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# The Philippine Review of Economics

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# Maternal mortality in Lao People's Democratic Republic

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Lao People's Democratic Republic (PDR) has the highest maternity mortality ratio (MMR- deaths per 1,000 live births) in Southeast Asia. This essay identifies the reasons for the high but declining MMR in the country. MMR remains high because of the high inequality in the uptake of critical maternal health services. The least advantaged women have lagged behind the most advantaged in terms of ante-natal care and delivery care. The decline in MMR could be attributed to various government social health protection programs that eased the financial constraint posed by the high out-of-pocket payments in maternal health care.

**JEL classification:** I12, I14, J13

**Keywords:** maternal health care, maternal mortality

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## 1. Introduction

The Millennium Declaration ratified by the United Nations in September 2000 is a global commitment in building a world that is free of extreme poverty. This commitment is embodied in the eight Millennium Development Goals (MDGs), each with well-defined numeric targets that are aimed to be achieved by 2015. In the final year of the MDGs in 2015, Ban Ki-Moon, the secretary general of the United Nations, reported that "...the MDGs helped to lift more than one billion people out of extreme poverty, to make inroads against hunger, to enable more girls to attend school than ever before and to protect our planet" [UN 2015a]. Specifically, the global community was able to accomplish MDGs on extreme poverty, access to safe drinking water, and improving the lives of at least 100 million slum dwellers in terms of durable housing and sanitation. While we have had modest progress, we failed to accomplish the MDGs related to education and health (i.e., primary schooling completion; infant, child, and maternal mortality; and basic sanitation). Moreover, progress on the MDGs had been highly diversified across countries.

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To build on its earlier success, the UN General Assembly in September 2015 unanimously ratified the Sustainable Development Goals (SDGs) that replaced the MDGs [UN 2015b]. There are 17 goals and 169 targets to be achieved by 2030. SDG 3.1 “Reduce the global maternal mortality ratio to less than 70 per 100,000 live births” is a response to the failure to achieve health-related MDGs, specifically MDG 5.A “Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio”. As of 2015, the global maternal mortality ratio (MMR) per 100,000 live births declined by just 45 percent, falling short of the MDG target of 75 percent [UN 2015a]. The SDG 3.1 target of MMR at 70 per 100,000 live births requires reducing the global MMR by an annual rate of 7.5 percent between 2016 and 2030, which is more than three times the 2.3 percent annual rate of reduction observed globally during the MDG years between 1990 and 2015.

The World Health Organization [WHO 2015] reports 303,000 maternal deaths worldwide in 2015; 99 percent of these deaths took place in developing countries. A large number of these deaths, such as those caused by hemorrhage, hypertension, and infection, is preventable (Khan et al. [2006]; Say et al. [2014]). Thus, contact with health professionals before, during, and after delivery is no doubt a good strategy in preventing maternal deaths. Yet health professionals could work effectively only in the context of a functional health system characterized by an affordable health care, health facilities with sufficient medical supplies, upgraded facilities, and better transport services to emergency care. This means that government policies that directly or indirectly promote utilization of maternal health (MH) care are crucial in saving the lives of women.

The purpose of this essay is to identify the reasons for the high, but, nevertheless, declining MMR in Lao PDR. Here, I explore the trends in the uptake of MH care and trace the gradual evolution of government health policies that promote maternal care. I choose Lao PDR because it has the highest ratio of maternal deaths in Southeast Asia, and the decline in maternal mortality in this country has been pronounced over the years. The main reason is the rising proportion of women who utilized MH care such as antenatal care, facility-based delivery, and skilled birth attendants (SBA). This country has implemented various health policies that encourage women to receive maternal care, foremost of which is the national free maternal and child health (MCH) policy in 2012.

This essay has four remaining sections. Section 2 gives an overview of maternal mortality around the world and in Lao PDR. Section 3 reviews the literature on the determinants of the uptake of MH care. Section 4 traces the history of health policies and describes the service readiness of health centers in Lao PDR. Finally, Section 5 concludes this essay.

## **2. An overview of maternal deaths**

Maternal death is defined as “the death of a woman while pregnant, or within 42 days of termination of pregnancy, from any cause related to or aggravated by the pregnancy or its management (from direct or indirect obstetric death), but not from accident or accidental causes” [WHO 2015:34].

There are two measures of maternal mortality: MMR (per 100,000 live births) and absolute number of maternal deaths. Worldwide in 2015, the MMR is 216; it is lowest in Europe and Northern America (13) and highest in Africa (495) (Table 1). In Africa, Sub-Saharan Africa has the highest MMR (555) and, in Asia, it is highest in South Asia (182). Of the 303,000 maternal deaths in 2015, Sub-Saharan Africa alone accounts for 65 percent and South Asia alone accounts for 22 percent.

**TABLE 1. Maternal mortality ratio (MMR) and number of maternal deaths around the world, 2015**

Continent	MMR <sup>1</sup>	Maternal deaths	
		Number	Percentage
Africa	495	204,000	67
Sub-Saharan Africa	555	197,000	65
Asia	119	90,000	30
South Asia	182	66,000	22
Europe	13	1,000	0
Latin America and the Caribbean	67	7,300	2
Northern America	13	580	0
Oceania	82	530	0
World	216	303,410	100

Source: World Health Organization (2015, Annex 16, p. 66)

The WHO [2015] reports that global MMR has been declining since 1990. There was a reduction in MMR by 44 percent over the past 25 years from an MMR of 385 in 1990 to 216 in 2015. There was also a reduction in the annual absolute number of maternal deaths by 43 percent from approximately 532,000 in 1990 to 303,000 in 2015. This decline could be attributed to the global rise in births attended by skilled health personnel. More than 71 percent of births were assisted by skilled personnel globally in 2014, an increase from 59 percent in 1990 [UN 2015a].

What are the causes of maternal deaths? Maternal cause of death is classified into seven categories: abortion, embolism, hemorrhage, hypertension, sepsis (infection), other direct causes, and indirect causes [Say et al. 2014]. Other direct causes are obstructed labor, ectopic pregnancy, and complications from anesthesia and caesarian section. Indirect causes are pre-existing disorders such as HIV/AIDS, anemia, diabetes, cancers, cardiovascular diseases, chronic respiratory diseases, and others.

