**Measure of Health Outcomes in Nepal and its Neighboring Countries**

Course Module (HS236a) International Health System and Development

Professor Diana Bowser

Student Indu Prakash Shahi

Date Dec 15, 2015

Institution Brandeis University

The Heller School of Social Policy and Management,

**Acronyms**

ANC Anti Natal Care

CBHI Community Based Health Insurance

FCHV Female Community Health Volunteer

GDP Gross Domestic Product

MDG Millennium Development Goal

MMR Maternal Mortality Rate

MOHP Ministry of Health and Population

OOP Out of Pocket

SBA Skilled Birth Attendance

SDG Sustainable Development Goal

WB World bank

WHO World Health Organization

**1.1 Background**

Improving maternal mortality is the fifth Millennium Development Goal (MDG) of the United Nations. The third Sustainable Development Goal (SDG) focuses on the healthy lives of all at all ages. Maternal mortality and healthy lives are interrelated. Maternal mortality obviously contributes to health status of a nation and hence it is very important to assess it.

Nepal is a mountainous country with population 28.17 million people, 82% of them live in the rural where female literacy rate for the age 15-24 years is 80% (WB, 2015). Over 60% of mothers still give birth at home in rural(Engel et al., 2013). Health expenditure as a percentage of Gross Domestic Product (GDP) remains at most 6%. Life expectancy is 68 years (census 2011) in Nepal. Maternal Mortality Ratio (MMR) is 197 per 100,000 (WHO, 2014). Out of Pocket (OOP) expenditure as percentage of Total Health Expenditure (THE) is 46 % in 2013 (WHO, 2014). Maternal mortality, child and infant mortality, accessibility to health service, poor management are major issues of health care services in Nepal (Engel et al., 2013). Very few physicians prefer to work in the rural than urban area. Some acute respiratory infection and some vector borne diseases are also major issues (Kuruvilla et al., 2014). Major public and private hospitals including university hospitals are centralized in the urban areas (MOHP, 2014). The political instability and corruption is considered another factors pushing behind the health system.

Average number of years that a person can expect to live is said to be life expectancy at birth (WHO). Good health system plays a key role in achieving longer life expectancy. Longer life expectancy can only be achieved when people are at good health. Higher GDP is only possible if people are at good healthy who contribute national economy, education, health, infrastructure and so on. This shows that life expectancy measures aggregate result of all the other indictors. Therefore, life expectancy is a good indicator of health status. Materiality mortality is defined as the number of maternal deaths due to birth, pregnancy related complications per 100,000 registered live births (WHO). Maternal mortality is also a good indicator of measuring the health status of a country. The better the health care accessibility, higher per capita health workers, use of latest technology, strong and sustainable health financing, lower remains maternal mortality. Therefore, study of maternal mortality is very important for health assessment in Nepal. Similarly, the OOP expenditure as percentage of THE shows amount of money paid by all individuals for health care over a period of time. This indicates how serious a country is towards lives the people. The lower the OOP means high priority on the health care services by government and wants to increase health status of individuals. The higher the total expenditure on health, the more will be health facilities, services, health workers, less will be the OOP.

The control knob component of health system consists of: financing, payment, regulation, organization and behavior. Health financing is the system of fund generation, expenditures and flow of funds used to support the health services delivery system (WHO). Sources of financing can be revenue, insurance, fees, donation or foreign aids. Major allocation of financing goes to heath workers, buying drugs and other health care services. The higher is health financing, more health workers can be hired, trained to increase access to health care services and more robust can be health system. Innovative financing measures in health workers has reduced maternal mortality much faster in some countries (Mbizvo & Say, 2012). Nepal had received the MDG award in 2005 for reducing maternal mortality sharply since 1990. One of the reasons behind it was increase in financing (Kuruvilla et al., 2014). There is significant increase in financing from both government and donor agencies during 2006 and 2011 (Table 5). Substantial amount of the money was allocated for increasing numbers of health workers, their capacity building, raising awareness on family health and maternal care through the Female Community Health Volunteers (FCHV) program. The financing increased accessibility to health care services by increasing health workers and their skills. Therefore, financing is closely linked with access as an intermediate indicator of health system and hence very important for health outcomes such as maternal mortality.

