

# **Determinants of Health Financing Transition: Empirical Evidence from South-East Asia**

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## *Abstract*

The objective of this study is to observe the pattern of health financing transition in the South-East Asia region over the period 1995 to 2013. The countries are selected as per the WHO classification. The health financing transition exhibits two types of health financing trends over the period. First, an increase in per capita government health expenditure; and second, a decline in out-of-pocket expenditure as share of total health expenditure. The study employs panel fixed effect regression model to empirically examine the determinants of health financing transition. The result shows that per capita income is the most important factor in the growth of total health expenditure while fiscal capacity and ageing are the major determinants which contributes to the reduced share of out-of-pocket expenditure. Further, there is a negative and statistical significant relationship between out-of-pocket expenditure and ageing. The income elasticity of government health expenditure is less than one, which implies that the health expenditure is treated as a necessity in the context of public health providers. It concludes that the speed of movement towards health financing transition is associated with country specific factor and time variant policy changes in the health sector.

**Keywords:** Health expenditure, economic growth and Panel data

**JEL classification:** H51, I11, I150, I180

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## 1. Introduction

### 1.1 Background

Health care financing is a key building block of the health system functions<sup>3</sup> framework of World health organisation (hereafter WHO) and plays an influential role in attainment of universal health coverage (hereafter UHC)<sup>4</sup> goals (Kutzin, 2013). The achievement of UHC needs a systematic health financing networks in a country that enable people to use all types of health services – promotion, prevention, treatment and rehabilitation without suffering financial hardship (World Health report, 2010). The health financing network is the function of collecting revenues, pooling resources and purchasing services (Gottret and George, 2006). The performance of all three health financing principles ultimately contributes to arrive at the policy goal of UHC. Mathauer and Guy (2011) have designed health financing performance indicators in the perspective of low income countries such as total health expenditure per capita, ratio of total health expenditure to GDP, per capita general government expenditure on health, ratio of general government expenditure on health to total health expenditure, ratio of general government expenditure to GDP, ratio of general government expenditure on health to total government expenditure and ratio of external funding for health to total health expenditure. Fan and Savedoff (2014) argued that these health financing indicators exhibits two basic health expenditure trends over time in most countries. First, an increase in per capita government health expenditure; and second, a decline in out-of-pocket (hereafter OOP) expenditure as share of total health expenditure. These trends is proposed as ‘health financing transition’ by Fan and Savedoff (2014). The main aim of moving faster through the health financial transition to achieve sustain UHC. For progress towards sustainable UHC, the health system interacts with the issues of social, political, and economic aspects of the country (Borgonovi and Amelia, 2013).

In this above conceptual framework, it has cleared that level of expenditure in the health sector is the most import indicators for health system. There has bulk of literature examined the determinants of heath expenditure which surely very important to observe the pace and pattern of

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<sup>3</sup> Health system include all the activities whose primary purpose is to promote, restore or maintain health. In precisely health systems are not just concerned with improving people’s health but with protecting them against the financial costs of illness. The challenge facing governments in low income countries is to reduce the regressive burden of OOP payment for health by expanding prepayment schemes, which spread financial risk and reduce the spectre of catastrophic health care expenditures (World health report, 2000).

<sup>4</sup> UHC provides assurance of health services to all needy people under three objectives such as equity in access, quality of health services and ensuring financial risk protection.  
([http://www.who.int/health\\_financing/universal\\_coverage\\_definition/en/](http://www.who.int/health_financing/universal_coverage_definition/en/) access 2015 November).

health financing transition for lower and lower middle income countries. Because these countries always suffers from financial constraint in government health spending and huge share of OOP spending (Duran et al., 2014; Reeves et al., 2015).

## **1.2 Review of literature**

Fan and Savedoff (2014) examines the determinants of health care expenditure of 126 countries from 1995 to 2009, found that total health expenditure per capita is significantly influenced by economic factor as income, demographic factor as ageing population and political factor as fiscal capacity of the government (as denoted as general government expenditure as share of GDP). Meijer et al. (2013) explained that the individual and societal factors influence health care expenditure. Individual factor are age, sex, marital status, living and working condition, co-residence status and socio-economic status etc.; and societal factors are national income, medical technology, wages and prices. Potrafke (2010) empirically examined the growth of public health expenditure has influenced by the political factors such as government ideology, election timing, coalition government, majority government in 18 OECD countries over the 1971-2004. Wang (2009) examined the US state level data, found that income, ageing, degree of urbanisation and the number of hospital beds are four key factors for determining health expenditure. Cantarero and Santiago (2010) examined physical factors such as number of beds in hospital, number of practitioners etc also are influencing the growth of health care expenditure. Sen (2005) examined that both supply side and demand side determinants of government health expenditure, in which physical factor captured as supply side and infant mortality rate denoted as proxy for demand side determinants. Sorenson et al. (2013) found that advances in medical technology and their diffusion across health system as the principal driver for growing expenditures. The changes in medical practices and technology are related to technological innovations, new medical technology for replacing traditional drugs, diagnostics and procedures in low income and middle income countries (Savedoff et al., 2012). Cutler and Mark (2001) says that technological change increases in the medical care cost overtime, it does not necessarily mean that technological change is bad because often bring health improvement and It is seems to bad only if the cost increases more than the benefits. Generally, the literature include 'time trend' as proxy for the advancement in medical technology and its impact on growth of health care expenditure.