Here is a caveat: “Causes of death data are especially difficult to analyze because of inadvertent errors such as misclassification and misinterpretation of cause of death coding rules or omission or incorrect entries because of the nature of some disorders leading to maternal deaths such as abortion” [Say et al. 2014:329]. Thus, reported maternal death distribution should be interpreted as simply estimates of the actual distribution of the causes of death.

AbouZahr and Royston [1991] for 1985, Khan et al. [2006] for 1997-2002, and Say et al. [2014] for 2003-2009 are the most commonly cited studies on the cause distribution of maternal deaths. Findings from these studies consistently show that hemorrhage is by far the number-one leading cause of maternal deaths worldwide, while the other important causes are indirect causes, hypertension, sepsis, and abortion.

AbouZahr and Royston [1991] reported that, globally in 1985, the cause distribution attributed 25 percent of maternal deaths to hemorrhage, 20 percent to indirect causes, 15 percent to infection, 13 percent to abortions, 12 percent to hypertension, 8 percent to obstructed labor, and 8 percent to other direct causes.

Table 2 shows the distribution of causes of maternal deaths in 1997-2002 [Khan et al. 2006:1068] and in 2003-2009 [Say et al. 2014:326]. However, data from the two studies are not perfectly comparable because “unclassified deaths” are included in Khan et al. [2006], but not in Say et al. [2014]. Nevertheless, the main findings from these two studies are consistent globally and across continents. Also, I notice that the cause distribution of maternal deaths in Khan et al. [2006] and Say et al. [2014] is fairly similar, indicating that the major causes of maternal deaths have remained largely the same since 1997.

**TABLE 2. Distribution of causes of maternal deaths, by region, 1997-2002 and 2003-2009**

Period covered	Cause of death (%)	Developed regions	Africa	Asia	Latin America and the Caribbean
1997-2002					
	Abortion	8.2	3.9	5.7	12.0
	Embolism	14.9	2.0	0.4	0.6
	Hemorrhage	13.4	33.9	30.8	20.8
	Hypertension	16.1	9.1	9.1	25.7
	Sepsis	2.1	9.7	11.6	7.7
	Other direct causes <sup>1</sup>	26.2	19.4	23.9	17.8
	Indirect causes <sup>2</sup>	14.4	16.7	12.5	3.9
	Unclassified deaths	4.8	5.4	6.1	11.7
	Total	100.0	100.0	100.0	100.0
2003-2009					
	Abortion	7.5	9.6	5.9	9.9
	Embolism	13.8	2.1	2.2	3.2
	Hemorrhage	16.3	24.5	30.3	23.1
	Hypertension	12.9	16	10.3	22.1
	Sepsis	4.7	10.3	13.7	8.3
	Other direct causes	20	9	8.3	14.8
	Indirect causes	24.7	28.6	29.3	18.5
	Total	100.0	100.0	100.0	100.0

<sup>1</sup> Other direct causes are obstructed labor, ectopic pregnancy, and complications from anesthesia and caesarian section.

<sup>2</sup> Indirect causes are pre-existing disorders such as HIV/AIDS, anemia, diabetes, cancers, cardiovascular diseases, chronic respiratory diseases, and others.

Note: Totals may not sum up to 100 due to rounding.

Sources: Khan et al. [2006] for 1997-2002 data; Say et al. ([2014] for 2003-2009 data.



Hemorrhage was the number-one killer of women in both Asia and Africa between 1997-2002 and 2003-2008. Say et al. [2014] reported that, globally in 2003-2009, hemorrhage accounted for a total of 27.1 percent of maternal deaths, and more than two-thirds of hemorrhage deaths were classified as postpartum hemorrhage. Hypertensive disorders represent the most important cause of deaths in Latin America and the Caribbean. HIV/AIDS is an important contributor to the indirect causes of death in Sub-Saharan Africa and anemia in South Asia. Other direct cause of death (importantly, ectopic pregnancy in 1997-2002) was recorded as the leading cause of maternal death in developed regions. Sepsis, or infection, was more frequent in Asia, Africa, Latin America, and the Caribbean compared with developed regions. Deaths due to abortion are more pronounced in developed regions and Latin America and the Caribbean. In more recent years, there has been an increase in HIV/AIDS-related deaths in Sub-Saharan Africa, as reported by Say et al. [2014]. Thus, the WHO [2015] highlights the need to prevent the spread of this disease.

Based on the model estimates of the WHO [2015], the MMR in Lao PDR declined from 905 in 1990 to 197 in 2015 (a reduction of 78 percent) (Table 3). The MMR in Lao PDR was 206 based on the calculations from the actual count of maternal deaths from the Population and Housing Census 2015 [Lao Statistical Bureau 2015]. The MMR of 206 in 2015 is close to the WHO model estimate of 197, indicating that MMR in Lao PDR was about 200 in 2015. Similarly, the absolute number of maternal deaths based on the WHO model estimates declined from 1,700 in 1990 to 350 in 2015. The actual count of maternal deaths was 376 from the Population and Housing Census in 2015 [Lao Statistical Bureau 2015], which is close to the WHO’s model estimate of 350. Clearly, there was a consistent decline in maternal deaths based both on model estimates and actual count from the census.

**TABLE 3. Maternal mortality ratio (MMR) and number of maternal deaths in Lao PDR, 1990-2015**

Year	MMR <sup>1</sup>	Number of maternal deaths
1990	905	1,700
1995	695	1,300
2000	546	930
2005	418	700
2010	294 (357) <sup>2</sup>	520
2015	197 (206)	350 (376)

<sup>1</sup> MMR: model-based estimates drawn from WHO [2015:70-77].

<sup>2</sup> Numbers in parentheses are based on the actual count from the Lao Social Indicator Surveys 2011/2012 [MOH 2012] and the Population and Housing Census 2015 [Lao Statistical Bureau 2015].

It is important to mention that Lao PDR is one of the nine countries that are categorized by WHO as having “achieved MDG 5.A” target of 75 percent reduction in the MMR between 1990 and 2015 (target MMR of 226 in the case of Lao PDR).<sup>1</sup> Yet, the MMR of 200 in 2015, which is less than 226, is considered high and far off from the SDG 3.1 target of 70. It will require more than 2 percent annual rate of reduction in the MMR between 2016 and 2030 to fulfill SDG 3.1.

