

Health expenditure, universal health coverage and mortality of mother and child in South East Asia

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ABSTRACT

Excess maternal and child mortality is the outcome of poor service quality. Though achieving universal health coverage including financial risk protection is a specific SDG health target, financing the increasing expenditure for quality health care is challenging for developing countries. Due to varying health service promoting strategy and economic condition, public financing and health care service across countries in South East Asia region are not at same level. This study explored variations in levels and trends of health expenditure and universal service coverage across South East Asian countries in connection with maternal and child mortality. Special attention had been paid on variability in health financing distribution. Secondary data were used in this study collected from Global Health Observatory data repository of WHO. Summary statistics, correlation and regression outputs were presented in various time series and cross-sectional plots. It is evident that health expenditure was increasing in higher rate in upper middle income countries than the lower middle income and low income countries. Increase in the government health financing was found to have significant impact on the reduction of maternal and child mortality. However, government financing were mostly interchanged with out-of-pocket spending in some lower middle income countries, where the maternal and child mortality was in increased proportion. In contrast, low out-of-pocket spending and low maternal and child mortality reflect better universal health care service in upper middle income countries.

Keywords: *Health expenditure, Health financing, Out-of-pocket spending, Universal health service coverage, Maternal and child mortality*

INTRODUCTION

Universal health coverage (UHC), defined as access to the complete range of the foremost appropriate health care and technology for all people at least possible price or with social health protection, is now a worldwide goal for countries to achieve (Gonani and Muula, 2015). Taking life expectancy, infant mortality, and under-5 mortality as health indicators, Hsieh et al. (2015) showed that higher coverage of public health services was significantly associated with improved population health. Keeping people healthy, quality health delivery systems with universal access enhance economic progress (Dieleman et al., 2017) and thereby fight against poverty. They also contribute to social harmony by providing assurance to the population that services are available within the event of illness (Evans et al., 2012). Aboubacar (2017) argued that there exist a positive and a statistically significant relationship between health expenditure and economic growth.

Kruk et al. (2018) reported that in lower middle income countries, an estimate of 8.6 million excess deaths occurred in 2016 due to receipt of poor-quality care (5.0 million) and non-utilization of health care (3.6 million). Among other, neonatal mortality is one of the outcomes of poor quality of health care. Thus, universal health coverage accompanied by investments into high-quality health systems could avert a number of deaths each year. To achieve an improved level and distribution of health, UHC became a specific SDG health target (3.8) to “Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all (World Health Organization, 2020).

Number of researches suggested that public financing is the key to achieving UHC (Yates, 2015; Rottingen et al., 2014; Tangcharoensathien, Mills and Palu, 2015). Mills (2014) argued that due to lack of financial protection for the costs of health care, approximately 100 million people are pushed below the poverty line each year by payments for health care, and many more could not seek treatment because of financial inability. Behera and Dash (2018) found the income elasticity of government health expenditure less than one, referring the health expenditure is necessary for the public health providers. In a recent study, Behera and Dash (2020) found a strong positive association between health expenditure and universal health coverage index.

However, the main challenge among MDG off-track countries is the failure to provide and sustain financial access to quality services by communities, especially the poor. In their joint report with WHO, Barroy et al. (2017) noted that despite its known importance for UHC, the

role of public funds from domestic sources to finance health stagnated between 2000 and 2014 in low-and middle-income countries (LMICs). Dieleman et al. (2018) predicted that per capita health spending would be increase fastest in upper-middle-income countries, at 4.2% per year, followed by lower-middle-income countries (4.0%) and low-income countries (2.2%). In an earlier study, Dieleman et al. (2017) noted that health spending remains disparate, with low-income (LI) and lower-middle-income (LMI) countries increasing spending in absolute terms the least, and relying heavily on out-of-pocket spending (OOPS) and development assistance. Moreover, tremendous variation shows that neither time nor economic development guarantee adequate prepaid health resources, which are vital for the pursuit of universal health coverage. Schweitzer (2012) also found that OOPS is much higher in LICs and MICs than in rich countries and are highly inequitable (World Bank Data, 2012). WHO advised that OOPS over 15% of the total health expenditure leads to impoverishment (WHO, 2011). The more that people are covered by some kind of financial risk sharing mechanism, the lower is the share of total spending out-of-pocket.

Eleven countries in the WHO South East Asia (SEA) region, home to quarter of world population, vary both in economy and their strategies for strengthening public health facilities. Between 1990 and 2015 the region reduced maternal mortality by 69%; under-five mortality decreased by 64% and neonatal mortality lowered by 54%; however, these achievements are unevenly distributed among and within the countries in the region (World Health Organization, 2016). All countries in this region are committed to achieve UHC as a part of sustainable development goals. World Health Organization regularly update the universal health coverage (UHC) service coverage index (SCI) which is formed from 16 indices in four areas: reproductive, maternal, newborn, and child health; infectious diseases; non-communicable diseases; and health service capacity, access and health security. The regional average for the UHC essential health services index increased to 64% in 2018 from 44% in 2010. However, still more than 800 million people within the region are predicted to not have sufficient access to essential health services (World Health Organization, 2019). Maternal and child mortality, universal health coverage and health expenditure in different countries in this region are major discussant topic of many of research articles (Ahmed and Alorbi, 2018; Rahman et al., 2018; Agustina, 2019; Pisani et al., 2017; Suzana et al., 2018; Han et al., 2018; Ranabhat et al., 2019; Kumar, 2019; Sumriddetchkajorn et al., 2019; Tangcharoensathien et al., 2019; Guinness et al., 2018). However, integrated studies on

universal health coverage coupled with health expenditure relating maternal and child mortality of South East Asia region are hardly available.

This study aimed to explore and compare levels and trends of health expenditure, universal health service coverage and maternal and child mortality in WHO South East Asian countries. In addition, relationships of maternal and child mortality with universal health service coverage and government health financing were assessed.

DATA AND METHOD

Time Series and Panel Data used in this study was collected from Global Health Observatory (GHO) data repository of WHO (<https://apps.who.int/gho/data/node.imr>). The WHO South East Asia (SEA) region consists of 11 countries: Bangladesh, Bhutan, Democratic People's Republic of Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand and Timor-Leste. Due to data unavailability Democratic People's Republic of Korea was excluded from the study.

As an explanatory study, this paper used summary statistics and graphical representations. Data and summary statistics have been visualized using different times of plots like coplot, bar diagram and scatterplot. To assess interrelationship and dependency between variable, correlation and regression techniques are applied.

RESULTS AND DISCUSSION

Trend and Source of Health Expenditure in WHO SEA Region

Fig. 1 represents the trend in current health expenditure (CHE) per capita USD in SEA region. It shows how health expenditure varied over time across South East Asian countries. Health expenditure increased over time in all the countries with varying rates. Per capita health expenditure was eventually higher in UMI countries than LMI and LI countries. Both the level and the rate of increase was unparallally higher in Maldives. It reached around USD 1000 in 2017 from around USD 200 USD in 2000. Over the period, CHE was the lowest in Bangladesh and the rate of increasing was slower than other countries in the region.