In this above backdrop, the study analysed determinants of health financing transition of South-East Asia countries for the period 1995 to 2013. It uses the global health expenditure database obtained from WHO National Health Accounts. It has applied the fixed effect regression

model to test whether the share of OOP expenditure to the total health expenditure is declining overtime and also capture other factors associated with it. It has significant policy implications for public health, equity and growth. The paper is organised as follows; section 1, introduction and review of literature; section 2, brief over view of health financing position in the South-East Asia countries; section 3, empirical methods and data; section 4, empirical results and discussion; and section 5 includes summary and conclusion.

## **2. Brief overview of heath financing transition in the South-East Asia region**

### **2.1 Health in South-East Asia**

South-East Asia is a region characterised by enormous social, economic and political diversity including public health challenges. The major area of concern in the health sector are maternal and child health, infectious diseases, non-communicable diseases, health workforce, and health-care financing reforms. Urbanisation is increasing in this region resulting urban slum rising and these household has lacked in access of the basic necessities such as water, sanitation, housing and sufficient living space etc. Life expectancy in all countries in the region improved as well as decrease in mortality have been contributing to ageing population. Health financing plays a critical role in progressing towards the goal of UHC in South-East Asia region but the region suffers huge financial constraint resulting inadequate public investment in health. In other words, government revenue which mediates the allocation of health expenditure is limited in this region. As a result of which there is high and even improvising OOP expenditure by households (WHO, 2013).

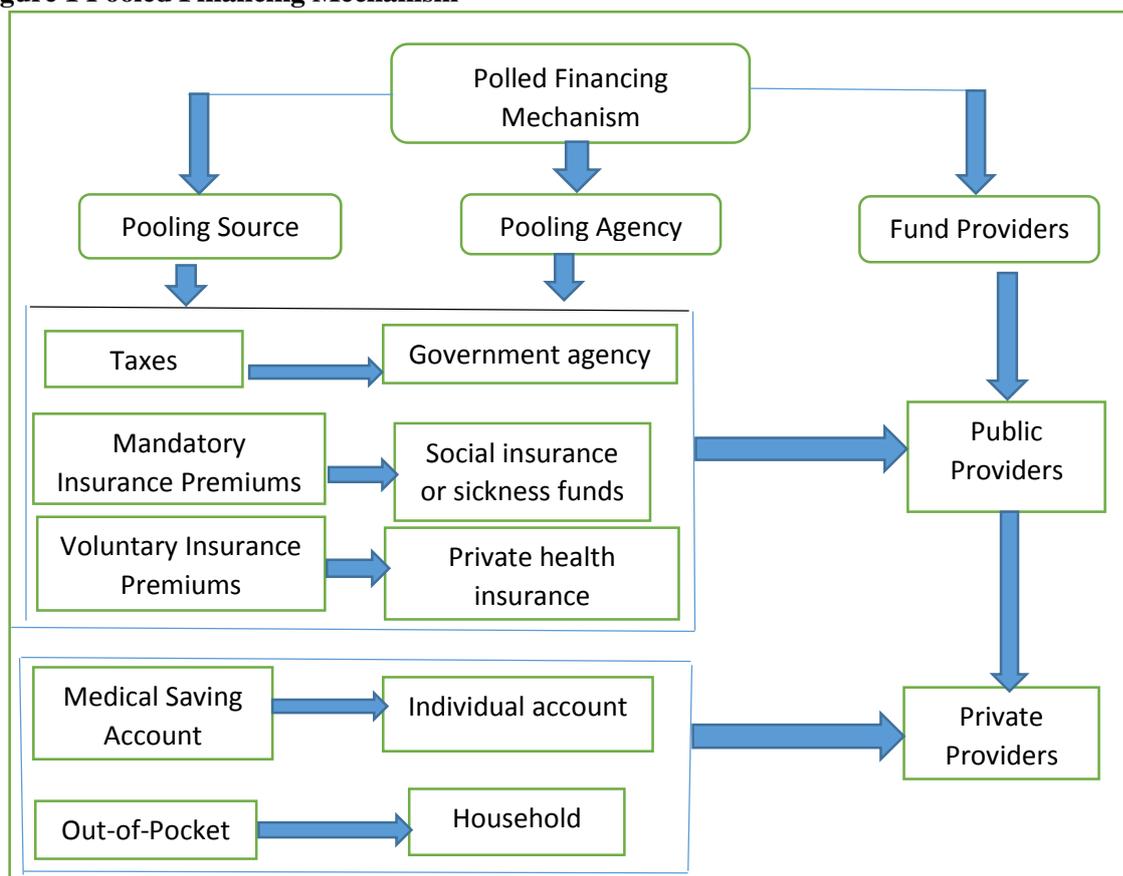
In terms of private financing, household expenditure is playing a dominant role for health care services and the level of catastrophic health expenditure differs between these countries. There are two most formal financing approaches initiated for the coverage and extension of financial risk protection are social health insurance for formal employees and general tax finance for the poor and vulnerable. The countries like Thailand is covered 98 percent of population coverage by financial protection schemes and OOP cost as percent of total health expenditure only 12 percent in 2013 (Viroj et al., 2011). In health care system of South-East Asia has implemented many innovative pro-poor financing schemes such as health card and 30-baht schemes in Thailand; the health fund for the poor in Vietnam; health equity funds in Cambodia and Laos; rich country like Singapore, running a hospital fees subsidy scheme for indigent patients called as Medifund; Social health insurance schemes ‘Jamkesmas’ in Indonesia provides free health care services for target poor; Self-employed women’s association (SEWA) is a health financing based income

