CHAPTER 2

LITERATURE REVIEW

This research focus on factors related to maternal behavior on receiving child immunization service. The review literature in this chapter is divided into 5 parts as the follows:

1. Background and Information about Lao PDR
    1.1 Country Profile
    1.2 Geography and Climate
    1.3 Demographic and Population characteristics
    1.4 Education
2. Health Profile in Lao PDR
    2.1 Health Policy Framework
    2.2 Health System Organization
    2.3 Health Infrastructure
    2.4 Health Personnel
    2.5 Human Resources for Health
3. Immunization situation in Lao PDR
    3.1 EPI Programme
    3.2 Immunization Coverage
4. Theoretical model: Health Belief Model
5. Related study

1. Background and information about Lao PDR

1.1 Country Profile

Lao People's Democratic Republic (Lao PDR) is a landlocked country in the Mekong Region, bordering with China, Myanmar, Thailand, Cambodia and Viet Nam. In the last two years, Lao PDR has been in a period of dynamic change with economic growth at around 8% (2010). In 2011, Lao PDR has entered the category of low middle income country (World Bank Report, year 2011, page 3). The country's growth is fully driven by foreign direct investment (FDI) on natural resource extraction industries and hydro power. Despite this growth in economy and the national efforts to bring down proportion of population living under poverty line to 27.6% in 2010 (UNDP Report, year 2011, page 5), the poverty gap is still getting wider, with most of the poor living in the vast rural areas of the country, so are the gaps in access to school, food, health care, especially among women and girls.

With an area of some 236800 square kilometres, three-quarter of which is mountains and plateaus. The population of Lao PDR has reached 6, 2 millions. About 85% of the population is rural dwellers and the 1999 census revealed that there were 60.000 more women than men. The average population density is 21 per square kilometre and the lowest population density is in Saysomboun Special Zone at 8 per square kilometre while the highest population in Laos is in Vientiane municipality, with 149 per square kilometre.

Lao PDR shared border with China to the north, Cambodia to the south, Vietnam to the east, Thailand to the west and Myanmar to the northwest. The country stretches for 1,700 km north to south, with an east-west width of over 500 a km at its widest, only 140 km at the narrowest point. (Lao at UN – Country Profile May 2012, page 1**)**

1.2 Geography and Climate

In the heart of the Indochina peninsula, the Lao PDR is a landlocked country of about 236,800 square kilometres. Its longest borders are with Thailand to the west and Vietnam to the east; it is also bordered by China to the north, Cambodia to the south and Myanmar to the northwest. The country stretches 1,700 kilometres north to south and between 140 to 500 kilometres from east to west.

The Lao PDR is heavily forested and mountainous. There is an abundance of rivers including a 1,900-kilometre section of the Mekong River (Nam Khong). The terrain is mostly rugged mountains with its highest point at 2,820 meters, which gives the country hydroelectric potential. Forest and woodland cover 47% of the land area. The Lao PDR also has natural resources, including coal, hardwood timber, hydropower, gypsum, tin, gold and gemstones. These resources all play a significant part in the economy.

The climate is tropical monsoon and has three distinct seasons. The cool season lasts from October to February, when the average temperature drops to about 16 degrees Celsius. The hot season is from the end of February to April when the temperature in the south can reach 40 degrees. The rest of the year is the rainy monsoon season. The mountain temperature is more than 10 degrees cooler and can become very cold during winter - in January; highland temperatures can drop to 0 degree.

The Lao PDR is divided into 17 provinces, one special zone and the Prefecture of Vientiane. The Capital city is Vientiane, in the west of the country on the Thai border. The Prefecture of Vientiane is the centre for business and government and has a population of 698,318. Savannaket is the largest city of the country, with 825,902 populations. Other cities include Luang Prabang in the north and Champasack in the south. (Health Investment in the Lao People's Democratic Republic March 2008, page 3 Investment in Lao PDR)

1.3 Demographic and Population characteristics

The Lao People's Democratic Republic is surrounded by five other countries in the Greater Mekong Region (all provinces have an international border): China, Cambodia, Myanmar, Thailand, and Vietnam, with an estimated population of 6.2 millions; 32% of them live in urban areas with the rest scattered in mountainous, hard to reach parts of the country, with little access to basic infrastructure and services. Each of the 49 officially recognized ethnic groups living in the Lao People's Democratic Republic has its own language/dialect and customs. The Lao -Tai ethnic group, also known as Lao Lum or lowland Lao, resides mainly in lowland areas of the country and cultivates paddy; they integrate well with the national development scenarios. Other groups, mainly living in slopes and highland areas, practice upland farming. They have different customs, languages and lifestyles from that of the lowland groups. Lao PDR population is a young population with 55% under 20 years old. The total

fertility rate is 3.7, the estimated population growth is 2.2 the average life expectancy at birth is 65 years, and the population density of Lao PDR is 25 people per km. (WHO Country Cooperation Strategy for the Lao People's Democratic Republic 2012-2015, page 3)

1.4 Education

The Office of Development Effectiveness is conducting a wide-ranging evaluation of the performance of Australian aid in three key sectors: education, health, and water and sanitation. This evaluation addresses the question: in the Lao People's Democratic Republic (Lao PDR), has the approach taken by the aid program from 2000 to 2008 to improve the delivery of essential education services for the poor been effective. Lao PDR presents a challenging geographical, political and socio-cultural environment within which to bring about systemic, pro-poor reforms in the provision of good-quality basic education services.

Progress towards universal primary education is gradual. With a net enrolment rate of 86 per cent for boys and 81 per cent for girls, Lao PDR ranks 17 out of 21 countries in East Asia and the South Pacific. In addition to lower overall enrolment rates for girls than for boys, children in rural areas, from poor households and from non-Lao-Tai households have significantly lower rates of enrolment and retention. Quality indicators are weak.

Education's share of total public government expenditure in 2005 was 14 per cent, falling back to 12.2 per cent in 2007-08. As a share of gross domestic product (GDP), education spending was 3.4 per cent (2005), placing Lao PDR in the bottom quarter of the 103 developing countries for which data are available. Almost 60 per cent of this spending is financed by donors. The share of domestically generated government revenues devoted to education in Lao PDR is among the lowest in the world. (Improving the Provision of Basic Education Service for the Poor Lao PDR "Case Study April 2009, page 4)

2. Health Profile in Lao PDR

Lao People's Democratic Republic is surrounded by five other countries in the Greater Mekong Region: China, Cambodia, Myanmar, Thailand, and Vietnam, with an estimated population of 6.2 million; 32% of which live in urban areas. The Lao population is a young population, with 55% under 20 years of age. The total fertility rate is 3.7 births per woman, the estimated population growth is 2.2%, and life expectancy at birth is 65 years on average. While Lao People's Democratic Republic is a low-income country, the economy has been growing steadily with gross domestic production (GDP) growing at around 8% over the last five years. It ranked 138th amongst 187 countries on Human Development Index (HDI) in 2011, with GDP per capita reported to be US$ 1004 in 2011. The proportion of the population living below the poverty line was 25.6% in 2009-2010. Poverty continues to have a distinctly rural face, with half of the rural poor continuing to live in seven chronically poor provinces. Women and girls still face the challenges of stereotypical attitudes on traditional gender roles, unplanned childbirths, heavy workload, and restricted opportunities for better education, especially in rural areas. Access to health care remains the biggest challenge; with women have greater inequity regarding family planning and maternal health. Women of reproductive age face very high risk during childbirth; the maternal mortality ratio (MMR) is estimated to be 405 per 100 000 live births in 2005. Malnutrition is widespread, with an estimated 37% of children under 5 years of age underweight. Malnutrition affects the growth of children, their potential to learn and their overall health condition later on, particularly for girls. (WHO Country Cooperation Strategy for the Lao People's Democratic Republic 2012-2015 Executive Summary VII)

2.1 Health Policy Framework

The Sixth National Socio-Economic Development Plan (NSEDP 2006-2010) identifies health as one of the four priority sectors for development. The "Health Strategy to the Year 2020" is Strategic Programme 12 of the Sixth National Plan, with four basic concepts: (1) full health-care services coverage and equity; (2) development of early integrated health-care services; (3) demand-based health services and (4) self-reliant or financially autonomous health services. It targets the improvement of health management and health financing structures as well as the affordability of services for the poor.

Specifically, Strategic Programme 12 includes “the introduction of health insurance and Health Equity Funds (HEF), both of which have a considerable impact on the financing of health services for the poor.” In addition, the 2007 Primary Health-Care Policy of the Ministry of Health (MOH (Lao)) directly addresses the Millennium Development Goals and is supported by such policies as those for reproductive health and, soon, regarding nutrition. (Lao People’s Democratic Republic: Health Financing Reform and Challenges in Expanding the Current Social Protection Schemes; Jean Marc Thome and Soulivanh Pholsena 2008: 74)

2.2 Health System Organization

The healthcare delivery system is essentially a public system, with government-owned and-operated health centres and district and provincial hospitals. The Lao public health system is mainly divided under the three arms of (a) health care; (b) prevention, promotion and disease control and (c) health management and administration with traditionally a strong vertical structure (Figure 2.1).

