

COST ANALYSIS OF PRIMARY HEALTHCARE CLINICS: A CASE STUDY OF COMMUNITY
BASED ORGANIZATIONS IN MYANMAR IN 2013



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การศึกษานี้เป็นการวิเคราะห์ต้นทุนของคลินิกรักษาพยาบาลระดับปฐมภูมิที่บริหารงานโดยองค์กรระดับชุมชน (Community-Based Organizations หรือ CBO) ในประเทศเมียนมาร์ในปี ค.ศ. 2013 โดยคลินิกรักษาพยาบาลถูกแบ่งเป็น 3 ประเภท ได้แก่ ประเภท A (คลินิกที่ตั้งอยู่ในโรงพยาบาลและมีการให้บริการแพทย์ทั่วไป บริการแพทย์เฉพาะทาง และการวินิจฉัยโดยใช้แลป) ประเภท B (คลินิกตั้งเดี่ยวที่มีการให้บริการแพทย์ทั่วไป บริการแพทย์เฉพาะทาง และการวินิจฉัยโดยใช้แลป) และประเภท C (คลินิกตั้งเดี่ยว ที่มีการให้บริการแพทย์ทั่วไปเท่านั้น) คลินิกที่ใช้ในการศึกษาแทนประเภท A B และ C ได้แก่ โรงพยาบาล Wachet Sangha องค์กร Bya-Mha-So Civil Serviced Organization และคลินิก Well-hearted Sea Charity Clinic ตามลำดับซึ่งทั้งหมดตั้งอยู่ในเมืองมันดาเลย์ วิธีการคำนวณต้นทุนของคลินิกประเภท A และประเภท B ใช้การปันต้นทุนแบบ Step Down โดยมีราคาซากเท่ากับร้อยละ 10 ของราคาซื้อขายของทุนแต่ละรายการและใช้วิธีการแบบ Straight Line ในการหาค่าเสื่อมราคา วิธีการคำนวณต้นทุนของคลินิกประเภท C ใช้การปันต้นทุนแบบจำแนกโดยตรง (Direct Allocation) ทั้งนี้ที่วิธีการคำนวณต้นทุนมีความแตกต่างตามประเภทของคลินิกนั้น ก็เพราะประเภท C มีศูนย์ต้นทุนเพียงศูนย์เดียว ในขณะที่ประเภท A และ B มีศูนย์ต้นทุนมากกว่าหนึ่งศูนย์ นอกจากนี้ การคำนวณต้นทุนทั้งหมดยังได้รวมต้นทุนค่าเสียโอกาสของบุคลากรทางการแพทย์ (ซึ่งได้บริจาคเวลาให้กับคลินิกเหล่านี้) โดยใช้ฐานเงินเดือนที่บุคลากรทางการแพทย์ได้จากรัฐบาล

ผลการศึกษา พบว่า ต้นทุนต่อหน่วยของศูนย์ต้นทุนผู้ป่วยนอกที่เกี่ยวข้องกับแพทย์ทั่วไป สำหรับคลินิกประเภท A B และ C เท่ากับ 6,020 MMK 2,108 MMK และ 1,102 MMK ตามลำดับ นอกจากนี้ การศึกษายังได้ทำการวิเคราะห์ความอ่อนไหว (Sensitivity Analysis) โดยกำหนดให้วิธีการหาค่าเสื่อมราคาแตกต่างไปจากเดิม ราคาซากแตกต่างไปจากเดิม และกำหนดให้ใช้ฐานเงินเดือนที่บุคลากรทางการแพทย์ได้รับจากภาคเอกชนแทนต้นทุนค่าเสียโอกาส พบว่า ไม่ว่าจะใช้ข้อสมมติใดก็ตาม ต้นทุนต่อหน่วยของคลินิกประเภท A ก็ยังสูงกว่าประเภท B และ C อยู่ดี โดยความแตกต่างของต้นทุนรวมและต้นทุนต่อหน่วย ขึ้นอยู่กับการเปลี่ยนแปลงค่าเสียโอกาส อัตราการใช้บริการ และทรัพยากรที่แต่ละคลินิกใช้ในแผนกบริหารเป็นหลัก ผลการศึกษานี้มีนัยยะต่อการจัดทำสัญญา ระหว่างรัฐบาลเมียนมาร์กับคลินิกภายใต้การบริหารงานขององค์กรระดับชุมชน ในการขยายการให้บริการทางสุขภาพ เพื่อให้ครอบคลุมประชาชนได้กว้างขวางมากยิ่งขึ้น

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This study is a cost analysis of primary healthcare clinics of community-based organizations (CBO) in Myanmar in 2013. CBO primary healthcare clinics are categorized into three types: type A (clinic that is housed in a CBO-based hospital, with general practitioners, specialists and laboratory services), type B (clinic that is not housed in a CBO-based hospital, with general practitioners, specialists and laboratory services) and type C (clinic that is not housed in a hospital, and has general practitioner services only). The facilities that represent type A, B, C in this study are Wachet Sangha Hospital, Bya-mha-so civil-serviced organization, Well-hearted Sea Charity Clinic respectively and they are all located around Mandalay city. The costing method for type A and type B is the step-down allocation method, with the salvage value being 10% of the original value and the depreciation method being straight line. The costing method for type C is the direct allocation method. The difference reflects the fact type C has only one cost center (general outpatient department, OPD), whereas type A and B have more than one (general OPD, eye OPD, dental OPD and other). Opportunity cost of donated labor (by medical personnel) are also factored into the calculation based on the government's salary.

The unit costs of general OPD for type A, B, C are 6020, 2108, 1102 MMK respectively. Sensitivity analyses are also performed, assuming different depreciation methods, salvage value and using private sector salaries for opportunity cost. The unit cost of type A is still higher than B and C. The difference of total costs and unit costs depends mainly on changes in opportunity cost, the utilizing rate and higher usage of resources in the administrative department. The study has an implication on how the Myanmar government may contract CBO clinics in expanding its health coverage.

Field of Study: Health Economics and Student's Signature

Health Care Management Advisor's Signature

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Abbreviation

| | | |
|--------|---|--|
| CBCO | = | Congregation-based Community Organization |
| CBO | = | Community-based Organization |
| CCS | = | Community Cost Sharing Scheme |
| ELCT | = | Evangelical Lutheran Church in Tanzania |
| GDP | = | Gross Domestic Product |
| GGE | = | General Government Expenditure |
| GHE | = | Government Health Expenditure |
| GP | = | General Practitioner |
| INGOs | = | International Non-Governmental Organizations |
| IHLCA | = | Integrated Households Living Condition Assessment Survey |
| IPD | = | Inpatient Department |
| MOH | = | Ministry of Health |
| MOL | = | Ministry of Labor |
| NGOs | = | Non-Governmental Organizations |
| NHA | = | National Health Account |
| NPO | = | Non-profit Organization |
| NRPCCs | = | Non-revenue Producing Cost Centers |
| OOPs | = | Out-of-pocket Expenditure for Health |
| OPD | = | Outpatient Department |
| PHC | = | Primary Health Care |
| RHC | = | Rural Health Center |
| RPCCs | = | Revenue Producing Cost Centers |
| SSB | = | Social Security Board |
| TB | = | Tuberculosis |
| THE | = | Total Health Expenditure |
| UC/UHC | = | Universal Health Coverage Scheme |
| VHC | = | Village Health Committee |

Chapter 1

Introduction

1.1. Problem Identification and Justification

The current health system of Myanmar operates under Primary Health Care approach according to Alma Alta declaration. Rural health centers (RHC) and their sub centers act as grass-root level health centers. The other level of hospital include Station Hospital, Township Hospital, District Hospital, State and Regional level General Hospital and Specialist Hospital, successively (MOH, 2013). RHCs are suitable only for rural settings. In urban areas, people go to RHC and Township Health Center only when they want to get preventive health care under the National Prevention Programs like National Immunization Day. For curative health care, those in urban community often seek care at private health clinics of different service providers including the clinics of community-based organization (CBO) (MOH, 2011-2016).

The Ministry of Health (MOH) of Myanmar constructs and announces the national health account (NHA) every year but NHA series are weak in many categories. The main reason is the lack of information of various health sectors. The Department of Health Planning of MOH, can obtain information mainly from health providers under MOH, itself, from other ministries and private sector to a very limited extent. Most of private health facilities do not know that they have to submit information to MOH (MOH, 2011-2012).

Costs of health care services have increased with the growing economy and changes in technology in various areas in recent years. This is reflected in a constant increase in total health expenditure. In most developing and low-income countries, almost all health expenditure is out-of-pocket expenditures (OOPs) and it is about 78.79% of total health expenditure (THE) in Myanmar(MOH, 2011-2012)..

The main factor influencing an increase in OOPs is that the government health facilities have limited access for people especially for the poor. In Myanmar, the poverty rate was 26% in 2010 and the only one health insurance scheme (Social Security Scheme) was able to provide some financial protection only for about 1% of population. That means over 98% of Myanmar people are without financial protection. The poor and near-poor communities in Myanmar, therefore have to rely on donations by other groups of the society or the themselves in the form of CBOs, when they need to seek health care services and they cannot afford to pay OOPs (IHLCA, 2007, San-San-Aye, 2012).

Community-based organizations (CBOs) are non-governmental, non-profit organizations. They play a crucial stakeholder role in the health system because they offer many useful services and programs to the community, especially urban (Wilson, et al., 2012). In low and middle income countries, the very poor community including women and children can get primary healthcare services via the clinics of CBO (Jareg and Kaseje, 1998).

CBOs in Myanmar, provides funeral services and give free medical care to the community. They try to fill the gap of health services of the MOH, for which there is often excess demand. Their sources of funding mostly come from the local community, well-wishers and local organizations. The collected fund for each CBO is pooled by the religious leader or the leader of CBO and used in their clinic expenses.

The MOH has been attempting to reach the goal of Universal Coverage since 2012. Previously, Myanmar health system operated with primary healthcare (PHC) approach to provide comprehensive medical care to the community. There were many gaps in implementing the PHC approach, including scarcity of resources, gaps in information between public and private sectors such as NGOs, CBOs and other health

financing initiatives. So, MOH sets up the strategy for UHC scheme to match with currently using primary health care approach (San-San-Aye, 2012).

Nowadays, MOH and its donor organizations focus to expand Universal Health Coverage scheme (UHC/UC) in Myanmar. They try to organize a separate body under the office of the President of Myanmar, which will act only as contractor and quality control body. They intend to contract with the RHCs, the private clinics and clinics of CBOs as a gate-keeper of UC scheme. Therefore, they need to know the cost of health care before contracting. However, there is still lack or limited information about the health care cost at every level of current system (MOH, 2012). Therefore, this study aim to cost primary health care clinics of community based organizations that provide free health care to the community.

1.2. Country Profile

The Republic of Union of Myanmar is the westernmost country in South-East Asia, located on the Bay of Bengal and Andaman Sea. Myanmar is bounded by Bangladesh, India, China, Laos and Thailand on the landward side, 1760 miles of the coast line is bounded on the west by the Bay of Bengal and on the south by the Andaman Sea. The country is administratively divided into Nay Pyi Taw Union Territory, (14) States and Regions (MOH, 2013).

After changing the political and administrative system, the Myanmar Health System still needs to improve in various fields. The Ministry of Health is the main organization of providing health care. It is taking the responsibility of providing comprehensive health care services covering activities for promoting health, preventing diseases, providing effective treatment and rehabilitation to improve the health status of the population. In recent years, the private, for profit, sector mainly provides ambulatory care and those providing institutional care have developed in Nay Pyi Taw,

Yangon, Mandalay and some large cities. There are also some facilities run by CBOs and Religious based societies that provides mainly ambulatory care and to a more limited extent institutional care and social health protection, especially in large cities and some townships (MOH, 2013).

1.2.1. Health System in Myanmar

In Myanmar, the National Health Committee laid down the National Health Policy in 1993. It has fifteen guidelines and one states that "To explore and develop alternative health care financing system", which is directly concerned with health care financing reforms in Myanmar. Following the policy guideline, a number of financing reform activities has been undertaken in the health sector since 1993. Myanmar Health Care System has evolved with changing political and administrative structure and the Ministry of Health acts as the major provider of comprehensive health care. It has a pluralistic mix of public and private system both in the financing and provision (MOH, 2013).

One of the objectives of the current National Health Plan (2011-2016) is, to develop the health system in line with the changing political, economic and social landscape of the country and ensure that health services provided are effective, efficient and equitable (MOH, 2011-2016).

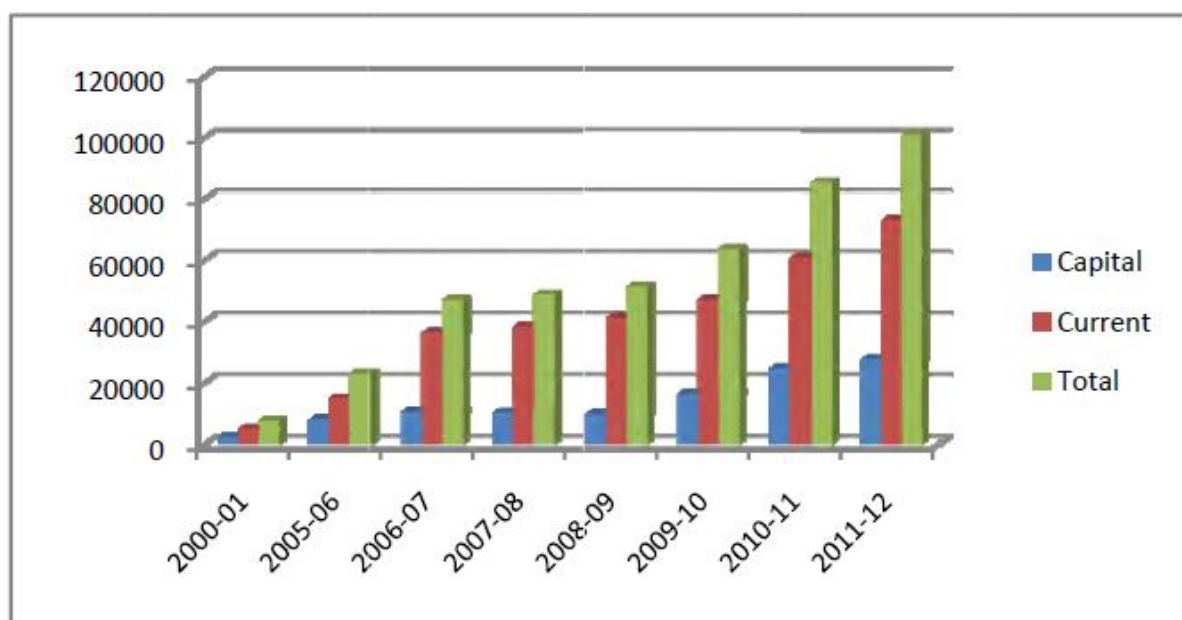
1.2.2. Health Financing in Myanmar

The sources of finance for health care in Myanmar, are the government, private households, social security, community contributions and external aid. The Union Government has increased health spending on both current and capital yearly. Total government health expenditure increased from 7,688 million MMK in 2000-2001 to 100,825 million MMK in 2011-2012 (MOH, 2013).