generation organisation for women and child health in India (Chongsuvivatwong et al., 2011). WHO (2013) report says the countries like Bhutan, Indonesia, Maldives, Sri Lanka and Thailand have made good progress in placing primary health care oriented health systems strengthening the goal of UHC while other countries of this region are now preparing for success.

## 2.2 Health financing System

The pooled financing is part of public or government financing and OOP health expenditure from domestic household or individual consumption in health. Government financing in health has three functions i.e. to collect revenue, pool risks and purchase services. The revenue collects from both public and private sources and revenue raising capacities increase as country incomes increases. Pooling funds from different sources and provide financing protection to the catastrophic driven individual.

**Figure 1 Pooled Financing Mechanism**



Source: Savedoff et al. 2012

The figure 1 shows that there are various mechanism of pooled financing for mobilizing funds and paying for health care such as taxes, mandatory insurance and voluntary insurance which

are pooled funds across groups of people. OOP expenditures and medical savings accounts are not pooled financing. OOP expenditure is paid by individuals for services received by themselves or members of their household. In Medical saving accounts, individuals keep certain proportions of income for future utilization of health care. These accounts allows individuals to obtain financial protection against future health risk.

### 2.3 Health Financing Transition

The health financing transition shows the relationships between the annual change in the pooled per capita health expenditure and annual change in OOP per capital health expenditure. In this relationships, it has seen three pattern of changing movement towards health financing transition.

Pattern 1: Move rapidly towards the health financing transition (when pooled health expenditure rises and OOP health expenditure declines or the same).

Pattern 2: Move slowly towards the health financing transition (when pooled health expenditure rises faster than the pace at which OOP health expenditure rises).

Pattern 3: Regress through the health financing transition (when OOP health expenditure rises faster than the pace at which pooled health expenditure rises).

**Table 1. Health Transition Phase and Pattern**

Country	1995-2005	2005-2013	1995-2013
	Phase 1	Phase 2	Phase 3
Bangladesh (Lower middle income)	Pattern 3	Pattern 3	Pattern 3
Bhutan (Lower middle income)	Pattern 2	Pattern 3	Pattern 2
India (Lower middle income)	Pattern 3	Pattern 1	Pattern 2
Indonesia (Lower middle income)	Pattern 3	Pattern 1	Pattern 2
Maldives (Upper middle income)	Pattern 3	Pattern 3	Pattern 3
Myanmar (Lower middle income)	Pattern 3	Pattern 1	Pattern 2
Nepal (Low income)	Pattern 1	Pattern 2	Pattern 1
Sri Lanka (Lower middle income)	Pattern 2	Pattern 3	Pattern 2
Thailand (Upper middle income)	Pattern 1	Pattern 1	Pattern 1

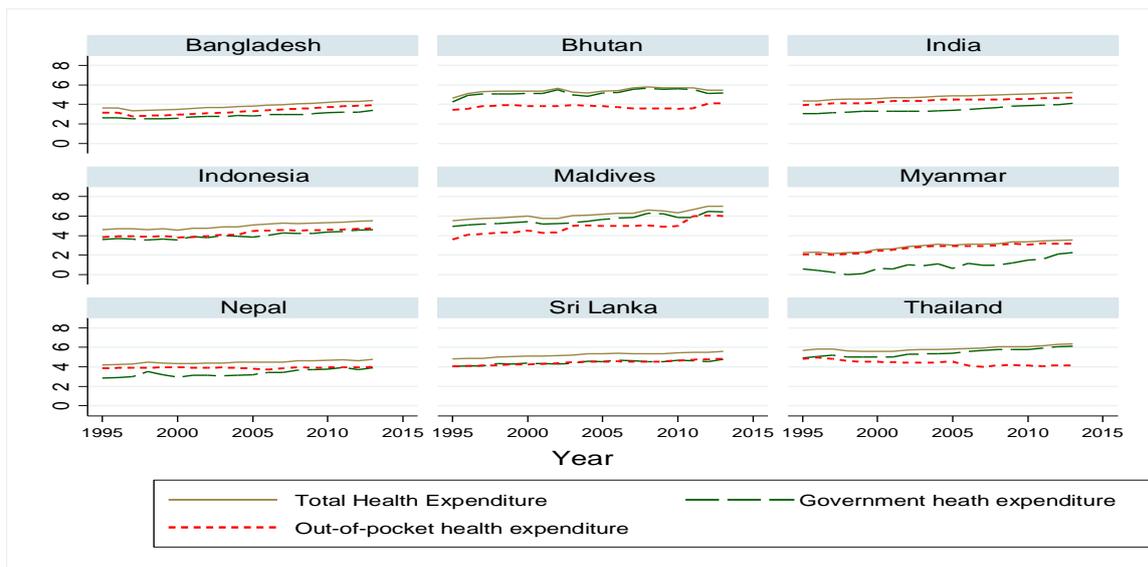
**Source:** As per figure 2 and 3; table 3 and 4

**Note:** Countries has categories according the World Bank income group such as Maldives, Thailand (Upper Middle income category as US\$ 2200-7000); Bhutan, India, Indonesia, Sri Lanka, Bangladesh and Myanmar (Lower Middle income category as US\$ 1000-2200); and Nepal (low income category as <US\$ 1000).

