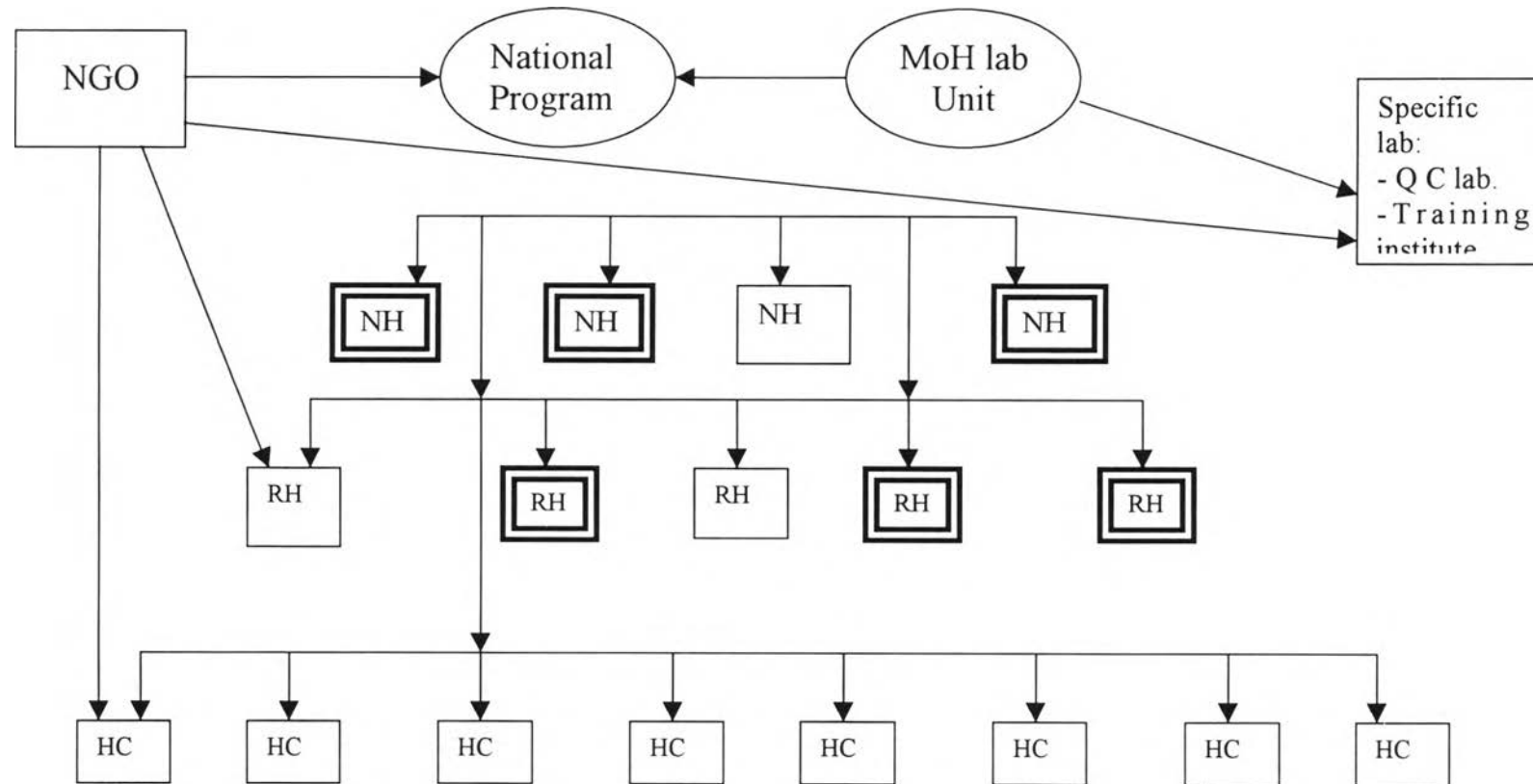
From the user fee system, the hospital has the budget to purchase the reagents and materials for used in the laboratory. Due to no standard, the type of reagent purchased

for each hospital is different from one hospital to another; therefore, the request list for reagents and materials sent to the MoH have many types of specifications for item that are impossible for the MoH to provide.