I want compare the health status of Nepal with its neighboring countries in respect of life expectancy, maternal mortality and Out of Pocket payment (OOP) as percentage of the THE. These all are related to one another. The reason behind the higher THE can be either higher maternal mortality or lower life expectancy and the government want to improve them. The lower THE can be because of the finance or funding problem even if there is higher maternal mortality and lower life expectancy. I want to find the rationale behind it and hence chose these three indicators.

Life expectancy, maternal mortality and OOP as percentage of the THE as a measure of health outcomes in Nepal are compared with India, Bangladesh and China from 1990 to 2013. Though the maternal mortality is found the highest in Nepal, it has been decreasing faster than the other countries. Increase in the institutional deliveries are significant in the second half of the last 10 years (Shrestha SK et el, 2012) resulting decline in maternal mortality. The reason behind decline in the maternal mortality is of interest to this point. There are some similar studies in relation to maternal mortality in the Nepal but non of them are found to have completely interrelated from health outcomes to control knob. This paper studies complete health assessment from control knob through health outcomes and hence a better than any published paper on maternal mortality in Nepal.

**1.2 Purposes of the Study**

A good health system is to deliver quality services whenever it is required (WHO). In absence of any health system components such as access, quality, efficiency, or part of control knob will be affected. Skilled Birth Attendance serves as an indicator of progress towards reducing maternal mortality (Baral et el 2010). Accessibility of the services are significant contributing factors in improving maternal mortality in Nepal (Baral YR et el, 2010). Innovative financing program has contributed to decline in the maternal mortality (Kuruvilla et al., 2014). Accessibility reduces maternal mortality from 13 % to 33 %(Carlough & McCall, 2005) and it is a significant contributing factor in improving maternal mortality in Nepal (Baral YR et el, 2010). Increase in finance and access decreases the MMR (Kuruvilla et al., 2014) (Shrestha SK et el, 2012). The specific purpose of the study is how financing to the FCHV program helped in increasing accessibility to health care services that further helped to improve maternal mortality in Nepal. The ultimate scope of the study is to assess the health system in Nepal. This paper is a step forward in capturing role of financing to the FCHV program which contributed most in reducing maternal morality in Nepal from 1990 to 2013.

**2 Methodology**

Table 1: Summary of Data

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **Definition (how it is measured)** | **Source** | **Years available** |
| **1. Performance Assessment (PB1)** | | | |
| **Health outcome indicator(s)** |  |  |  |
| Maternal Mortality | It is number of registered maternal deaths due to birth pregnancy related complications per 100,000 registered live births. | WHO | 1990 - 2013 |
| Life Expectancy | Average number of years that a person can expect to live in | WHO | 1990 - 2013 |
| **Financial Risk Protection** |  |  |  |
| Out of pocket expenditure as a percent of total health spending (OOP/THE) | Ratio of direct outlay by households for health care to the total expenditure on health (THE) (sum of government and private health expenditure in a given year). | WB | WB 2011 |
| **2. Intermediate Indicator assessment (PB2)** | | | |
| **Intermediate indicator Analyzed** | | | |
| Access | access is defined through availability, accessibility, acceptability and quality (more of a human rights approach) | Lecture Class 4 slide | 1990 - 2013 |
| **Measure(s) used to assess Intermediate Indicator** | | | |
| Skilled Birth Attendance under safe delivery program | Delivery attained by health workers who have taken 2 months skilled training on maternal delivery case. | MOHP, Nepal | 2001- 2011 |
| **Health system solution linked to intermediate indicator** | | | |
| Humane resources though Female Community Health Volunteer (FCHV) program | The female volunteers initially undergo two nine-day training sessions, with a five-day refresher course every year on maternal health and health awareness. | MOHP | 2001 - 2013 |
| **3. Control Knob Analysis (PB3)** | | | |
| **Control knob linked to Intermediate Indicator** | | | |
| Financing through Nepal Family Health Program to FCHV program | Program designed for maternal and Child health care | MOHP | 2006 - 2011 |
| **Intervention that addresses control knob** | | | |
| Nepal Family Health Program. | Program designed for maternal and Child health care | MOHP | 2006 - 2011 |