The government expenditure on health and education sector was increased in the fiscal year of 2012-2013. From the year 2011-2012 to 2012-2013, the Government Health Expenditure (GHE) as the percentage of Gross Domestic Product (GDP) increased from 0.21% to 0.76%. The GHE as the percentage of General Government Expenditure (GGE) sharply increased from 1.05% to 3.14% (MOH, 2013).

Figure 1: Government Health Expenditures

Government Health Expenditures (2000-01 to 2011-12)



Source: MOH, (2013)

The general health financing picture in Myanmar is well known, and is characterized by a high rate of OOP expenditures. As a nationwide health insurance program, the social security scheme had been implemented in accordance with 1954 Social Security Act by the Social Security Board (SSB) of Ministry of Labor (MOL). The contribution is tri-partite with 2.5% by the employer 1.5% by the employee while the government contribution is in the form of capital investment. Insured workers under

the scheme are provided free medical treatment, cash benefits and occupational injury benefit from the scheme's branch offices, Social Security Clinics and Workers' Hospitals that are located in nation-wide (Hlaing, 2009).

The Social Security Act (1954) has been replaced by the Social Security Law (2012) for increasing the coverage by compulsory contributions from the formal sector as well as voluntary contributions from the informal sector and the community (Hlaing, 2009).

Table 1: A Summary of Health Financing Initiatives Reviewed

| Type of Finance or Scheme | Source of Revenue |
|--|--|
| Maternal and Child Health Voucher Schemes | To be decided (Proposal Stage Only) |
| Township Micro-Protection Pre Payment Scheme | Pre-Payment Schemes through Township Micro-Protection (Proposal Stage Only) |
| Emergency Referral Funds according to project Mandate (Nutrition, MCH, Child Health, 3 diseases) | Development partner Funds through (3 Diseases Fund, Global Fund, JIMNCH) |
| Hospital Equity Funds | Development partner Funds to establish Hospital Health Equity Funds at Hospitals. |
| Community Cost Sharing (CCS) | User Fee with exemptions |
| Township Trust Funds | Voluntary contribution by township well-wisher, with revenue generated through interest bearing Township Accounts for provision of care for the poor (1 Bed 1 Lakh)* |
| Drug Revolving Funds | Seed money donated by community*, user fees |
| Community Based Organization or Health Foundation schemes | Mix of donations and pre-payment mechanisms by community members* |

| | |
|--|--|
| Free direct health care provision by NGOs | NGO funding or community donation of funds or labor* |
| Village Health Committee Pre Payment Scheme | Pre-payment Schemes by Village Health Committees.* |
| Public Sector Salaries and Operational Funding | General Government Revenue |

Source: Health Financing Review, Myanmar, (2012)

The Social Security Act (1954) comes into effect in 108 townships in 13 States and Divisions and there are altogether 494,385 covered in public, co-operative and private sectors in March, 2006. This was only one percent of population at that time and leaving the rest uninsured (San San Aye and Khine, 2006).

Under the government health system of Myanmar, there are multiple health financing schemes that are implemented at Township level. They have specific project mandates, payment schemes, target beneficiaries and medical and social benefit packages. Coverage is very limited, and Government Township financing schemes are unable to generate sufficient revenues to cover the costs for the poor (MOH, 2012).

Overall, 11 types of schemes have been identified and variously implemented through Townships, INGOs, NGOs, Foundations, community based organizations (CBOs) and Village Health Committees (VHCs) and all of these schemes are summarized in the Table (1). In which two schemes are only under the proposal stage, two run by the donation of international donors, one is financed mostly out-of-pocket expenditures, five are from local community and community-based organizations, which are asterisked (*) in table (1). The government can fully run only one scheme (MOH, 2012).

In Myanmar, main health facilities, which provide healthcare services to the urban community, are specialized private clinics or other private clinics. These are 73 percent of the total health facilities. The second largest group of facilities is township hospitals which accounts for 14 percent (IHLCA, 2007).

1.3. Community-based Organization (CBO)

Community-based organizations play a crucial stakeholder role in the health system because they offer many useful services and programs to the community especially the urban community (Wilson, et al., 2012). In low and middle income countries, the very poor community including women and children can get the primary healthcare services via the clinics of CBO (Jareg and Kaseje, 1998).

There are two types of CBO. These are institution-based and neighborhood-based organizations. The first one is also known as a congregation-based community organization (CBCO). This is often founded by religious or community leaders in accordance with the religious or cultural based belief. This attracts people in the community to participate in the activities of the organization. CBCO makes participants to become closer together through personal faith values to the public life and finally creates the same identity (Bieberich, 2010, Swarts, 2008). This type of organization shares religious faith and empowers the members to work more and more for the religion and justice (Jacobsen, 2001, Warren, 2001).

The other one, the neighborhood-based organization is different from the first one. This organization is founded by a socio-economic or working class of community. They focus on the right and belief of the respective community. This organization focuses on the work done and the outcome result. They wish to give empowerment to the target group or community (Swarts, 2008).

According to Wilson et al (2012), most of the community based organizations are mainly focused on a specific point of interest. For example, most health-related CBOs are targeted to the HIV/AIDS vulnerable group, mental health and drugs addiction, etc. (Wilson, et al., 2012).

In Myanmar, community-based organizations were first founded by Christian missionaries under the British Colonial period. Bishops tried to make the local people interested in Christianity by offering some forms of welfare to the community. Blake (2005) conducted a research by visiting 140 villages and wards all around the country in 2003. He found the 682 community-based organizations in his survey and received the information from 455 out of 682 CBOs. Among these CBOs, only 3% are oriented specifically in health, environment and sanitation matters (Blake, 2005).

Community-based organizations are founded by the guidance of religious belief. These organizations are managed under the leadership of religious and community leaders. At first, these organizations started to give social help to the local community such as funeral services, donating fund for the people who are not able to afford healthcare costs and the local disaster relief donation. Subsequently, most of these organizations started to open clinics to give free medical care for the poor (Blake, 2005).

CBOs request local medical doctors and specialists to contribute their effort to their clinics and give medical care. Such organizations are now well developed in many cities of Myanmar. Most CBO clinics can give only primary medical care but some can provide specialist outpatient care (OPD), some basic laboratory examinations and some other investigations (for example: electrocardiogram, USG). Some big CBOs have their own-operated hospitals and give medical care to the community. The financing

mechanism of the CBOs totally depends on contributions of the donor communities, external local sources and patients, themselves (Blake, 2005).

Table 2: Classification of the Primary Healthcare Clinics of the CBOs

| | |
|--------|--|
| Type A | Clinic that is housed in a CBO-based hospital, with general practitioner (GP), specialists and laboratory services |
| Type B | Clinic that is not housed in a hospital, and has GP, specialist service and laboratory services. |
| Type C | Clinic that is not housed in a hospital, and has GP services only. |

In Myanmar, CBOs exist as both congregation-based and neighborhood-based organization. Examples of congregation based community organization (also known as institution based organization) are Wachat Sangha Hospital, Muslim Charity Hospital, Yangon Civil-service Organization, Bya-mha-so Civil-service Organization, Well-hearted Sea Charity Clinics, etc. Examples of neighbor-hood based organizations are the Parent-teacher Association, Myanmar Traditional Handicraft Association, Myanmar Medical Association, Environmentalist Association, etc. It should be noted that neighborhood-based CBOs in Myanmar are mostly engaged in charitable cause rather than healthcare provision. The focus of this study is therefore on the congregation based community organizations because almost all of CBCOs in Myanmar give curative health services to the community.

CBCOs can be sub-divided into many different types according to their organizational structure, functions and services. The following classifications are proposed in this study because they are appropriately given the context in Myanmar,

where PHC's often perform the same functions and the only difference between them is the size and the location. In this study, the researcher would like to differentiate primary healthcare clinics of the community-based organizations into three types described as shown in Table 2.

The example of Type A clinic belongs to Wachet Sangha Hospital. Wachet Sangha Hospital houses a clinic, located in Sagaing town near Mandalay. There are only two Type B clinics in Myanmar. One is owned by Yangon CSO and the other by Byamha-so CSO which are located in Yangon and Mandalay respectively. Type C clinics are available throughout the country and they are often part of CCBOs (for example, Well-hearted Sea Charity Clinic).

1.3.1. Services of Clinics of CBOs

Primary healthcare clinic in this study means the clinic that provide curative services to community because the ministry of health provide all preventive services as national programs and projects. Type A and B have various curative services that are provided to the community while type C clinic can provide only GP services. Type A and B clinic provide GP services, specialist services including internal medicine specialist services, surgical specialist services (that consist of general surgery, orthopedic surgeon, ENT surgeon, ophthalmologist, etc.) and basic laboratory services.

1.4. Research Question

Are the total cost and unit cost from the provider's perspective different among different types of primary healthcare clinics of community-based organizations?

1.5. Objective

1.5.1. General Objective

To calculate total and unit costs incurred in primary healthcare clinics of different types of community-based organizations in Myanmar

1.5.2. Specific Objectives

- To determine the total cost of primary healthcare clinics of different types of CBOs from the provider perspective in the year 2013
- To determine the unit cost of primary healthcare clinics of different types of CBOs from the provider perspective in the year 2013

1.6. Hypothesis of the study

The total cost and unit cost of type A clinic are higher than those of type B and type C.

1.7. Scopes of the study

The study will focus only on the provider side healthcare costs of primary healthcare clinics of community based organization. The cost analysis of total cost and unit cost for the healthcare will be calculated in this study. These PHCs run by CBOs (i.e. one Type A PHC, one Type B PHC and one Type C PHC) will be included in the analysis.

1.8. Expected Possible Benefits

This study will perform a cost analysis of the different types of the selected CBOs of Myanmar in the year 2013. The analysis will provide the total cost and unit cost of healthcare service for the patient from the provider's perspective in 2013

Moreover, there is no previous calculation of cost for healthcare delivered by

CBOs. The result of this study can provide basic information about the unit cost of healthcare that can help in implementing the UC scheme as the government of Myanmar now starts to be interested in expanding universal coverage. It can also provide information for improving data for National Health Account (NHA) because Myanmar NHA still has not included health expenditures from the private nonprofit sector.



Chapter 2

Literature Review

2.1. Methodological Issues

2.1.1. Definitions of costs

Costs can be defined many ways according to author's perspective. Creese and Parker said that cost can be meant in term of money that was paid for input resources. So, there will have several definitions of the notion of cost (Creese and Parker, 1994).

Carrin and Evlo also said that cost can be expressed as monetary term of non-monetary term. Cost is the value of input resources or services. This means that cost of a thing is a value that might not be fully captured in their price (Carrin and Evlo, 1995).

2.1.2. Classification of costs

To estimate a health program's costs, classification of its components is necessary to describe. Cost elements can be differentiated in several ways. A good classification scheme depends on the background situation or problem and that is relevant to the particular situation. The classes of categories must not overlap. The classes chosen must cover all the possibilities (Creese and Parker, 1994).

Capital costs are the costs for the capital assets including cost for buildings, vehicles, non-equipment like refrigerators, and medical equipment. Depreciation is needed to consider in calculating the capital cost (Carrin and Evlo, 1995).

Recurrent costs are the costs of the input resources that are used within one year. For example, salary cost for all personnel, medical supplies including drugs and some medical equipment (Creese and Parker, 1994).

Cost can be further divided according to the cost behavior that describes as the changes of the total costs due to the changes in the volume of the activities in an organization. So, the cost can also classify as the fixed cost, variable cost and semi-variable cost (Drury, 2007).

Fixed cost is the cost that does not change with the amount of the output in the specific period of time, for example, rent, equipment lease payment (Drummond, et al., 2005).

The variable cost is the cost that directly changes with the change in the amount of output, for example, supplies, food (Drummond, et al., 2005).

Semi-variable cost (also known as mixed cost) is the cost that is the combination of fixed and variable cost, for example, the cost of maintenance (Drury, 2007).

Total Cost is the cost to produce a total amount of output (Drummond, et al., 2005).

Average Cost, the cost to produce one unit of output, is calculated from the total cost by dividing the total amount of output (Haddix, et al., 2003).

Marginal cost is the cost of producing one additional output. It can be calculated that the total original cost minus the change in total cost that result by producing the another addition output (Haddix, et al., 2003).

Hospital cost is the cost of the all expenditure of hospital within a year that includes the depreciation of capital inputs. Then, the hospital cost can be further divided into hotel cost and treatment cost. Hotel cost is more associated with inpatient department of hospital (Drummond, et al., 2005).

2.1.3. Calculating the Hospital Cost

The analysis of the hospital costing includes the allocation of inputs to different cost centers and calculating the unit cost for the each of the final output. According to the manual for the analysis of hospital costing by Shepard et al., the following six steps will be used in this study to calculate the hospital costing data:

- Defining the final product.
- Defining the cost centers.
- Identifying the full cost for each input.
- Assigning inputs to cost centers.
- Allocating all costs to final cost centers.
- Computing the total and unit cost for each final cost center (Shepard, et al., 1998).