With the MOH (Lao) at the apex, there are 4 central hospitals, 6 special centres, 17 provincial and regional hospitals, 141 district hospitals, 740 health centres, and around 5,000 village drug dispensaries (Figure 2.2). There are around 5,000 hospital beds in the country. Each health centre covers about 7,000 people, but many centres serve less than 1,000. The health network covers 93 per cent of population at an average walk of 90 minutes to a health facility. There are, however, major differences between urban/ rural and rich/poor villages as shown in the Lao Expenditure and Consumption Survey 2002/2003: 108 minutes for rural residents to 19 minutes for urban ones; 3 hours to reach a health facility in the highlands compared to an average of 48 minutes in the lowland areas. One quarter of the poor live in villages with a medical practitioner against one half of the non-poor. Those figures represent the correlation between poverty and geographic location or ethnicity. (Lao People’s Democratic Republic: Health Financing Reform and Challenges in Expanding the Current Social Protection Schemes; Jean Marc Thome and Soulivanh Pholsena, 2008: 74, 75)

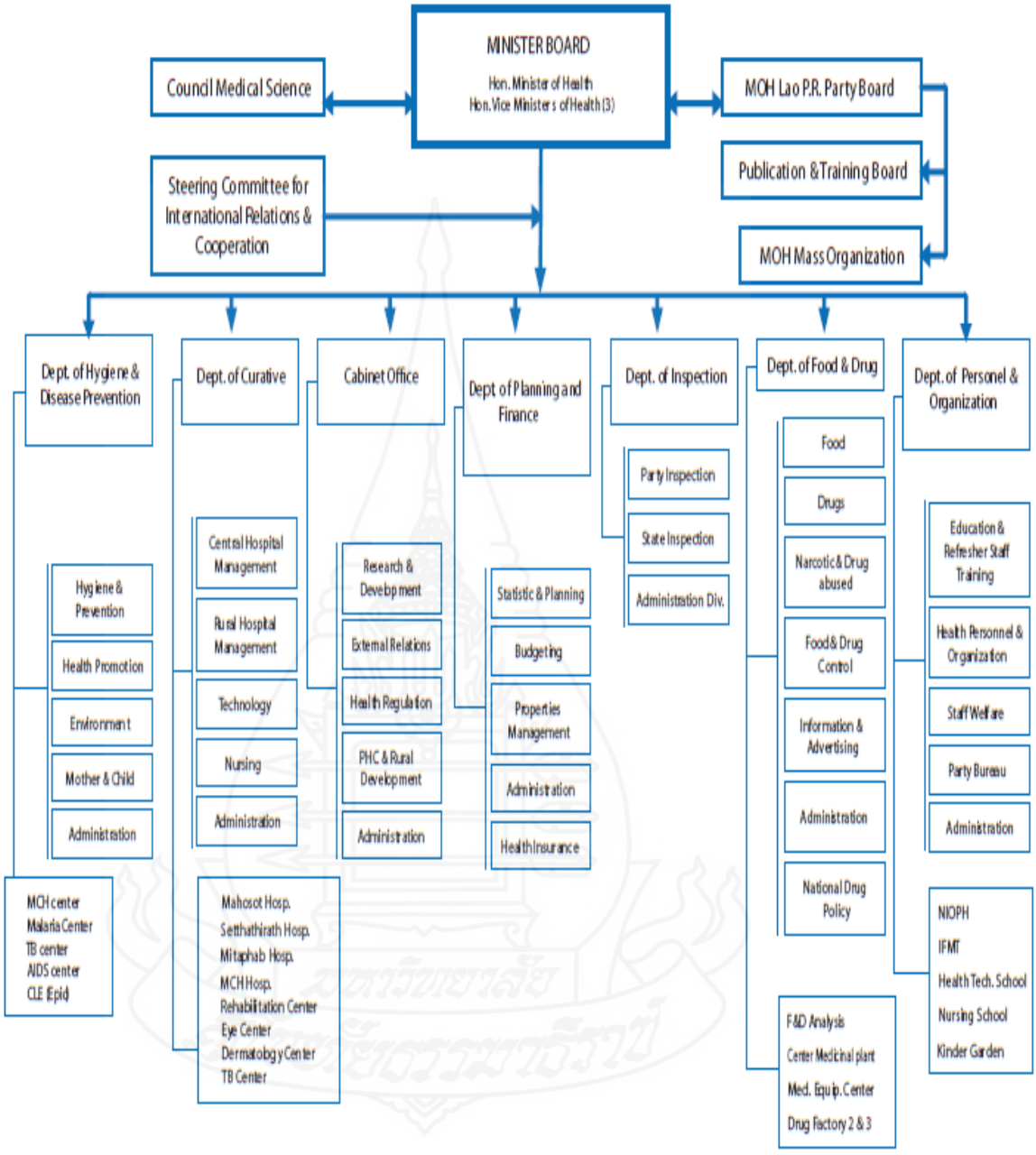

Figure 2.1 Organizational Chart in the Ministry of Health, Lao PDR

Source: Ministry of Health, "Resources for Health: Analysis of the situation in the Lao PDR" (June 2007)

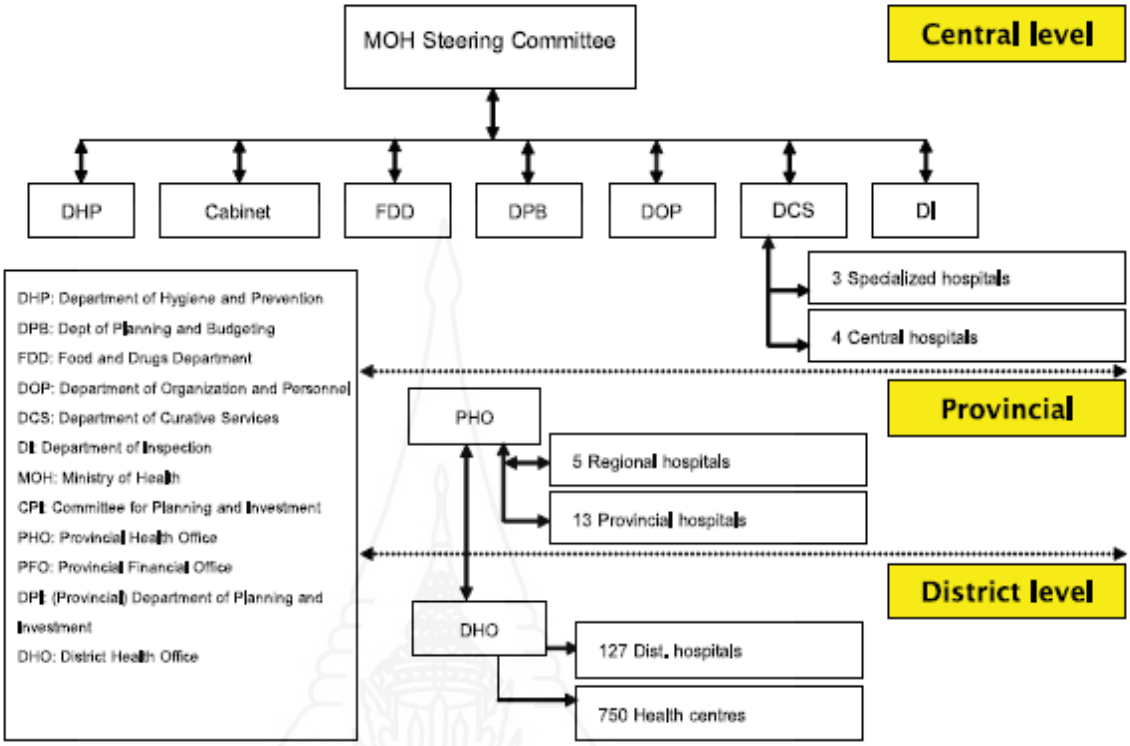

Figure 2.2 Organizational chart of the Lao public health system

Source: Ministry of Health, "Resources for Health; Analysis of the situation in the Lao PDR" (June 2007)

2.3 Health Infrastructure

The overall health infrastructure in the Lao People's Democratic Republic is weak. Logistic and physical asset management needs to be strengthened. The drug management system is in need of updating and improvement. In 2009, the Ministry of Health issued ministerial decree No.594/ MOH to integrate logistic systems into one system in order to harmonize the drug supply system. The National Medical Equipment Management policy has been revised recently with the health infrastructure component integrated. This, together with the decree on drug management will create a path to equitable access to quality drugs and medical technologies and a rationalized medical equipment management

system. With support from WHO and other DPs, a medical product supply centre has been established for a more unified logistic and supply system.