F**igure 1: (Nepal) Health System Performance Analysis**

Maternal Mortality in Nepal

c

Proposed Solution or Existing Intervention:

(More sustainability on training and financing is proposed for FCHV program)

c

Control Knob Impacted:

More financing increased FCHV program activities

(Write It Here)

Linked Cause 2:

Financing through FCHV program

Broad Health System Solution:

FCHV program increased accessibility

Linked Cause 1

Female Community Health Workers (FCHV)

c

c

Accessibility increased

(Write It Here)

c

Maternal Mortality decreased from 1990 to 2013

I divided the methodology into three parts. First it assessed the health status in Nepal with its three other neighboring countries: India, China and Bangladesh. Maternal mortality in Nepal was analyzed then with its accessibility as an intermediate indicator and finally how financing component of the control knob had helped to increase numbers of health workers and the capacity building of the FCHV who played key role behind increase in access to health care services.

I chose three neighboring countries so that it is easy to compare the regional relevancy and cultural similarity that affect health care access. Sometimes, it became easy and necessary to implement the same program that was already in the neighboring country. It helped to run health care program, for instance, it was hard for women to accept contraceptive in some countries. Next it also helped to share and exchange: knowledge, experience, technology to train people and health workers of neighboring countries very easily.

In order to complete this assignment, I had extracted data from the WHO web site, World Bank Data Observatory, Central Bureau of statistics in Nepal, Ministry of Health and Population (MOHP) in Nepal web page. I visited published and unpublished articles on Pubmed, google scholar and Brandeis’ Library search page for literature review. I also reviewed FCHV and safe motherhood program as part of the methodology. For life expectancy, I used data from 1990 to 2013 with five-year time lag and ten years for mortality of the same period. For the financial protection, data from 2000, 2012 and 2013 are used.

In order to measure the health system performance of Nepal, I selected three indicators; life expectancy, maternal mortality and OOP expenditure as percentage of the THE. The OOP expenditure as percentage of the THE is assessed in order to find the level of financial protection among the countries. The maternal mortality and life expectancy, used to assesses the health status, are compared among the countries and the main causes associated to the existing maternal mortality is further studied.

Life expectancy at birth is the overall mortality level of a population (WHO). In other words, life expectancy is the average future survival years of life. It is sum of average number of years who survives complete year plus average number of survival years who died during a year. The higher is life expectancy at birth, better is considered health status. The maternal mortality is numbers of death, irrespective of diseases, of women during the pregnancy or until 42 days from delivery divided by the total women population of the fertility age (age 15 to 49). Low maternal mortality indicates better health care or health system in a country. Therefore, I took it as one of the measure to assess the health status in Nepal compared to the other three countries. The OOP expenditure as percentage of the THE measures the amount of money spent for health care by all individuals in any fiscal year. Lower the OOP, better is considered health system in a country. Therefore, I wanted to compare the health performance of Nepal and comparator countries in terms of OOP as financial risk protection.

The control knob framework consists of *financing, payment, organization, regulation and behavio*r. Health financing is raising money and mobilizing: where does money come from, who control and where does it go (WHO). Most health financing are revenue based. Some are based on insurance premium, capitation fees and donation. Higher the health financing, more health workers can be hired and trained that increases access to health care, can increase maternal care program. Higher or lower payment to health workers also affects the access. Infrastructure, equipment, logistic and human resources constitute organization that also helps to increases access. Change in consumers’ behavior is necessary to measure the impact of the control knob. Therefore, each components of control knobs are equally important to increase access and better health care system.