2.1.3.1. Defining the final product

Defining the final product in all industry is very important step. For hospital being a type of industry, different inputs, like health personnel, medical resources and non-medical resources, are used to diagnose and treat the diseases of the people. So, the treatment can be the final product for the hospital industry but it can be very broad in costing the hospital analysis. For clarification and easy to calculate, the treatment can be divided into two treatment types according to the inpatient department (IPD) and outpatient department (OPD). The final unit measurement for IPD is the admission and the hospital length-of-stay. The one for the measurement of

OPD is the outpatient visit. The final product is not as simple as like this in costing of the hospitals that have teaching and researching function (Butler, 1995).

2.1.3.2. Defining the cost centers

The classification of the cost centers is the overhead cost center, intermediate cost center and final cost center. This can tell us how the hospital organizational structure can be analyzed due to cost centers. Each cost center use the various types of input resources and produce the different output (Shepard, et al., 1998).

Overhead cost center includes the general departments like the overhead administration office, financial and accounting office that provide only the supporting services in producing the output medical treatment (Drummond, et al., 2005).

Intermediate cost center includes the medical supporting departments like the laboratory, radiology department, medical store, etc. that provide the supportive services which indirectly affect the medical treatment (Shepard, et al., 1998).

Final cost center includes the inpatient wards and outpatient department. They provide the final output, the medical treatment to the patients (Shepard, et al., 1998).

2.1.3.3. Identifying full cost for each input

This process is the describing the cost for each and every input resources that used in the hospitals. The resources are classified according to their based nature like labor, supplies, equipment, buildings and land (Shepard, et al., 1998). In identifying the cost, the resources that can use more than one year is identified as capital cost and the one that can use within one year is identified as recurrent cost. The depreciation of cost need to consider in calculating the capital cost to determines how the cost of capital includes in the costing of the hospital in every year (Mogyorosy and Smith, 2005).

In calculating the capital cost, the depreciation should be considered to use. There are different types of depreciation. Among these types, the straight-line method of depreciation is the most common used method for depreciation of capital costs (Lucey, 2003).

2.1.3.4. Determining the final cost center in hospital

Determining the final cost center is crucial because the allocation of overhead cost to the final cost center is the important step in hospital costing. Although there are various classifications about the cost centers, this depends on the activities and functions of the targeted organization. The final cost centers of the hospital are the inpatient departments and outpatient department. The ancillary centers or diagnostic centers, such as laboratory and radiology department, are not the final cost centers (Newbrander and Lewis, 1999, Shepard, et al., 1998).

The cost centers can be divided as the revenue producing cost centers (RPCCS) and the non-revenue producing cost centers (NRPCCs). The patient care departments, that can produce revenue by charging the fees for the treatment and diagnostic services, are RPCCs. These departments include the patient rooms, diagnosis tests and the prescribing treatment (Stinson, 2002).

The NRPCCs are the departments that cannot produce the revenue. They provide services to the other departments like the patient rooms. The administration office, housekeeping and laundry are the example of NRPCCs (Stinson, 2002).

2.1.4. Methods of Cost Allocation

There is a various ways of allocating the overhead costs and analyzing the cost of the service or department in hospital. The most commonly used methods are as followed:

- Direct allocation
- Step-down allocation
- Step-down allocation with Iteration
- Simultaneous allocation (Drummond, et al., 2005).

2.1.4.1. Direct Allocation Method

In direct allocation method, each and every overhead cost is directly allocated to the final cost centers. For examples, the cost of the administration office is directly allocated to the outpatient (Drummond, et al., 2005).

2.1.4.2. Step-down Allocation Method

This is the partial adjustment for the interaction of overhead departments. The costs of the overhead department are allocated to the other overhead, supportive departments and to the final cost centers (Drummond, et al., 2005).

2.1.4.3. Step-down Allocation Method with Iteration

This is the full adjustment for the interaction of overhead departments. The costs of the overhead department are allocated to all of the other overhead, supportive departments and to the final cost centers (Drummond, et al., 2005).

2.1.4.4. Simultaneous Allocation Method

This is the full adjustment for the interaction of overhead department. This methods use the same data as the step-down allocation method but it solves a set of simultaneous equations to give the allocations. This allocates the cost of supportive

departments to other departments and consider all the interdepartmental services (Drummond, et al., 2005).

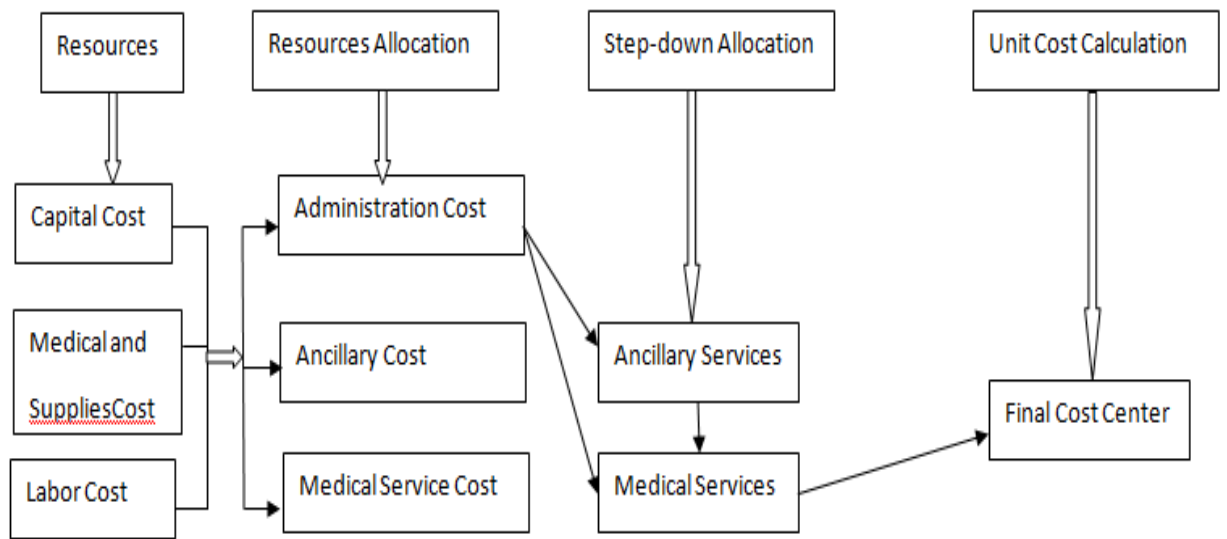
2.1.5. Unit cost determination

After finishing the allocation of all cost to each cost center, the total costs of the each cost center is identified. So, the unit cost of each output can be calculated. For calculating the unit cost, the clarification of the unit of measurement is needed. The context of service could influence the selection of proper measurement resources. The financial records, the medical results and case reports are the crucial resources to measure the resource utilization (Drummond, et al., 2005).

2.1.6. Step-down Allocation Method

In step-down allocation method, the allocation of the cost for all resources is set up into three departments, firstly. Then, the cost of the administration department is allocated into the other two departments as the second step. The last step is that the cost of the ancillary department is also allocated to the medical service departments. After all allocation of the cost is done to the final cost center, the unit cost for the outpatient will be calculated. Detailed allocation of this method is mentioned in Fig 2. The final output is the outpatient care

Figure 2: Step-down Allocation Method



2.2. Cost analysis of the Health center in developing countries

In the health system of the developing countries, the primary health centers and hospitals play the crucial role. Around 50 to 80 percent of healthcare resources are consumed by hospital services. For the allocation of the scarce resources and improving of efficiency in provision of inpatient and outpatient care, the costing is important because the cost of the healthcare is increased and the resources are limited (Flessa and Dung, 2004).

In Myanmar, there have been no available studies on costing of hospitals and primary healthcare services. However, there are many reports and papers on the cost analysis of hospital exist in other ASEAN and developing countries. This study is based on the studies done in the other countries (Fabricant, 2002, Flessa, 1998, Flessa and Dung, 2004, Hussain, 1983, Mills, et al., 1993).

2.2.1. Cost analysis of a primary health center in Bangladesh

This is first-ever analysis of costing the primary health care center in Bangladesh. The primary healthcare center that mentioned in this paper is mostly similar in the organizational structure with the type B and C clinics of the CBOs that the researcher proposed in this study (Hussain, 1983).

Hussain studied the cost of the primary health care center at the thana, that is the smallest governmental administrative unit in Bangladesh in 1979. Each thana is an approximate population of 200,000-300,000 and there are 472 thana in Bangladesh at that time. The study included capital and recurrent costs. The data collection method is examining the records of the each thana. He classified the cost centers into three types: (a) general, (b) intermediate and (c) final cost center (Hussain, 1983).

The capital costs for 1979 were US\$ 36,382 with the 10% interest rate and including the depreciation. The recurrent costs are 62% of the overall costs and that is US\$ 59,556. The salary costs and the allowances of the staff contributed the 68.2% of the recurrent costs. Among the annual cost 35.8% is for the buildings, 42.3% is for the salaries and allowances and 10.2% for medicines (Hussain, 1983).

2.2.2. Cost of Services in Vietnamese Hospitals

Vietnam, being a socialist country, is now transitioning to a market economy. Vietnam health system has a booming in private sectors. The public sector of the Vietnam health system needs to be evaluated in both efficiency and resource allocation (Flessa and Dung, 2004).

In this study, the cost analysis of the five Vietnam hospitals was done including the one central hospital, two provincial hospitals and two district hospitals. The objective of the study was to find out the cost of hospital costs in Vietnam by finding the average costs and main cost driver (Flessa and Dung, 2004).

Flessa and Dung used the step-down allocation approach of costing in this study. He defined the output to calculate cost. The cost centers are also identified according to the organizational structure of hospitals. He classified into the two main cost centers: direct and indirect cost center (Flessa and Dung, 2004).

The proportion of the personnel cost is the major part in this study, about 35-64%. The second largest parts is the cost of drugs, it goes between 15-27%. The unit cost of the OPD case per visit is higher in the central level than provincial level. The cost in provincial level is also higher than the cost in the district level. The reasons are that the patients who visiting to the central and provincial level hospital need higher and more procedure than the patient of district level. The higher level hospital uses the advanced facilities for the patient. The other thing that he found in this study is

that some investigation costs are much more higher in district level hospitals (Flessa and Dung, 2004).

2.2.3. Cost Analysis of Essential Health Services in Cambodia

This study was done in health system of Cambodia in 2002. This is the unpublished report for the health system assessment project, done by Ministry of Health, Cambodia and WHO. This study also used the step-down method of allocation. In this study, health center costs including depreciation averaged \$1,260 per month, with a range from \$662 to \$3,245, although the high cost of one HC was due to consumption of drugs which could not be verified. The mean unit cost including depreciation for 16 health center is \$ 1.33 and excluding depreciation is \$ 1.19 (Fabricant, 2002).

Total monthly costs for district hospital is \$ 9,711(averaged, including depreciation), its range is from \$ 4,367 to \$ 15, 789). The direct cost is the largest proportion of total cost in this study. The ratio of direct cost to total costs for health centers is over 90% and that for district hospitals is 76.9%. Average annual recurrent cost for health center that excluded depreciation, is 0.96% and that cost including depreciation is 1.09% (Fabricant, 2002).

2.2.4. Cost of District Hospital in Malawi

Malawi is one of the low-income country of Sub-Saharan Africa. The cost of the district hospital in Malawi health system is studied in this study. The objective of the study is that to develop the guidelines to improve the efficiency of hospital and allocation of resources for healthcare. Hospitals of Malawi were selected in term of size, staff structures, infrastructure and geographical location. Mill used the step down allocation method to calculate the cost in this study and he made some assumption for the useful life for some capital (Mills, et al., 1993).

Capital cost in this study is the highest of the total cost and about 46-57%. Drugs and pharmaceutical supplies cost follow the second place and about 37%. While the salary cost take the vary proportion between 27-39% of total recurrent cost, the drugs and pharmaceutical costs take the proportion between 25-38% of total recurrent cost (Mills, et al., 1993).

In this study, there is a significant difference among hospitals. In calculating the unit recurrent cost, the cost per bed of one hospital is 75% higher than the other one. Similarly, the cost per inpatient day is 234% higher in comparing two hospitals. According to the result, Mill cautiously concluded that this is because of the sensitivity of data used. He found that the bed occupancy rate of the more expensive hospital is less than that of the cheaper one. Another reason is due to the different length of stay. Some wards in the hospital make the longer length of study due to the natural history of disease, for example TB ward. After getting the all result, Mill summarized this study in term of efficiency of the operation of hospitals and resource retribution (Mills, et al., 1993).

2.2.5. Cost of Hospital Services in Tanzania

Flessa conducted a study about hospital services in Tanzania, one low-income African country. His study was based on seven hospitals which are owned by Evangelical Lutheran Church in Tanzania (ELCT). ELCT is the major healthcare provider in Tanzania's health system. The objective of the study is to explore how hospitals can sustain while cost was increasing and ability to pay was decreasing. Step-down allocation method is also been used in this study. Costs are collected and allocated to different cost centers and finally to final cost center. In this study, average cost for inpatient day and average cost for outpatient day is calculated (Flessa, 1998).

Flessa found in this study that over appointing the staffs and over using drugs can cause the technical efficiency. Several costs were increasing comparatively slower than increasing output in this study. Therefore, average cost was decreased. The facts in case of general staff, working in administration, laundry, guards, cleaners, equipment and building, was truly became the main cause of economies of scale. Flessa suggested that sustainability and affordability could be reconciled with increasing technical efficiency, standard settings, reducing services and risk sharing (Flessa, 1998).

According to the cost studies of these countries, the most utilizing cost allocating method is the step-down allocation method. All the studies collected, analyzed and calculated the total costs and the unit cost per output.