The WHO [2015] reports that Lao PDR has the highest MMR in the Greater Mekong Subregion: Cambodia has 161; Thailand, 20; Vietnam, 54; and Myanmar, 178. The National Health Statistics Report 2015/2016 [MOH 2016:56] shows that MMR was highest in the provinces of Phongsaly, Huaphan, and Oudomxay in the north; Savanakheth in the central part; and Saravan and Champasak in the south. The Lao National Mother and Child Health Center data base also shows that hemorrhage was the most important cause of maternal deaths nationwide.

### 3. Determinants of the uptake of maternal care

The WHO identifies four strategies in decreasing maternal deaths: family planning (FP); antenatal care (ANC); delivery care, such as institutional delivery and utilization of SBA; and post-natal care. I skip the analysis on post-natal care because information on it is largely absent in nationally representative data sets in Lao PDR.

The death of a woman is considered a maternal death if there is pregnancy and child birth. Since FP decreases the number of pregnancy and child birth, FP decreases the exposure of a woman to maternal death. The WHO recommends at least four ANC visits: 1 in the first trimester, 1 in the second trimester, and 2 in the last trimester (i.e., 1-1-2 ANC).<sup>2</sup> ANC visits detect problems during pregnancy to prevent birth defects and delivery complications and provide preventive and routine interventions (e.g., iron and folic acid supplement, etc.). Birth in a facility and SBA (doctors, nurses, and midwives) facilitate safe delivery by preventing complications and providing emergency obstetric care when needed.

In the following paragraphs, I identify the factors affecting the uptake of ANC and delivery care. I focus my review on the impact of socioeconomic factors, health insurance coverage, and government decentralization. Socioeconomic factors refer to women's education, partner's education, household wealth, complications during pregnancy, number of previous births or parity, distance to health facility, urbanity, etc.

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<sup>1</sup> The other eight countries are Bhutan, Cambodia, Cabo Verde, the Islamic Republic of Iran, Maldives, Mongolia, Rwanda, and Timor-Leste [WHO 2015].

<sup>2</sup> Recently, the WHO recommended eight ANC visits that replace the 1-1-2 ANC visits. The eight ANC visits include first visit in the first trimester (up to 12 months of pregnancy), two visits in the second trimester (at 20 and 26 weeks), and five visits in the third trimester (at 30, 34, 36, 38, and 40 weeks).

### 3.1. Antenatal care

#### 3.1.1. Socioeconomic factors

A woman's education is found to have a significant impact on the uptake of ANC (Agus and Horiuchi [2012]; Simkhada et al. [2008]; Tenkorang [2016]) and so does her partner's education [Simkhada et al. 2008]. A woman from a wealthy household is more likely to have an ANC consultation compared with one from a poor household (Agus and Horiuchi [2012]; Simkhada et al. [2008]; Tenkorang [2016]). A woman in her first pregnancy is more likely to undergo ANC compared with those who have previous births (Agus and Horiuchi [2012]; Celik and Hotchkiss [2000]). Pregnancy complications positively affect the uptake of ANC services [Simkhada et al. 2008]. Women who live in more developed areas and those who live in urban areas are significantly more likely to receive an ANC consultation [Celik and Hotchkiss 2000]. Quality of access (e.g., concrete roads) to a health facility matters significantly more than just the mere distance in the decision of a woman to undergo an ANC consultation (Agus and Horiuchi [2012]; Tenkorang [2016]).

In rural villages in Khammouane and Champasak of Lao PDR, Manithip et al. [2011] found that the following women are significantly more likely to use ANC: women whose husbands were salaried employees, women younger than 18 years old at first pregnancy, the more educated women, and women perceiving ANC as somewhat useful. Awareness of the usefulness of ANC was related to more frequent use of ANC. Scopaz, Eckermann, and Clarke [2011] argue that there is a high degree of inequality in the uptake of maternal care between Vientiane Capital and other provinces in Lao PDR mainly because of differential access to fully equipped health facilities. Travel time to a health facility determines the choice when, where, and why Lao women choose to have ANC, delivery care, and post-natal care. The World Bank [2013, 2016a] shows that there is low utilization of maternal and child health services and that inequitable distribution of health outcomes cross socioeconomic dimensions such as income, ethnicity, and geography. For example, households in the poorest quintile spent 43 percent of their monthly household expenditure on an institutional birth compared with households in the richest quintile, which spent only 26 percent [WB 2013]. High out-of-pocket (OOP) expenditure by households on health care, including MH care, exerts a heavy financial toil on the less endowed households.

A special case study in 2013 of 24 villages in six provinces with a high prevalence of maternal deaths in Lao PDR shows that the following are significant determinants of a pregnant woman regularly visiting public health facilities: mother's education, household income, and intended pregnancy exerting positive impacts; and travel time to nearest public health facility and intense physical activity of mothers during pregnancy exerting negative impacts [NERI 2014]. In fact, three maternal deaths in the sample were associated with hard work in brick

factories during pregnancy. In summary, female education, household income, and access to health facility are oftentimes cited as significant determinants of the uptake of ANC in Lao PDR.

### *3.1.2. Health insurance*

While the impact of health insurance coverage on the utilization of ANC services is expected to be positive, results from empirical studies are inconclusive. Health insurance coverage positively and significantly affects the uptake of ANC in Mali [Smith and Sulzbach 2008] and in Turkey [Celik and Hotchkiss 2000], but not in Senegal [Smith and Sulzbach 2008] and not in Ghana [Tenkorang 2016]. Kesuma's 2017 findings in Indonesia suggest that having a government health card is positively associated with ANC utilization of both at least one ANC and four ANC. Women who have a health card were found to be 2-3 percentage points more likely to have at least one ANC visit and 3 percentage points more likely to have at least four ANC visits than those women who have no card. Importantly, the impact of the health card is strongest among the poor: a poor woman who has a health card is 5 percentage points more likely to have one ANC visit and 6 percentage points more likely to have four ANC visits compared with a poor woman who does not have the card.