In terms of traditional medicine, more attention has been given to strengthening implementation of the national policy through formulating a national traditional medicine strategy, and upgrading the Centre for Traditional Medicine to the Institute of Traditional Medicine at the central level.

The National Blood Centre is under the management of Lao People's Democratic Republic Red Cross. With support from DPs since 2005, quality related requirements including cold chain and testing reagents have been met. However, there is still much to do, especially at hospital level to meet all national and network requirements for blood transfusion safety.

Surveillance technologies have improved considerably with computer-based systems currently functional at provincial levels. (WHO Country Cooperation Strategy for the Lao People's Democratic Republic 2012-2015: 15**)**

2.4 Health Personnel

As to health personnel, there are about 18,000 public sector health workers of which 70 per cent are MOH (Lao) staff and 30 per cent are from the ministries of National Security and National Defence. Low salaries and low levels of basic training inhibit health system efficiency. Staffing is urban-biased; there is often low motivation, conflict of interests and a lack of training and career development opportunities. Only 63 per cent of the medical staff works at health facilities.

The private sector for health is expanding, mainly in urban areas with over 2,000 private pharmacies, about 500 private clinics and 600 traditional medicine practitioners. Currently, the first private hospitals are about to start operating. The regulatory framework is more or less in place. Implementation and enforcement face typical challenges including conflicts of interest, as most of the senior public health personnel are directly or indirectly involved in private health practice after official working hours. (Lao People's Democratic Republic: Health Financing Reform and Challenges in Expanding the Current Social Protection Schemes; Jean Marc Thome and Soulivanh Pholsena, 2008: 75)

2.5 Human Resources for Health

In 2009, a total of 12,422 health workers were employed in the Lao PDR Ministry of Health. Of these, 58% (7,235) were female and 16% (2,021) were from ethnic minority backgrounds. Administrative personnel represented about 24% (2,986) and technical staff 76% (9,436) (Govt Lao PDR 2010, page 4). Of the total MoH workforce less than 30% (3,385) were medical doctors, nurses and midwives with middle and high-level professional education, and about 70% were lower-level staff. Doctors represent about 6% of the district level staff and only eight doctors work in health centres (Sihabandith 2009; WHO WPRO, 2008: 9).

The overall health worker (doctors, nurses and midwives) per population ratio in 2009 was 0.5 per 1000, far lower than the 2.3 health worker per 1,000 people recommended by WHO (WHO 2006, page 7) The largest proportion of health workers employed by the MoH are at the district and provincial levels. However, the largest increase in staff numbers between 2005 and 2008 occurred at the central and health centre level (Figure 3). The majority of the additional staff were reportedly female (Paphassarang et al. 2009, page 13) The private sector is expanding, mainly in urban areas, with over 2,000 private pharmacies, about 254 private clinics and 600 traditional medicine practitioners.

The key human resources for health issues facing Laos are comparable to those in most low-income countries; a recognised shortage of health workers, low salaries for public sector health workers, morale and productivity are low, there is a disparity in distribution between urban and rural areas and between facilities, and the level of competence of health personnel is not consistent with actual needs (Govt Lao PDR, 2006; WHO WPRO, 2008: 7)

Efforts are being made by the Laotian government to improve the availability of health workers in the nation. As indicated earlier, the National Policy on Human Resources for Health places greater emphasis on providing and retaining health workers in remote and underserved areas with specific reference to the 47 poorest districts. Other strategic measures in place to boost health worker production include improving the medical and nursing education and increasing the number of students and health workers from underserved ethnic minority backgrounds through targeted selection and recruitment (Govt Lao PDR, 2006: 23)

To facilitate this, the government has decentralised the training of health workers to the provinces. It is hoped that this will promote recruitment and retention of staff closer to their home and cultural settings (Paphassarang et al. 2009, page 19) In the meantime, Pacasa (the Civil Service Authority) has published a decree concerning incentives for all civil servants in remote areas (different levels based on remoteness and access to services) but implementation is likely to be very gradual due to cost implications.

3. Immunization status in Lao PDR

Childhood immunization is widely recognized to be one of the 'best buys' in public health, dramatically reducing child mortality rates, illness and health care expenditure for the very low cost input of vaccines. In the Greater Mekong Sub-region, Lao PDR falls below other countries on childhood immunization rates. For the third round of diphtheria-pertussis-tetanus (DPT3) combination in 2005, countries in the region reported rates as follows: Thailand (98%), Viet Nam (95%), China (87%), Cambodia (82%), Myanmar (73%) and Lao PDR reported the lowest rate of 49%. In Lao PDR childhood immunization rates have continued to fall since the 1990s and are particularly low in rural, remote and ethnic minority areas. Efforts by the government to increase immunization coverage rates have had limited results, and consequently coverage rates have remained low. (Revitalizing Community Demand for Immunization – Final Project Report December, 2007: 4)

3.1 EPI Programme (National Immunization Programme Report 2002)

Since the early 1980s, the Lao Government has placed the National Immunization Program (NIP) as one of the highest priority programs of the country. It recognized that the rationale for investing in immunization was very compelling– the program is low-risk with a proven track record of decreasing the burden of disease, is largely a public good, is highly cost-effective, has significant potential for economies of scale that lead to lowering unit costs, has low marginal costs for expanding and improving the program, and can be financially sustained.

However, performance of the NIP in the past years has been inadequate. Routine immunization coverage remain low and among the lowest in the region. Since 1996 routine coverage has been dropping and in 2001, national DPT-3 coverage dipped below 50%. Results of the National Health Survey that same year reported that only 32% of children between the ages of 12-23 months are fully immunized.

Current Program Objectives and Targets: The main objectives of the Multi-year plan of the Lao National Immunization Program (NIP) are the following:

3.1.1 To raise immunization coverage for all antigens to 80% by 2003. At current levels of coverage, this target is overly ambitious and 80% coverage is unlikely before 2007.

3.1.2 To introduce DPT-hepatitis B vaccine into the NIP in 2001, and to achieve national coverage comparable with other vaccines. As of May 2002, DPT-Hepatitis B vaccine with AD syringes and safety boxes had been introduced to approximately 6 % of the national target population (based on a total target of 188,195 children <1 year of age). A phased introduction during 2003 and 2004 is planned.

3.1.3 By the end of 2004 all immunization injections in Lao PDR will be given using auto-disable equipment. The target is to have 100% of immunization injections given with AD syringes that are properly disposed of in safety boxes and effectively incinerated by 2005.

3.1.4 To maintain polio-free status until global certification of poliomyelitis eradication.

3.1.5 To reduce the incidence of neonatal tetanus (NNT) and measles by 2005 through accelerated disease control.

3.1.6 To promote the integration of EPI and other health services under EPI plus concept. General Strategies for the NIP are listed as follows:

1) Focus on the development of sustainable systems for planning and delivery of immunization services at all levels, particularly in low-performing areas.

2) Develop and strengthen disease surveillance by building on the existing AFP surveillance system, incorporating other vaccine preventable diseases, so that detection, reporting, investigation, and response can be properly managed.

3) Carry out large scale disease control activities where necessary to rapidly reduce disease burden, respond to outbreaks, or eliminate vaccine preventable diseases.

4) Maintain the NIP as a flexible and innovative program by seeking to incorporate appropriate new vaccines and interventions and by integrating the delivery of other health services.

5) Maintain close partnership with all partner agencies supporting immunization, both local and international, particularly through the mechanism of the Interagency Coordinating Committee (ICC) for Immunization.

3.2 Immunization Coverage (National Health Statistic Report 2009-2010)

The immunization of children is the most effective way of preventing and controlling a number of diseases including tuberculosis, diphtheria, tetanus, pertussis (whooping cough), polio, hepatitis B and Haemophilus influenzae. Improvements in these indicators contribute to a decrease in childhood mortality and morbidity and contribute to the achievement of the Millennium Development Goals.

DPT-HepB3 indicator defied as the percentage of children who have received at least three doses of DPT-HepB vaccine in the first year of life. This indicator indicated that continuity of use by parents, client satisfaction with services, and capability of the system to deliver a series of vaccinations.