Fig. 2 displays the trend in domestic general government health expenditure (GGHE-D) as percentage of domestic general government expenditure (GGE-D) in SEA region. It shows the contribution of government in health sector in terms of total domestic budget. Proportion of GGHE-D was in general higher in UMI countries than in LMI and LI countries. Over the period the proportion of government health budget did not change much in all the countries

except Maldives. With a sharp increasing rate, proportion of GGHE-D in Maldives reached at 22% in 2017 from 8% in 2000. Though very slowly increasing, after Maldives, the proportion of government health budget in Thailand was continuously higher than other countries. As compared among LMI countries in 2017, proportion of GGHE-D was the highest in Indonesia. A slowly decreasing trend was noticed in Bangladesh with proportion of GGHE-D 3% in 2017 which was the lowest within the region.

The entire health expenditure are usually financed from four sources: domestic general government health expenditure (GGHE-D), out-of-pocket spending (OOPS), external fund (Ext) and other private fund (Other). Health sector of some of the countries in SEA region are greatly supported by some external funds. In 2017, external funds cover 22% of health expenditure of Timor-Leste. In the same year, proportion of external funds in Nepal, Bhutan, Myanmar and Bangladesh was 15%, 9%, 9% and 7% respectively. In other countries, share of external funds did not exceed one percent of the CHE. Private health financing also shared a good percentage of health expenditure in some of the countries. In 2017, percentage of private financing in Indonesia, Thailand, India, Maldives, Sri Lanka and Nepal was respectively 16%, 12%, 10%, 8%, 6% and 5% (GHO data repository of WHO (<https://apps.who.int/gho/data/node.imr>)).

Trends in GGHE-D and OOPS as percentage of the CHE in SEA region are displayed in Fig. 3 and Fig. 4, which show how government and public share of health expenditure vary over the period 2000 to 2017. Proportion of GGHE-D within CHE in Bangladesh decreased to only 17% in 2017 from 29% in 2000. In consequence, OOPS gradually increased to increased to 74% in 2017 from 61% in 2000. Unlike Bangladesh, proportion GGHE-D in Bhutan was higher than that of OOPS. Though GGHE-D decreased to 75% in 2017 from 80% in 2000, OOPS did not change much; the OOPS in 2000 and in 2017 was 12% and 13% respectively. Like Bangladesh proportion of OOPS in India was in general higher than that of GGHE-D. However, a slowly decreasing trend in OOPS was observed over the period; from 72% in 2000 it reached 62% in 2017. The GGHE-D in 2000 and 2017 was respectively 21% and 27%. Proportion OOPS was also higher than that of GGHE-D in Indonesia until 2015. In recent years, OOPS declined in exchange with GGHE-D. Proportion of OOPS and GGHE-D in Indonesia in 2000 was respectively 44% and 29% and those became 35% and 48% in 2017. OOPS in Maldives sharply decreased over time with increasing GGHE-D. From 33% in 2000 GGHE-D increased to 71% in 2017 while from 63% in 2000 OOPS reduced to 21% in 2017. Level of OOPS in Myanmar was the highest among the countries in SEA region.

From 86% in 2000 it slowly declined to 76% in 2017. At the same time, GGHE-D was comparatively lower in Myanmar than other countries; GGHE-D in 2000 and 2017 was 13% and 15% respectively. As mentioned earlier, health expenditure of Nepal was greatly financed by external sources. GGHE-D in Nepal increased to 22% in 2017 from 16% in 2000, and OOPS reached to 58% in 2017 from 56% in 2000. OOPS in Sri Lanka slowly increased in exchange with GGHE-D. In 2000, respective OOPS and GGHE-D in Sri Lanka were 40% and 54% and in 2017 those became 50% and 43%. Unlike other countries, proportion of GGHE-D in Thailand increased rapidly over time and remained much higher than the percentage of OOPS. From 55% GGHE-D sharply increased to 76% in 2017, and in consequence, OOPS decreased to 11% in 2017 from 34% in 2000. A major portion of health expenditure of Timor-Leste was financed by external funding. At the same time, GGHE-D also increased rapidly over time; from 46% in 2000, it increased to 66% in 2017. On the other hand, OOPS decreased from 41% in 2000 to only 8% in 2017. As we observe, in most of the countries, levels of GGHE-D and OOPS were interchanged with each other. In Thailand, Timor-Leste, Maldives, Indonesia, Myanmar and India GGHE-D increased over time with decreasing OOPS. On the other hand, in Bangladesh, Sri Lanka and Bhutan GGHE-D decreased over time with increasing OOPS. It is, therefore, can be said that where the government financing is higher, financial hardship of public for health care is lower.

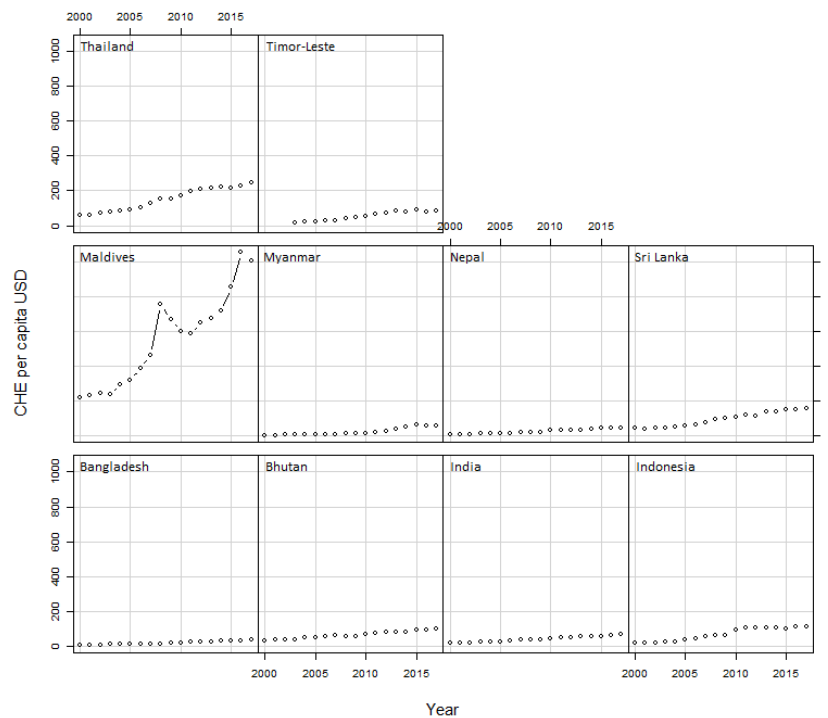


Fig. 1: Trend in current health expenditure (CHE) per capita USD across countries in South East Asia Region