The MoH provide only essential reagents and materials according to the needed of CPA activities, but the uncertainty demand for the types of laboratory test of physicians and patients (some patients ask for laboratory testing without consult with physicians) are larger than the types of test in the standard of MoH. Therefore, to have available of laboratory test answer to the need of physicians or patients, some hospitals allow the laboratory staff to perform the activities that could provide the test that do not have in the standard of the MoH. So the types of test decided by the MoH lab committee seem not applicable at the national hospital labs because they use more supplement of supplies that has to purchase by hospital budget (if the hospital has fee system) or staffs money (individual or group).

Figure 2.

Diagram of interrelated of laboratory supply



Note. NH= National Hospital, RH= Referral Hospital, HC= Health centre



= Some hospitals with User Fee system. The fee was used to purchase supplement reagents



= Flow of supply

## **5. The Coordination Actors in the Lab Supply System**

The current system of laboratory supply involves many internal and external actors. These range from state government administrators to laboratory professionals at the implementation level. All these actors are influenced and effect the laboratory supplies system. The interrelationship of supplies among the key actors is complicated regarding the decision-making power and practices.

### **5.1 Government Policy Makers**

Government policymaker include state administrators, economic planners, and coordination committee (CoCom) members. The government has been involved with health supplies through the financial policy process and the procurement strategies. According to government financial policy, the MoH has financial expenditure control with concurrence by the Ministry of Economic and Finance (MEF) also required. The total procurement list for all health supplies has to be submitted to the MEF for funding approval.

The current financial system has a long process of documentation and adoption. It requires many steps from the MoH to the MEF. Moreover, the national money cycle from taking taxes and distributing them to the health sector is always late. In this case, the budget approval also is late the lead to resulting in late arrival of goods negatively

effecting to the performance of the health services. The actual work situation of health supplies always involves the state administrator; in order to solve this problem, the state administrator decided on a strategy for MoH to purchase all the health supplies from a monopoly supplier (Sokkimex Company Limited) who can afford to pay ahead, then be reimbursed from the MEF later. Therefore, the complicate system of financial approval at the MEF is handle by the Sokkimex company.

## **5.2 Coordination Actors at the MoH**

In the post political conflict involving development of the health sector the MoH has established a mechanism for coordination that reflects overall health development and international aid coordination.

### **5.2.1 Coordination Committee (CoCom)**

The Coordination Committee was chaired by a Secretary of Health and its members included representatives from MoH, WHO, UNICEF, UNDP, ICRC, bilateral agencies and leading NGO representatives in health. The mission of CoCom was defined as the relationship between the national authority and the range of the actors in the health sector. The CoCom objectives were to monitor and evaluate all profound health activities carried out by the international aid agencies working in the health sector; to provide advice and make recommendations to MoH in order to support planning,



coordination and implementation of health sector activities; to evaluate health information and health activities mapping which identify the priorities, and constraints, and to recommend national policy and plans for public health sectors; to review the need of financial resources for health, human resources and to facilitate the most appropriate use of technical advices to the MoH and to provide information on currently planned activities to the international agencies working in health and to review the proposal of all external funded project to ensure the consistency with national health policy (Lanjou S. et al, 1999 p.229).

The CoCom is supported by a secretariat and executive committee, which chaired by the Cabinet Director and includes the Director General of Health, Director of Planning and Policy, and the Director of International Relations. Technical assistance is provided by the WHO representative and other representative from donors agencies participate in the CoCom meeting. The MoH also established a number of CoCom sub-committee to assist and advise the MoH on specific health services.

The health NGOs and international organizations working in the Cambodian health sector have established a coordination mechanism committee at the national level called MEDICAM. The elected representatives of MEDICAM have joined in the CoCom. MEDICAM also appointed representatives to participate in the CoCom Sub-Committees.