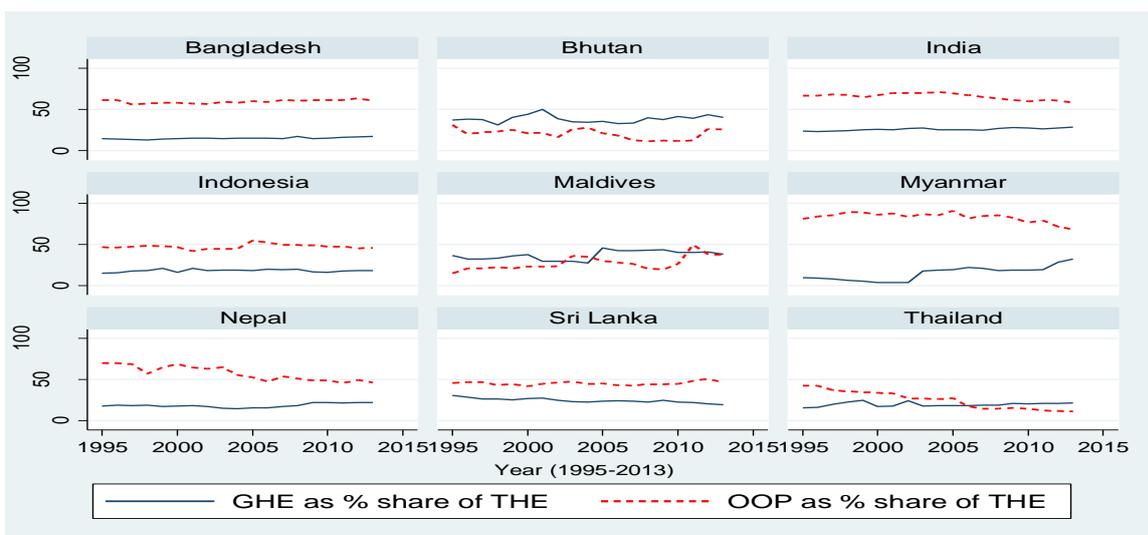
Figure 2 shows that the countries like Thailand, Bhutan, and Maldives moving faster towards health financing transition because per capita total health expenditure increases due to

increase in government health expenditure and per capita OOP expenditure reduces. The countries like India, Bangladesh, Nepal, Sri Lanka and Indonesia are moving slower towards health financing transition. Figure 3 shows that the OOP expenditure as share of total health expenditure reduced at a faster rate than the share of government health expenditure in the countries like Bhutan, Maldives and Thailand. The OOP expenditure has reduced slower rate in India, Nepal, Sri Lanka and Indonesia while OOP expenditure are increasing at a faster rate in Bangladesh and Myanmar.

**Figure 2. Trends of health expenditure per capita in the South-East Asia region over 1995-2013**



**Figure 3. Trends of government and OOP expenditure as share of total health expenditure**



**Table 2. Comparison of growth rate of per capita government and OOP health expenditure**

Country	Government health expenditure (%)			OOP health expenditure (%)		
	1995-2005	2005-2013	1995-2013	1995-2005	2005-2013	1995-2013
	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3
Bangladesh	2.3	7.5	4.6	2.6	7.7	4.9
Bhutan	14.5	2.2	9.1	3.0	2.3	2.7
India	3.7	9.3	6.2	5.9	2.5	4.4
Indonesia	3.8	10.3	6.7	7.7	3.5	5.9
Maldives	7.8	14.9	11.0	19.1	22.4	20.6
Myanmar	5.4	25.8	14.5	9.8	3.3	6.9
Nepal	6.1	10.7	8.1	-1.8	2.2	1.0
Sri Lanka	5.4	3.3	4.5	5.2	3.5	4.4
Thailand	5.6	9.6	7.4	-2.3	-3.5	-2.8