2.2.6. Unit Cost of Medical Services at Different Hospital in India

This study was conducted in five different hospital in India in 2010-2011 by Chatterjee et.al. These five hospitals include one charitable hospital, one private hospital, one district hospital, one private teaching hospital and one tertiary care teaching hospital. According to this study the major varying component in hospitals are human resources, capital costs and material costs. This study used the step-down allocation method in calculating the cost (Chatterjee, et al., 2013).

In this study, the unit cost for outpatient visit is varied Rs 94 to Rs. 2213. The lowest cost is in district hospital and it costs only Rs. 94. The unit cost for charitable hospital is Rs. 115 and that for private teaching hospital is Rs. 188. The tertiary teaching hospital cost Rs. 242 and the unit cost for OPD in private hospital is Rs. 2213, which is the highest unit cost for OPD in this study (Chatterjee, 2013) (Chatterjee, et al., 2013).

The results of this study can help hospital administrators to understand the cost structures and run their facilities more efficiently. The results can also be used in health policy and planning of India health administrators (Chatterjee, et al., 2013).

2.2.7. Cost Analysis of Mirwais and Nangarhar Regional Hospitals in Afghanistan

In this study, the total cost and unit costs of two regional hospitals of Afghanistan are analyzed in 2011-2012. The step-down method of allocation was used to calculate total cost and unit cost of two hospitals (Yonus, 2012).

In this study, the total cost of OPD visit were 526,582 USD and 685,333 USD, respectively. Then, unit cost of OPD visit was calculated by dividing total costs of each OPD departments by number of visit. Among the unit cost of different OPD, the unit cost of tuberculosis OPD is highest and about 67 USD per visit. The lowest unit cost is 0.3-1 USD which is the unit cost of pediatric OPD (Yonus, 2012).

The Mirwais hospital is smaller in number of bed and number of utilization than that of Nangarhar hospital, in this study. The Mirwaris hospital is more expensive and incurs higher total costs and unit cost than Nangarhar hospital (Yonus, 2012).

Chapter 3

Methodology and Conceptual Framework

3.1. Study Design

This study is the cost analysis of the healthcare from the provider perspective. This study uses primary data to analyze the cost (total cost and unit cost) of outpatient clinics of different types of the CBOs. The classification of the CBOs is such that there are three types. Type A is a clinic that is housed in a CBO-based hospital and has general practitioner, specialists and laboratory services. Type B is a clinic that is not housed in a hospital and has GP, specialist services and laboratory services. Type C is a clinic that is not housed in a hospital and has only GP services. The study period is for the year 2013.

Sample selection was done with purposive sampling or convenient sampling. In this study, each clinic was chosen from three types of clinics of different CBOs. For type A clinic, Wachet Sangha Hospital was selected to be collected data. One reason was that this hospital has proper data keeping on the financial and the patient report. Another reason was that this hospital was not too much concern with any political and administration system because political issue was still sensitive in Myanmar even government administrative system has been changed. The reason for choosing sample for type B clinic was same with type A clinic.

Type A and B were same in having multiple facilities in their OPD. Only one different was type B clinic was not housed in a hospital while type A was housed. They both had an administrative department, ancillary department and various types of specialist clinics.

Type A Clinic (Wachet Sangha Hospital) that was chosen in this study, located in Sagaing Town which located on the riverbank of Ayeyarwaddy River and thirty

minutes driving distance from Mandalay City (Mandalay city also located on the opposite riverbank of Sagaing). Type A clinic was initially opened for monks and nuns of local areas and then they expanded their services to all local communities. This clinic was housed in hospital. Thus, it had various departments including administrative department, ancillary department and clinical departments.

Among various services that was provided by type A clinic, eye OPD was famous because eye specialist team from foreign countries came and operated all kinds of eye diseases, free of charge. If one patient who already showed at eye OPD of type A clinic and needed to operate his/her disease, he/she was entitled to show the clinic of foreign specialist team and can get the requirement treatment from them. Operating days of specialist outpatient department of type A clinic were on weekends. Every weekend, the administrative team needed to provide transport to pick up all volunteer medical personnel for OPD.

Type B clinic, Bya-mha-so clinic, was located in eastern part of Mandalay City and covered local community from all vicinities of Mandalay. If someone needed specialist or GP treatment and they cannot afford to pay charges for medical care, they can come and take medical treatment from this clinic. The operating day of this clinic is on Wednesday and weekend. Each and every volunteer medical personnel came themselves and donated their effort to the clinics according to their respective schedule.

There were a lot of type C clinics throughout Myanmar but most of these clinics types did not have proper record keeping for the financial and patient data. Well-hearted Sea Charity Clinic was known to have proper recording keeping system. So, it was selected in this study. This clinic located in northwest part of Mandalay city and it covered the local community of that area by providing GP services. If some patients

needed medical care beyond GP service, they were transferred to OPD of government hospital and that of Bya-mha-so clinic (which was also chosen as type B clinic in this study) for further treatment. This opened daily from 8 am to 11 am except from Sunday.

The main reason of choosing these three clinics are that all clinics are located in same geographic area (shown in appendix) and their coverage population is mostly similar. They also had adequate organizational structures and proper record keeping. The last reason is that all of these clinics are focused only on social welfare of community and not associated with any political issues.

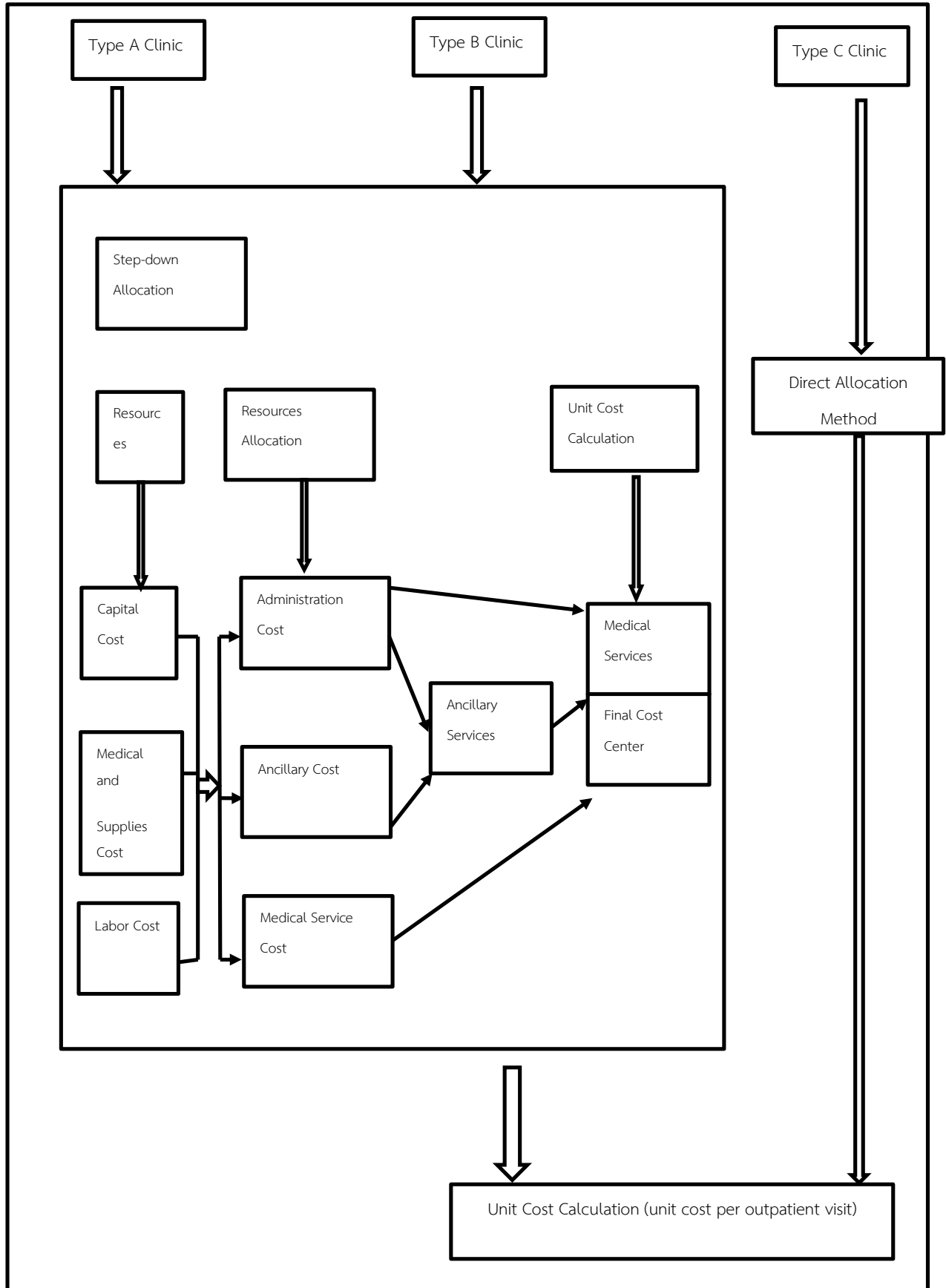
3.2. Conceptual Framework

Three types of clinics of CBOs are categorized in this study. Type A clinic is a clinic that is housed in a CBO-base hospital, with general practitioner (GP) service, specialists and laboratory services. Type B clinic is a clinic that is not housed in a hospital, and has a GP, specialists and laboratory services. Type C clinic is a clinic that is not housed in a hospital, and has GP services only.

So, in calculating total cost of type A and B clinics, step-down method of allocation was used in this study because these types of CBO clinics run multiple services, including administrative service, ancillary service and clinical services. The resources are set-up into different cost centers and step-down method was used to allocate. Final cost center is clinical service cost center. Total cost of outpatient department was focused in this study. After getting total cost of outpatient department, unit cost per outpatient visit was calculated.

On the other hand, direct allocation method was used in calculating total cost of type C clinic. Finally, unit cost per outpatient visit of clinic is calculated from total cost and total number of outpatients of clinic.

Figure 3: Conceptual Framework of study



3.3. Data Collection Method

The required data were collected for one calendar year from the 1st January to 31st December of 2013. Data were collected from the record keeping of three CBOs (i.e. Wachet Sangha Hospital for Type A, Bya-ma-so CSO for Type B and Well-hearted Sea Charity Clinic for Type C). They included the following:

- the general information and data about the CBOs,
- the expenditures for the medical, non-medical and administrative supplies,
- the list of human resources and salaries and
- patient records

3.4. Data Analysis

The collected data were put into the spreadsheet of Microsoft Excel. The imported data were then classified into the capital cost, the material cost and the labor cost. Then the unit cost calculation was done for each output by the following steps.

Three types of primary healthcare clinics of community based organizations are selected to collect data. Wachet Sangha Hospital has type A clinic. This clinic is housed in hospital and has specialist clinics, laboratory services, radiological services and GP services. The second type of clinic, type B clinic, is from Bya-mha-so CSO. Clinic of Bya-mha-so CSO is not housed in hospital but this has specialist clinics, laboratory services, radiological services and GP services. The last type, type C clinic is Well-hearted Sea clinic, which has only GP services.

Table 3: Cost Items and Cost Calculation Methods

| Cost Item | Cost Calculation Method | Assumption |
|---------------------------------|--|--|
| Capital Cost (in one year) | Cost of using buildings + Cost of Renovation + Cost of medical equipment in one year | <ol style="list-style-type: none"> 1. Straight-line method of depreciation 2. Salvage Value is assumed as 10% of original value 3. Life year of building is 20 years and that of equipment is 10 years 4. Medical equipment cost more than 100,000MMK and more than one year |
| Recurrent Cost (in one year) | Cost of utility bills + Salary of permanent staffs + medical equipment and supplies | |
| Labor Cost (in one year) | Opportunity Cost of donated labor | Hourly income is calculated based on government salary |
| Total Cost (in one year) | Capital cost + Recurrent cost + Labor cost | |
| Unit Cost (in one year) | Total cost / total number of patient | |

After data collection from the three types of clinics, costs are identified as different cost items and allocated into different cost centers. The list of cost items and cost calculation methods are shown in Table 3. The cost items are capital cost, recurrent cost, labor cost, total cost and unit cost. All cost items are within one year. Capital cost includes cost of buildings, cost of renovation and cost of medical equipment. In calculating capital cost, straight-line method of depreciation is used. Salvage value is assumed as 10% of original value. Life year of buildings is estimated as 20 years and of equipment is 10 years.

Recurrent cost consists of utility bills, salary of permanent staffs, disposable medical equipment and instrument which costs less than 100,000MMK and less than one life year. Labor cost is opportunity cost of donated labor. It is calculated by multiplying hourly income with working hours (donated working hours). Income per hour is obtained from the government salary because almost all medical personnel who donate their efforts for CBOs are from the government sector.

Total cost can be calculated by summing capital cost, recurrent cost and labor cost. Finally, unit cost is obtained from the formula of total cost divided by total number of patients.

After defining cost items and the cost calculating method, cost centers are identified to analyze cost of the clinics, For type C clinic, it does not have too many cost centers, so the direct allocation method is used to analyze costs. For type A and B clinics, there are three cost centers which are administrative cost center, the ancillary cost center and the final or clinical cost center (include general OPD, eye OPD, dental OPD and other type of OPD). In this study, only outpatient department is included. The inpatient department is excluded from analysis in hospital based clinic. The cost center identification is shown in table 4.

In table 4, all cost centers, including administrative department, ancillary department and all types of OPDs (general, eye, dental and other OPDs), are present in type A and B clinic. However, type C clinic only has outpatient department for GP service.

All cost items are allocated into respective cost centers and analyzed. At first, detail costs of administrative department are put and calculated to get total cost of that department, in analysis of type A and type B clinics. Then, the total cost of administrative department is divided and allocated into the ancillary department and each of the OPD departments.