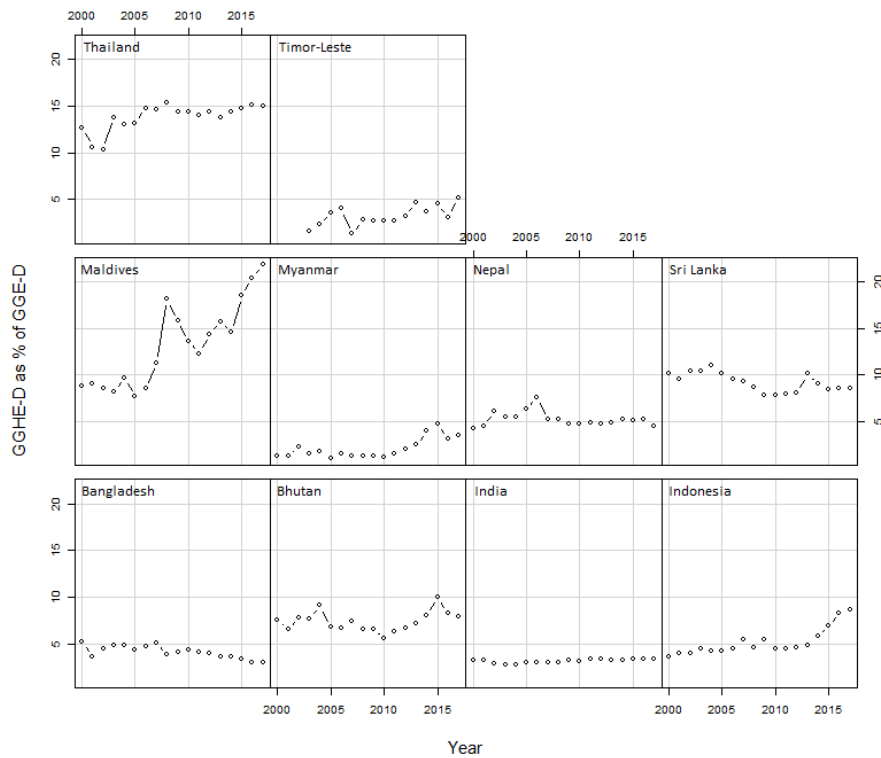


Fig. 2: Trend in domestic general health expenditure (GGHE-D) as percentage of domestic general expenditure (GGE-D) across countries in South East Asia Region.

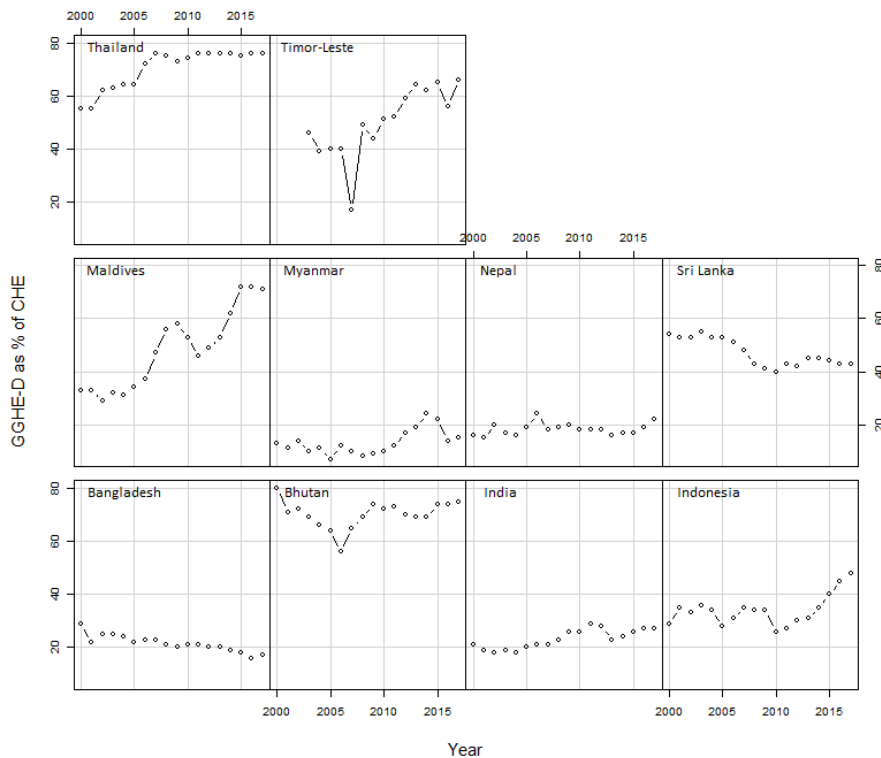


Fig. 3: Trend in domestic general health expenditure (GGHE-D) as percentage of current health expenditure (CHE) across countries in SEA Region.

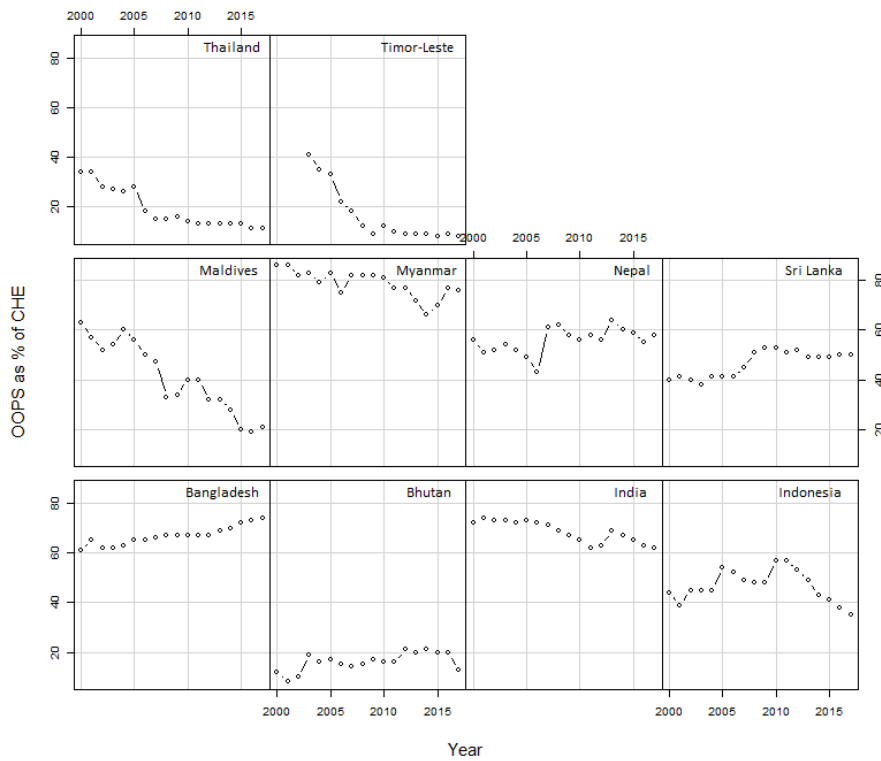


Fig. 4: Trend in out of pocket spending (OOPS) as percentage of current health expenditure (CHE) across countries in SEA Region.

UHC index of service coverage (SCI) in SEA Region

The universal health coverage (UHC) service coverage index (SCI) and its component: reproductive, maternal, newborn and child health of countries in SEA region for the years 2015 and 2017 are displayed in Fig. 5A and 5B respectively.