Source: As per table 4

**Table 3. Comparison of government and OOP expenditure as share of total health expenditure**

Country	GHE as % of THE			OOP as % of THE		
	1995	2005	2013	1995	2005	2013
	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3
Bangladesh	36.2	36.1	35.3	61.3	59.9	60.2
		(-0.1)	(-0.8)		(-1.4)	(0.3)
Bhutan	69.2	78.9	73.8	30.8	20.7	25.4
		(9.7)	(-5.1)		(-10.1)	(4.7)
India	27.0	23.1	32.2	66.7	69.4	58.2
		(-3.9)	(9.1)		(2.7)	(-11.2)
Indonesia	35.7	28.5	39.0	46.6	54.6	45.8
		(-7.2)	(10.5)		(8.0)	(-8.8)
Maldives	58.6	59.2	57.6	14.9	30.0	37.5
		(0.6)	(-1.6)		(15.1)	(7.5)
Myanmar	19.0	9.0	27.2	81.0	90.6	68.2
		(-10)	(18.2)		(9.6)	(-22.4)
Nepal	26.5	27.7	43.3	69.6	52.8	46.2
		(1.2)	(15.6)		(-16.8)	(-6.6)
Sri Lanka	46.8	45.1	43.9	45.7	45.3	46.5
		(-1.7)	(-1.2)		(-0.4)	(1.2)
Thailand	47.0	64.4	80.1	42.6	27.2	11.3
		(17.4)	(15.7)		(-15.4)	(-15.9)

Note: In parenthesis denotes the difference in previous year.

Source: As per table 4

Table 2 represents the annual average growth of per capita government health expenditure and per capita OOP expenditure over the period 1995-2013. The result shows that the growth of government health expenditure is increased at faster rate than the OOP in countries like Bhutan, Myanmar, India, Sri Lanka and Nepal. So, the countries moving faster towards health financing transition. The government health expenditure is reduced than the OOP in countries like

Bangladesh, Maldives. In Thailand, the government health expenditure is increased at faster rate and OOP expenditure reduced at faster rate even negative. Table 3 compares government and OOP expenditure as share of total health expenditure in particular time period. The countries like Bangladesh, India, and Indonesia having higher OOP expenditure across all the time periods. The countries like Thailand, Bhutan, and Myanmar are having higher government health expenditure in all time periods. But compare the two time point 1995 and 2013, it shows that the share of OOP expenditure has been reduced in all countries except Maldives and Sri Lanka.

### **3. Empirical Method and Data**

Nine countries have chosen in South-East Asia regions out of eleven countries. The countries like Democratic People's Republic of Korea and Timor-Leste are not included due to unavailability of data. The period of the study covers from 1995 to 2013. The data source is obtained from national health account in the online data base of WHO. World health organisation has classified member states into six regions such as African Region, Region of the Americas, South-East Asia region, European region, Eastern Mediterranean region, and Western Pacific region. This study has taken South-East Asia region on the basis of following criteria.

First, South-East Asia region was the first of the six WHO region which is established in 1948. It captures not only to a quarter of the world's population but also to a daunting range of both communicable and non-communicable diseases. The health status of the world is significantly influenced by the health status of the South-East Asia region (WHO, 1999). Second, the speciality of this region is that there is huge diversity in terms of geography, linguistic and political structure but the countries face common health challenges. The countries like Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka face triple burden of persisting infectious diseases, incomplete demographic transition, HIV and AIDS, massive unplanned urbanisation. Again, health system is very weak such as limited national health insurance schemes, large role of the private sector and high OOP payments (Sadana et al., 2004). Third, it has gained substantial improvement in health related millennium development goals from 1990 to 2013 such as reduction of under-five mortality rate and maternal mortality ratio, reduction in incident of malaria and HIV; and limited progress in the percentage of antenatal coverage (World health statistics, 2015). Fourth, as the best of my knowledge there is no study undertaken in the context of South-East Asia region to analysis the determinants of health expenditure composition. Fifth, uniformity has maintained in the selection of sample and collection of data.

### 3.1 Description of variables

Health expenditure has categorized as OOP payments and prepayments. Out-of-pocket payments refer to the payments made by the patients at the point of receiving services. Prepayments are contributions made through general taxation, payroll tax, compulsory insurance and voluntary insurance. In this study, it focused on ‘total health expenditure (public prepayments and private prepayments)<sup>5</sup>, ‘government health expenditure (public prepayments)’ and out of pocket expenditure’. In addition to health expenditure and its components, there are many factor affects the growth of health expenditure such as GDP per capita, fiscal capacity (ratio government expenditure and income), and demographic structure (share of elderly 65 and above) etc.

**Table 4. Descriptive Statistics in the panel dataset**

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>
<i><b>Dependent Variable</b></i>		
Total health expenditure per capita (THEpc)	194.3977	180.2821
General government health expenditure per capita (GHEpc)	107.8655	123.9408
Out-of-pocket health expenditure per capita (OOPHEpc)	68.72515	57.12021
OOP as percentage of THE	47.79123	20.71651
<i><b>Independent Variable</b></i>		
Percentage of Government expenditure to GDP (Fiscal capacity)	23.42105	9.240087
Percentage of Elderly population age 65 and above to total population	5.077778	1.341894
Gross domestic product per capita (GDPpc)	4393.971	3004.198

Notes: Balanced panel over 1995-2013 for 9 countries and 171 observation. GDP per capita and health expenditure variables are all in million constant 2005, PPP\$.