## *3.2. Delivery care*

### *3.2.1. Socioeconomic factors*

Hodge et al. [2015] found that religion, birth order, woman's education, and wealth were important factors in deciding for a facility-based delivery. Moreover, these authors found that women who lived in Java-Bali area were more likely to choose institutional birth compared with women who lived in other areas. Thind and Banerjee [2004] and Titaley, Dibley, and Roberts [2011] found that the presence of SBA for births at home was significantly affected by birth order, woman's age and education, partner's education, wealth, and religion. In two districts in Indonesia, Ronsmans et al. [2009] found a significant impact of wealth on utilization of SBA.

### *3.2.2. Health insurance*

Coverage of health insurance decreases OOP expenditure and thus encourages facility-based delivery and utilization of SBA. Smith and Sulzbach [2008] found that, in Senegal and Mali, women who were covered by health insurance were more likely to give birth in a facility. Quayyum et al. [2010] found in two districts in Indonesia that insurance coverage significantly decreased OOP expenditure for MH care, including that for delivery care. Brooks et al. [2017] found a positive relationship between health card program and delivery care utilization. In contrast,

Kesuma [2017] found that, in Indonesia as a whole, the impact of a health card on facility-based delivery is not clear because results from the ordinary least squares model and instrumental variable model are different. Nevertheless, results from the ordinary least squares model show that health card membership increases the likelihood of a facility-based delivery and utilization of SBA, and such tendency is stronger among poor women.

### 3.2.3. *Government decentralization*

The devolution of powers away from the central government and to the local government has affected the implementation of reproductive health programs. Lakshminarayanan [2003] in the Philippines and McIntyre and Klugman [2003] in South Africa found that decentralization has negatively affected equity in the provision of reproductive health services across regions in the country, including delivery care. Financial constraints of each of the local governments lead to different degrees of provision. Kesuma [2017] found that, in Indonesia, inequality in delivery care utilization between the eastern and western regions has widened over the years, particularly in the post-decentralization period with the east lagging behind the west.

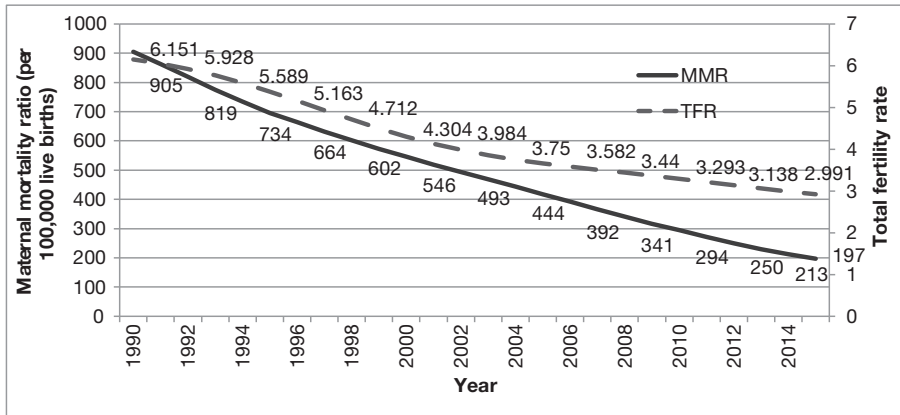
### 3.3. *An overview of maternal health care in Lao PDR*

Figure 1 shows a simultaneous decline in total fertility rate (TFR)<sup>3</sup> and MMR, indicating a strong positive correlation between the two. The TFR in Lao PDR declined from about 6 in 1990 to about 3 in 2015, and MMR declined simultaneously and steadily from 905 to 197 in the same period. The MOH [2015] argues that the decline in maternal mortality in Lao PDR could be largely attributed to the halving of the TFR from 6 to 3. Note, however, that while the annual rate of reduction in the TFR between 1990 and 2015 is about 2 percent, the annual decline in MMR is higher at about 3 percent. Clearly, while birth control is important in reducing the MMR, MH care during pregnancy and delivery is also an important contributor to the declining MMR.

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<sup>3</sup> TFR represents the number of children that would be born to a woman if she were to live to the end of her child-bearing years and bear children in accordance with age-specific fertility rates of the specified year.

**FIGURE 1. Maternal mortality and total fertility rate in Lao PDR, 1990-2015**

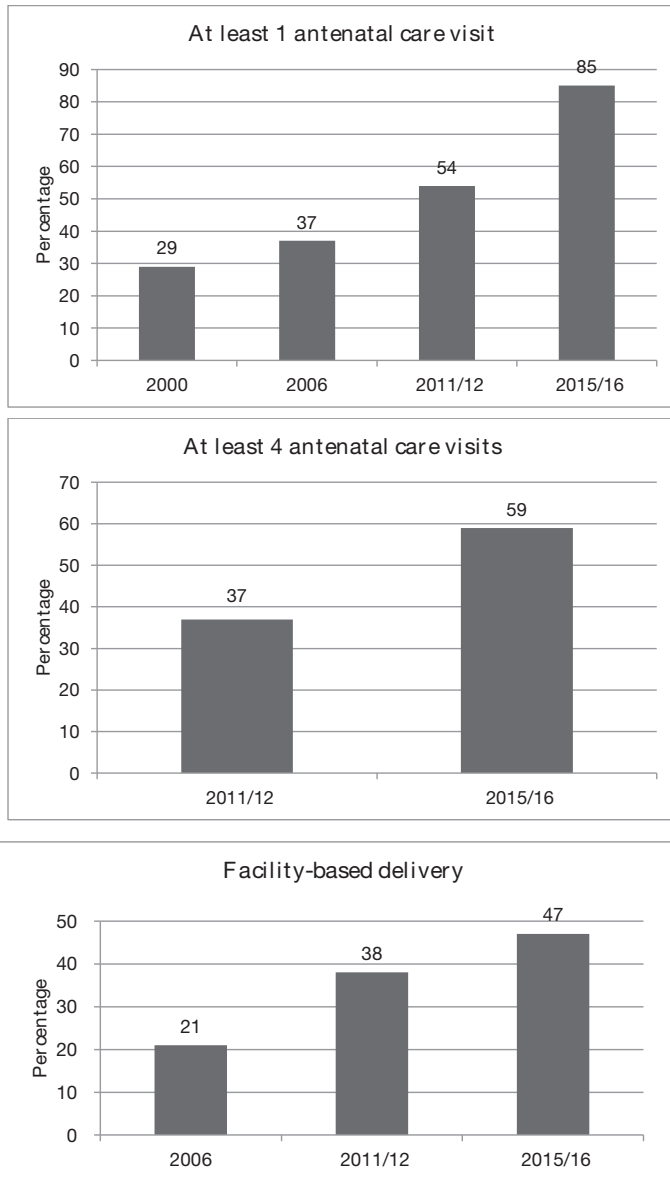


Note: Figure drawn using data from the World Development Indicators database.