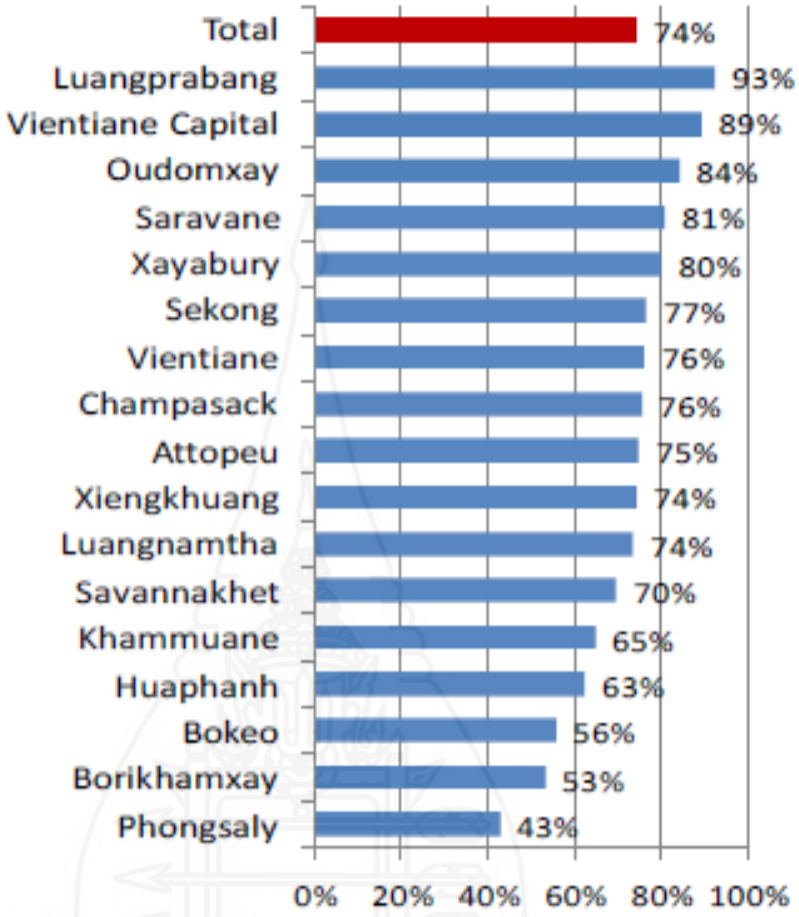

Figure 2.3 DPT-HepB3 coverage for children under 1 year compared by province: Lao PDR, 2009-2010

Source: Ministry of Health, Department of Planning and finance

From the figure 2.3 illustrating compare between 17 provinces (including one capital city), it can be seen that most of provinces are achieving 70% and above coverage ranking for 70% to 93%. This is a remarkable achievement indicating that the basics of child health services are well received by majority of provinces. However, there were five provinces out of 17 are achieved lest than 70% ranking from 43% to 65% particularly Phongsaly are the lowest coverage just covered only 43% which

is far behind the MOH target (85%). This is may be Phongsaly provinces is remote provinces, limited access by EPI team (no road and mean of transportation) and insufficient resources.

Measles coverage rate is defined as the percentage of children who have received at least one dose of measles vaccine in the first year of life. The indicator indicated the level of protection against a disease of major public health importance. Measles coverage is also an MDG indicator.

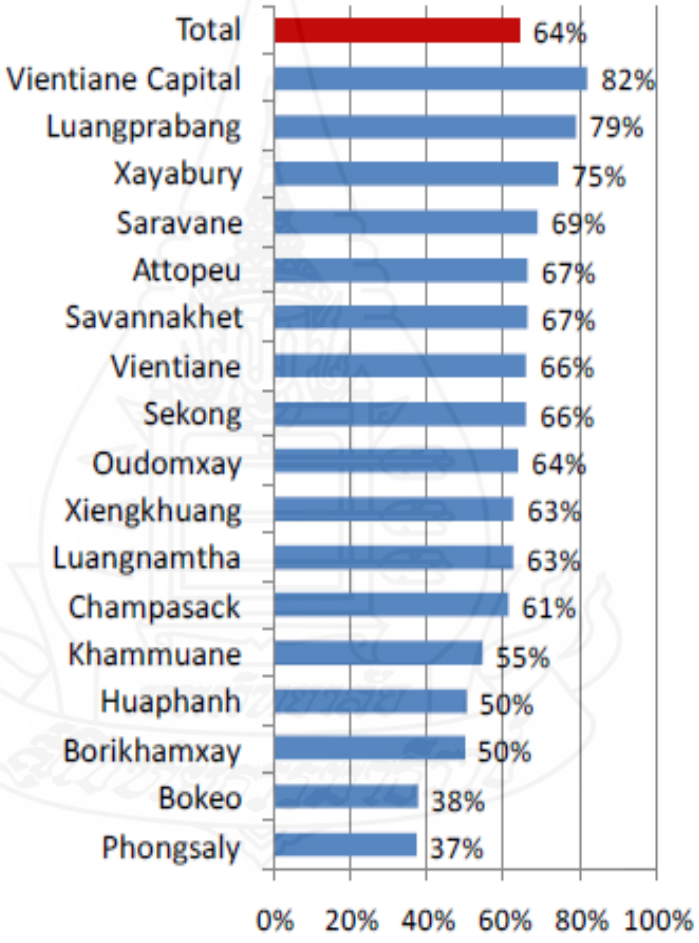

Figure 2.4 Measles coverage for children under 1 year compare by provinces: Lao PDR, 2009-2010

Source: Ministry of Health, Department of Planning and finance

From the Figure 2.4 illustrating the coverage of Measles for children less than 1 year by province. It can be seen that only 3 out of 17 provinces demonstrated immunization coverage more than 75%. These provinces are better of provinces with resources and capacity to support it achieving target. It is also to be note that, there were 2 provinces Phongsaly and Bokeo provinces are the lowest performance of Measles coverage reaching only 37% and 38% respectively. The rest of majority provinces perform measles coverage similar to DPT- HepB3 which ranking from 50% to 69%. This contributes to lower national coverage by Measles reaching only 64% lower than MOH target (2010: 85%) and MDG target by 2015: 90%

Full immunization is the percentage of children under one year of age who have received at least one dose of BCG vaccine, at least three doses of polio vaccine, at least three doses of DPT-HepB vaccine, and at least one dose of measles vaccine in the first year of life. This indicator is use in many countries to assess the capability of the system to provide all vaccines in the childhood schedule in the first year of life; also measures public demand and perceived quality of services achievement of EPI program in the country. For Lao PDR the coverage of DPT-HepB3 are use to assess the EPI program.

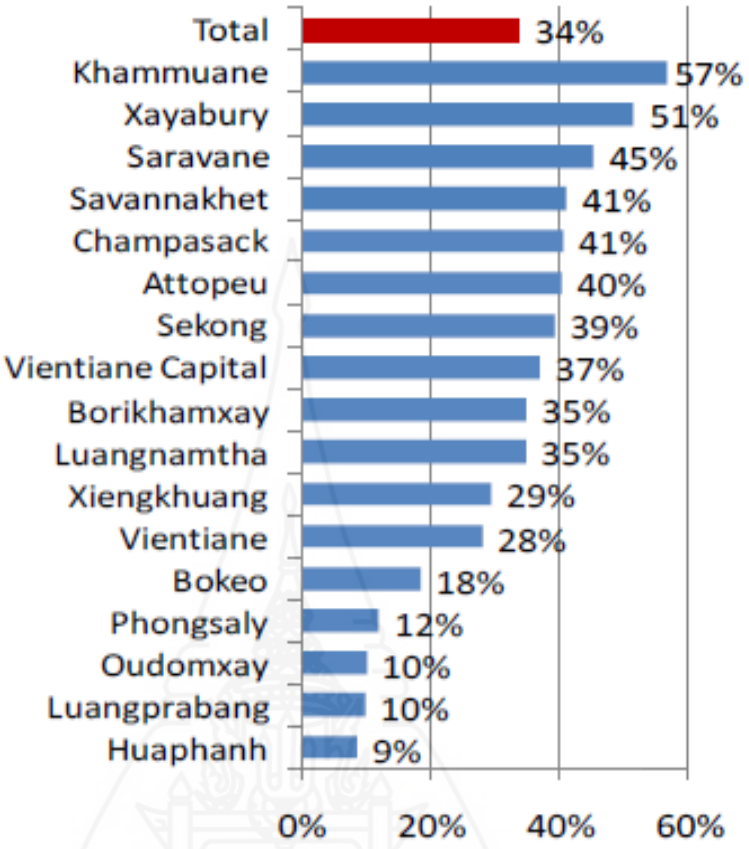

Figure2.5 Proportion of children under 1 year receive fully immunized by provinces: Lao PDR, 2009-2011

Source: Ministry of Health, Department of Planning and finance

From the Figure 2.5 shows the proportion of children under 1 year fully immunize it is to be noted that the performance of Oudomxay and Luangprabamg in figure 1 and 2 on DPT-HepB3 and Measles indicated the high level of achievement coverage. However, as can be seen in Figure 2.3 these two provinces, the coverage of full immunize drops down to the bottom of scale reaching only 10 % coverage together with Huaphan and Phongsaly coverage only 9% and 12% respectively.