Table 4: Cost Center Identification

| Cost Centers | A | B | C |
|---------------------------|---|---|---|
| Administrative Department | + | + | |
| Ancillary Department | + | + | |
| Outpatient Department | + | + | + |
| 1. General OPD | + | + | |
| 2. Eye OPD | + | + | |
| 3. Dental OPD | + | + | |
| 4. Other OPD | + | + | |

For the ancillary department, it includes two departments: laboratory department and radiology department. Costs of these departments are put and analyzed to get the total cost of ancillary department. Then this cost is also allocated

to each OPD department. At the level of the final cost center, direct cost (capital cost and recurrent cost of that OPD) and indirect cost (cost from administrative department and cost from ancillary department) are summed up and calculated as the total cost of each final cost center. The unit cost (cost per patient of each OPD) is calculated using total cost and total number of patient of each OPD.

3.4.1. Baseline and Sensitivity Analyses

Baseline analyses are done using straight line depreciation method and the salvage value is assumed as 10% of the original value. The opportunity cost is not included in baseline analysis 1 but it is included in baseline analysis 2. These are the results that are considered to be most appropriate (especially baseline 2).

After getting the baseline result of the study, some sensitivity analyses are done to examine whether or not changes in the method of depreciation, the salvage value and the opportunity cost can change the total cost and the unit cost. The first type of the sensitivity analysis is to change the depreciation method from straight line to double declining. The second type is to change in the salvage value from 10% to 20% of original value. The last type is to change in the opportunity cost from one that is based on government salary to one that is based on private sector salary. For private sector, opportunity cost calculation is based on income per hour. The assumption in this sensitivity analysis is income per hour of specialist medical doctor is 12000MMK while income per hour for the rest of other medical personnel remains the same. The list of different scenarios are shown in table 5.

Scenario 1 is change in opportunity cost from government salary to private earning. Scenario 2, 3 and 4 are using same depreciating method but change in salvage value. Salvage value in these three scenarios is change to 20% of original value. Then,

scenario 2 does not include opportunity cost while scenario 3 include opportunity cost with government salary and scenario 4 use opportunity cost with private income.

In scenario 5, 6 and 7, method is depreciation is changed into double declining balance method. In this method, salvage value is not affected. So, different between these three scenarios is concerned only with opportunity cost. Scenario 5 calculation does not include opportunity cost. Scenario 5 calculation uses opportunity cost based on government salary while the rest use opportunity cost with private income

Table 5: List of Baseline and Sensitivity Analyses

| No. | Name of analysis | Detail calculation Method |
|-----|------------------------|---|
| 1. | Baseline 1 | Straight line + Salvage value 10% + No opp. Cost |
| 2. | Baseline 2 | Straight line + Salvage value 10% + Opp. Cost (govt.) |
| 3. | Sensitivity Scenario 1 | Straight line + Salvage value 10% + Opp. Cost (private) |
| 4. | Sensitivity Scenario 2 | Straight line + Salvage value 20% + No opp. Cost |
| 5. | Sensitivity Scenario 3 | Straight line + Salvage value 20% + Opp. Cost (govt.) |
| 6. | Sensitivity Scenario 4 | Straight line + Salvage value 20% + Opp. Cost (private) |
| 7. | Sensitivity Scenario 5 | DDB + No opp. Cost |

| | | |
|----|---------------------------|---------------------------|
| 8. | Sensitivity Scenario 6 | DDB + Opp. Cost (govt.) |
| 9. | Sensitivity Scenario 7 | DDB + Opp. Cost (private) |

3.5. Assumptions

Some additional assumptions were proposed for this study.

The healthcare service that was provided by the different types of clinics was assumed to be at same quality at the GP level, the specialist level and lab services.

The useful life span of the medical equipment, non-medical equipment and vehicles was 10 years. The usage of the building space was not certain in hospital based clinic. So, the cost of the building was allocated to the general cost center and then followed the step-down method. The opportunity cost of land was not included also.

Chapter 4

Results

4.1. Results

The illustration of how the step-down allocation is done for type A and B clinic, is explained in the very first part of this chapter. However, the illustration of the step-down allocation is mentioned in detail only for type B as an example. The detail calculation for type A is expressed in appendix. For type C clinic, the direct allocation method is used because this type of clinic has only one cost center. At the second part, the baseline scenario (1 & 2) calculation and result are shown. The sensitivity analyses are shown in the last part of this chapter. . Illustration of the Step-down Allocation for Type B Clinic

4.1.1. Illustration of the Step-down Allocation for Type B Clinic

After collection the required data, the straight line depreciation of capital cost (including administrative, general OPD, laboratory services, radiological department and dental OPD for type B clinic is done by using the original cost of capitals, salvage value that is 10% of original value and useful life of 20 years. Then, the capital cost is allocated into different departments. 4% to the administrative department and 24% each to general OPD, laboratory department, radiological department and dental OPD. The laboratory department and radiology department is combined to assumed as ancillary department.

Cost of the administrative department is calculated by using the calculated capital cost and collected recurrent cost. The total cost calculated of administrative department is then equally allocated into six cost centers (2 ancillary departments, general OPD, eye OPD, dental OPD and other). The cost of ancillary department is calculated by summing the capital cost, recurrent cost and cost form administrative

cost. Then, the calculated total cost is further allocated by general, eye and dental departments in percentage of 60%, 20% and 20% respectively.

At the level of final cost center (general OPD, eye OPD, dental OPD and other), the total cost is calculated by summing the capital cost, recurrent cost, cost from administrative department and cost from ancillary department. There is no opportunity cost included in baseline calculation 1 but opportunity cost being from government salary is included in baseline calculation 2. The unit cost per outpatient visit of type B clinic is calculated from the total cost and total patient attendant numbers of that OPD of type B clinic. The detail calculation of step-down cost allocation method for type A and B clinic are shown in appendix.

4.1.2. Baseline Result 1:

In calculating unit cost per patient at the level of final cost centers, the following equation is used.

$$\text{Total cost} = \text{Direct Cost (Capital cost + Recurrent Cost)} + \text{Indirect Cost}$$

Type A clinic is housed in a hospital. This hospital had opened for more than 20 years. So, the building cost is excluded in calculation. Medical equipment that is set up in this hospital, has the same life year with the building. Capital cost of type A clinic is therefore zero.

Cost of administrative department of type A clinic is allocated and calculated. Total cost of administrative department was further allocated into ancillary department and clinical departments. Cost for ancillary department was also calculated by using the direct cost and indirect cost from administrative department. Then, total cost of ancillary department was also allocated into clinical departments (inpatient and outpatient departments). Inpatient department was excluded in calculation of this study. Outpatient departments have four sub-OPD according to

medical specialty. Unit cost per outpatient visit is then calculated. The detailed analysis of step-down allocation method and unit cost calculation of general OPD of type B clinic is shown in appendix 1, 2 and 3.

Type B clinic had similar organizational structure with except housing in a hospital and inpatient department. It had administrative department, ancillary department and outpatient department. Therefore, cost allocation and step-down allocation were done as type A clinic.

According to table 6, type A and type B clinic are comparable in cost at general OPD (in which general medicine, surgery, ob. and gyn., child, ENT, skin are included), eye OPD and dental OPD. However, type C clinic has only cost for GP services.

Table 6: Baseline result 1

| Type of clinic | Cost Center | Direct Cost | | Indirect Cost | | Total cost | Total Patient | Unit Cost |
|----------------|----------------|-------------|-----------|---------------|----------|------------|---------------|-----------|
| | | Capital | Recurrent | Admin | Ancill | | | |
| A | General OPD | 0 | 8155735 | 9178380 | 3689252 | 21023367 | 4861 | 4324.91 |
| | Eye OPD | 0 | 13322430 | 9178380 | 3689252 | 26190062 | 16858 | 1553.57 |
| | Dental OPD | 0 | 15213500 | 9178380 | 3689252 | 28081132 | 3092 | 9081.87 |
| | Other (Accu.) | 0 | 1608400 | 3059460 | 111796 | 4779656 | 4255 | 1123.30 |
| B | General OPD | 1825200 | 51973044 | 4022315 | 13367793 | 71188352 | 36211 | 1965.93 |
| | Eye OPD | 2520000 | 8617880 | 4022315 | 4455931 | 19616126 | 7461 | 2629.16 |
| | Dental OPD | 1825200 | 3156550 | 4022315 | 4455931 | 13459996 | 2986 | 4507.70 |
| | Other (Rehab.) | 270000 | 222090 | 4022315 | 0 | 4514405 | 1767 | 2554.84 |
| C | GP services | 496575 | 15721459 | 0 | 0 | 16218034 | 20344 | 797.19 |

In table 6, there is four final cost centers in type A and B respectively, which type C clinic has only one cost center. The total cost of type A and B clinic is calculated

from the total direct cost (capital cost + recurrent cost) and the total indirect cost (cost from administrative department + that from ancillary department). Whereas, the total cost of type C clinic is equal to the total direct cost. The capital cost of type A clinic is shown as zero in table because its life year is more than its useful life year.

Most of unit cost are relatively higher in type A than type B. This is because of high administrative cost while low utilization of patient in type A clinic. Type A clinic is famous for eye OPD. Number of patient in eye OPD of type A clinic is significantly high. Cost for eye care OPD is relatively lower in type A. For general and dental OPD cost, cost at type A clinic is double than type B clinic. Highest outpatient rate is at general OPD of type A clinic and second is at eye OPD of type B clinic. The unit cost of type C clinic is only about 750 MMK and it is the lowest unit cost in table.

4.1.3. Baseline Result 2

For baseline result 2, opportunity cost is put in calculating of direct cost. Opportunity cost is derived from hourly income of medical personnel and number of donating working hour. Hourly income come from government salary. So, total cost is calculated by using the following formula.

$$\text{Total cost} = \text{Direct Cost (capital cost + recurrent cost + opportunity cost) + Indirect Cost (from Admin and ancillary dept.)}$$

In table 7, there is four final cost centers in type A and B respectively, which type C clinic has only one cost center. The total cost of type A and B clinic is calculated from the total direct cost (capital cost + recurrent cost+ opportunity cost) and the total indirect cost (cost from administrative department + that from ancillary department). Whereas, the total cost of type C clinic is equal to the total direct cost. The capital cost of type A clinic is shown as zero in table because its life year is more than its useful life year. The opportunity cost of one medical personnel is calculated

by multiplying the income per hour of this personnel, which based on the government salary, by donated working hour at clinics.

By adding opportunity cost in calculation, total cost of both types is increased. Unit cost per patient is increased approximately 1000 MMK in type A clinic and 500 MMK in type B clinic. Opportunity costs of general OPDs in both type of clinics are highest in amount. Unit cost per patient in dental OPD of type A clinic is highest and cost about 10,000MMK which is double of that cost of dental OPD of type B. The unit cost of type C clinic is the lowest one in this analysis also. It cost only about 1000 MMK.

Table 7: Baseline result 2

| Type of clinic | Cost Center | Direct Cost | | | Indirect Cost | | Total cost | Total Patient | Unit Cost |
|----------------|---------------|-------------|-----------|-------------|---------------|----------|------------|---------------|-----------|
| | | Capital | Recurrent | Opportunity | Admin | Ancill | | | |
| A | General OPD | 0 | 8155735 | 8237500 | 9178380 | 3689252 | 29260867 | 4861 | 6019.52 |
| | Eye OPD | 0 | 13322430 | 1625000 | 9178380 | 3689252 | 27815062 | 16858 | 1649.96 |
| | Dental OPD | 0 | 15213500 | 3250000 | 9178380 | 3689252 | 31331132 | 3092 | 10132.97 |
| | Other (Accu.) | 0 | 1608400 | 1937500 | 3059460 | 111796 | 6717156 | 4255 | 1578.65 |
| B | General OPD | 1825200 | 51973044 | 5156250 | 4022315 | 13367793 | 76344602 | 36211 | 2108.33 |
| | Eye OPD | 2520000 | 8617880 | 500000 | 4022315 | 4455931 | 20116126 | 7461 | 2696.17 |

| | | | | | | | | | |
|---|-------------------|---------|----------|---------|---------|---------|----------|-------|---------|
| | Dental OPD | 1825200 | 3156550 | 1812500 | 4022315 | 4455931 | 15272496 | 2986 | 5114.70 |
| | Other (Rehab.) | 270000 | 222090 | 550000 | 4022315 | 0 | 5064405 | 1767 | 2866.10 |
| C | GP Service | 496575 | 15721459 | 6206250 | 0 | 0 | 22424284 | 20344 | 1102.26 |

4.1.4. Unit Cost of Sensitivity Analysis

According to table 8, scenario 1 is calculated by using opportunity cost based on private earning. So, unit cost of patient who seeking healthcare at general OPD is significantly higher than that in baseline 1 and 2. The reason is that general OPD has many specialist doctors than other disciplines. Income per hour of a specialist, in private sector, is 10 times greater than that of government salary in real world.

Table 8: Result of Sensitivity Analysis

| Name of analysis | Unit cost of OPD patient in Type A clinic | | | | Unit cost of OPD patient in Type B clinic | | | | Unit cost of OPD patient in Type C clinic |
|------------------|---|---------|----------|---------|---|---------|---------|---------|---|
| | General | Eye | Dental | Accup. | General | Eye | Dental | Rehab. | |
| Baseline 1 | 4324.91 | 1553.57 | 9081.87 | 1123.30 | 1965.93 | 2629.16 | 4507.70 | 2554.84 | 797.19 |
| Baseline 2 | 6019.52 | 1649.96 | 10132.97 | 1578.65 | 2108.33 | 2696.17 | 5114.70 | 2866.10 | 1102.26 |
| Scenario 1 | 13096.25 | 1648.78 | 10132.97 | 2083.94 | 2330.98 | 3272.50 | 6554.75 | 2866.10 | 1102.26 |
| Scenario 2 | 4320.08 | 1552.18 | 9074.28 | 1121.83 | 1953.27 | 2579.70 | 4409.98 | 2534.68 | 794.48 |
| Scenario 3 | 6014.69 | 1648.57 | 10125.38 | 1577.17 | 2095.66 | 2646.71 | 5016.98 | 2845.94 | 1099.54 |

| | | | | | | | | | |
|---------------|----------|---------|----------|---------|---------|---------|---------|---------|---------|
| Scenario 4 | 13091.42 | 1647.38 | 10125.38 | 2082.46 | 2318.32 | 3223.04 | 6457.03 | 2845.94 | 1099.54 |
| Scenario 5 | 4365.12 | 1565.17 | 9145.09 | 1135.62 | 2018.13 | 2833.02 | 4910.52 | 2637.97 | 817.79 |
| Scenario 6 | 6059.73 | 1661.56 | 10196.19 | 1590.96 | 2160.52 | 2900.04 | 5517.52 | 2949.23 | 1122.86 |
| Scenario 7 | 13136.47 | 1916.63 | 10196.19 | 2096.25 | 2383.18 | 3476.37 | 6957.58 | 2949.23 | 1122.86 |

In scenario 2 and 3, change in salvage value cannot affect too much on unit cost of each OPD. Only small amount of cost declines from baseline result 1 and 2. Moreover, the results of scenario 4 have a little different from that of scenario 1. The results of scenario 5, 6 and 7 are also not much different with result of baseline 1, 2 and scenario 1.