In two-year period (2015-2017), the UHC index of service coverage showed marginal progress in all countries within the region except Nepal (see Fig. 5A). The highest progress in UHC SCI was noticed in Thailand; from 75 in 2015 it increased to 80 in 2017. The index of Nepal degraded to 48 from 51; however, Nepal gained visible progress in UHC SCI component: reproductive, maternal, newborn and child health; from 69 in 2015 it increased to 74 in 2017 (see Fig. 5B). A number of countries including Thailand, Sri Lanka, Indonesia, Bhutan and Bangladesh did not get any progress in UHC SCI component: reproductive, maternal, newborn and child health.

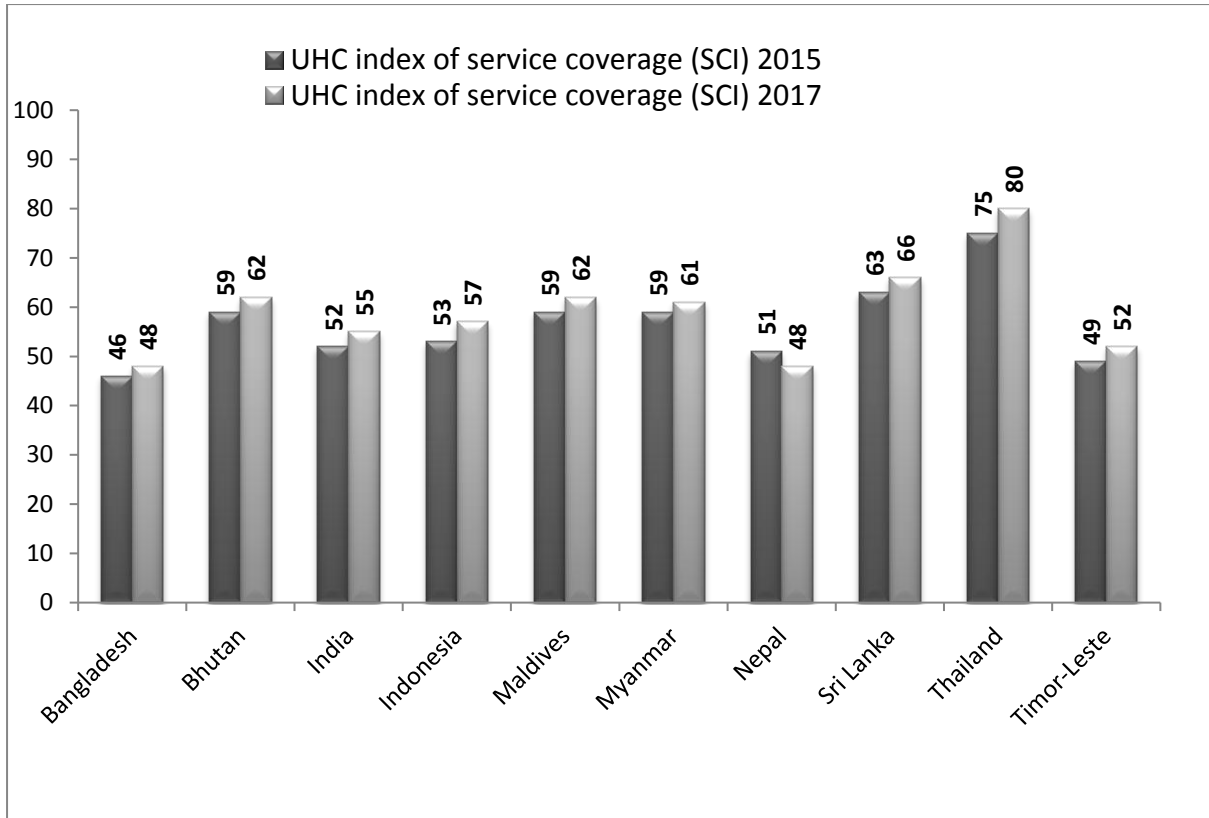


Fig. 5A: UHC service coverage index (SCI) in South East Asian countries.

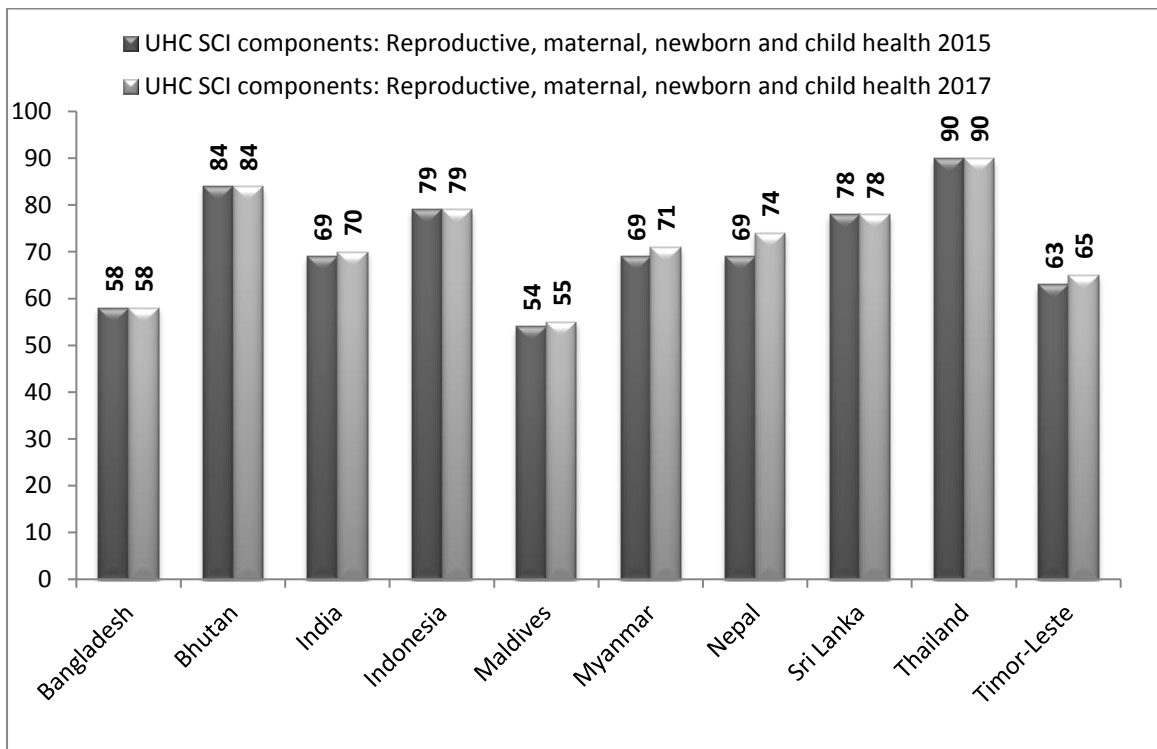


Fig. 5B: UHC SCI components: Reproductive, maternal and child health in South East Asian countries.