Immunization coverage rates are highly dependent on the accuracy of numerator and denominator. Incorrect population data can significantly distort the indicator value. The under-estimation or over estimation of the denominator (nr. of children under 1 year old) in a number of districts is thought

to cause the indicator to reflect an immunization rate of over 100% or lower than real situation and which reflects inaccurately high results for these provinces.

Since effective vaccination relies on a number of key structures which need to be in place to ensure the constant availability and functioning of a broad range of systems such as cold chain functioning, accessible health facilities which are staffed management systems to ensure sufficient stocks of vaccinations, and an accurate HIS reporting system, it is important to have accurate measurement of the immunization rate in disadvantaged areas. Such high immunization rates imply that all these structures are in place and are functioning well, which may not necessarily be the case.

Other indicators related to children health such as Polio3 and BCG performed by different provinces are presented in the statistic tables 7 and 8 attached as annexes to this report.

4. Theoretical Model: The health belief model

Of the various model in health psychology that are used to explain health behavior, The Health Belief Model provides the most appropriate theoretical framework in which to examine how Lao parents think about immunization and disease. The Health Belief Model (HBM) is a social-cognitive model developed in the 1950's by the U.S. Public Health Service (Mullen, Hersey, & Iverson 1987), which is often used to explain and predict health related behaviors (Strecher & Rosenstock, 1997: 17). This model had often been used to predict a variety of preventative health behaviors, such as dental checkups, dieting, driving under the influence, and sexual risk behavior.

The basic component of The Health Belief Model are derived from a well-established body of psychological and behavioral theory whose various models hypothesize that behavior depends mainly upon two variable (1) the value placed by an individual on a particular goal; and (2) the individual's estimate of the likelihood that a given action will achieve that goal. In the context of health-related behavior, these correspondences are (1) the desire to avoid illness (or if ill, to get well); and (2) the belief that a specific health action will prevent illness. For example, if a person's goal is to avoid a health problem, the individual must feel personally vulnerable (perceived susceptibility) to a problem judged

to be potentially serious (perceived severity), and he or she must estimate that specific action will be beneficial in reducing the health threat (perceived benefit) and will not involve overcoming obstacles (perceived barriers). Thus, as Rosenstock notes in describing this model, "The combined levels of susceptibility and severity provided the energy or force to act and the perception of benefits (less barriers) provided a preferred path of action" (Rosenstock, 1966: 11)

When applied to parents' immunization behavior, The Health Belief Model suggests that simply having knowledge and awareness about infectious diseases will not necessarily result in increased visit to a hospital for vaccinations. Instead, the model specifies four related elements that must be present for knowledge about disease to be translated into preventative action **(Onta, 1998).** First, an individual must perceived that he or she is susceptible to an infectious disease, and second, that person must also perceive that the disease is a serious condition. Third, he or she must believe that there are benefits to taking preventive action. Finally, the individual must also perceive that any potential barriers to taking preventive action are outweighed by potential benefits. Based on this model, perceived susceptibility, perceived severity, and perceived benefits are likely to be positively related to immunization behavior, while barriers to taking action are likely to be negatively related to it.

A final variable completes the original Health Belief Model: the presence of an internal or external stimulus, or "cue to action" that triggers the individual's health behavior. An internal cue may include symptoms of illness, whereas external cues include media campaigns about health promotion or interpersonal interaction, such as learning that a friend had been affected by a health problem. A diagram of the HBM is presented below in Figure 2.6

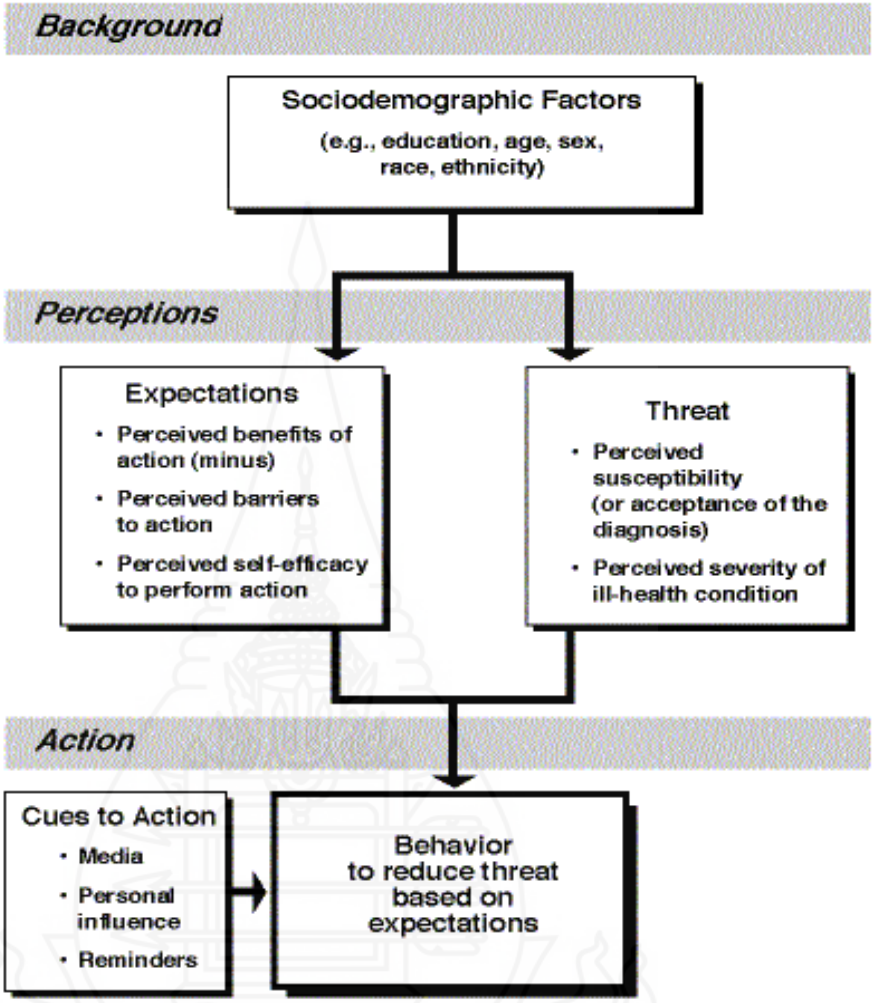

Figure 2.6 A Schematic Outline of Health Belief Model

Source: Rosenstock, et al., 1990

More recently, the concept of "self-efficacy" has been added to some versions of The Health Belief Model. Rosenstock suggests that self-efficacy was not explicitly incorporated into early versions of The Health Belief Model because the original focus was on circumscribed preventive actions, such as receiving an immunization or accepting a screening test. (Rosenstock, 1990: 15) he proposes that self-efficacy is more useful in understand behaviors, such as those related to chronic illness care, which occur over a period of time and require lifelong changes in behaviors. Because the behavior of interest

in this study was a circumscribed action, the concept of self-efficacy was not felt to add explanatory power and thus was not include in the model.

Although The Health Belief Model has been used extensively in studies of health behaviors, critics of the model have pointed out a variety of limitations. There had been a lack of uniformity in testing the model, especially in the way variables are operationalized. (Champion, 1984: 19). Tools used to measure Health Belief Model components have not been refined or standardized. In addition, the model does not apply numeric coefficients to the concepts of susceptibility, severity, benefits, and barriers, nor does it delineate the specific nature of the relationships among the variable.(Rosenstock, 1990: 25) Most studied, however, have treated the model as additive and have tested only direct relationships between the variables and the health-related behavior of interest.

Another problem with The Health Belief Model is lack of consistency in the use and testing of model. That is, not all variables have been included in all studies. For example, identifying and measuring the concept of cues to action had been problematic. Cues can be diverse in nature, may occur in a flecting manner, and an individual may or may not consciously remember events that trigger action. In retrospective studies, the nature and important of cues is more difficult to evaluate because research participants are questioned about behaviors performed in the past. For these and other reasons, the variable "cues" has not been included in many studied based on The Health Belief Model (Harrison, 1992: 17)

Because the Health Belief Model is a psychosocial model, it accounts for only as much of the variance in health behaviors as can be explained by attitudes and beliefs that are obvious to and consciously evaluated by individuals (Janz, 1984, page 19). Other factors related to the individual, such as demographic variable, personality factors, social support, or previous health experiences may play role in influencing behavior, but they are not an explicit part of this model. Instead, they are thought to influence the major variables in the model. In addition, concepts reflective of larger social structure, such as institutional or public policy, poverty, and social isolation that may affect access to health care, are not included in the Health Belief Model. However, this criticism could also be directed at most other psychosocial models.