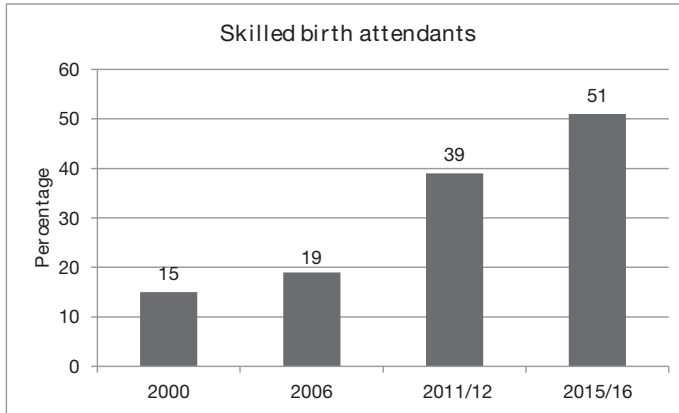
The WHO assesses that the FP program could reduce maternal mortality by as much as 30 percent. The Lao Social Indicator Survey in 2011/2012 [MOH 2012] showed that around 95 percent of sexually active population (15-49 years old) stated that they knew of at least one contraception method and, in fact, one out of two was using modern contraception. Most district health centers, with support from the United Nations Population Program (UNFPA), are able to provide FP services, and all contraceptives are dispensed free of charge. The FP program in Lao PDR involves many government agencies such as the MOH, the Lao Women’s Union, and the Lao Youth Union as well as international partners such as the United Nations Population Program, WHO, and the United Nations Development Program.

Uptake of ANC of at least one time during the 9-month pregnancy rose from 29 percent in 2000 to 85 percent in 2015/2016, whereas uptake of the WHO-recommended four ANC rose from 37 percent in 2011/2012 to 59 percent in 2015/2016 (Figure 2). ANC is a clinical healthcare package that includes the following: measurements of height, weight, blood pressure, mid-upper arm circumference, and fundal uterus height measurement, and fetal heartbeat; tetanus toxoid vaccination; iron and folic acid supplement; maternal care counseling and education, including FP; and basic laboratory tests, such as blood count test and urine test.

**FIGURE 2. Utilization of maternal health care in Lao PDR, 2000-2016**



Continuation of Figure 2



Source: Author's calculations from the multiple indicator cluster surveys in 2000 and 2006 and from the Lao Social Indicator surveys in 2011/2012. Data in 2015/2016 were taken from the National Health Statistics Report 2015/2016 [Ministry of Health 2016].

Facility-based delivery rose from 21 percent in 2006 to 47 percent in 2015/2016 (Figure 2). This means that, as late as 2015/2016, one out of two Lao women continues to give birth at home. Facility-based delivery occurred mostly in public hospitals (i.e., district and provincial hospitals). Private clinics that offer delivery services are growing, but they are mainly concentrated in Vientiane Capital. So far, there is no private hospital in the country. Some minority women give birth in temporary birthing huts outside the home or in the forest without any assistance.

Utilization of SBA had increased from 15 percent in 2000 to 51 percent in 2015/2016 (Figure 2). Deliveries by SBA are mostly conducted by doctors and, to some extent, by nurses and midwives. It is reasonable to presume that deliveries in a facility are conducted by SBA, and, thus, the question is who assists during births at home. My calculations from the Lao Social Indicator Survey 2015/2016 [MOH 2016] reveal that a large majority of home births were assisted by unskilled attendants: friends or relatives (52 percent), traditional birth attendants (22 percent), village health workers and others (16 percent), and no one (4 percent). It is thus reasonable to presume that the high MMR is due to the high proportion of births at home (one out of two) assisted by unskilled birth attendants (94 percent) who could not detect and provide immediate and appropriate emergency obstetric care. The World Development Indicators database of the World Bank shows Lao PDR lagging behind its neighboring countries in terms of coverage of births attended by SBA: Cambodia had 89 percent of births attended by SBA in 2014; Vietnam, 94 percent in 2014; Myanmar, 60 percent in 2016; and Thailand, 100 percent in 2012.



Uptake of MH care in 2011/2012 varies widely across women based on their residence, education, ethnicity, and household wealth (Table 4). The most advantaged women—such as those who lived in urban areas, had tertiary schooling, belonged to the majority group Lao-Tai, and belonged to households in the richest wealth index quintile—have exhibited the best performance in terms of four ANC visits or more, institutional delivery, and doctor-assisted delivery. The least advantaged women are those who lived in rural areas without roads, had no education, belonged to an ethnic minority group, and came from the poorest households.

**TABLE 4. Utilization of maternal health care in Lao PDR, 2011/2012**

Characteristic	Antenatal care (four visits and more)	Facility-based delivery	Doctor-assisted delivery
Residence			
Urban	70.6	74.2	NA
Rural with roads	29.7	29.2	NA
Rural without roads	9.9	11.6	NA
Woman's education			
None	8.8	15	13.2
Primary	34	30.4	29.8
Lower secondary	56	55.6	55.6
Upper secondary	78	81.3	80.6
Post-secondary non-tertiary	84.8	84.7	83.7
Higher	87	90.4	88.7
Ethnicity			
Lao-Tai	55	51.8	52.1
Mon-Khmer	16.5	20.1	17
Hmong-Mien	8.5	16.7	15.2
Chinese-Tibetan	6.1	19.1	17
Wealth index quintile			
Poorest	9.1	10.5	8.9
Second	19.3	21.6	20
Middle	41.4	37.4	36.4
Fourth	56.8	55.1	56.2
Richest	82.6	87.4	86.8

<sup>1</sup> NA means not available.