In order to assess the impact of control knob framework into access, I analyzed the impact of health worker on access by skilled birth attended rate behind the reason to decline maternal mortality in Nepal. Also, program such as the FCHV, safe motherhood, were reviewed as part of methodology. Increase in finance and the Skilled Birth Attendance (SBA) decreases the MMR (Kuruvilla et al., 2014)(Shrestha SK et el, 2012). Increase in the health workers, increases accessibility. Increase in the accessibility increases the SBA. Therefore, this methodology looked for how financing had been spent in health workers in order to increase the access that decrease maternal mortality.

I assessed data on the healthcare financing both from the government and donor agencies from 2006 to 2011 and their allocation on health workers and their services. Again within the maternal health I further looked into their focus areas of financing where more money was spent for health workers who can help to increase birth attendance, distribute free drugs such as iron tablet, service delivery in the rural area, training to the FCHVs, distributing leaflets on maternity care, raising awareness in order to increase the access to health care services that further helped in decline in maternal mortality. I analyzed the outcomes of the financing on health workers that increases access to health care services resulting in higher the SBA. I also analyzed the impact of financing on maternal mortality and came to a conclusion of the study that intermediate indicator (access) is closely linked to both financing component of control knob and health outcomes.

**3 Results**

This section shows role of financing on health workers who significantly contributed to increase the SBA in order to improve access that reduced maternal mortality.

The maternal mortality and life expectancy are considered to be good measures of the population health outcome. The better health system in any country results better outcomes. Therefore, I have taken these two indicators to compare health status in Nepal and its 3 neighboring countries. The fifth MDG targets - reduce maternal mortality by three quarters by 2015 (WHO, 2015). Accessibility plays important role in reducing maternal mortality. Chance of utilizing health services remain 2 times higher if there is health post near by (Acharya et el, 2000). It is also researched that physical accessibility has significant role in utilization of health service (Hotchkiss D, 2001). This shows that there is close relation in between accessibility of health care services and maternal mortality as a health outcome indictor.

The literature shows innovative financing measures in health workers has remarkably decreased maternal mortality. Financing through FCHV program as link cause 2 is closely related to financing component of the control knobs. Because of more financing, skills and capacity building of the FCHV were also increased in Nepal. The more financing helped FCHV program to educate, train and develop their skills and knowledge. This further helped to FCHV increase health awareness, accessibility and availability of their services in a reliable and consistent way in their community, mainly in the rural areas. Increase in the service level of the FCHV and access to their services was not possible without financing. This delineates that there is close link in financing and role of the FCHV program. Availability of health workers in the community encouraged women to take benefits of the service at any time, even in the remote area. The FCHV increased awareness on health education and also prevented more women from becoming mother at a high risk age. In this way financing program on FCHV is closely linked to FCHV who helped to improve maternal mortality in Nepal from 1990 to 2013.

The table 2 below shows maternal mortality and life expectancy in Nepal and its neighboring countries from 1990 to 2013. During the period, Nepal has higher maternal mortality rate than any other countries, except in 2010 where India lead the highest 220 women per 100,000 live birth. Nepal recorded the highest maternal mortality of 790 per 100,000 lives birth in 1990 while china recorded the lowest as 32 lives per 100,000 lives in 2013. China’s maternal mortality in 1990 is less than that of other countries in 2013 which shows that China has a better maternal status even in 1990 compared to other countries. This may be the result of better health system in China even before 1990. India has lower maternal mortality than Nepal and Bangladesh follows the lowest among the three. Though the maternal mortality is decreasing in all the countries, still it is found very high compared to developed countries or even China. The lowest maternal mortality in Nepal, Bangladesh and India is 197, 170 and 190 per 100,000 lives birth respectively in 2013.