Trends in Maternal and Child Mortality in SEA Region

Trend in maternal mortality ratio (MMR), neonatal mortality ratio (NMR) and under-five mortality ratio in SEA region is shown in coplots given in Fig. 6A, 6B and 6C respectively. All countries showed decreasing trend in MMR for the period 2000 to 2017. The decreasing rate is the highest in Nepal to reach 186 in 2017 from 553 in 2000. After Nepal, MMR in Bangladesh, Bhutan and India had similar sharply decreasing trend to reach below 200 in 2017. MMR in Timor-Leste showed very sharply decreasing trend until 2010, and after that it became little sluggish, and reached a value below Bangladesh and Bhutan. MMR in Indonesia gradually decreased to 177 in 2017 from 272 in 2000. MMR in Myanmar slowly decreased to 250 from 340. Being achieved the SDG target (MMR less than 70), the UMI countries (Thailand, Sri Lanka and Maldives) showed very slow declining rate in MMR.

Though SDG target was not achieved by LMI and LI countries, substantial reduction in NMR in South East Asian countries was observed. NMR in Bangladesh sharply decreased to 18 in 2017 from 42 in 2000. NMR in Bhutan also decreased sharply to 17 from 32 within this period. Though the decreasing rate was high, MMR in India in 2017 was 24 as it started from a big value, 45 in 2000. NMR in Indonesia gradually decreased to 13 from 23 in 2000. In Myanmar, MMR had moderate decreasing trend to reach a value 24 in 2017. NMR in Nepal and Timor-Leste had sharply decreasing trend and reached near to 20 in 2017. Thailand, Sri Lanka and Maldives already achieved the SDG target (NMR less than 12) and showed slowly decreasing trend.

U5MR in LMI and LI countries declined sharply over time. Recent levels of U5MR in Bangladesh, Bhutan, and Nepal were close to 30; In India, it reached 39; in Indonesia, it reached 26. MMR in Myanmar and Timor-Leste were still greater than 40. Like as MMR and NMR, U5MR in UMI countries already achieved the SDG target (U5MR less than 25).

As a whole, only the UMI countries achieved the SDG target regarding maternal and child mortality. LMI and LI countries in the region showed considerable reduction in MMR, NMR and U5MR. However, still a long way to go. The level of MMR in Myanmar and Nepal was as high as 250 and 183 respectively in 2017. Myanmar along with India also showed the highest level of NMR (around 24 in 2017) within the region. The level of U5MR in Myanmar and Timor-Leste was close to 48 in 2017, which was the highest in this region. The good sign is that Indonesia is very close to achieve the SDG Target regarding NMR and U5MR.