Source: Who Online Data Base of the National Health Accounts

#### 3.1.1 Income and health care expenditure

The income elasticity of health expenditure can be defined as the percentage change in health expenditures in response to a given percentage change in income. Income elasticity below one denotes health care expenditure as an income inelastic and therefore a "necessary" good. On the other hand, elasticity estimates greater than one denote health care as an income elastic and therefore a “luxury” good (Di Matteo, 2003). Generally, GDP per capita has been taking as proxy

<sup>5</sup> Total health expenditure (THE) included both public and private expenditure on health both domestic and external agents. Government health expenditure from domestic sources (GHE) included government expenditure on health from general government revenue and payroll taxes. It excluded External funds channelled through governments. OOP expenditure (OOP) included payments for doctor’s consultation fees, medication, laboratory tests and hospital bills. It can be in the form of user charges in general or cost sharing under insurance policies (Xu and Saksena, 2011).

for income in the literature related to the determinant of the health expenditure. Baltagi and Francesco (2010) have examined that income is the most important factor explains the growth of health care expenditure. Other study such as Farag et al. (2012); Schiber and Maeda (1999); Musgrove et al. (2002) have categorised countries in difference income panels, found that the elasticity of income for health expenditure is lower for lower-middle income countries as compared to high income countries where the share of government expenditure rises and share OOP expenditure decreases with respect to income.

### **3.1.2 Fiscal space and health care expenditure**

Total government expenditure as a percentage share of GDP denoted as fiscal space for an economy. So, the economic growth as a source of expanding fiscal space. Low income countries suffered from multiple and complex health financing problems to mitigate high disease burden. The government fiscal capacity is crucial to ensure better access to essential health services and financial protection (Durairaj and Evans, 2010). Government fiscal capacity is positively impact to the government health expenditure, with a highly significant elasticity of 1.45 (Fan and Savedoff, 2014).

### **3.1.3 Ageing and health care expenditure**

The increasing share of older people in the population called ageing and its effect on health expenditure growth is the subject of scholarly debate among the health researchers. Luca et al. (2006); Cantarero and Santiago (2010); and Khan and Mahumud (2015) found that the large share of old people (age above 75) tends to increase health costs. The argument is that an older population tends to cause higher health expenditure because of the increased incidence of illness as well as proximity to the time of death of the elderly. Ageing of population have not contributed to growth of health expenditure (Barros, 1998; Sen, 2005; Fan and Savedoff, 2014). In the above mention studies have taken total health expenditure per capita as the dependent variable.

### **3.1.4 Time trend and health care expenditure**

Luca et al. (2006); Cantarero and Santiago (2010); Farag et al. (2013) have taken time variable to capture the cost difference over time due to changes in medical technology or other factor that may affect the growth of health expenditure at the national level.

### 3.2 Econometric Method of Estimation

This study has applied fixed effect model to observe the pattern of expenditure transition and its composition in the South-East Asia regions on the basis of WHO classified regions.

Here the regression equation are:

$$y_{it} = \alpha + \beta_1 x_{1it} + \beta_2 x_{2it} + \beta_3 x_{3it} + a_i + \mu_{it} \dots\dots\dots (1)$$

$$y_{it} = \alpha + \beta_1 x_{1it} + \beta_2 x_{2it} + \beta_3 x_{3it} + \gamma \cdot t + a_i + \mu_{it} \dots\dots\dots (2)$$

The equation (1) shows, the one-way fixed effect model without time dummy and equation (2) shows the two-way fixed effect model with time dummy along with other explanatory variables. The one-way fixed effect model which controls for time-invariant country specific unobservable effects. The two-way fixed effect model is very relevant because there are time trends and year specific shocks such as war, epidemics, drought which might be disturbing with this relationship (Farag et al., 2013). For country and year subscript are ‘i-th county’, ‘t’ respectively. In the both equation,  $a_i$  represents the effects of those variables particular to the i-th country which are invariant overtime. It assume that the country effects,  $a_i$ , are treated as fixed rather than random. In other words, it allows for heterogeneity or individuality among the select countries but intercept does not vary overtime, that is time invariant. The model is called an unobserved effects model or a fixed effect model.  $\mu_{it}$  as an error term, often called the idiosyncratic error or time varying error because it represents unobserved factors that change over time and affect  $y_{it}$ . In equation 2, we added  $\gamma \cdot t$ , the coefficient  $\gamma$  will measure an annual rate of change over time in the dependent variables. This time trend measures any consistent annual changes that are not explained by other included explanatory variables. In this study, some unobserved factors such as changing technology and medical practices, cost pressures and public policies may contributing to great health expenditure. It can be tackled through the equation 2, where it added the time as one explanatory variables. In using fixed effects, the goal is to eliminate  $a_i$  because we believes that it is correlated with one or more of the  $x_{1ij}$ . But suppose, we found that  $a_i$  is uncorrelated or independent with any explanatory variables in all time periods, the equation (1) becomes a random effects model. Comparing the FE and RE estimates that whether there is correlation between the  $a_i$  and the  $x_{1ij}$  also assume that the idiosyncratic errors and explanatory variables are uncorrelated across all time periods, so it will be verified through the Hausman test (Wooldridge, 2000). In this study, sample of countries are not selected through randomly rather systematically purposefully selected the South-East Asia countries according to the WHO regions. So here it has applied only fixed effect model and no need to verify through Hausman test.