So, it can be concluded that change in depreciation method and change in salvage value cannot affect the change of unit cost in this study. Only opportunity cost is main factor that can obviously increase the unit cost per patient in this study.

According to table 8 results, the unit cost of type C clinic does not change obviously even salvage value and depreciation method changed. For opportunity cost, present or absent of opportunity cost in calculating total cost is crucially important. It can affect unit cost per patient, directly.

Chapter 5.

Discussion and Conclusion

5.1. Discussion and Conclusion

This study is cost analysis of primary healthcare clinics under the administration of community-based organizations. This study found that there is a difference between type A and B clinics. These are in terms of management, staffs, number of specialist and utilization rates. Most unit costs at the type A clinic are more expensive than those at type B. This is mainly due to administrative cost. Therefore, it is matched with the study hypothesis.

One interesting feature is that volunteer medical personnel of both clinics are mainly from Mandalay City. Type A clinic is a little bit far from the city and need to arrange transportation for volunteer medical personnel while type B does not. The unit cost of eye OPD of type A clinic is lower than that of type B because type A has a higher utilization rate of eye OPD. The explaining for high utilization is that a foreign eye specialist team always comes to this hospital and performs operations on behalf of the hospital. So, if anyone who visits at eye OPD of type A and needs to operate, he may have a chance of getting treatment from the foreign specialist team.

The change in the depreciation method and salvage value do not obviously affect the unit cost in this study. However, the opportunity cost of medical personnel is extremely important for unit cost calculation. Both the administrative teams of type A and B are not interested to put opportunity cost of medical personnel into their expenses because they are voluntarily donated their effort. Including the opportunity cost which is calculated from government salaries, can change the unit cost per patient. The unit cost becomes higher when opportunity cost, based on private earning

instead of government salaries, is added to total cost. Opportunity cost also affects in unit cost calculation of type C clinic.

The highest unit cost in this study is about 13,000MMK. This is the unit cost per patient at general OPD of type A clinic where the opportunity cost (private) is included in cost calculation. The unit cost per patient at general OPD of type B clinic is lower than that at type A. The reason is that type B clinics has low administrative cost than type A while utilization rate is in reverse. The unit cost per patient at type C clinic cost about 800 MMK in baseline calculation result. The highest cost is about 1,100MMK which is calculated based on opportunity cost with private earning. This unit cost per patient is the lowest cost in this study. This is because the type C clinic has only GP services and use not too much administrative cost also.

5.2. Limitation of Study

Myanmar Health System lacks information in various areas of healthcare. The NHA of Myanmar mainly considers about the information of the public health sector. The previous research work, papers and reports, about cost analysis of health expenditure of both the private and the public, is not accessible in Myanmar.

Although, a lot of CBOs exist in many towns and cities in Myanmar, there has been no compilation on the exact number, scale and scope of CBOs. Almost all CBOs have no proper record keeping and organizational management.

In this study, cost calculation is from the provider's perspective and does not include the cost from the patient's side. Capital cost of most medical equipment cannot be separated from the capital cost of building because all types of CBO in this study depend mainly on donation. Donor community always donate a complete building equipped with medical instrument.

The total cost and unit cost of the patient cannot be categorized and calculated according to the severity of diseases and variety of diseases. The categorization of outpatient departments was used according to the proposed structure of the selected clinics.

5.3. Recommendation

For type A clinic, the most utilizing part is Eye Specialist OPD. It has a low unit cost with a high utilization rate. The weakest part is general OPD because it bundles many medical specialties and specialist doctors with a low utilization rate. So, the unit cost is significantly higher. Type A clinic should try to increase the utilization rate of all specialty like eye OPD, with minimum use of resources.

For type B clinic, unit cost per patient is fair. This may be due to the geographical location and the fact that the clinic works with minimally required number of specialists. That is greatly affects the cost calculation. Type B clinic is in a geographically accessible location for the poor local community and this is a reason of why they have a high utilization rate. For type C clinic, the cost calculation method is not complicated and the unit cost per patient is about 800MMK. This cost is affordable in local community. The problem in this level type of clinics is the lack of proper administrative management, record keeping and financial management. If type C clinics were to build up proper management, the MOH can contract with this type of clinics as gatekeeper of the health system.

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APPENDIX

Appendix 1: Step-down Allocation for Type B clinic

| Step-down Allocation for Type B Clinic | | | |
|--|-----------|----------|---------|
| Capital Cost: Admin+General+ Lab+Radiology+Dental | | Eye | Other |
| original cost | 169000000 | 56000000 | 6000000 |
| S.V | 16900000 | 5600000 | 600000 |
| Useful life | 20 | 20 | 20 |
| Straightline 10% | 7605000 | 2520000 | 270000 |
| Capital Cost for | | | |
| Admin | 4% | 304200 | |
| General | 24% | 1825200 | |
| Lab | 24% | 1825200 | |
| Radio | 24% | 1825200 | |
| Dental | 24% | 1825200 | |
| Ancill Dept | | 3650400 | |

Appendix 2: Step-down Allocation of Admin and Ancillary Department of Type B Clinic

| Cost of Admin Dept. of Type B Clinic | | Cost of Ancillary Dept. of Type B Clinic | |
|---|----------|---|--------------|
| Straight line 10% | | Straight line 10% | |
| Capital cost | 304200 | Capital cost | 3650400 |
| Recurrent | | Recurrent | |
| Cost | 23829690 | Cost | 10584625 |
| Total Cost | 24133890 | Cost from admin | 8044630 |
| | | Total Cost | 22279655 |
| Stepdown Allocation (six dept. equally share admin cost) | | Stepdown Allocation | |
| 2 Ancillary Dept. | 8044630 | General | 60% 13367793 |
| General | 4022315 | Eye | 20% 4455931 |
| Eye | 4022315 | Dental | 20% 4455931 |
| Dental | 4022315 | | |
| Rehab Dept. | 4022315 | | |

Appendix 3: Unit Cost Calculation of Type B Clinic

| Type B Clinic | | | |
|-------------------------|-----------------|-----------------|-----------------|
| Cost of General OPD | | | |
| | Straight line | Straight line | DDB |
| | 10% | 20% | |
| Capital cost | 1825200 | 1622400 | 2661141.6 |
| Recurrent Cost | 51973044 | 51973044 | 51973044 |
| Cost from admin | 4022315 | 4016682 | 4045536 |
| Cost from ancillary | 13367793 | 13117673 | 14398788 |
| Opp. Cost | 0 | 0 | 0 |
| Total Cost | 71188352 | 70729799 | 73078509 |
| | | | |
| Total Patient | 36211 | 36211 | 36211 |
| | | | |
| Cost per Patient | 1965.93 | 1953.27 | 2018.13 |

Appendix 4: Unit Cost Calculation of Type B Clinic (Contd.)

| Type B Clinic | | | | |
|---------------------|---------------|-------------------|-------|-----------|
| Cost of General OPD | Straight line | | | DDB |
| | 10% | Straight line 20% | | |
| Capital cost | 1825200 | 1622400 | | 2661141.6 |
| Recurrent Cost | 51973044 | 51973044 | | 51973044 |
| Cost from admin | 4022315 | 4016682 | | 4045536 |
| Cost from ancillary | 13367793 | 13117673 | | 14398788 |
| Opp. Cost | 5156250 | 5156250 | | 0 |
| Total Cost | 76344602 | 75886049 | | 73078509 |
| Total Patient | 36211 | 36211 | | 36211 |
| Cost per Patient | 2108.33 | 2095.66 | | 2018.13 |
| Opp. Cost | | | | |
| Number of doctor | 5 | 30 | 0 | |
| working hour | 3 | 3 | 3 | |
| GovSalary | 1250 | 937.5 | 437.5 | |
| workingdays | 50 | 50 | 50 | |
| Opp. Cost | 937500 | 4218750 | 0 | 5156250 |

Appendix 5: Unit Cost Calculation of Type B Clinic (Contd.)

| Type B Clinic | | | |
|-------------------------|-------------------|-------------------|-----------------|
| Cost of General OPD | Straight line 10% | Straight line 20% | DDB |
| Capital cost | 1825200 | 1622400 | 2661141.6 |
| Recurrent Cost | 51973044 | 51973044 | 51973044 |
| Cost from admin | 4022315 | 4016682 | 4045536 |
| Cost from ancillary | 13367793 | 13117673 | 14398788 |
| Opp. Cost | 13218750 | 13218750 | 0 |
| Total Cost | 84407102 | 83948549 | 73078509 |
| | | | |
| Total Patient | 36211 | 36211 | 36211 |
| | | | |
| Cost per Patient | 2330.98 | 2318.32 | 2018.13 |
| | | | |
| Opp. Cost | | | |
| Number of doctor | 5 | 30 | 0 |
| working hour | 3 | 3 | 3 |
| Salary | 12000 | 937.5 | 437.5 |
| workingdays | 50 | 50 | 50 |
| Opp. Cost | 9000000 | 4218750 | 0 |
| | | | 13218750 |

Appendix 6: Unit Cost Calculation of Type B Clinic (Contd.)

| Type B Clinic | | | |
|---------------------|-----------------|-----------------|-----------------|
| Cost of Eye OPD | Straight line | Straight line | DDB |
| | 10% | 20% | |
| Capital cost | 2520000 | 2240000 | 3674160 |
| Recurrent Cost | 8617880 | 8617880 | 8617880 |
| Cost from admin | 4022315 | 4016682 | 4045536 |
| Cost from ancillary | 4455931 | 4372558 | 4799596 |
| Opp. Cost | 0 | 0 | 0 |
| Total Cost | 19616126 | 19247119 | 21137171 |
| Total Patient | 7461 | 7461 | 7461 |
| Cost per Patient | 2629.16 | 2579.70 | 2833.02 |

Appendix 7: Unit Cost Calculation of Type B Clinic (Contd.)

| Type B Clinic | | | |
|---------------------|-------------------|-------------------|----------|
| Cost of Eye OPD | Straight line 10% | Straight line 20% | DDB |
| Capital cost | 2520000 | 2240000 | 3674160 |
| Recurrent Cost | 8617880 | 8617880 | 8617880 |
| Cost from admin | 4022315 | 4016682 | 4045536 |
| Cost from ancillary | 4455931 | 4372558 | 4799596 |
| Opp. Cost | 500000 | 500000 | 0 |
| Total Cost | 20116126 | 19747119 | 21137171 |
| Total Patient | 7461 | 7461 | 7461 |
| Cost per Patient | 2696.17 | 2646.71 | 2833.02 |
| Opp. Cost | | | |
| Number of doctor | 2 | 0 | 0 |
| working hour | 4 | 4 | 4 |
| GovSalary | 1250 | 937.5 | 437.5 |
| workingdays | 50 | 50 | 50 |
| Opp. Cost | 500000 | 0 | 0 |
| | | | 500000 |

Appendix 8: Unit Cost Calculation of Type B Clinic (Contd.)

| Type B Clinic | | | | |
|---------------------|-------------------|-------------------|----------|--|
| Cost of Eye OPD | | | | |
| | Straight line 10% | Straight line 20% | DDB | |
| Capital cost | 2520000 | 2240000 | 3674160 | |
| Recurrent Cost | 8617880 | 8617880 | 8617880 | |
| Cost from admin | 4022315 | 4016682 | 4045536 | |
| Cost from ancillary | 4455931 | 4372558 | 4799596 | |
| Opp. Cost | 4800000 | 4800000 | 0 | |
| Total Cost | 24416126 | 24047119 | 21137171 | |
| Total Patient | 7461 | 7461 | 7461 | |
| Cost per Patient | 3272.50 | 3223.04 | 2833.02 | |
| Opp. Cost | | | | |
| Number of doctor | 2 | 0 | 0 | |
| working hour | 4 | 4 | 4 | |
| Salary | 12000 | 937.5 | 437.5 | |
| workingdays | 50 | 50 | 50 | |
| Opp. Cost | 4800000 | 0 | 0 | |
| | | | 4800000 | |

Appendix 9: Unit Cost Calculation of Type B Clinic (Contd.)

| Type B Clinic | | | |
|---------------------|----------------------|----------------------|-----------|
| Cost of Dental OPD | | | |
| | Straight line 10% | Straight line 20% | DDB |
| Capital cost | 1825200 | 1622400 | 2661141.6 |
| Recurrent Cost | 3156550 | 3156550 | 3156550 |
| Cost from admin | 4022315 | 4016682 | 4045536 |
| Cost from ancillary | 4455931 | 4372558 | 4799596 |
| Opp. Cost | 0 | 0 | 0 |
| Total Cost | 13459996 | 13168189 | 14662823 |
| Total Patient | 2986 | 2986 | 2986 |
| Cost per Patient | 4507.70 | 4409.98 | 4910.52 |

Appendix 10: Unit Cost Calculation of Type B Clinic (Contd.)