In Nepal, life expectancy is increased from 54 years in 1990 and to 68 years in 2013. Bangladesh has its life expectancy of 60 years in 1990 and increased to 71 years in 2013. Indian life expectancy is 58 years in 1990 and increased to 66 years in 2013. The life expectancy among the countries is pretty much similar. It is found lowest (54 years) in Nepal in 1990 and the highest in China (75 years) in 2013. Chinese life expectancy in 1990 is higher than that of all the comparator countries during 1990 to 2013, except Bangladesh in 2013, where it is higher than China. In conclusion, both of the indicators are in improving order. The mortality is in decreasing order while life expectance is increasing order. These are positive outcomes of the health system performance in Nepal and other three selected countries.

**Table 2: Two measures of health outcome in Nepal and its neighboring countries**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **a) Maternal Mortality (per 100,000 live birth) in Nepal and Neighboring Countries** | | | | |
| **Year** | **Nepal** | **India** | **Bangladesh** | **China** |
| 1990 | 790 | 560 | 550 | 97 |
| 1995 | 580 | 460 | 440 | 76 |
| 2000 | 430 | 370 | 340 | 63 |
| 2005 | 310 | 280 | 260 | 50 |
| 2010 | 210 | 220 | 200 | 36 |
| 2013 | 197 | 190 | 170 | 32 |
| **b) Life Expectancy (years) in Nepal and Neighboring Countries** | | | | |
| 1990 | 54 | 58 | 60 | 69 |
| 2000 | 62 | 62 | 65 | 71 |
| 2013 | 68 | 66 | 71 | 75 |

**Sources: WHO- apps.who.int/gho/data/node**

Table 3 below shows the THE as percentage of the GD is found in increasing order in each country, except in India, where it is found decreasing as well as increasing. There is no substantial difference in the THE as percentage of the GDP among the countries, however Bangladesh has the lowest percentage of THE as percentage of the GDP. Nepal has the highest percentage (6% in 2013) of the THE as percentage of the GDP among the countries since 1990 to 2013. Bangladesh has the lowest THE (2.6 in 1990) as percentage of the GDP. I have compared OOP as percentage of THE as financial protection. It is found in decreasing trend in each country except Bangladesh. The OOP as percentage of THE is decreased from 69% in 2000 to 46.2 % in 2013 in Nepal, a decline of 33 % during the same period. The greatest decline 42% was in China among the comparator countries.

**Table 3: Measure of Financial Protection**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **a) THE as a percentage of of GDP** | | | | |
| **Year** | **Nepal** | **India** | **Bangladesh** | **China** |
| **2000** | **5.4** | **4.3** | **2.6** | **4.6** |
| **2012** | **5.5** | **3.8** | **3.5** | **5.4** |
| **2013** | **6** | **4** | **3.7** | **5.6** |
| **b) Government expenditure on Health as % of Total government expenditure** | | | | |
| **2000** | **7.6** | **4.6** | **7.4** | **10.9** |
| **2012** | **9.8** | **4.3** | **6.8** | **12.5** |
| **2013** | **11.9** | **4.5** | **7.8** | **12.6** |
| **c) Out Of Pocket expenditure as % of Total Expenditure on Health)** | | | | |
| **2000** | **68.8** | **67.1** | **57.8** | **59** |
| **2012** | **49.2** | **60.6** | **63.3** | **34.3** |
| **2013** | **46.2** | **58.2** | **60.2** | **33.9** |