## 4. Empirical results and discussion

### 4.1 Total health expenditure per capita

Table 5 presents regressions in which the dependent variable is the total health expenditure per capita. The column 4 represents one-way fixed effect model and column 5 represents two-way fixed effect model. Per capita income, fiscal capacity and ageing population are positive and statistical significant with total health expenditure but income is highly significant and elasticity is 0.908 unit (column 4). In two-way fixed effect model, income and fiscal capacity are having positive and statistical significant with health expenditure but ageing is showing negative and insignificant (column 5).

**Table 5. Fixed effect regression result for total health expenditure per capita (natural log)**

Variables	(1)	(2)	(3)	(4)	(5)
Ln(GDPpc)	1.037*** (0.0393)	0.659*** (0.0993)	0.548*** (0.107)	0.908*** (0.0610)	0.484*** (0.114)
Fiscal capacity			0.00788** (0.00307)	0.00558* (0.00302)	0.00770** (0.00305)
Ageing population				0.0567** (0.0242)	-0.0546 (0.0346)
Constant	-3.557*** (0.319)	-0.707 (0.770)	-0.0199 (0.802)	-2.933*** (0.388)	0.713 (0.923)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects (Dummy)	No	Yes	Yes	No	Yes
Observations	171	171	171	171	171
R-squared (Within)	0.812	0.837	0.844	0.821	0.847
Number of country	9	9	9	9	9

**Note:** Column (1) and (4) are one-way fixed effect model and column (2), (3) and (5) are two-way fixed effect model. Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

### 4.2 Government health expenditure per capita

Table 6 presents regressions in which the dependent variable is the government health expenditure per capita. In one-way fixed effect model, per capita income, fiscal capacity and ageing population are positive and highly statistical significant with government health expenditure. In supply side, income and revenue mobilization of the government are facilitating the growth of per capita government health expenditure. In demand side, per capita government health expenditure increase due to increase in ageing population. In other words, one percent increase in the share of elderly to the total population, the per capita government health expenditure

increases at 0.16 percent (column 4). But in two-way fixed effect model, ageing is not statistical significant with government health expenditure (column 5).

**Table 6. Fixed effect regression result for government health expenditure per capita (natural log)**

Variables	(1)	(2)	(3)	(4)	(5)
Ln(GDPpc)	1.185*** (0.0564)	0.570*** (0.139)	0.285** (0.141)	0.794*** (0.0799)	0.354** (0.150)
Fiscal capacity			0.0202*** (0.00405)	0.0181*** (0.00396)	0.0204*** (0.00405)
Ageing population				0.167*** (0.0317)	0.0592 (0.0459)
Constant	-5.690*** (0.457)	-0.984 (1.078)	0.774 (1.059)	-3.793*** (0.509)	-0.0205 (1.223)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects (Dummy)	No	Yes	Yes	No	Yes
Observations	171	171	171	171	171
R-squared (Within)	0.733	0.779	0.812	0.787	0.814
Number of country	9	9	9	9	9

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### 4.3 Out-of-pocket health expenditure per capita

**Table 7 Fixed effect regression result for OOP health expenditure per capita (natural log)**

Variables	(1)	(2)	(3)	(4)	(5)
Ln(GDPpc)	0.872*** (0.0724)	1.063*** (0.191)	1.024*** (0.209)	1.177*** (0.109)	0.634*** (0.205)
Fiscal capacity			0.00275 (0.00603)	-0.00134 (0.00538)	0.00167 (0.00552)
Ageing population				-0.187*** (0.0432)	-0.333*** (0.0626)
Constant	-3.079*** (0.588)	-4.606*** (1.481)	-4.366*** (1.575)	-4.568*** (0.692)	0.105 (1.670)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects (Dummy)	No	Yes	Yes	No	Yes
Observations	171	171	171	171	171
R-squared (Within)	0.474	0.504	0.504	0.530	0.587
Number of country	9	9	9	9	9

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 7 presents regressions in which the dependent variable is the out-of-pocket health expenditure per capita. In both one-way and two-way fixed effect model, only per capita income is positive and statistical Significant to per capita OOP expenditure. There is negative and

statistical significant relationship of ageing and OOP per capita expenditure. Fiscal capacity have no impact on the growth of per capita OOP expenditure. The income elasticity of per capita OOP expenditure is more than one and coefficient is 1.177 unit in column 4 and income elasticity is less (0.634 unit) in two-way fixed effect in column 5.

#### 4.4 Out-of-pocket expenditure as share of total health expenditure

Table 8 presents regressions in which the dependent variable is the OOP health expenditure as share of total health expenditure. Fiscal capacity and ageing are negative and statistical significant relationship with OOP expenditure as share of total health expenditure. It shows that OOP expenditure as share of total health expenditure reduces with increase in government revenue mobilization capacity and ageing population. Income is positive and statistical significant relation with OOP expenditure as share of total health expenditure in one-way fixed effect model and showing insignificant relation in two-way fixed effect model (column 4 and 5).