In spite of the criticisms, the Health Belief Model has been used successfully for over thirty years to understand health behaviors in a variety of circumstances. As Kirscht wrote in his analysis of the model, it is "complex and variable in its history, yet surprisingly robust and useful" (Kirscht, 1988: 29) Thus, it is a very useful method for explaining health behavior -one that should provide substantial power in predicting the perceptions that underlie immunization behavior in Laotian parents.

5. Related Study

Several studies have already provided evidence supporting the utility of the Health Belief Model in understanding the factors associated with parents' vaccination behaviors.

5.1 Reasons for incomplete vaccination and factors for missed opportunities among rural Nigerian children. (Abdulraheem, Onajole, Jimoh and Oladipo, 2011: 1) Mothers play an important role in immunization of their children. A target of 95% immunization coverage is necessary for the sustained control of vaccine preventable diseases. Partial immunization coverage against vaccine preventable diseases is a significant public health problem especially in rural areas in Nigeria. The reasons for partial immunization and factors responsible for missed opportunities are poorly understood and little data is available to explain the phenomenon that could support the decision making. This study aimed at finding out the reasons for partial immunization and factors responsible for missed opportunities for immunization in children less than one year of age. Mothers of children within one year of age were the study subjects using a cross-sectional study design. The immunization card was utilized to check for completeness and correctness of immunization schedule, and also for identifying the appropriate use of all available opportunities for immunization. About two-third (62.8%) of the children were not fully immunized by one year of age, 33.4% had experienced a missed opportunity for immunization and 36.4% were partially and incorrectly immunized. Parents objection, disagreement or concern about immunization safety (38.8%), long distance walking (17.5%) and long waiting time at the health facility (15.2%) are the most common reasons for partial immunization. Missed opportunities for immunization and partial immunization need to be avoided in order to enhance the fully immunized percentage for

those children who reach the health facility, especially in rural areas where the immunization coverage is below the expected national coverage (minimum 80%).

5.2 Gender and immunization : Final Report on Case Studies, November 2010 Swiss Centre for International Health, Swiss Tropical and Public Health Institute Florence Sécula, Lise Beck, Christian Schindler, Xavier Bosch-Capblanch, Adriane Martin Hilber.

Knowledge, awareness and information barriers. In studies, levels of knowledge and awareness of care takers related to immunization practice are strongly correlated with the status of children's vaccination. Mothers' knowledge is the most frequently mentioned factor affecting children's immunization. Studies frequently report an overall lack of understanding by the population of an immunization program such as the general benefit of vaccination for the child's health (Maekawa), or the use of the vaccination card (Katz), the target diseases of immunization, the vaccination schedule (Maekawa, Tokizawa) or the place of vaccination (Mayxay).

The mothers' "perception" of vaccination plays a key role in their attitude towards immunization (Phouphenghack, Shiyalap, Tokizawa, Phimmasane). Favourable perception by mothers of the immunization program is correlated with a completed immunization of the child (Phouphenghack). Perceptions by mothers of the nearest vaccination place and of the appropriate time to get the vaccination influence their choice to make use of this health service (Shiyalap). But perceptions of the inefficacy (Phimmasane) or danger (Phouphengack) of vaccines deter parents from taking their children to vaccination.

Sources of information on immunization significantly influence the practice of immunization depending on who the informant is and on when the information is provided. Friends, relatives or key persons are often cited as informants whose advice or encouragements are positively correlated with a higher compliance to immunization (Masuno, Phimmasane, Phouphenhack). Household visits by health staff also significantly influence the rate of fully immunized children in Maekawa's study while in Phoupheghack' study, mothers of fully immunized children predominantly received information from village leaders. Receiving information on immunization before delivery is reported by Maekawa to significantly influence the rate of fully immunized children.

Socio-demographics factors. Most quantitative studies included mothers as their sample subgroup, and thus correlate motherrelated socio-demographic factors to the immunization status of children. Phimmasane's study is a notable exception because it conducts a sex-disaggregated analysis of both mothers' and father's education and reports on the impact of father's education on the immunization status of children.

Education is one of the factors most frequently reported by studies (Masuno, Maekawa, Phoupehghack). As stated by Masuno (2009), children born to women with higher education are more likely to be protected against tetanus at birth. For Shiliyap, education of mothers is linked with their occupation as women with higher education would seek for/access more EPI information and bring their child to get vaccination more often.

Maternal occupations that afford mothers more time is also a factor contributing to higher immunization of children (Shiyalap). In the case of Tokizawa, employment plays an important role as it gives women the opportunity to talk about immunization or children's diseases at their workplace. However, mother's occupation is not correlated to a higher immunization rate in Phouphenghack's study. No significant correlation between income and immunization is shown by Mayxay, Phouphenghack, and Maekawa. However, in the latter study, the possession of livestock – which one can consider as a sign of economic wealth - is significantly associated with a higher immunization status of the child. Mother's willingness to pay at some stage (transport costs for example) in the immunization process is presented as an influential factor of full immunization (Maekawa). Similarly, Phimmasane and Shiyalap show a positive association between income and immunization of children. Studies also show that the younger age of mothers favourably influences a fuller immunization status of children (Phouphengack, Masuno, Shiyalap). The number of children tends to affect the status or level of children immunization in different ways. Death of a child in the past would favour a care-seeking behaviour among women

(Masuno). Mayxay's findings show that families were measles cases were reported tend to be larger than controls. Shiyalap also reports that mothers who had 1 to 2 children tend to complete the immunization of these children more frequently than mothers with larger families. However,

Phouphenghack does not acknowledge a correlation between the number of children alive per mother and the number of children who received vaccination.

Geographical and physical accessibility factors. Distance has been identified as a factor impacting the status of child immunization (Maekawa, Shiyalap). Spatial factors were expressed in terms of zone of residence (Maekawa) proximity to a health facility and access to the immunization site (Maekawa). The mode or costs of travelling to the vaccination place (Shiyalap, Phimmisane) were also associated with the utilization of immunization services by mothers. Fixed health centres are positively associated with a higher and more complete immunization status of children according to Phouphenghack. But in Maekawa's study, the sites of immunization as well as the means of transport to immunization site are not associated with the immunization status.

Only in Masumo's study was distance not associated with immunization status but this may be explained by the geographical location of the study, in the capital province where health facilities are accessible by car/bus. Maxay reported that the second most frequent reason for not taking children to vaccination was the inaccessibility of medical staff to the village.

Quality of immunization service. Factors linked to the delivery of immunization service stress the lack of timeliness of the vaccination programme. From the demand side, it often happens that the population is generally unaware of the vaccination schedule. The waiting time at the health facility is frequently perceived as a factor for non-vaccination (Phimmasane, Shiylap). There is a common perception that opening hours of health facilities and schedule of vaccination are conflicting with the (mostly agricultural) activities of the population (Katz, Phimmasane). Mothers and caretakers of children often claim to be too "busy" to take the children to vaccination (Shiyalap, Tokizawa). The general attitude of health staff, such as their readiness to provide the service and the courtesy of vaccinators, affects the willingness of mothers to vaccinate their children. (Katz, Phouphenghack, Shiyalap). From the immunization service side, studies reports that lack of motivation and incentive for health workers to provide quality immunization service as well as a lack of medical supplies negatively impact the immunization coverage (Katz, Phimmasane). Effective coordination, strong leadership and a better integration of health services are still missing to ensure an increase in coverage. (Katz, Phimmasane).

The findings reported by quantitative studies bring forward socio-demographic characteristics, accessibility factors and knowledge issues. While the data collected is of crucial importance to identify the overall pattern of immunization among the population, surveys were mostly descriptive except the one PhD thesis (Phouphenghack) which contained some analysis and interpretation of the author. All samples of reviewed surveys are sub-national and therefore the findings are not nationally representative. In addition, surveys are usually gender-biased by selecting predominantly mothers as respondents. When survey samples include both parents, reported data is usually not sex disaggregated (Katz, Mayxay). One exception to that is Phimmasane's study which puts both mothers' and fathers' education in perspective. Other gender or cultural aspects, such as ethnicity or traditional health practices, are left unexplored by these quantitative studies.

5.3 The Effects of Planned Instruction on Mother's Knowledge, Health Beliefs and Number of Children Receiving Immunization in Sikhothtaboung District, Vientiane, Lao P.D.R. Khamphoxay Phommathansy, Kaimook Wichiencharoen, Apawan Nookong July-September 2010. To study the effects of planned instruction on mother's knowledge, health beliefs, and number of children receiving immunization for diphtheria, pertussis, neonatal tetanus, and polio. Quasi-experimental research, a two group pre-test post-test design.

The study subjects were mothers living in Sikhothtaboung District, 30 mothers from Viengkham, Chansavang, and Nongteng Villages as an experimental group, and 30 mothers from Nongneo, Nalao, and Thongpong Villages as a control group. The experimental group received planned instruction and handbooks while the control group did not. Data were collected using a questionnaire, asking about mothers' knowledge and health beliefs regarding diphtheria, pertussis, neonatal tetanus, and polio, before the intervention and at the first time they took their children for DTP and Polio vaccination. Data analysis included means and standard deviations of knowledge and health belief scores about diphtheria, pertussis, neonatal tetanus, and polio.