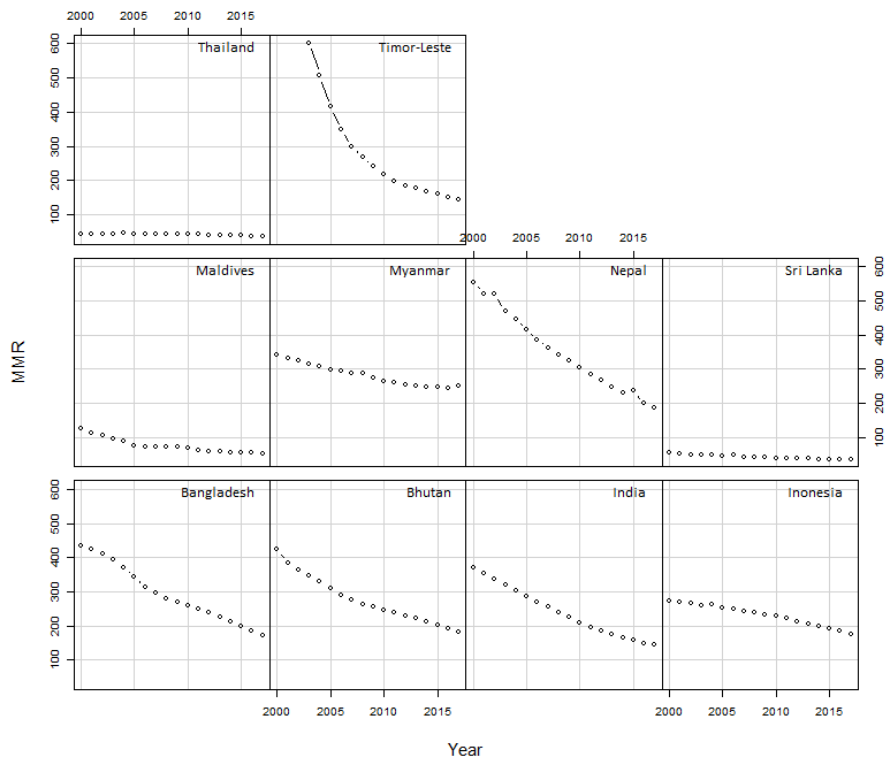


Fig. 6A: Trend in maternal mortality ratio (MMR) in SEA region

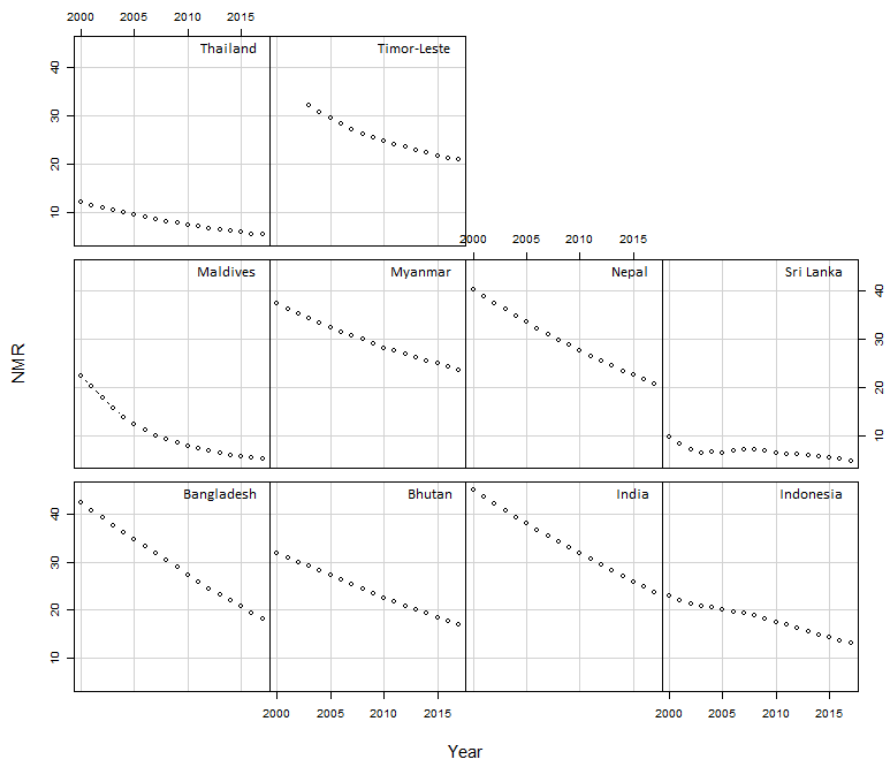


Fig. 6B: Trend in neonatal mortality ratio (MMR) in SEA region

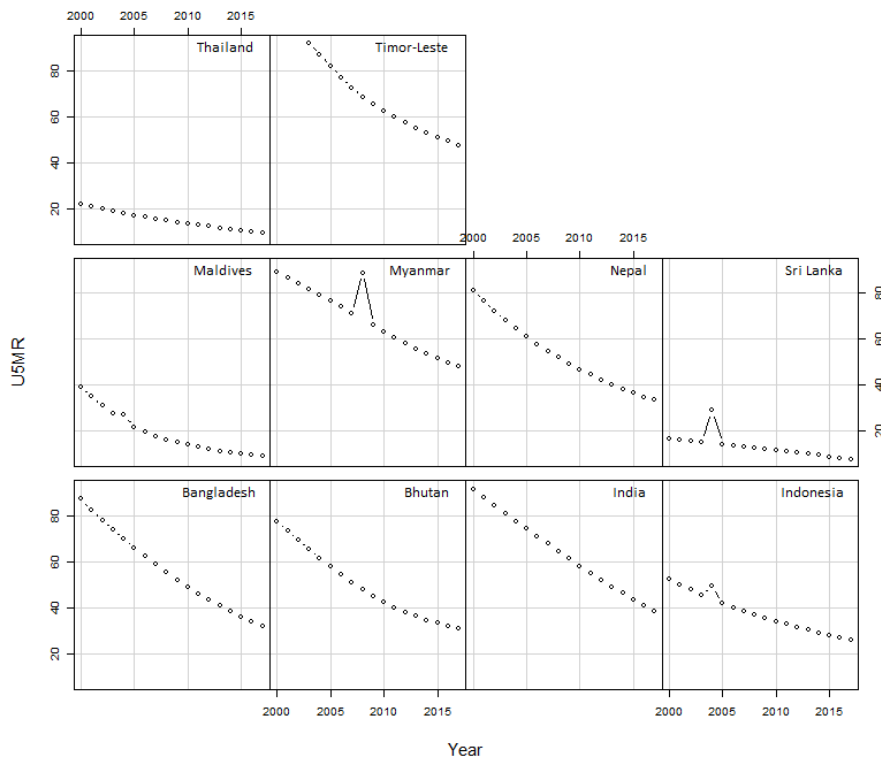


Fig. 6C: Trend in under-five mortality ratio (MMR) in SEA region

Health Expenditure and Mortality condition in SEA Region

The scatterplots of MMR, NMR and U5MR with domestic general government health expenditure (GGHE-D) as percentage of GGE-D are given in Fig. 7A, 7B and 7C. The vertical dashed lines in plots indicate SDG targets: MMR less than 70; NMR less than 12 and U5MR less than 25. The solid line in each graph indicates regression line from the mortality ratio on the percentage of GGHE-D. Values of correlation and slope coefficient are given in a box inside the plot; values within parenthesis indicate the p-value.

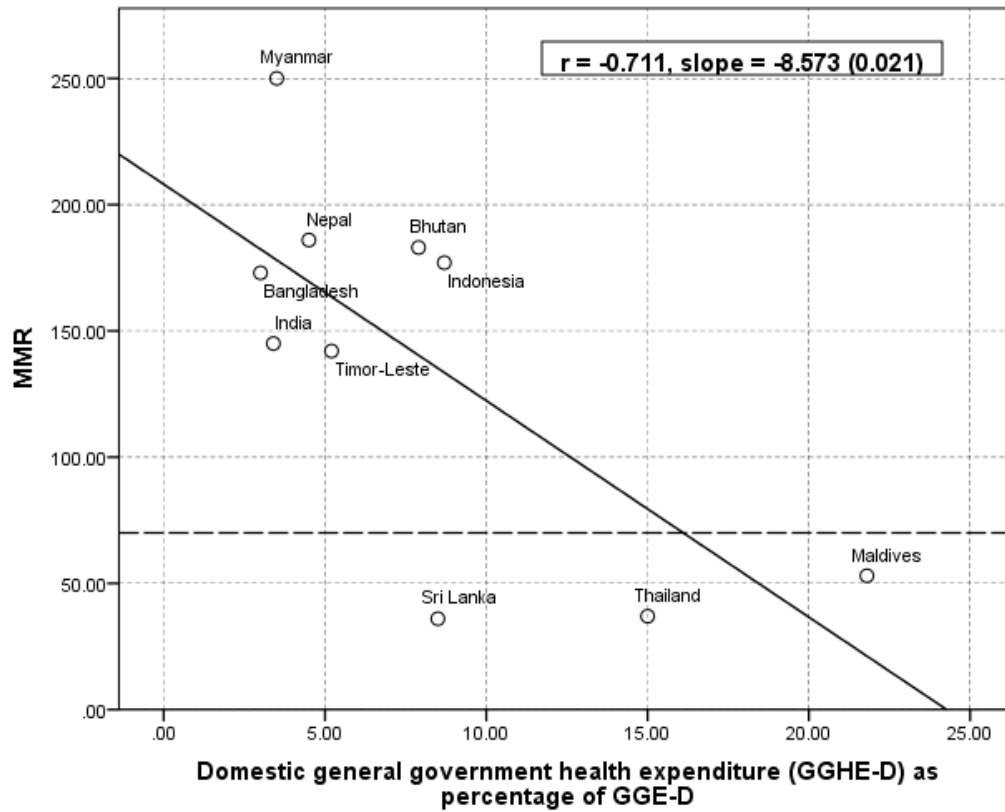


Fig. 7A: Maternal mortality ratio (MMR) against government health expenditure (2017)

All the mortality ratios (MMR, NMR and U5MR) are found to be significantly negatively correlated with the percentage of GGHE-D within GGE-D. A negative sign in the slope coefficient indicates mortality ratio decreased with increased government health expenditure. For a one unit change in the percentage of GGHE-D, MMR decreased by 8.573 units, NMR decreased by 1.050 units and U5MR decreased by 1.974 units.