Source: Ministry of Health [2012]

Interestingly, the uptake of maternal care of the most advantaged women had risen remarkably over time, whereas the uptake of the least advantaged women had also risen but at a relatively slower phase. Comparing data from the Lao Reproductive Health Survey 2005 [Ministry for Planning and Investment 2005] and the Lao Social Indicator Survey 2011/2012, I found that institutional births rose by about two times more for women with upper secondary education compared with women with no education (16 percentage points vs 7 percentage points). Likewise, institutional births rose by about three times more for women living in urban areas compared with women living in rural areas without roads (22 percentage points vs 7 percentage points). The proportion of births assisted by doctors rose by nearly 3.2 times more for women with upper secondary education compared with women with no education (35 percentage points vs 11 percentage points). Clearly, there emerged a higher degree of inequality in MH care utilization in more recent years with the least advantaged women lagging behind the most advantaged ones. It is thus reasonable to speculate that maternal mortality in more recent years is increasingly concentrated among women in the least advantaged group, who have lower utilization of skilled care. These are women with no education and those living in rural areas without roads.

To summarize, while there has been a modest increase in the uptake of ANC, the coverage of SBA and institutional births continue to be low, both at about 50 percent in 2015/2016. Moreover, there has been a notable widening gap in institutional births and use of SBA between the most advantaged and the least advantaged women. The lower uptake of MH services appears to be driven by demand-side factors, such as financial constraints, maternal education, and physical and cultural barriers. The next section describes how the Lao government has been addressing the financial barrier caused by the high OOP payment on health care, including MH care.

## **4. Health policies and service readiness in Lao PDR**

### *4.1. Health expenditure*

The public health sector in Lao PDR has evolved from a centralized system in which the government provided free services to a fee-for-service system, followed by a gradual reintroduction of selected free services (e.g., health care for the poor) and the establishment of various health financing schemes. OOP expenditures are high and believed to be the most serious impediment in the uptake of MH care. In 2012, the national free MCH policy was implemented to provide free services for antenatal care, delivery care, and postnatal care.

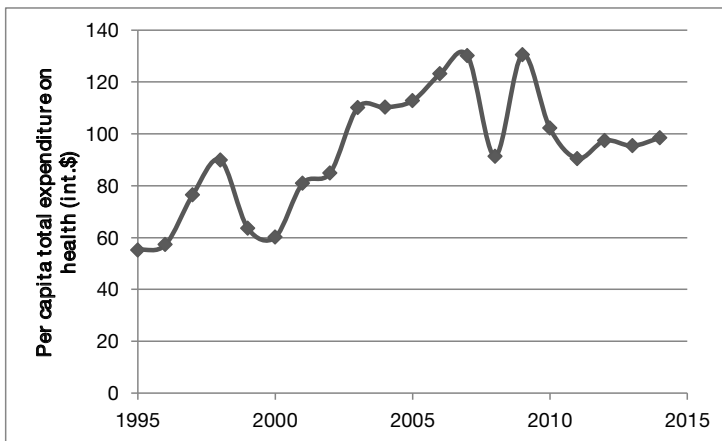
Data from the WHO health expenditure database show per capita total expenditure on health (PPP int.\$) of Lao PDR rising from \$55 in 1995 to \$130 in 2009 (highest level) and stagnating at around \$100 in 2012-2014 (Figure 3).<sup>4</sup>

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<sup>4</sup> The Lao PDR's \$100 (PPP int.\$) per capita total expenditure on health in 2014 is equivalent to current \$32 (or less than \$3 per capita per month).

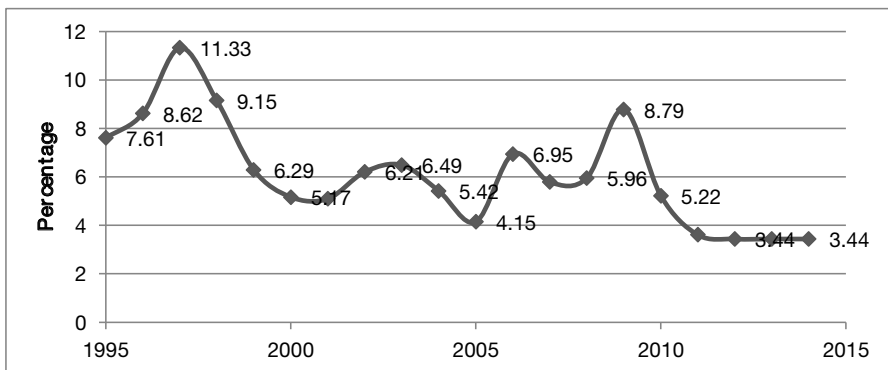
Lao PDR’s \$100 per capita total expenditure on health in 2014 was the lowest in the Greater Mekong Subregion: Cambodia had \$183; Myanmar, \$103; Thailand, \$599; and Vietnam, \$390. The share of general government expenditure on health as a percentage of total government expenditure was highest in 1997 at more than 11 percent, declining gradually in 1998-2010, until it reached the lowest level at about 3 percent in 2012-2014 (Figure 4), which is far off from the 9 percent target. Education share of the government budget is higher at around 12 percent. This might be an indication of stronger financial commitment to education relative to health on the part of the Lao government.

**FIGURE 3. Per capita total expenditure on health in Lao PDR, 1995-2014**



Note: Figure drawn using data from the global health expenditure database of the World Health Organization.

**FIGURE 4. General government expenditure on health as a percentage of total government expenditure in Lao PDR, 1995-2014**



Note: Figure drawn using data from the global health expenditure database of the World Health Organization.