The difference in knowledge and health belief scores after intervention between the 2 groups was analyzed by independent t-tests. The difference in the number of mothers bringing their children for vaccination in the 2 sample groups was analyzed by Fisher's exact test.

Results of this study showed that the mother's knowledge and health beliefs after intervention between groups were significantly different ($p < .05$), but the number of children receiving immunization between groups were not significantly difference.

In accordance with the results of this study, the planned intervention conducted in this study may provide a hospital or other health service unit with guidance for promoting mother's knowledge and heath belief about diphtheria, pertussis, neonatal tetanus, and polio. As such it could encourage more mothers to vaccinate their children. Further research should be conducted on encouraging mothers to take children for vaccinations, and on the influences of providing social support for expenses, and travel.

5.4 Parents' health beliefs and HPV vaccination of their adolescent daughters by Paul L. Reiter, Noel T. Brewer, Sami L. Gottlieb, Annie-Laurie McRee, Jennifer S. Smith; University of North Carolina, Chapel Hill, NC, United States; Centres for Disease Control and Prevention, United States (2009). Though many studies have documented correlates of HPV vaccine acceptability, our study is one of the first to examine correlates of vaccine initiation. The current study aimed to identify modifiable correlates of HPV vaccine initiation among adolescent girls in high risk communities and whether correlates varied by race and urban/rural status. In 2007, we conducted a cross-sectional survey of 889 parents of adolescent girls aged 10–18 living in areas of North Carolina, USA with high cervical cancer rates. We analysed data using logistic regression. Health Belief Model constructs were associated with HPV vaccine initiation in multivariate analyses, including doctor's recommendation to get HPV vaccine, perceived barriers to obtaining HPV vaccine, and perceived potential vaccine harms. While exploratory stratified analyses suggested that many of the same parent beliefs were important correlates of HPV vaccine initiation regardless of racial group or urban/rural status, a few differences did exist. These potentially modifiable beliefs offer well-defined targets for future interventions designed to increase HPV vaccine coverage. However, the beliefs' relative importance may differ between racial groups and regions. (Elsevier Ltd. All rights reserved, 2009: 45).

5.5 The study on Knowledge and Perception of Mothers about Immunization of Children under 3 Years of Age in Saythany District, Vientiane, Lao PDR by Kongxay Phouphenghack 2007. This cross-sectional study was conducted on knowledge, perception and sources of information

on immunization status for mothers with children under three years of age, aged 19 to 45 years old with mean age about 27 years in Xaythany district, Vientiane capital, Lao PDR. A total of 108 mothers who had children lower than 3 years old were chosen for this study from 3 health centers and 10 villages. A structured questionnaire was used to interview the respondents by visiting the households. Descriptive statistics were used to describe knowledge level and perception, and other independent variables while the associations between these factors were determined by using the Chi-square test. Research finding shown that most of children (90%) were vaccinated among those vaccinated children, received their vaccination from the mobile services unit (57.41%). The total immunization coverage among children under three years of age among the group of incompleted immunization, was BCG(79%), OPV1(48%), OPV2(31%), OPV3(1.8%), DPTHepB1(46%), DPT-HepB2(31%), DPT-HepB3(1.85%), and Measles vaccine coverage (9%). The results also indicated that higher maternal education level, lower number of children, younger age, and vaccination at heath center correlated with higher children's immunization status, mean while family income and mothers' occupation were not correlated. Regarding the knowledge of mother on Expended Program, Immunization, diseases and immunization programs. Roughly-equal number of mother about on-third in each case-had good, fair, and poor levels of knowledge about immunization Perception on susceptibility, severity, barrier, and the overall perception scores were significantly different between the complete and incomplete immunization groups. Sources of information on immunization and side effects of vaccines were mostly received by the respondents from health centers and health volunteers.

5.6 Factors affecting routine immunization coverage among children aged 12-59 months in Lao PDR after regional polio eradication in Western Pacific Region (Masaharu Maekawa1, Somthana Douangmala2, Kayako Sakisaka3, Kenzoh Takahashi4, Outavong Phathammavong1, Anonh Xeuatvongsa5, Chushi Kuroiwa 2007). The global poliomyelitis eradication programme had a great impact on routine immunization coverage in Lao PDR: DPT3 increased 23% in 1992 to 56% in 1999; OPV3 27% to 64%. However, after the achievement of regional eradication, coverage became stagnant in accordance with the withdrawal of various sources of financial supports. In place of the former funds, a public-private global partnership began to support EPI. We aim to explore factors affecting routine immunization coverage. From February to March of 2005, a crosssectional

questionnaire survey was conducted, targeting 341 mothers living in two districts where immunization coverage was the lowest and the middle in Oudomxay province. DPT3 coverage was 72%, higher than the national target of 65%; however, the drop-out rate was 21%. Influential factors on fully immunized child was distance, literacy, possession of livestock; mothers knowledge of immunization target diseases, measles immunization schedule; and mother's willingness to pay for immunization. In total, 98% of all mothers lived within a 30-minute walk of the immunization site. Household visits increased the immunization status among mothers who were illiterate, utilizing an outreach site for immunization, not willing to pay for immunization, receiving home delivery, and without health education attendance. The much higher routine immunization coverage especially in a district of poor EPI activities suggests a well-designed primary health care approach under the district strategy, the zone-zero social mobilization strategy and good lines of communications; it also points to the benefits of the polio eradication initiative. Household visits were found to be effective for people living with difficulties in such as education, living location, and finance. An equally shared funding system for the basic health as well as international policy for respecting the existing system in poor country is important.

5.7 Mothers and vaccination: Knowledge, attitudes, and practice in Iran by Shahla Roodpeyma, Zinat Kamali, Reza Babai and Zohreh Tajik; Department of Pediatrics, Taleghani Medical Center, Shaheed Beheshti University of Medical Sciences, Tehran, Iran (November, 2006: 33). A knowledge, attitude and practice study on vaccination was undertaken among Iranian mothers in paediatric clinic of a university medical centre in Tehran, between March and August 2005, and 668 mothers responded to a questionnaire-based interview. The results showed a favourable attitude towards children immunization in 95.5% of respondents. Nearly half (51.4%; 95% confidence interval: 47.6%–55.2%) of mothers knew the name of the diseases against which their children were being vaccinated. More than half (67%) of respondents gave disproportionate importance to mild inter current illness as a reason to defer immunization. About half of children (341 = 51.1%) experienced vaccination delay. Results of logistic regression analysis showed increase in: birth order, number of children in household, and mother's age significantly predicted vaccination schedule non-adherence ($P = 0.02$, $P = 0.02$ and $P = 0.04$ to $P = 0.001$ respectively) and increasing mother's age was the most significant factor for

vaccination delay. Educating mothers about the vaccines and vaccine preventable diseases, and improving their performance are recommended.

5.8 Parental Decision Making and Childhood Vaccination by Janelle Highland, MA Case Western Reserve University (2005: 59) Extensive research has been done examining the decision making process related to health decisions. For the issue of childhood vaccination, the parental decision making process concerning choice of parents to vaccinate their children has received considerable attention. The research done on parental choice and vaccination has looked at how the decision making process between parents who choose to vaccinate and those who do not may differ, how these decisions are made, the psychosocial factors that may influence decision to vaccinate, and how the decision making process can be influenced. Others have looked at the methods parents use when making the decision to vaccinate or not, and how they estimate risk.

Research examining the decision making process for parents mulling over vaccinating their children has focused on examining the factors that contribute to their final decision, the thought processes of parents making these decisions, and predicting vaccination behaviors. Social cognition models have been used in research on vaccination practices, and often look at vaccination decision as the outcome of weighing perceived risks (Sturm et al 2005). Of these theories, the Health Belief model has been the most widely applied (Sturm et al 2005).