**Table 8 Fixed effect regression result for OOP as % of Total health expenditure**

Variables	(1)	(2)	(3)	(4)	(5)
Ln(GDPpc)	-6.184*** (1.757)	8.585* (4.433)	13.02*** (4.782)	5.390** (2.517)	6.347 (4.892)
Fiscal capacity			-0.314** (0.138)	-0.333*** (0.125)	-0.333** (0.132)
Ageing population				-5.849*** (0.999)	-5.685*** (1.491)
Constant	97.92*** (14.25)	-15.47 (34.40)	-42.87 (35.96)	41.59** (16.02)	33.49 (39.77)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects (Dummy)	No	Yes	Yes	No	Yes
Observations	171	171	171	171	171
R-squared (Within)	0.071	0.197	0.225	0.245	0.298
Number of country	9	9	9	9	9

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

#### 5. Summary and conclusion

The study starts with the aim to observe the health financing transition pattern among the South-East Asia countries over the period 1995 to 2013. From the theoretical analysis of health financing transition, we found two types of health expenditure trends exhibits in a country. First, per capita government expenditure increases; and second, the share of OOP expenditure to the total health expenditure reduces. One of the objective is to observe the common pattern such as,

the speed with which countries is moving towards health financing transition over the period. The result shows that Thailand is moving rapidly through the health financing transition in which government health expenditure increases while OOP expenditure decline rapidly as showing negative. In low income country like Nepal is moving towards the health financing transition in the overall period. The lower middle income countries such as Bhutan, India, Indonesia, Myanmar and Sri Lanka are moving towards the health financing transition at the slower pace. But the regressive nature of health financing transition have seen in Bangladesh (lower middle income country) and Maldives (Upper middle income country) while OOP health expenditure increases at a faster pace than the pace at which government health expenditure increases. So, it may say that level of income of a country is a necessary to influence the growth of the government expenditure but it is not a sufficient factors for rise in health expenditure in the South-East Asia region. There are other factors instead of per capita income affecting the health expenditure growth toward the health financing transition. It found that all South-East Asia countries except Thailand, the main source of health care expenditure is OOP payment by the household and its share to the total health expenditure is still high as compared to other developing countries.

The empirical analysis of health financing transition is undertaken by examining the factors which determine the growth of health care expenditure, applying fixed effect regression model. It has selected income, ageing population and fiscal capacity of the government as the independent variables and health expenditure (total, government and out-of-pocket) as dependent variable. In regression specification used one-way fixed effect (without year trend) and two-way fixed effect (with year trend) model for robustness of the result. The result shows that per capita income is the major factor that impacted health expenditure growth in government as well as OOP expenditure in both two model specification. But the elasticity of income varies among the composition of health expenditure. The income elasticity of health expenditure is less than one in the case government expenditure while it is more than one in the case of OOP expenditure. So, health treats as necessity while health care services provided by the government agents and treats as luxury, when health expenditure born by the private agents. The similar results regarding income elasticity of health expenditure as those of found Musgrove et al. (2002), Gaag and Stimac (2008), Schiber and Maeda (1999), Baltagi and Francesco (2010), Farag et al. (2012) and Okunade (2005) etc. The per capita government health expenditure increases also due to increase fiscal capacity of the government to mobilize revenue as well as increase the elderly population. The relation of fiscal capacity to total health expenditure is positive and statistical significant while the coefficient is 0.007 unit. The increase in total health expenditure has derived from high level of government

health expenditure which mediated through fiscal capacity. Because the elasticity of government health expenditure is 0.2 percent with respect to fiscal capacity. Ageing population has also impacted positively to government health expenditure resulting rise in total health expenditure. There is no relationship between fiscal capacity and per capita OOP expenditure because fiscal capacity is the part of government provider perspective and nothing with private agents. But fiscal capacity is highly significant and negative relationship with the share of OOP expenditure. It shows that as government spending capacity increases at one percent, the share of OOP expenditure to the total health expenditure reduces at 0.33 percent. Ageing is highly significant and negative relationship to per capita OOP and OOP share as per total health expenditure. It may show that as people become older, they spend less in health expenditure from their out of pocket resulting reduce in OOP expenditure. But the result is little bit confused because the literature shows the mixed evidence regarding the association between ageing and health expenditure.

Comparison between one-way and two-way fixed effect regression model, it has found that growth of health expenditure and movement towards health financing transition influence by the country specific individual factor as well as policy changes over the time period. The two-way fixed effect model shows that, there has been some policy changes in the health sector among the countries over the time period. These policy changes have been made by the respective government agency in terms of advancement of medical technology, changes in the source of government finance and prioritization of health expenditure to achieve UHC. It found that the pattern 1 of health financing transition (pooled financing increases at a faster rate and OOP expenditure reduces) is achieved through the generation of fiscal capacity. As a result of which the government will be able to mediate the resources in the old age care initiatives programmes and reduce the OOP expenditure burden. Our result also shows that the per capita OOP expenditure is inverse with increase in ageing population. The health financing transition is very important input for the policy maker regarding the expenditure pattern of health and behaviour in the low and middle income countries, for which it will be easy to adopt new public policy and strengthening the management of the health system as a whole for the consideration of equity and efficiency. In the limitation, it ignores or does not incorporate other determinants of pooled financing and OOP expenditure in the context of political, economic and geographical scenarios. Since the major objective is to examine the short run determinants of health financing transition, the study did not incorporate any long run empirical analysis of the same. In future, this study is able to explore other aspects of health transition in terms of coverage and outcome, equity etc. It can be extended to other WHO regions and World Bank income group classifications.

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