| Cost of Dental OPD | Type B Clinic | | |
|-------------------------|-------------------|-------------------|-----------------|
| | Straight line 10% | Straight line 20% | DDB |
| Capital cost | 1825200 | 1622400 | 2661141.6 |
| Recurrent Cost | 3156550 | 3156550 | 3156550 |
| Cost from admin | 4022315 | 4016682 | 4045536 |
| Cost from ancillary | 4455931 | 4372558 | 4799596 |
| Opp. Cost | 1812500 | 1812500 | 0 |
| Total Cost | 15272496 | 14980689 | 14662823 |
| | | | |
| Total Patient | 2986 | 2986 | 2986 |
| | | | |
| Cost per Patient | 5114.70 | 5016.98 | 4910.52 |
| | | | |
| Opp. Cost | | | |
| Number of doctor | 2 | 7 | 0 |
| working hour | 4 | 4 | 4 |
| GovSalary | 1250 | 937.5 | 437.5 |
| workingdays | 50 | 50 | 50 |
| Opp. Cost | 500000 | 1312500 | 0 |
| | | | 1812500 |

Appendix 11: Unit Cost Calculation of Type B Clinic (Contd.)

| Type B Clinic | | | |
|---------------------|-------------------|-------------------|-----------|
| Cost of Dental OPD | Straight line 10% | Straight line 20% | DDB |
| Capital cost | 1825200 | 1622400 | 2661141.6 |
| Recurrent Cost | 3156550 | 3156550 | 3156550 |
| Cost from admin | 4022315 | 4016682 | 4045536 |
| Cost from ancillary | 4455931 | 4372558 | 4799596 |
| Opp. Cost | 6112500 | 6112500 | 0 |
| Total Cost | 19572496 | 19280689 | 14662823 |
| Total Patient | 2986 | 2986 | 2986 |
| Cost per Patient | 6554.75 | 6457.03 | 4910.52 |
| Opp. Cost | | | |
| Number of doctor | 2 | 7 | 0 |
| working hour | 4 | 4 | 4 |
| Salary | 12000 | 937.5 | 437.5 |
| workingdays | 50 | 50 | 50 |
| Opp. Cost | 4800000 | 1312500 | 0 |
| | | | 6112500 |

Appendix 12: Unit Cost Calculation of Type B Clinic (Contd.)

| Type B Clinic | | | |
|-------------------------|----------------------|----------------------|----------------|
| Cost of Rehab OPD | | | |
| | Straight line 10% | Straight line 20% | DDB |
| Capital cost | 270000 | 240000 | 393660 |
| Recurrent Cost | 222090 | 222090 | 222090 |
| Cost from admin | 4022315 | 4016682 | 4045536 |
| Cost from ancillary | 0 | 0 | 0 |
| Opp. Cost | 0 | 0 | 0 |
| Total Cost | 4514405 | 4478772 | 4661286 |
| | | | |
| Total Patient | 1767 | 1767 | 1767 |
| | | | |
| Cost per Patient | 2554.84 | 2534.68 | 2637.97 |

Appendix 13: Unit Cost Calculation of Type B Clinic (Contd.)

| Cost of Rehab OPD | Type B Clinic | | | DDB |
|-------------------------|----------------|-------------------|--------|----------------|
| | Straight line | | | |
| | 10% | Straight line 20% | | |
| Capital cost | 270000 | 240000 | | 393660 |
| Recurrent Cost | 222090 | 222090 | | 222090 |
| Cost from admin | 4022315 | 4016682 | | 4045536 |
| Cost from ancillary | 0 | 0 | | 0 |
| Opp. Cost | 550000 | 550000 | | 0 |
| Total Cost | 5064405 | 5028772 | | 4661286 |
| | | | | |
| Total Patient | 1767 | 1767 | | 1767 |
| | | | | |
| Cost per Patient | 2866.10 | 2845.94 | | 2637.97 |
| | | | | |
| Opp. Cost | | | | |
| Number of doctor | 0 | 2 | 2 | |
| working hour | 4 | 4 | 4 | |
| GovSalary | 1250 | 937.5 | 437.5 | |
| workingdays | 50 | 50 | 50 | |
| Opp. Cost | 0 | 375000 | 175000 | 550000 |

Appendix 14: Unit Cost Calculation of Type B Clinic (Contd.)

| Cost of Rehab OPD | Type B Clinic | | | DDB |
|---------------------|---------------|--------|-------------------|---------|
| | Straight line | | Straight line 20% | |
| | 10% | | | |
| Capital cost | 270000 | | 240000 | 393660 |
| Recurrent Cost | 222090 | | 222090 | 222090 |
| Cost from admin | 4022315 | | 4016682 | 4045536 |
| Cost from ancillary | 0 | | 0 | 0 |
| Opp. Cost | 550000 | | 550000 | 0 |
| Total Cost | 5064405 | | 5028772 | 4661286 |
| Total Patient | 1767 | | 1767 | 1767 |
| Cost per Patient | 2866.10 | | 2845.94 | 2637.97 |
| Opp. Cost | | | | |
| Number of doctor | 0 | 2 | 2 | |
| working hour | 4 | 4 | 4 | |
| Salary | 12000 | 937.5 | 437.5 | |
| workingdays | 50 | 50 | 50 | |
| Opp. Cost | 0 | 375000 | 175000 | 550000 |

Appendix 15: Step-down allocation of Administrative Department of Type A Clinic

| Cost of Admin Dept. of Type A Clinic | | |
|--------------------------------------|-----|---------------------------|
| | | Straight line with 10% |
| Capital cost | | 1380000 |
| Recurrent Cost | | 75106500 |
| Total Cost | | 76486500 |
| Stepdown Allocation | | |
| Ancillary Dept. | 20% | 15297300 |
| IPD | 40% | 30594600 |
| OPD | 40% | 30594600 |
| OPD | | |
| General | 30% | 9178380 |
| Eye | 30% | 9178380 |
| Dental | 30% | 9178380 |
| Accupuncture | 10% | 3059460 |

Appendix 16: Step-down allocation of Ancillary Department of Type A Clinic

| Cost of Ancillary Dept. of Type A Clinic | | |
|--|-----|---------------------------|
| | | Straight line with 10% |
| Capital cost | | 0 |
| Recurrent Cost | | 7061800 |
| Cost from admin | | 15297300 |
| Total Cost | | 22359100 |
| Stepdown Allocation | | |
| IPD | 50% | 11179550 |
| OPD | 50% | 11179550 |
| OPD | | |
| General | 33% | 3689252 |
| Eye | 33% | 3689252 |
| Dental | 33% | 3689252 |
| Accupuncture | 1% | 111796 |

Appendix 17: Unit Cost Calculation of Type A Clinic

| Type A Clinic | | | | |
|---------------------|---------------------------|---------------------------|-------------|--------------|
| Cost of General OPD | Straight line with 10% | Straight line with 20% | DDBwith 10% | DDB with 20% |
| Capital cost | 0 | 0 | 0 | 0 |
| Recurrent Cost | 8155735 | 8155735 | 8155735 | 8155735 |
| Cost from admin | 9178380 | 9159980 | 9331713.333 | 9331713.333 |
| Cost from ancillary | 3689252 | 3684192 | 3731418 | 3731418 |
| Opp. Cost | 0 | 0 | 0 | 0 |
| Total Cost | 21023367 | 20999907 | 21218867 | 21218867 |
| Total Patient | 4861 | 4861 | 4861 | 4861 |
| Cost per Patient | 4324.91 | 4320.08 | 4365.12 | 4365.12 |

Appendix 19: Unit Cost Calculation of Type A Clinic (Contd.)

| Type A Clinic | | | | | | | |
|---------------------|---------------|----------|--------------------|--------------|-------------|--------------|----------|
| Cost of General OPD | | | | | | | |
| | Straight line | | Straight line with | | DDBwith | | |
| | with 10% | 20% | 10% | DDB with 20% | 10% | DDB with 20% | |
| Capital cost | 0 | 0 | 0 | 0 | 0 | 0 | |
| Recurrent Cost | 8155735 | 8155735 | 8155735 | 8155735 | 8155735 | 8155735 | |
| Cost from admin | 9178380 | 9159980 | 9331713.333 | 9331713.333 | 9331713.333 | 9331713.333 | |
| Cost from ancillary | 3689252 | 3684192 | 3731418 | 3731418 | 3731418 | 3731418 | |
| Opp. Cost | 42637500 | 42637500 | 42637500 | 42637500 | 42637500 | 42637500 | |
| Total Cost | 63660867 | 63637407 | 63856367 | 63856367 | 63856367 | 63856367 | |
| Total Patient | 4861 | 4861 | 4861 | 4861 | 4861 | 4861 | |
| Cost per Patient | 13096.25 | 13091.42 | 13136.47 | 13136.47 | 13136.47 | 13136.47 | |
| Opp. Cost | | | | | | | |
| Number of doctor | 16 | 17 | 12 | 16 | 17 | 12 | |
| working hour | 4 | 4 | 4 | 4 | 4 | 4 | |
| Salary | 12000 | 937.5 | 437.5 | 12000 | 937.5 | 437.5 | |
| workingdays | 50 | 50 | 50 | 50 | 50 | 50 | |
| Opp. Cost | 38400000 | 3187500 | 1050000 | 42637500 | 38400000 | 3187500 | 1050000 |
| | | | | 42637500 | | | 42637500 |

Appendix 20: Unit Cost Calculation of Type A Clinic (Contd.)

| Type A Clinic | | | | |
|---------------------|------------------|------------------|-------------|--------------|
| Cost of Eye OPD | Straight | Straight | DDB 10% | DDB with 20% |
| | line with 10% | line with 20% | | |
| Capital cost | 0 | 0 | 0 | 0 |
| Recurrent Cost | 13322430 | 13322430 | 13322430 | 13322430 |
| Cost from admin | 9178380 | 9159980 | 9331713.333 | 9331713.333 |
| Cost from ancillary | 3689252 | 3684192 | 3731418 | 3731418 |
| Opp. Cost | 0 | 0 | 0 | 0 |
| Total Cost | 26190062 | 26166602 | 26385562 | 26385562 |
| Total Patient | 16858 | 16858 | 16858 | 16858 |
| Cost per Patient | 1553.57 | 1552.18 | 1565.17 | 1565.17 |

Appendix 21: Unit Cost Calculation of Type A Clinic (Contd.)

| Type A Clinic | | | | | | | | | |
|---------------------|--------------------|----------|-------|-------------|-------------|---------|---|---------|--|
| Cost of Eye OPD | Straight line with | | | DDB | | | | | |
| | 10% | 20% | | 10% | 20% | | | | |
| Capital cost | 0 | 0 | | 0 | 0 | | | | |
| Recurrent Cost | 13322430 | 13322430 | | 13322430 | 13322430 | | | | |
| Cost from admin | 9178380 | 9159980 | | 9331713.333 | 9331713.333 | | | | |
| Cost from ancillary | 3689252 | 3684192 | | 3731418 | 3731418 | | | | |
| Opp. Cost | 1625000 | 1625000 | | 1625000 | 1625000 | | | | |
| Total Cost | 27815062 | 27791602 | | 28010562 | 28010562 | | | | |
| Total Patient | 16858 | 16858 | | 16858 | 16858 | | | | |
| Cost per Patient | 1649.96 | 1648.57 | | 1661.56 | 1661.56 | | | | |
| Opp. Cost | | | | | | | | | |
| Number of doctor | 2 | 6 | 0 | 2 | 6 | 0 | | | |
| working hour | 4 | 4 | 4 | 4 | 4 | 4 | | | |
| GovSalary | 1250 | 937.5 | 437.5 | 1250 | 937.5 | 437.5 | | | |
| workingdays | 50 | 50 | 50 | 50 | 50 | 50 | | | |
| Opp. Cost | 500000 | 1125000 | 0 | 1625000 | 500000 | 1125000 | 0 | 1625000 | |

Appendix 22: Unit Cost Calculation of Type A Clinic (Contd.)

| Cost of Eye OPD | Type A Clinic | | | | | | | | |
|---------------------|--------------------|----------|--------------------|-------------|-------------|-------------|-------------|--------------|-------------|
| | Straight line with | | Straight line with | | | DDB 10% | | DDB with 20% | |
| | 10% | 20% | 10% | 20% | 10% | 20% | 10% | 20% | |
| Capital cost | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Recurrent Cost | 13322430 | 13322430 | 13322430 | 13322430 | 13322430 | 13322430 | 13322430 | 13322430 | 13322430 |
| Cost from admin | 9178380 | 9159980 | 9331713.333 | 9331713.333 | 9331713.333 | 9331713.333 | 9331713.333 | 9331713.333 | 9331713.333 |
| Cost from ancillary | 3689252 | 3684192 | 3731418 | 3731418 | 3731418 | 3731418 | 3731418 | 3731418 | 3731418 |
| Opp. Cost | 1605000 | 1605000 | 5925000 | 5925000 | 5925000 | 5925000 | 5925000 | 5925000 | 5925000 |
| Total Cost | 27795062 | 27771602 | 32310562 | 32310562 | 32310562 | 32310562 | 32310562 | 32310562 | 32310562 |
| Total Patient | 16858 | 16858 | 16858 | 16858 | 16858 | 16858 | 16858 | 16858 | 16858 |
| Cost per Patient | 1648.78 | 1647.38 | 1916.63 | 1916.63 | 1916.63 | 1916.63 | 1916.63 | 1916.63 | 1916.63 |
| Opp. Cost | | | | | | | | | |
| Number of doctor | 2 | 6 | 0 | 2 | 6 | 0 | 2 | 6 | 0 |
| working hour | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Salary | 1200 | 937.5 | 437.5 | 12000 | 937.5 | 437.5 | 12000 | 937.5 | 437.5 |
| workingdays | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Opp. Cost | 480000 | 1125000 | 0 | 1605000 | 4800000 | 1125000 | 0 | 5925000 | 5925000 |

Appendix 23: Unit Cost Calculation of Type A Clinic (Contd.)