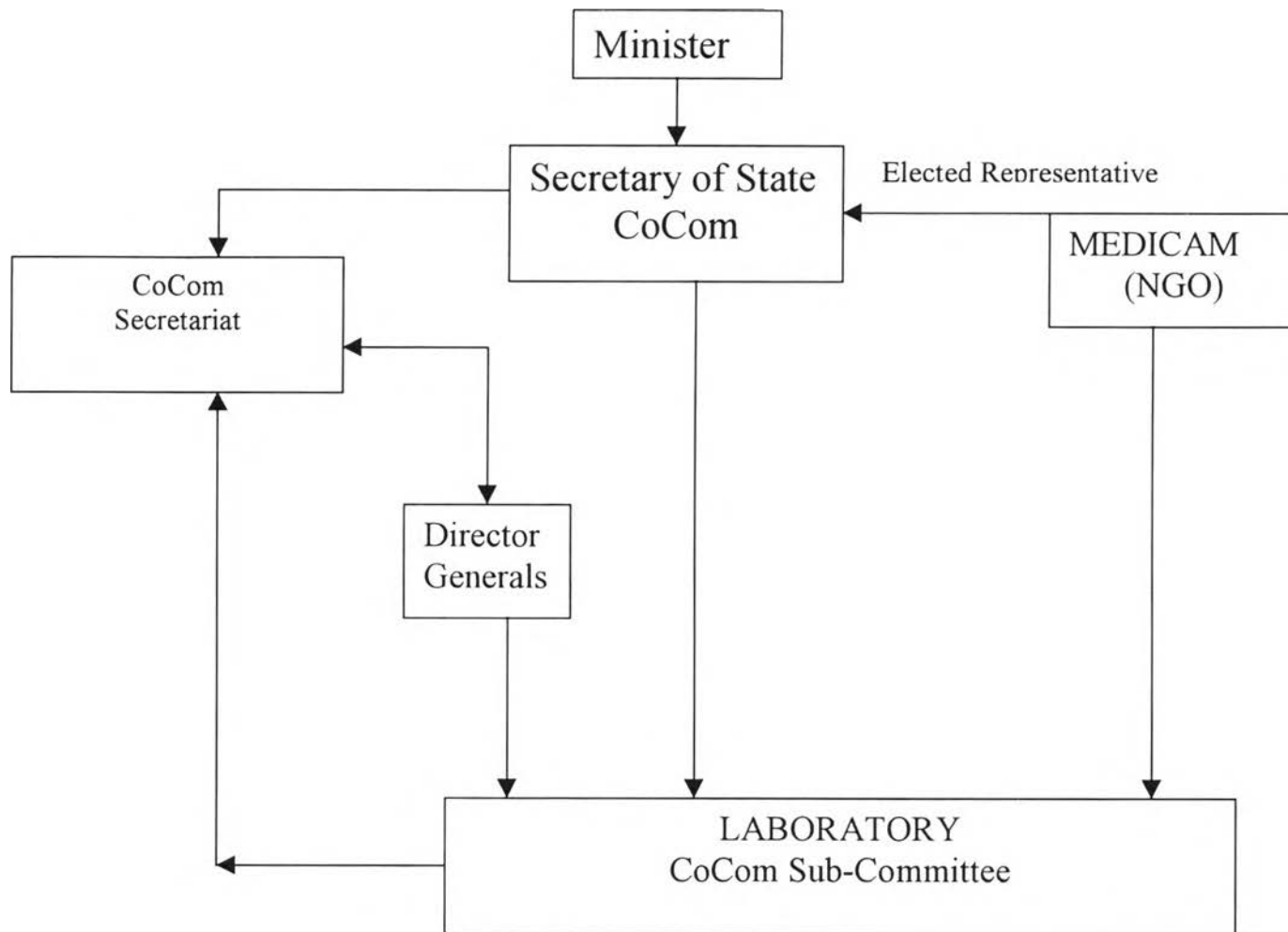


Figure.3. Coordination Committee Of the Ministry of Health

### **5.2.2 Laboratory CoCom Subcommittee (LCS)**

In order to develop and strengthen laboratory services, the MoH established a LCS in 1995. The main role of LCS is to provide the information to the MoH on the matter of lab services, and also to represent the CoCom in formulating the National Laboratory Policy, in developing lab standard guideline and frameworks for the current and future development of laboratory services, in assisting in solving problems related to services performance. The LCS collaborated with and involved all agencies that relate to laboratory as seen in the term of references (appendix B). The members of the LCS are from the National Centers, National Hospitals MoH and NGOs that are appointed by MEDICAM or the NGO related with laboratory works.

Laboratory supply known as a chronic problem since 1996 by CoCom laboratory subcommittee (LCS) because of the inadequate, poor quality and expired reagent. To solve this problem LCS establishing the draft standard of lab items (see appendix C), standard technique, test method for rationalizing the supplies in 1996 and the same time the LCS established the proposals to integrate the lab supply for all programs. LCS has also proposed to change the laboratory structure to have the single lab administration for strengthening the lab service and avoids separate system between national program and general program with several recommendations for improving the lab supply system. The proposals have seen by Director General of Health (DGH) but no opportunity to enter into the CoCom agenda due to some reasons (see analysis). The

Director General for Health has no authority to decide on such proposals, therefore, until now; none of the framework established by the LCS has been approved.