Source: <http://apps.who.int/gho/data/node.main.75>

Table 4 below explains increasing trend in *the skilled birth attendance rates* in Nepal from 2001 to 2011 by place, level of education and economic status. Of the total deliveries in rural in 2011, only 37% female attended skilled birth an increase from 11.6 % in 2001, while almost 79% female attended skilled birth in urban an increase from 53.7% in 2001. This shows the increase in the accessibility. In 2006, 47% females who attended skilled birth were found to have at least secondary level school compared to 21% who attended the skilled birth has only primary level of education. Females who do not have any education and attended skilled birth were merely 9% in the same year. Only 13% poorest females attended skilled birth in 2011 compared to 89% in the richest families. Second quintiles families who attended skilled birth was 28% in 2011.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table 4: Skilled Birth Attendance in Nepal, 2001 to 2011**   |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Skilled Birth Attendance (in two or three years preceding the survey) (%)** | | | | | | | | | | | | | **a) Place of Birth** | | | **b) Level of education** | | | **c) Economic Status** | | | | | | | **Year** | **Rural** | **Urban** | **None** | **Primary** | **Secondary or higher** | **Q1** | **Q2** | **Q3** | **Q4** | **Q5** | | **2011** | **36.7** | **78.5** |  |  |  | **12.4** | **27.7** | **42.6** | **57.6** | **86.6** | | **2010** | **26.1** | **53.2** |  |  |  | **7.7** | **20** | **25.8** | **42.5** | **65.7** | | **2006** | **15.8** | **53.2** | **8.5** | **21** | **47** | **5.2** | **11** | **13.4** | **25.6** | **60.5** | | **2001** | **11.6** | **53.7** | **7.5** | **17.7** | **47.4** | **4.2** | **5.3** | **10.5** | **16.2** | **48.8** |   Source: WHO(<http://www.who.int/nha/en/(world> health organization’s national health account |

In order to backup the health workers and the SBA, consistence funding support from the government and donor agencies had played crucial role. Substantial increase in the funding for maternal health in the remote made improvement in the access to the health services such as SBA. The progress was supported by behavioral change as women’s health awareness level was increased thorough the FCHV program.

Apart from this free health care services for the poor and cash in hand for the SBA further accelerated improvement in the mortality(Engel et al., 2013). Besides, it has been found that increase in the financial support from donors, consistent policy focus and resources from the government made maternal mortality improvement (Shrestha S et el, 2014).

The table 5 below shows health financing in maternal health by government and donor agencies from 2006 to 2011. The government financing was increased to Rs13930 in 2011, compared Rs4516 in 2006. The financing from the donor agencies increased from Rs4714 in 2006 to Rs9884 in 2011.

**Table 5: Health care financing in Nepal, from 2006 to 2011(Rs. million)**

|  |  |  |  |
| --- | --- | --- | --- |
| Year | Government Financing | Donors’ Financing | Total Amount |
| 2006 | 4516 | 4714 | 9230 |
| 2008 | 7499 | 7448 | 14947 |
| 2011 | 13930 | 9884 | 23814 |

Source: Budget Analysis 2010/11 (MOHP), Nepal Government, Kathmandu

The allocation of the fund for maternity was increased to 12% in 2011 from 6.2% in 2006 (MOHP, Budget Analysis, 2011). Most of the financing were allocated for capacity building of FCHV by offering them refresher and advance training on delivery, and raising awareness on health care education during pregnancy (MOHP, 2011), mainly focused in rural part of Nepal. Allocation for family health and FCHV program has been increased by 3.34% in 2011 to Rs809.4 Million (MOHP, 2012). Besides the above, the fund was allocated to set of the SBA training centers where such training sites were increase to 18 in 2011 from 15 in 2008 (USAID, 2011) from where FCHV can get training. From the above, it delineates a success story for improved maternal mortality in Nepal due to financing to FCHV program under the NFHP.

**4 Discussion**

These results are comparatively very important for health performance research. The results themselves lead to curiosity toward health system frame works and link from control knobs through health outcomes. The results are in logical order and indicators further show how health system components are interconnected. There are some similar studies in relation to maternal mortality in the Nepal but non of them are found to have completely interrelated from health outcomes to control know which is a unique feature of this report. Result section shows the improvement in the health indicators despites the political instability and lack of infrastructure and preference of health workers to work in the urban area.

The results provided in the above tables are very crucial to a researcher or the government of Nepal for a health system assessment there. It will further help to a researcher to find out what is lagging behind this. For instance, we will have chance to see whether the higher maternal mortality is because of lack technology or education or income level or whether it is because of health system or intermediate indicators and so on. Therefore, these results are very important. From the Table 3 it clear that the government expenditure on health as percentage of the total expenditure is less than 8 percent for India and Bangladesh. Nepal increased it from 10 percent in 2012 to 12 percent 2013. But China has allocated more than 11 percent since 2000. Therefore, these results are very important to find out the reason behind the high life expectancy in China compared to lower in Nepal and very low maternal mortality in China compared to very high in Nepal. These figures will also help to detect the weakness of the health system or health framework or intermediate indicators. The study may come to conclude to implement Abuja Declaration 2001, which mentions a threshold for government in certain countries in Africa to spend 15 percent of their government budget into health sectors. These results are equally important for policy maker in Nepal.