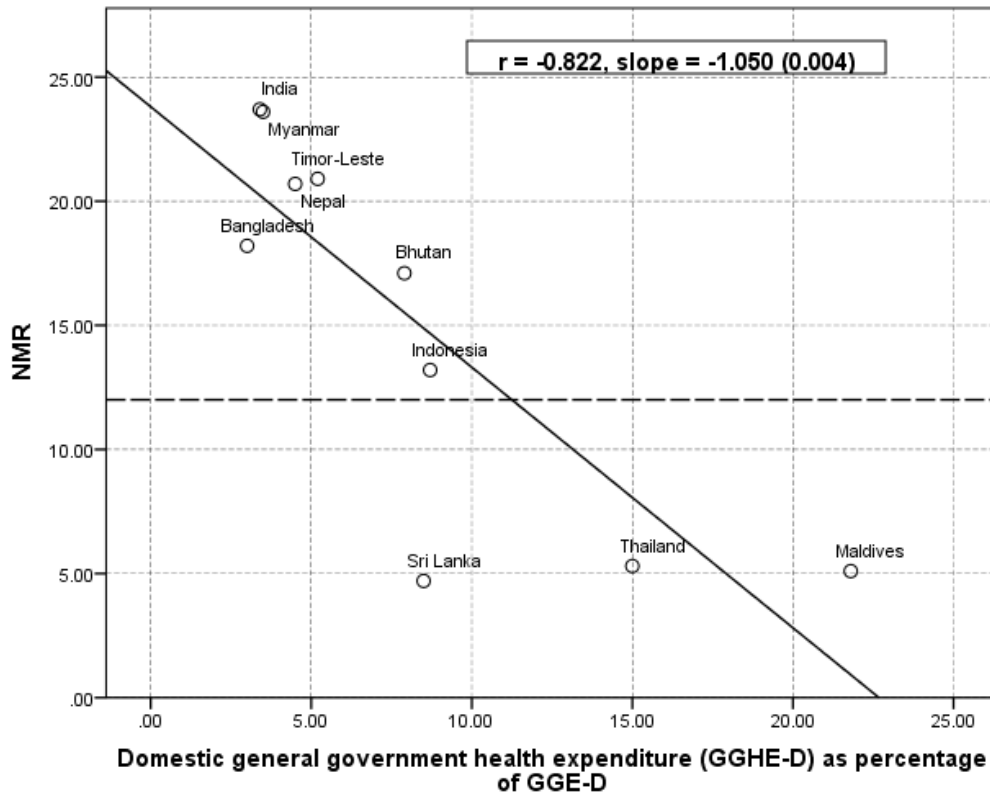


Fig. 7B: Neonatal mortality ratio (NMR) against government health expenditure (2017)

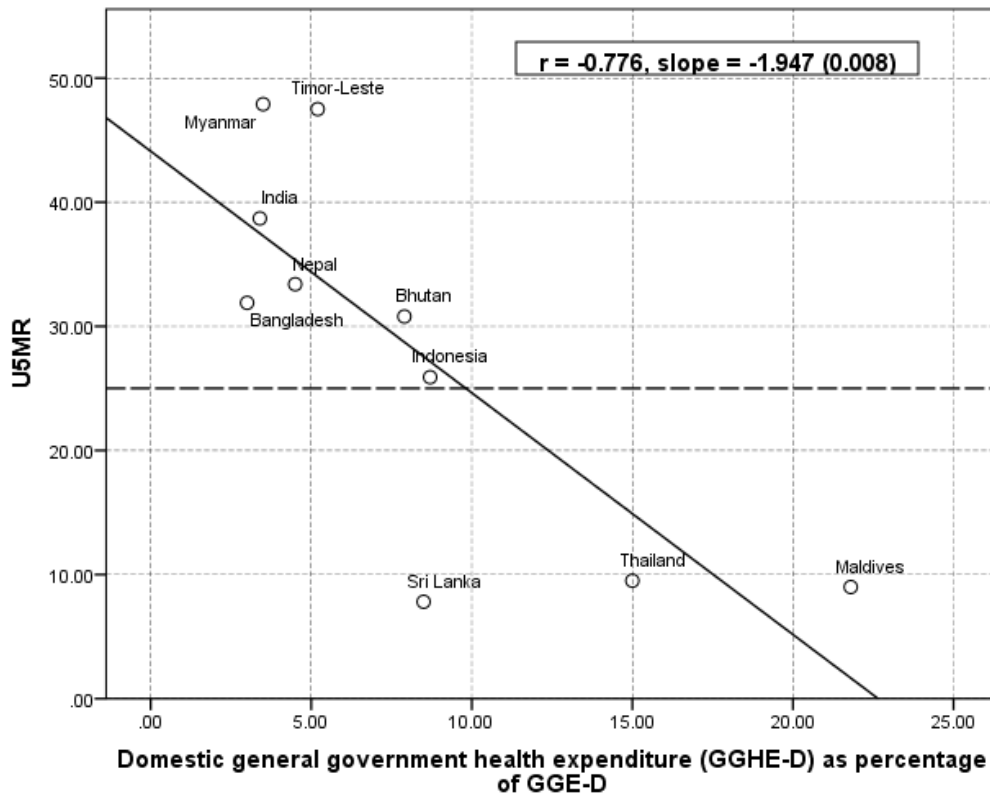


Fig. 7C: Under-five mortality ratio (U5MR) against government health expenditure (2017)

UHC SCI and Mortality condition in SEA Region

The scatterplots of MMR, NMR and U5MR with UHC index of service coverage (UHC SCI) are given in Fig. 8A, 8B and 8C. With UHC SCI, only NMR was found to be significantly negatively correlated. Both MMR and U5MR showed negative correlation, but marginally insignificant at 5% level of significance. This may happen since the sample size is small (10 in this case).

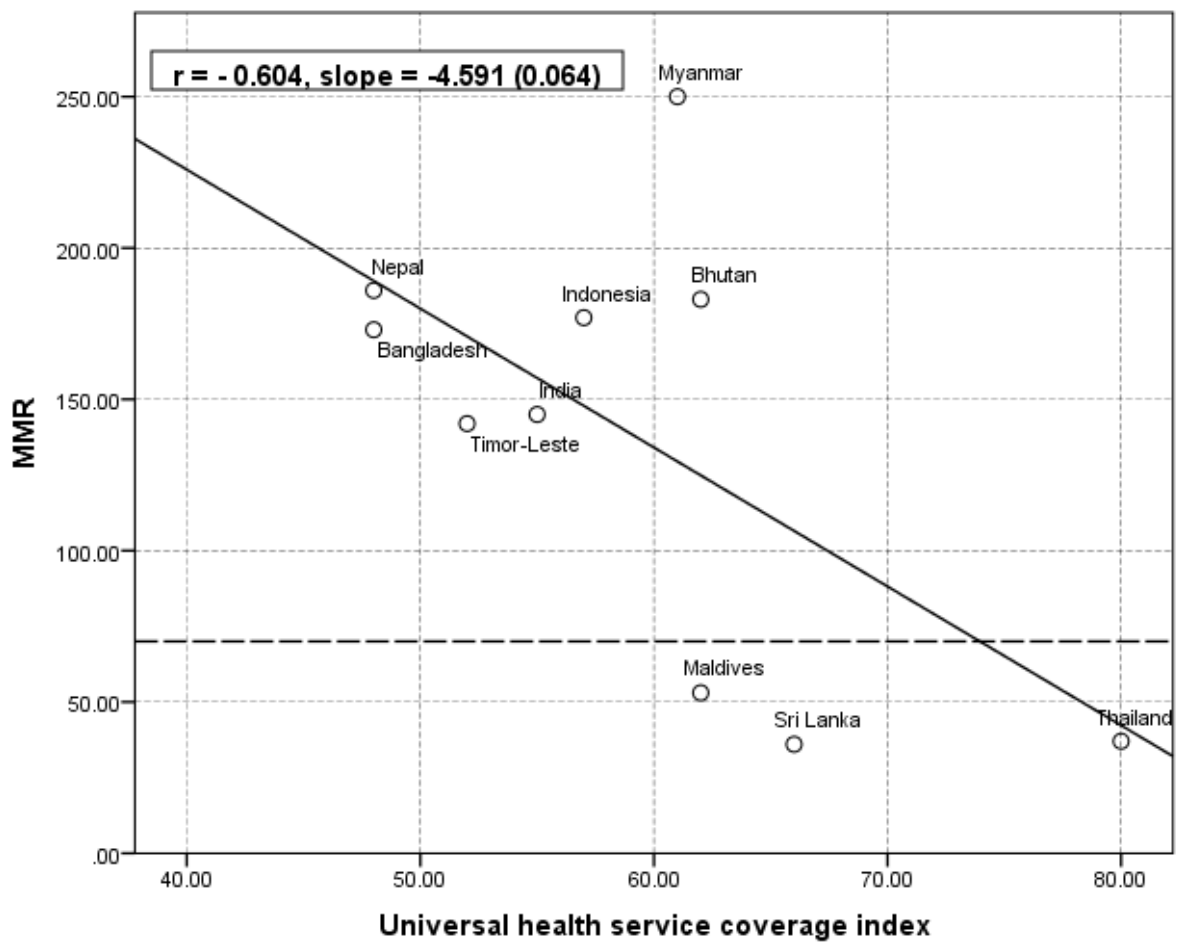


Fig. 8A: Maternal mortality ratio (MMR) against UHC index of service coverage (2017)