The standard list of laboratory also not yet approved by DGH, but it was implemented by the MoH officers that responsible for lab services as the guideline for supply to laboratories due to the difficulty in getting information of need from laboratory agencies. The result of many expired reagents showed that the standard list is inapplicable and need revising.

### **5.3 MoH Laboratory Unit**

The role of laboratory unit is to provide the lab supplies in terms of materials and reagents to all GPLs and NPLs and to assist in managing the lab services including monitoring, and evaluation of activities provided. The national programs receive the lab supplies from the MoH in whole amount and distribute to their network by it's own system including reagents they purchased from donated budget. In practice, the MoH lab unit is unable to interfere any laboratory matter in the national programs such as the donated budget or supplies for donors, management of supply, allocation plan and monitoring.

The lab unit is the implementation organization for any laboratory policy or guideline from the LCS that has already been approved by MOH. Currently this unit does not

perform its entire role well because the LCS has not had any comprehensive system for supply and frameworks for development.

#### **5.4 International Organization**

There are 59 internationally based and 29 locally based NGOs registered as active in the Cambodian health sector (MEDICAM, 1999). Theoretically, the role of international organizations should be defined by CoCom but in practice international organizations have their own agendas, draw their own plans. They just need to send plans to the relevant authorities if required, which usually approved the plans anyway. Several donors support laboratory services and mainly in the area of national programs by approval from state administrator or CoCom.

The leading organizations that have contributed to the laboratory services are World Bank (WB), Asian Development Bank (ADB), Japan International Cooperation Agencies (JICA), European Union (EU), Medecins Sans Frontieres (MSF), Gesellschaft für Technische Zusammenarbeit [GTZ (Agency for Technical Cooperation, Germany)], and World Health Organization (WHO). The government has made an agreement with the WB and ADB for health investment in rehabilitation of health services and facilities through new construction and provision of the medical equipment to those facilities. The laboratory equipment is one of the items in the rehabilitation program. The WB is an important external supplier of laboratory equipment to all newly creating

RHs and agencies that responsible in Communicable Diseases Control Program. Therefore, almost all the National Program agencies and some specific health institutions were supported by the WB in terms of equipment, reagents and renovation of the laboratory facilities. The NGOs only support the programs in which they interested and select. For example, JICA support MCH and TB centers, the EU and WHO assist the ML program, GTZ support the National Institute of public health.