Nepal has the highest maternal mortality among the three other countries. However, it is found decreasing fast. The maternal mortality of 790 in 1990 was reduced to just 197 in 2013, a reduction of 75 percent compared to India (66%) Bangladesh as 69% and China 67% in the same period. The average maternal mortality rate in China is 59 lives birth per 100,000 compared to Nepal as 420, 347 in India and 327 in Bangladesh. The variability is (231) in the mean is again highest in Nepal compared to that of India and Bangladesh, where it is found very close in between them (144 and 146). The average life expectancy is the lowest (61 years) in Nepal among the countries and highest is achieved by China (72 years).

In case of total expenditure on health, on an average Nepal had spent 1.6 percent higher than India, 2.4 percent higher from Bangladesh and only 0.433 percent higher than China. The government health expenditure as percentage of total expenditure, on average, is 5.3, 2.4 and -2.2 percent higher than India, Bangladesh and China respectively. Similarly, on an average, out of pocket payment is found; 7, 6 and 12 percent higher than India, Bangladesh and China. There is cross over in expenditure on health and the OOP data. Nepal is spending more on heath than India and Bangladesh but less than China. The result is quite reverse for the OOP among the same countries. While Nepal spends less in health than in china but the OOP is higher for Nepalese than Chinese people they are paying.

The measure of financial protection shows that there is correlation between the percentage of health expenditure and the out of pocket expenditure. The higher the expenditure on health as percentage of GDP or of total government expenditure, the lower is found the out of pocket expenditure. We can conclude from the Table 3 that: a) the increase in the health expenditure lower the OOP and maternal mortality, b) it increases life expectancy. There is positive effect of health expenditure on the life expectancy and maternal mortality.

Maternal mortality is highly related with the intermediate indicator access. From the Table 2 & 4 we found that maternal mortality decreasing but the access is increasing. Higher the accessibility to health care services, the lower is mortality. Accessibility can contribute up to 33% reduction the maternal mortality (Carlough & McCall, 2005). Comparing the data (Table 4), the SBA rate is more than double (78.5%) in urban area than rural for the year 2011.But the SBA is much higher in rural (4times) than urban (1.5 times) from 2001 to 2011. The reason behind this is the FCHV program increases accessibility to health care services by raising health awareness mainly to rural area. Families or mothers whose education is at least secondary level are five times (47%) more likely to have the SBA than mothers who do not have any education (8.5%). The FCHVs remain always available in the community and who worked not only as health workers but also as mentors.

Numbers of health services were also made available thorough the FCHV program and did significant contributions to decline in the MMR. They have quite close relation with health post or sub health post that further increase access to health care. Substantial numbers of the FCHVs in the rural area made health services more accessible and pushed mortality down. This is because accessibility increases chance of using health services 2 times (Acharya et el, 2000) – shorter the distance, higher is accessibility. Providing the above facts, it was not possible without consistent financing from government and donors into the FCHV program.

The money was mainly used for, training to FCHV, their skills development and increasing awareness in health education, available services and drugs distribution thorough FCHVs in the rural area (“Analysis,” 2013). Fresher, refresher, and advance level of training were offered to the FCHVs. This increases FCHVs’ reliability, quality, accessibility and efficiency. Because of this more women visited them for any sort of health care advice or counselling and propelled to further accessibility which improved maternal mortality. Financing also made health workers and their service available 24/7. Some drugs such as the iron tablet, were also made freely available thorough FCHV. Financing made more FCHV available in the rural who played a key role in disseminating knowledge, awareness and maternal health care service available in the community.