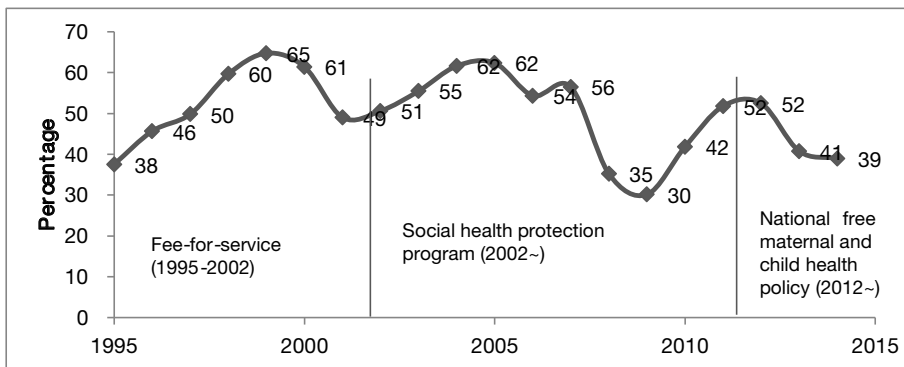
The private sector has played an increasing role in financing health care since 1995 when the health sector was transformed from government free service to fee-for-service. For example, between 1999 and 2008, the share of the general government health expenditure to the GDP hovers between 0.7 and 1.4 percent, while that of the private health expenditure is more than double, varying between 2.2 and 3.1. Government health spending as a share of the GDP is erratic over time because of fluctuations in external financing for health.

The Lao National Health Accounts in 2014 [MOH 2014] show that the health sector is financed from three main sources: households through OOP payments contributing nearly 40 percent of the total health funds, government budget through budget allocation from the Ministry of Finance contributing nearly 30 percent, and external sources (or donor funds) contributing the remaining 30 percent. The high contribution of donors to the health sector makes health programs susceptible to large volatility in the flow of foreign funds.

#### 4.2. History of health financing

The history of health financing programs in Lao PDR could be conveniently divided into three phases since the country's establishment in 1975: Phase I (1975-1995) covers the government free services; Phase II (1995-2002) covers fee-for-service; and Phase III (2002 onward) is the era of social health protection program, including the national free MCH policy in 2012 (Figure 5). In Phase I, health care was funded primarily through the government budget with generous support from the Soviet Union, Vietnam, and China. When support from these countries dwindled, the government needed to find alternative sources of funding.

**FIGURE 5. Out-of-pocket expenditure as a percentage of total health expenditure in Lao PDR, 1995-2014**



Note: Figure drawn using data from the global health expenditure database of the World Health Organization.

The government officially adopted user fees through Prime Ministerial Decree 52/PM in 1995 and the Revolving Drug Funds (RDFs) in 1997. Decree 52 introduced user fees for government health services that include laboratory tests, diagnostics, medicine, and in-patient charges. The RDFs charge patient for drugs at cost plus 25 percent in order to ensure that the stocks of medicine could be replenished. In recognition of the inequalities caused by the fee-for-service policy, the government revised Decree 52 in 2005 to include a quote for fee exemptions for the poor and other groups: government officials and retirees, retired military officials, people with disability, students under 18 years old, and monks and novices.

However, the Revised Decree 52 was superseded by Prime Ministerial Decree 381/PM in late 2005 on the collection of health service technical revenues, which sets out the principles for the collection of technical revenues by government entities. In 2008, the fee schedule was revised and renamed “Presidential Decree No. 3,” which specifies the fees payable by users of government health service on a service-by-service basis, including that of MH services such as deliveries and ANC consultations.

The high OOP payments in the fee-for-service regime have discouraged the utilization of public health services. Due to high prices of drugs resulting from the RDFs and the perceived poor quality of health services, the Lao people frequently resort to alternatives such as traditional medicine and self-medication. The poor who utilized public healthcare services paid for it by selling assets and by borrowing money from relatives [Akkhavong et al. 2014:54). According to the World Bank [2016b:27] survey of 120 health centers around the country in 2013/2014, the most important source of health center revenues are the RDFs collected through the sale of drugs to patients at facilities. Since the health centers use the RDFs as a source of operational financing, drug prices are higher in public health facilities than in private pharmacies.

The Lao government in the early 2000s started implementing social health protection programs. There are five government health insurance schemes: State Authority for Social Security, Social Security Organization, Community-based Health Insurance (CBHI), National Health Insurance, and Health Equity Funds. The private health insurance program is in its infancy; thus, there are no statistics on its coverage.

The State Authority for Social Security is operated by the Ministry of Labor and Social Welfare with civil servants as the target population. The Social Security Organization (also operated by the same ministry) is earmarked for salaried private and state enterprise employees. The CBHI (administered by the MOH) is designed for self-employed or non-salary workers in the informal sector such as farmers, merchants, and others. Under the CBHI, 50 percent of the insurance premium is paid for by the government. The National Health Insurance scheme is also administered by the MOH, which is also earmarked for the informal

sector, but with no premium subsidy from the government. Finally, the Health Equity Funds operated by the MOH using donor funds is considered a public welfare scheme, which is intended for identified poor households (i.e., those living below the poverty line). Except for the State Authority for Social Security, which has reached 100 percent coverage of its target population, the coverage of other schemes remained low in 2015/2016: Social Security Organization has 46 percent, CBHI has 5 percent, National Health Insurance has 12 percent, and Health Equity Funds has 40 percent in 2015/2016 [MOH 2016]. The proportion of the entire Lao population that is covered by a social protection program is about 40 percent as of 2015/2016.

Of relevance to MH, households with a pregnant woman are more likely to enroll in CBHI and National Health Insurance as the informal sector is the largest sector in the country. The World Bank [2013:6] household survey in 2010 in the central and southern provinces in the country showed that households with pregnant women who are enrolled in the CBHI have lower OOP expenditure and thus have higher utilization rates of MH care. But because of the low coverage of the targeted population in the CBHI (5 percent) and National Health Insurance (12 percent), the impacts of these schemes could be limited. It is thus not surprising that household OOP expenditure on MH care remains high and thus the utilization of MH services remains low in Lao PDR.

To comply with the MDG 5.A of decreasing maternal mortality by 75 percent, the government issued Prime Ministerial Decree No. 178/PM (“National Free Maternal and Child Health”) policy in 2012. This policy provides fee exemptions for antenatal and postnatal care and delivery services and provides cash allowances to patients for food and transport. The World Bank [2013, 2016a] studies show that this policy is expected to encourage pregnant women to solicit MH care by easing their financial constraints. However, this policy has also the potential to be regressive (“capturing by the elite”). Wealthier households are more likely to capture the greater benefits from this policy because they have the higher utilization rates of health services.