| Type A Clinic | | | | |
|---------------------|------------------------------|------------------------------|-----------------|-----------------|
| Cost of Dental OPD | Straight line with 10% | Straight line with 20% | DDB with 10% | DDB with 20% |
| Capital cost | 0 | 0 | 0 | 0 |
| Recurrent Cost | 15213500 | 15213500 | 15213500 | 15213500 |
| Cost from admin | 9178380 | 9159980 | 9331713.333 | 9331713.333 |
| Cost from ancillary | 3689252 | 3684192 | 3731418 | 3731418 |
| Opp. Cost | 0 | 0 | 0 | 0 |
| Total Cost | 28081132 | 28057672 | 28276632 | 28276632 |
| Total Patient | 3092 | 3092 | 3092 | 3092 |
| Cost per Patient | 9081.87 | 9074.28 | 9145.09 | 9145.09 |

Appendix 24: Unit Cost Calculation of Type A Clinic (Contd.)

| Type A Clinic | | | | | | | | | |
|---------------------|------------------|---------------------------|----------|-------------|--------------|-------------|-------------|-------------|-------------|
| Cost of Dental OPD | | | | | | | | | |
| | Straight | | | DDB with | | | | | |
| | line with 10% | Straight line with 20% | | 10% | DDB with 20% | | | | |
| Capital cost | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Recurrent Cost | 15213500 | 15213500 | 15213500 | 15213500 | 15213500 | 15213500 | 15213500 | 15213500 | 15213500 |
| Cost from admin | 9178380 | 9159980 | 9159980 | 9331713.333 | 9331713.333 | 9331713.333 | 9331713.333 | 9331713.333 | 9331713.333 |
| Cost from ancillary | 3689252 | 3684192 | 3684192 | 3731418 | 3731418 | 3731418 | 3731418 | 3731418 | 3731418 |
| Opp. Cost | 3250000 | 3250000 | 3250000 | 3250000 | 3250000 | 3250000 | 3250000 | 3250000 | 3250000 |
| Total Cost | 31331132 | 31307672 | 31307672 | 31526632 | 31526632 | 31526632 | 31526632 | 31526632 | 31526632 |
| Total Patient | 3092 | 3092 | 3092 | 3092 | 3092 | 3092 | 3092 | 3092 | 3092 |
| Cost per Patient | 10132.97 | 10125.38 | 10125.38 | 10196.19 | 10196.19 | 10196.19 | 10196.19 | 10196.19 | 10196.19 |
| Opp. Cost | | | | | | | | | |
| Number of doctor | 0 | 15 | 5 | 0 | 15 | 5 | 0 | 15 | 5 |
| working hour | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| GovSalary | 1250 | 937.5 | 437.5 | 1250 | 937.5 | 437.5 | 1250 | 937.5 | 437.5 |
| workingdays | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Opp. Cost | 0 | 2812500 | 437500 | 3250000 | 0 | 2812500 | 437500 | 3250000 | 3250000 |

Appendix 25: Unit Cost Calculation of Type A Clinic (Contd.)

| Type A Clinic | | | | | | | | | |
|---------------------|------------------------|----------|------------------------|----------|--------------|-------------|--------------|-------------|--|
| Cost of Dental OPD | | | | | | | | | |
| | Straight line with 10% | | Straight line with 20% | | DDB with 10% | | DDB with 20% | | |
| | Capital cost | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Recurrent Cost | 15213500 | 15213500 | 15213500 | 15213500 | 15213500 | 15213500 | 15213500 | 15213500 | |
| Cost from admin | 9178380 | 9159980 | 9159980 | 9159980 | 9331713.333 | 9331713.333 | 9331713.333 | 9331713.333 | |
| Cost from ancillary | 3689252 | 3684192 | 3684192 | 3684192 | 3731418 | 3731418 | 3731418 | 3731418 | |
| Opp. Cost | 3250000 | 3250000 | 3250000 | 3250000 | 3250000 | 3250000 | 3250000 | 3250000 | |
| Total Cost | 31331132 | 31307672 | 31307672 | 31307672 | 31526632 | 31526632 | 31526632 | 31526632 | |
| Total Patient | 3092 | 3092 | 3092 | 3092 | 3092 | 3092 | 3092 | 3092 | |
| Cost per Patient | 10132.97 | 10125.38 | 10125.38 | 10125.38 | 10196.19 | 10196.19 | 10196.19 | 10196.19 | |
| Opp. Cost | | | | | | | | | |
| Number of doctor | 0 | 15 | 5 | 5 | 0 | 15 | 5 | 5 | |
| working hour | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| Salary | 12000 | 937.5 | 437.5 | 437.5 | 12000 | 937.5 | 437.5 | 437.5 | |
| workingdays | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | |
| Opp. Cost | 0 | 2812500 | 437500 | 3250000 | 0 | 2812500 | 437500 | 3250000 | |

Appendix 26: Unit Cost Calculation of Type A Clinic (Contd.)

| Type A Clinic | | | | |
|---------------------|------------------|------------------|-------------|----------|
| Cost of Accup OPD | Straight | Straight | DDB with | DDB with |
| | line with 10% | line with 20% | 10% | 20% |
| Capital cost | 0 | 0 | 0 | 0 |
| Recurrent Cost | 1608400 | 1608400 | 1608400 | 1608400 |
| Cost from admin | 3059460 | 3053327 | 3110571.111 | 3110571 |
| Cost from ancillary | 111796 | 111642 | 113073 | 113073 |
| Opp. Cost | 0 | 0 | 0 | 0 |
| Total Cost | 4779656 | 4773369 | 4832044 | 4832044 |
| Total Patient | 4255 | 4255 | 4255 | 4255 |
| Cost per Patient | 1123.30 | 1121.83 | 1135.62 | 1135.62 |

Appendix 27: Unit Cost Calculation of Type A Clinic (Contd.)

| Type A Clinic | | | | | | | | | |
|---------------------|--------------------|---------|---------|-------------|--------|---------|---|---------|---------|
| Cost of Accup OPD | | | | | | | | | |
| | Straight line with | | | DDB with | | | | | |
| | 10% | 20% | | 10% | 20% | | | | |
| | | | | | | | | | |
| Capital cost | 0 | | 0 | 0 | | | | | 0 |
| Recurrent Cost | 1608400 | | 1608400 | 1608400 | | | | | 1608400 |
| Cost from admin | 3059460 | | 3053327 | 3110571.111 | | | | | 3110571 |
| Cost from ancillary | 111796 | | 111642 | 113073 | | | | | 113073 |
| Opp. Cost | 1937500 | | 1937500 | 1937500 | | | | | 1937500 |
| Total Cost | 6717156 | | 6710869 | 6769544 | | | | | 6769544 |
| Total Patient | 4255 | | 4255 | 4255 | | | | | 4255 |
| Cost per Patient | 1578.65 | | 1577.17 | 1590.96 | | | | | 1590.96 |
| Opp. Cost | | | | | | | | | |
| Number of doctor | 1 | 9 | 0 | 1 | 9 | 0 | | | |
| working hour | 4 | 4 | 4 | 4 | 4 | 4 | | | |
| GovSalary | 1250 | 937.5 | 437.5 | 1250 | 937.5 | 437.5 | | | |
| workingdays | 50 | 50 | 50 | 50 | 50 | 50 | | | |
| Opp. Cost | 250000 | 1687500 | 0 | 1937500 | 250000 | 1687500 | 0 | 1937500 | |

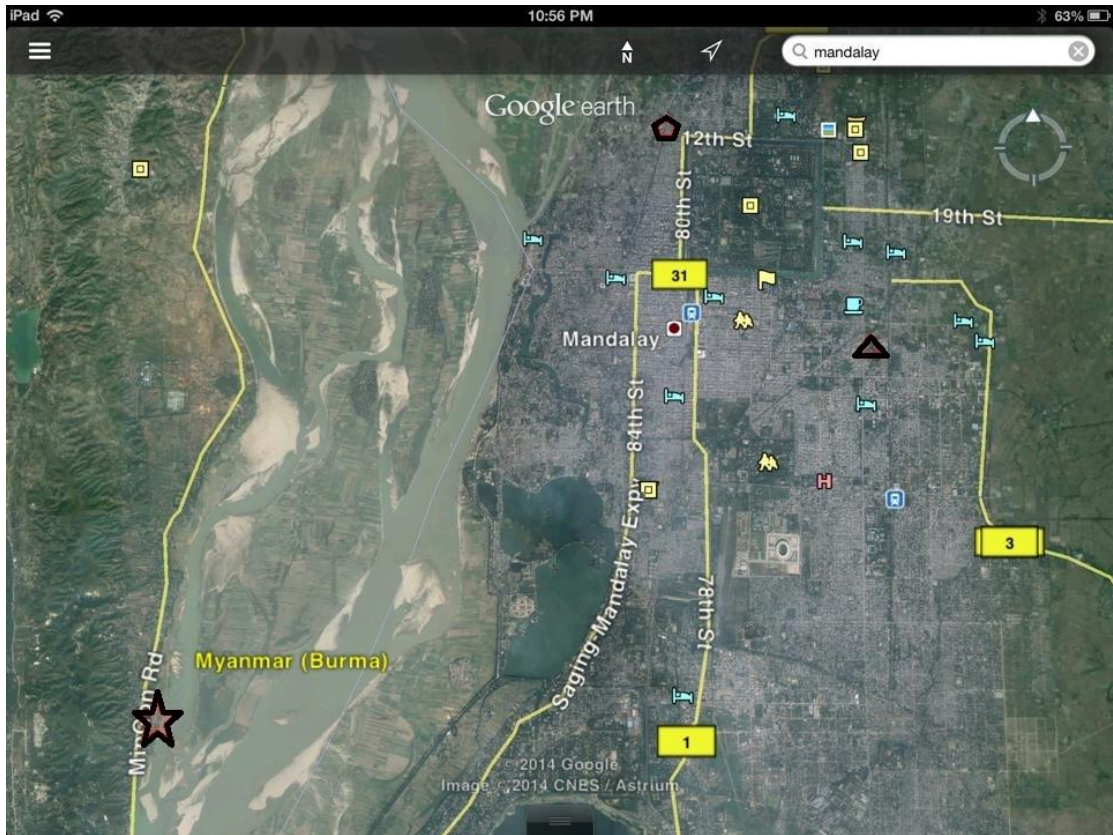
Appendix 28: Unit Cost Calculation of Type A Clinic (Contd.)

| Type A Clinic | | | | | | | | | |
|---------------------|---------------|---------|----------|-------------|---------|--------------|---|---------|--|
| Cost of Accup OPD | | | | | | | | | |
| | Straight line | | | DDB with | | | | | |
| | with 10% | | with 20% | 10% | | DDB with 20% | | | |
| Capital cost | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Recurrent Cost | 1608400 | 1608400 | 1608400 | 1608400 | 1608400 | 1608400 | | | |
| Cost from admin | 3059460 | 3053327 | 3053327 | 3110571.111 | 3110571 | 3110571 | | | |
| Cost from ancillary | 111796 | 111642 | 111642 | 113073 | 113073 | 113073 | | | |
| Opp. Cost | 4087500 | 4087500 | 4087500 | 4087500 | 4087500 | 4087500 | | | |
| Total Cost | 8867156 | 8860869 | 8860869 | 8919544 | 8919544 | 8919544 | | | |
| Total Patient | 4255 | 4255 | 4255 | 4255 | 4255 | 4255 | | | |
| Cost per Patient | 2083.94 | 2082.46 | 2082.46 | 2096.25 | 2096.25 | 2096.25 | | | |
| Opp. Cost | | | | | | | | | |
| Number of doctor | 1 | 9 | 0 | 1 | 9 | 0 | | | |
| working hour | 4 | 4 | 4 | 4 | 4 | 4 | | | |
| Salary | 12000 | 937.5 | 437.5 | 12000 | 937.5 | 437.5 | | | |
| workingdays | 50 | 50 | 50 | 50 | 50 | 50 | | | |
| Opp. Cost | 2400000 | 1687500 | 0 | 4087500 | 2400000 | 1687500 | 0 | 4087500 | |

Appendix 29: Direct Allocation Method for Type C clinic

| | Type C clinic | | | | | | DDB without Opp. Cost | DDB with Opp. Cost (Gov.) | DDB with Opp. Cost (Private) |
|-----------------------|------------------------------------|----------|---|----------|--|----------|--------------------------------|------------------------------------|---------------------------------------|
| | Straight line without Opp. Cost | | Straight line with Opp. Cost (Gov.) | | Straight line with Opp. Cost (Private) | | | | |
| | 10% | 20% | 10% | 20% | 10% | 20% | | | |
| Total Capital Cost | 496575 | 441400 | 496575 | 441400 | 496575 | 441400 | 915750 | 915750 | 915750 |
| RecurrentCost | 15721459 | 15721459 | 15721459 | 15721459 | 15721459 | 15721459 | 15721459 | 15721459 | 15721459 |
| Opp. Cost | 0 | 0 | 6206250 | 6206250 | 6206250 | 6206250 | 0 | 6206250 | 6206250 |
| Total Cost | 16218034 | 16162859 | 22424284 | 22369109 | 22424284 | 22369109 | 16637209 | 22843459 | 22843459 |
| Total Patient | 20344 | 20344 | 20344 | 20344 | 20344 | 20344 | 20344 | 20344 | 20344 |
| Cost per Patient | 797.19 | 794.48 | 1102.26 | 1099.54 | 1102.26 | 1099.54 | 817.79 | 1122.86 | 1122.86 |

Appendix 30: Geographical Location of Selected Clinics



Source: Google Map, 2014

Type A Clinic =



Type B Clinic =



Type C Clinic =



VITA

| | |
|-------------------------|--|
| Name | Dr. Win Htut |
| Date of Birth | 22.2.1984 |
| Place of Birth | Mandalay City |
| Nationality | Myanmar |
| Race | Burmese |
| Religion | Buddhist |
| Academic Qualifications | M.B, B.S., M.Med.Sc. (HCM) |
| Present Functions | Staff Officer (Grade 3), Directorate of Medical Services, Nay Pyi Taw City, Myanmar. |