More money helped printing more leaflets on service need and their availability in the local area. Health workers were main sources of distribution the leaflets. Further the money was spent on the training centers to produce more skilled health workers where. In this way financing, a part of the control knobs played a key role in improving maternal mortality in Nepal and hence it is very important. This proves that there is interconnection in between financing, access and health outcomes. Increase in financing helps to increase activities of FCHV program that increased the access & services to improve maternal mortality. This is a proof to focus on financing component of control knob in order to increase access to health care service and improve maternal mortality.

There are significant changes in health seeking behaviors due to economic and educational development in the nation which is outside of the scope this study. There is substantial development in the infrastructure and organizational structure that has improved to accessibility to the health care service, quality and equity and might have contributed further reduction to maternal mortality which is again beyond the scope of the study. Decentralization of the services and regulation imposed on physicians to serve the rural area immediately after graduation are also excluded for the study.

**5 Conclusion**

Nepal has almost achieved MDG5: reduce mortality by three quarter by 2015. One reason behind this is sharp increase in the intermediate access followed by health financing through the FCHV program. Again this was impossible without good health system in the country. From this we can conclude that health system in Nepal is taking its shape in order to further improve maternal mortality and achieve SDG3 by 2030, regardless of the political instability. Since there is a big gap in the accessibility in between rural and urban area, Nepal should focus more on health awareness, accessibility and availability of health care services in days to come. Higher amount of financing in the FCHV program developed the skills and knowledge of the FCHVs who in return became focal person in disseminating health care knowledge, information, services availability and accessibility in a community level. Consistent information from the FCHVs insisted community people to utilize maternal health care services available, resulting improve in maternal mortality.

From the above it shows that if the sustainability in the financing and health workers is provided, definitely health system in Nepal will take remarkable progress in further improving maternal mortality in near future.

**References:**

Acharya LB, Cleland J (200). Maternal and child health services in rural Nepal: does access or quality matter more? Health Policy and Planning, Oxford University Press

Analysis: Nepal’s maternal mortality decline paradox. (2013). *IRIN Asia English Service*.

Engel, J., Glennie, J., Adhikari, S. R., Bhattarai, S. W., Prasai, D. P., & Samuels, F. (2013). *NEPAL’S STORY:Understanding improvements in maternal health* (pp. 01–32). Overseas Development Institute.

Kuruvilla, S., Schweitzer, J., Bishai, D., Chowdhury, S., Caramani, D., Frost, L., … Murray, J. (2014). Success factors for reducing maternal and child mortality. *Facteurs de Réussite Pour La Réduction de La Mortalité Maternelle et Infantile.*, *92*(7), 533–544B. http://doi.org/10.2471/BLT.14.138131

Mbizvo, M. T., & Say, L. (2012). Global progress and potentially effective policy responses to reduce maternal mortality. *International Journal of Gynecology and Obstetrics*, *119*, S9–S12. http://doi.org/10.1016/j.ijgo.2012.03.009

Analysis: Nepal’s maternal mortality decline paradox. (2013). *IRIN Asia English Service*.

Engel, J., Glennie, J., Adhikari, S. R., Bhattarai, S. W., Prasai, D. P., & Samuels, F. (2013). *NEPAL’S STORY: Understanding improvements in maternal health* (pp. 01–32). Overseas Development Institute.

Kuruvilla, S., Schweitzer, J., Bishai, D., Chowdhury, S., Caramani, D., Frost, L., … Murray, J. (2014). Success factors for reducing maternal and child mortality. *Facteurs de Réussite Pour La Réduction de La Mortalité Maternelle et Infantile.*, *92*(7), 533–544B. http://doi.org/10.2471/BLT.14.138131

Mbizvo, M. T., & Say, L. (2012). Global progress and potentially effective policy responses to reduce maternal mortality. *International Journal of Gynecology and Obstetrics*, *119*, S9–S12. http://doi.org/10.1016/j.ijgo.2012.03.009