5.9 Maternal utilization of immunization services for their children aged 2-5 years in Sanakham District, Vientiane Province, Lao PDR. 2004, Kitti Shiyalap, Daokeo Siharath, Kanittha Chamroonsawasdi. This cross sectional descriptive study was aimed to describe and identify the relationship between maternal utilization of immunization services for their children aged two to five years and its related factors as their socio-demographic characteristics, knowledge, perception, accessibility, availability, and social support. By a multistage sampling technique, 280 the mothers were selected from sixteen villages in Sanakham District, Vientiane Province, Laos. It was revealed that 62.5 percent of the respondents brought their children to completely received immunization in accordance with its schedule. The immunization rate for each type of vaccines was observed that the BCG vaccine was very high (90.4 percentage) compared with other vaccine. The majority of them were farmers, with a low education and family monthly income. By largely their age were ranged between 20-29 years old

and they had only 1-2 children. About half of them had moderate knowledge and perceptions toward the immunization program in additional to getting moderate social support from various groups in the villages. It was demonstrated that the maternal education, occupation, and the number of children were related with the utilization of immunization services. The total knowledge and perception on barriers of receiving immunization services accompanied with its accessibility and availability were associated with the service usage. More over these, the overall of social support and tangible social supports were also related to the services too. All of these had significant association with a level at $P < 0.05$

5.10 The Health Belief Model and Factors Relating to Potential Use of a Vaccine for Shigellosis in Kaeng Koi District, Saraburi Province, Thailand by Piyarat Butraporn1, Alfred Pach, Robert P. Pack, Rungwit Masngarmmeung, Thavorn Maton1, Pusadee Sri-aroon1, Andrew Nyamete, and Wanpen Chaicumpa (2002: 78). Shigellosis is an important cause of morbidity and mortality throughout the world. Approximately, 1.1 million deaths occur a year due to this disease, making it the fourth leading cause of mortality worldwide. This paper explores local interest in and potential use of a vaccine for shigellosis in Thailand where *Shigella* poses an important public-health concern. Data for this study were collected during June - November 2002 from 522 subjects surveyed using a socio behavioural questionnaire in Kaeng Koi district in central Thailand. The community demand and likely use of a vaccine were examined in relation to the Health Belief Model, which provides analytical constructs for investigating the multiple issues of local readiness to accept and access a new vaccine. As the key outcome variable, most respondents showed interest in receiving a vaccine against dysentery which they thought would provide useful protection against the disease. However, there was only a moderate number who perceived dysentery as serious and themselves as susceptible to it, although it was perceived to cause some burden to and additional expense for families. Most people identified a number of groups who were thought to be especially vulnerable to dysentery, such as the elderly, pre-school, and school-age children, and poor labourers. Other outcomes of the study included the identification of acceptable and convenient sites for its delivery, such as government health clinics and private clinics, and respected sources for information about the vaccine, such as health clinic personnel and community health volunteers. This information suggests that components of the Health Belief Model

may be useful in identifying community acceptance of a vaccine and the means of introducing it. This health information is important for planning and implementing vaccine programmes.

5.11 The result from study of Saleumsak K., (2002: 79) had done in Nongbok district Khammmeuan province, Lao PDR, about the type of Knowledge, this study found majority (75 percent) who knew about vaccine preventable diseases transmission. But they were confused about negative question, especially 36.6 percent and 44.3 percent though that using uten sil as the sick person does not transmit tuberculosis and touching the rush of body could not transmitted measles. As well as the knowledge about vaccine preventable diseases, most of them (more than 80 percent) had known how protected their children from contracting those diseases. But items of negative questions, their knowledge was lower than the positive question. About half (46.7 percent) knew that injecting antibiotic won't protecting a child from contracting poliomyelitis, 48 percent had know the schedule of DPT, OPV and Measles vaccine.

5.12 A 2002 the study on beliefs about immunization and children's health among childbearing mothers in Nepal by Donald Matsuda (2002: 37). This study assessed specific cultural beliefs about immunization and children's health, and also tested the four components of the Health Belief Model in relation to use of childhood immunization among childbearing mother. The result of this study suggest that mothers who have received less formal education may be at greater risk of not being immunized and that health education interventions in this community may be more effective if they focus on perceived benefits of immunization in future intervention efforts.

5.13 Beliefs About Immunization and Children's Health Among Childbearing Mothers in Nepal (Donald Matsuda, 2002: 4). This study assessed specific cultural beliefs about immunization and children's health, and also tested the four components of the Health Belief Model in relation to use of childhood immunizations among childbearing mothers in Nepal. One hundred and eighteen surveys were administered to mothers visiting one of two health care facilities in the country-Kanti Children's Hospital on the northern side of the Kathmandu Valley and Patan Health Post in the northeastern Himalaya region. Of those surveyed, 69% reported being immunized and 65% indicated that their spouse had also been immunized. Most surprisingly, 102 out of the 118 subjects (or 86% of the total sample) reported that all of their children were immunized, 2 reported that half of their children were immunized, and

13 stated that none of their children were immunized. Based on multiple regression analyses, perceived benefits was the only component of the Health Belief Model that was significantly related to immunization use, with greater perceived benefits being associated with greater frequency of vaccination among the mothers ($p < 0.05$). In addition, those mothers with higher levels of education were more likely to have higher immunization rates ($p < 0.05$). Furthermore, qualitative findings indicated that mothers reported benefits of immunizing children that appeared to be a major reason for their children's immunization. The results of this study suggest that mothers who have received less formal education may be at greater risk of not being immunized and that health education interventions in this community may be more effective if they focus on perceived benefits of immunization in future intervention efforts.

5.14 While these studies suggest that the perceived threats (susceptibility and severity of diseases) are the most significant predictors of parents' vaccination behaviors, other studies have challenged this conclusion. In particular, an epidemiological study conducted among young adult in Demark found that perceived benefits and, more importantly, perceived barriers were significantly related to immunization rates in both parents and their children (Nexoe, 1997: page 63). Moreover, several additional studies have indicated perceived barriers to be the component of model that is most related to childhood vaccination behavior among parents (Janz 1984: page 72); Mark 1999; Henderson, 1999: 72).

5.15 The study conducted by Vongkhamdy K., (1999: 49) in Pakse district Champasack province, Lao PDR, (1999) revealed that 60.5 percent among the mother with children completely immunized children had high knowledge and only 39.5 percent of them had low knowledge. 63.6 percent of mother with completely immunized children had inadequate knowledge and 36.4 percent had adequate knowledge. There was significance relationship between children immunization status and knowledge of mother on immunization.

5.16 A 1996 study of parents in a rural Cameroonian village analyzed factors associated with caregiver compliance to child immunization schedules. The researchers found that both perceived susceptibility and perceived severity of infectious diseases were reliably associated with greater compliance to appropriate vaccination timeline (Tuma, 1996: 29). Another study conducted among mothers and primary caregivers in Indianapolis, Indiana (USA) also showed that perceived severity and susceptibility

were two components of the Health Belief Model that were significantly related to greater likelihood of immunization (Zimet,1995: 45)

5.17 The result from the study of Budisuharda D, (1995: 49) had done in the rural areas of Chonburi province, Thailand. It shows that 88,5 percent of the mother knew about children diseases, which can be prevented by immunization. Majority (98.7 percent) of the mother knew that BCG vaccination should given on age 0 – 2 months, and 86,6 percent of the mother also knew that the first those for DPT/OPV at 2-3 months of children's age and frequency of DPT/OPV was three. Child should receive this under one year of age. Almost 75 percent of mothers had high average of knowledge and there was significance association between the knowledge of mother and completeness of child vaccination.

5.18 With reference to the study among women conducted by Suhandi V, in the rural community in Prachiburi province, Thailand (1989: 81). This survey revealed that those women whose had good knowledge on tetanus neo natorum also shows to have good practice and moderate practice compare to those respondent who had poor knowledge. The respondent who had poor knowledge had also poor practice.

5.19 Ashraf UA., (1989: 29) in Kabinburi district, Prachinboury province, Thailand, showed that 82,4 percent of mother who had adequate knowledge had their children completely immunized while only 56 percent of mother with inadequate knowledge had their children complete immunized. Their was no association between the knowledge and completeness of immunization.

5.20 The result from the study of Petchavai Limtragool in Northeast Thailand, (1987: 91). In order to ascertain the mother perception of susceptibility to the immunization diseases that found the mother who had a high degree of perception had their children completely immunized to a greater extent at 72.20 percent that mother who had medium or low degree of perception. When perception of severity was study, it was found that 65 percent of mother who had high degree of the perception of severity of diseases have had their children completely immunized, again higher than for mother with medium or low degree perception. Similarly with the perception of the benefit of the immunization, mother with a high immunized more, at 68.8 percent, than mother with medium or low level perception of the benefit of immunization. There is found to be significance relationship (p=.01) between perception and immunization.

5.21 The study in rural areas of Chonburi province, Thailand, by Budisuhardja D, (1955: 63) shows that the perception of the mother towards the immunization services was significance association with the utilization of immunization services by the mother.

6. Conclusion

From the above literature review related to the mother's knowledge and perception towards the immunization status of their children, it is evident that a lot of work has been done on immunization status of children. However, in most of these studies, there was more focus on relationship between socio-demographic, knowledge, perception and immunization status of mother and their children under 1 year of age. Hopefully, this information will provide some useful insights as to what could be contributing to failure to attain complete immunization coverage in Lao PDR. With this information, targets and focused programme can be initiated to intervene and improve the situation of immunization activities