## **6. Objectives and Scope of the Study**

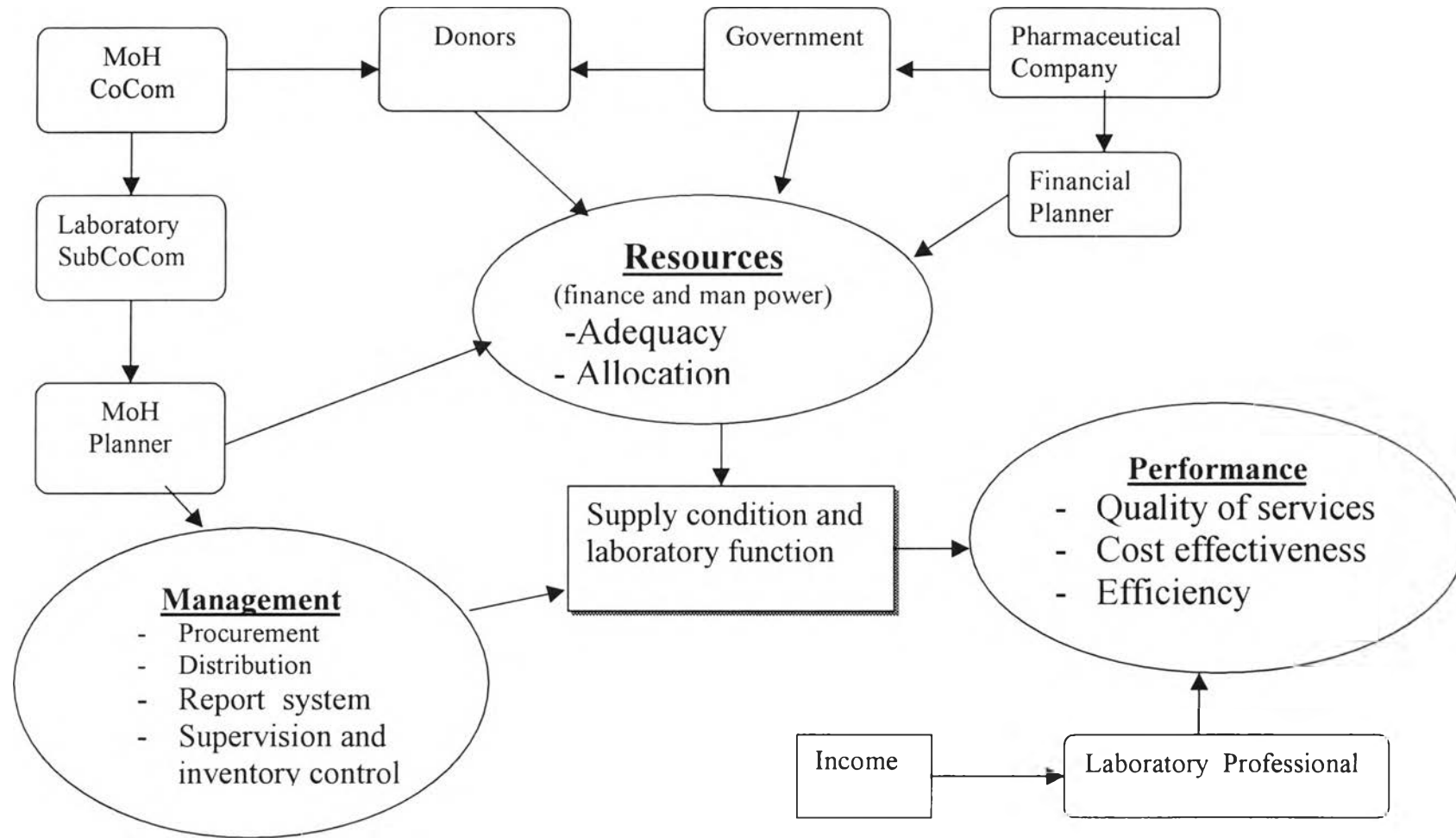
### **6.1 Objectives**

This study attempts to fulfill three objectives:

- 1) To explore the extent of the problems related to the quality and condition of supplies, reagent and equipment and laboratory professional in the Cambodian health system.
- 2) To identify the factors influencing the performance of laboratory services.
- 3) To propose possible strategies for improving the laboratory services.

### **6.2 Conceptual Framework**

Figure 4



**Framework of influencing factors**

### **6.3 Scope of the study**

According to the above framework, two main factors affect the supply condition and laboratory function. First, is the adequacy of resources and the process of allocation. Resources are included financial and manpower which is related to number and capacity of staff. Second, is management of supply that includes procurement, distribution, information, and supervision. These two factors influenced by the key players from high level who has power or role in financial allocation, policy decision and managing laboratory supplies. At the performance level, the laboratory professionals are the influence actors who respond in providing services. The influences of the lab professional to the condition of supplies and function of laboratory appear from their practice habit that related to their interest.

The players represent as the most influencing factors because, they do not directly cause the supply condition but through their allocation of resources, management or administration of supply. Therefore, this study will focus on the key actors and the laboratory agencies that regularly receive reagents and material supplies from the MoH as a part of the three objectives divided earlier.



## **7. Organization of the Remaining Chapters**

Chapter two reviews the relevant literature on problems related to laboratory supplies especially the behavior or nature in practice of the key players or stakeholders in the health system that may influence the performance and development of health services in low income countries. Chapter three describes the methodology employed for the study, explaining how information was collected and the sources of the information. Finally the limitations of the study. Chapter four presents the findings and analyzes the result of the study. Chapter five provides the factual conclusion and a set of recommendations that can be translated into strategies to improve laboratory supplies. Chapter six is the presentation part of the thesis examination; this chapter is as the presentation form with slides to be used during the thesis presentation. Chapter 7 is the annotated bibliography. This is the brief overview of major books or report documents that the researcher have consulted during thesis preparation. All of these are the general overview of the thesis with the expected outcome of improving and rationalizing the laboratory supply system in Cambodia and providing a good impact on public health expenditure to upgrade the quality of health care delivery with reasonable price which people can afford.