While there is no study in Lao PDR that shows the impact of various social health protection programs on maternal deaths, there is a visible correlation between the implementation of various social health protection programs and the decline in MMR. Model-based MMR estimates of the WHO declined by 64 percent between 2000 and 2014. The link between insurance coverage and maternal mortality is the decline in OOP expenditure, which encourages ante-natal care and delivery care of those who are enrolled. Figure 5 shows that OOP expenditure, as a percentage of total health expenditure, has been decreasing since 2002 with the implementation of various social health protection programs. The impact of the national free MCH on decreasing the OOP has started to become visible in 2013.

### 4.3. *Service readiness*

The MOH [2016] shows that there are 137 district hospitals in the country, 17 provincial hospitals, 27 army hospitals, 11 police hospitals, 1,026 health centers, and more than 5,000 village drug kits. The district hospitals (Type A, which provides basic surgical services such as caesarian section, and Type B, which does not) and the 1,026 health centers are the frontline health service providers. Since there are 137 district hospitals in 147 districts around the country, it is reasonable to say that there is at least one public hospital for every district.

However, Akkhavong et al. [2014:62] mention that the number of hospital beds per 1,000 population in Lao PDR has been on a declining trend, falling from 1.8 beds in 1996 to 1.1 in 2003, and then to 0.8 beds in 2010. In terms of personnel, the density of skilled personnel (doctors, nurses, and midwives) is also declining from 1.6 in 1995 to 1.3 in 2005 to 1.04 in 2012. The Lao PDR's staff density is less than one-fourth of the WHO-recommended 4.45 skilled health professionals per 1,000 population. The declining health staff density over the years can be attributed to inadequate quota of posts allocated to the MOH by the Ministry of Home Affairs in the midst of a rapidly growing population.

A World Bank [2016b] report from a survey of 120 health clinics in 2013/2014 around the country shows that the availability of essential medicine at health centers was generally poor in spite of its high dependence on the RDFs. The availability of essential medicine such as diazepam, magnesium sulphate, metronidazole, enalapril, procaine benzyl penicillin, zinc tablets, and folic acid tablets was particularly low across health centers [WB 2016b:30]. Data from an earlier survey of 41 health centers in 2010 by the World Bank in high-priority and poor communities in southern and rural Lao PDR [WB 2013:37] showed that few clinics had the life-saving MH drugs such as uterotonic drugs to treat hemorrhage, injectable antibiotics to treat infections, and magnesium sulphate to treat eclampsia or pre-eclampsia. Coincidentally, hemorrhage, hypertensive disorders, and infections were major causes of maternal deaths in Lao PDR. Data from the World Bank survey of 120 health clinics in 2013/2014 show an underutilization of the health center workers with a mean of only 5.6 consultations per worker per day [WB 2016c:32]. This is lower than that of rural Tanzania, where the median number of consultations per day per health worker is 14.

Overall, this section shows that the high OOP expenditure serves as a serious impediment in the uptake of MH care. Nevertheless, there has been a gradual evolution of social health protection programs that could have seemingly eased financial constraints to health care. There is a large network of existing health facilities spread out across the country, but service readiness of these facilities appears to be much less satisfactory in terms of staff density and availability of essential medicine. It is thus not surprising that health centers are underutilized as shown by the World Bank [2016c] survey data.

## 5. Summary and conclusions

According to WHO [2015], about 830 women die every day around the world from causes related to pregnancy and childbirth. Almost all of these deaths took place in developing countries, and many could have been prevented. Lao PDR has the highest maternal death ratio in Southeast Asia. In this essay, I explore the reasons for the high, but, nevertheless, declining maternal death ratio in Lao PDR. Lao PDR has experienced a marked decline in MMR over the years, and this could be attributed to a modest increase in the utilization of ANC, institutional delivery, and SBA. While this progress is notable, utilization of MH services remains low: only 60 percent of pregnant women had the WHO-recommended four ANC, only one out of two births occurred in a health facility, and only one out of two births was attended by SBA in 2015/2016. High OOP expenditure on health care is believed to be the most serious impediment in the utilization of MH care. Household expenditure on health care, including MH care, started increasing in 1995 with the shift of health care financing away from free government services to private financing through OOP payments.

In recognition of the unacceptably high MMR and the barriers caused by the high OOP expenditure on MH care, the government launched various social health protection programs, and one of them is the national free MCH policy in 2012. It exempts pregnant women from user fees in public health facilities for critical maternal services and provides them some cash payments to cover transport and opportunity cost. The coverage of the free national MCH rose to as high as 92 percent in 2015/2016 [MOH 2016:25]. Incidentally, in 2015/2016, there were only 78 officially reported maternal deaths in the country [MOH 2016:58], which is only about one-third of the 202 reported maternal deaths in 2013 when the program was just starting. It appears that the national free MCH policy is effective in encouraging the uptake of MH services.

Since all pregnant women could take advantage of this program, it is expected to have a positive impact in decreasing the existing inequality in access to maternal services. The World Bank [2013:2] reports that, while the financial protection implied by the national free MCH is strong, there are other barriers to the utilization of maternal services that have to be addressed, such as maternal education, cultural practices, and physical access to MH services. This may mean improving the knowledge and awareness of the marginalized and poor women of the importance of MH services and how they could benefit from the policy. Reimbursement of transport expenses as recognized by the national free MCH is helpful in decreasing physical access to MH services.

To sum up, I wish to answer the question I raised in the Introduction: "What are the reasons for Lao PDR's high but declining ratio of maternal deaths?" MMR remains high because of the high inequality in the uptake of critical maternal services. The least advantaged women, such as those living in rural areas without roads and those who have no education, have continued to lag behind the most



advantaged women in terms of ANC and delivery care. The reason for the decline in MMR is the overall modest improvement in the proportion of women who had access to ANC and delivery care. This is made possible by the various social health protection programs that have been implemented by the Lao government since the early 2000s. These programs have eased the financial constraints posed by the high OOP payments in MH care. Specifically, the international community should salute the government of Lao PDR for the national free MCH policy, which is an innovative policy that directly targets the problem of high MMR in the country. This policy is expected to save young Lao women from dying during pregnancy and child birth.

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