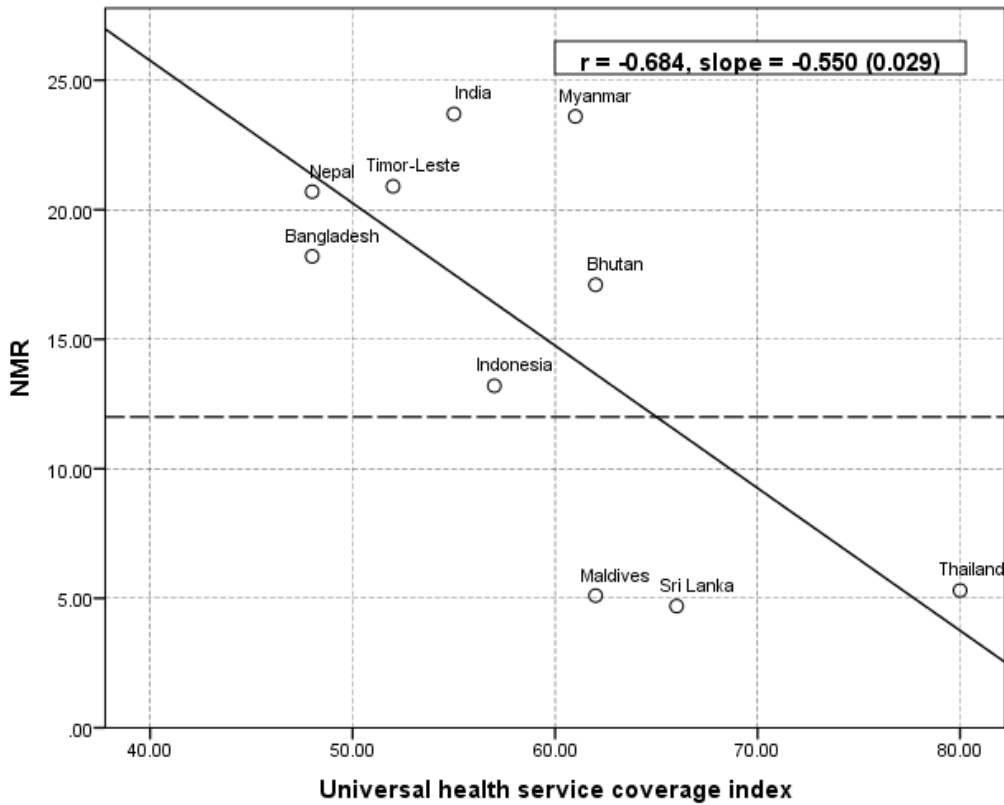


Fig. 8B: Neonatal mortality ratio (NMR) against UHC index of service coverage (2017)

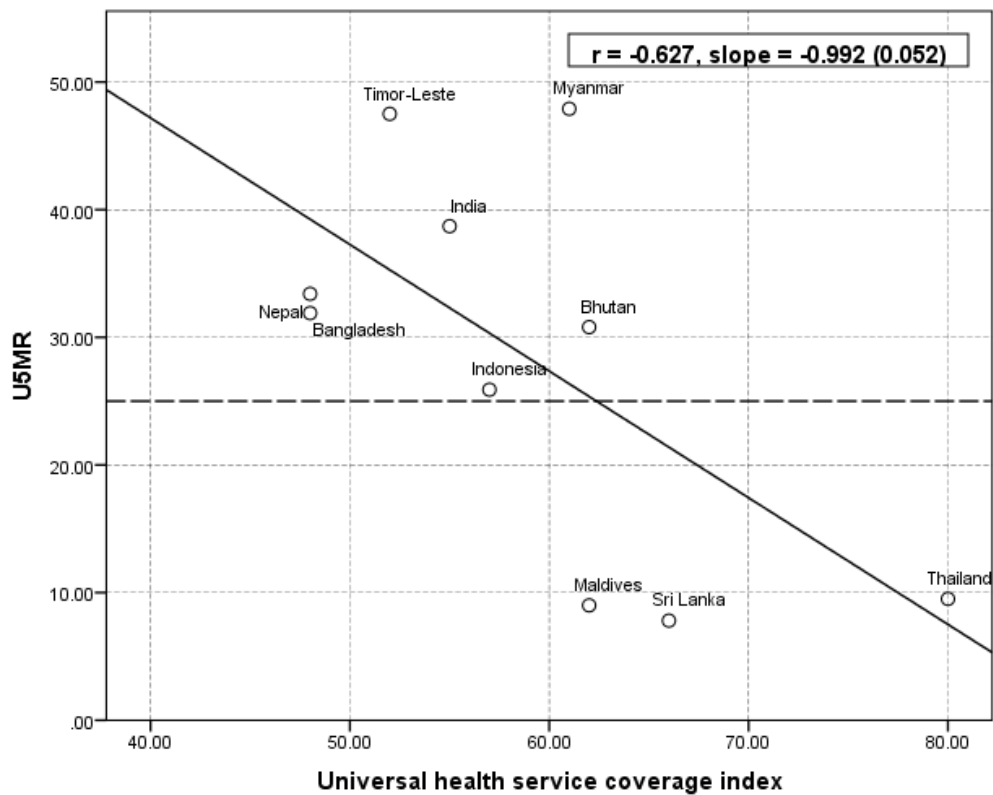


Fig. 8C: Under-five mortality ratio (U5MR) against UHC index of service coverage (2017)

CONCLUSIONS

This study addressed the universal health care service in South East Asian countries in relation to health expenditure, health finance and maternal and child health. It is found that health expenditure is increasing in higher rate in upper middle income countries than the lower middle income and low income countries. However, low out-of-pocket spending and low maternal and child mortality reflect better universal health care service in upper middle income countries. On the other hand, very high out-of-pocket spending coupled with high maternal and child mortality is the sign of poor universal health care service in some of the lower middle income countries. It is observed that government financing on health care service were mostly interchanged with out-of-pocket spending. Moreover, increase in the government health finance was found to have significant impact on reduction of maternal and child mortality. A panel data analysis or inclusion of large number of countries in future study could add deep insight to the findings.

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