



Munich Personal RePEc Archive

**Does the Higher Level of Health System  
Spending Speed Up the COVID-19  
Detection Rate?: Evidence from  
South-East Asia Region**

Behera, Deepak

AIPH University

24 April 2020

Online at <https://mpra.ub.uni-muenchen.de/100554/>  
MPRA Paper No. 100554, posted 26 May 2020 08:58 UTC

# Does the Higher Level of Health System Spending Speed Up the COVID-19 Detection Rate? Evidence from South-East Asia Region

Deepak Kumar Behera<sup>1</sup>

## Abstract

*This study examines the relationship between the spreads of COVID-19 and health system spending in the South-East Asia Region (SEAR). We have taken two potential indicators of health system financing – per capita government health expenditure and government health expenditure as a percentage of general government expenditure. Further, we have taken two indicators for COVID19 – total confirmed cases and total fatality rate (death rate). We found that the stronger health system financing countries reduce the spreads of COVID-19 sooner than the lower spending country. The suggestion could be increased funding on health infrastructure as well as human resources lead to enhance the detection and testing capacity of any health system irrespective of any infectious disease.*

**Keywords:** Health spending; COVID-19; South-East Asia; Confirmed cases; Fatality rate

## 1. Introduction

Recent COVID -19 pandemic creates a fear among the common people across the globe because it's mild- nature of symptoms and resource constraints for rapid testing of suspected individuals due to poor health system in many Asian countries. On the above backdrop, this study tries to find out, first, whether there is a positive relationship between levels of public health system spending and the total number of confirmed cases after detection. Second, whether there is a negative association between the prioritization of health spending and the case fatality rate.

In this study, we have taken a sample of the South-East Asia Region (SEAR) of the World Health Organization (WHO) which includes 11 countries – Bangladesh, Bhutan, India, Indonesia, Maldives, Myanmar, Nepal, South Korea, Sri Lanka, Thailand, and Timor-Leste. We have taken two potential indicators of health system financing – per capita government health expenditure and

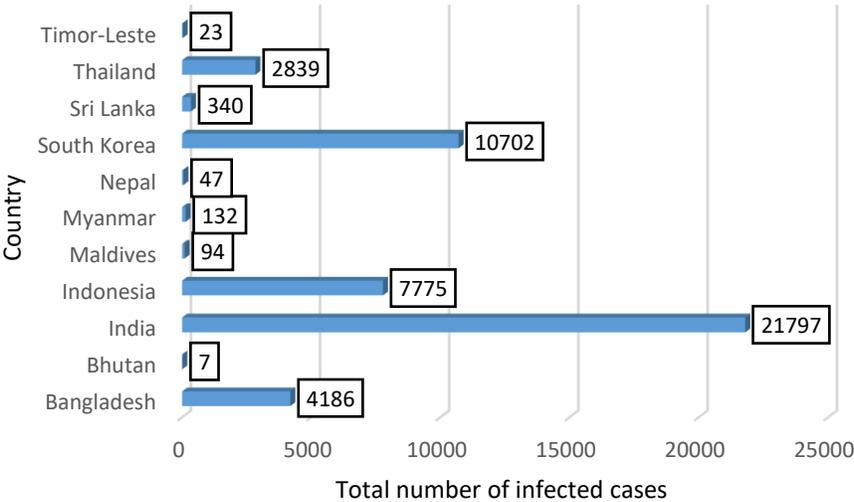
---

<sup>1</sup> Dr. Behera is working as a faculty at the School of Public Health, AIPH University, Bhubaneswar-752101, India; Email: dkbehera@aiph.ac.in; deepakkumar.behera59@gmail.com

government health expenditure as a percentage of general government expenditure as suggested by. The first indicator provides insights into the distribution of government spending on health across the population and it is a strong predictor of the extent to which the health system depends on out-of-pocket spending. The second indicator provides information about the priority that the government gives to funding health relative to other public expenditures. Both government health expenditure and General government expenditure include the revenues raised and expenditures made from compulsory social health insurance contributions (Behera and Dash, 2019). One target that has been recommended by African heads of state is that 15% of total government expenditure should be devoted to the health sector (McIntyre and Kutzin, 2016). Further, we have taken a few indicators for COVID19 – total confirmed cases and total fatality rate (death rate). The study is based on a cross-sectional observation of 11 countries at a particular time – 23 April 2020 at 9:30 PM and data has been collected from various sources – Worldometers (2020) and World Bank (2020).

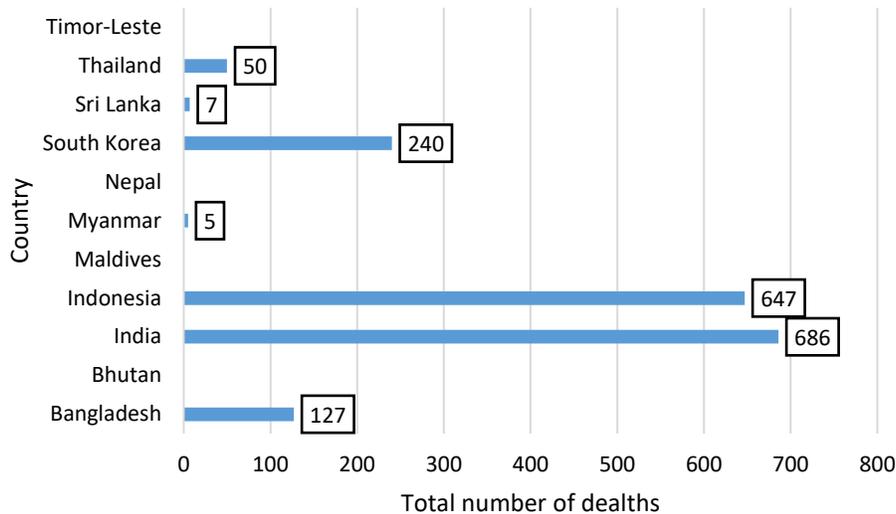
**2. Trends of COVID-19 Confirmed Cases and Death in SEAR**

Figure 1 shows the total confirmed COVID-19 cases in SEAR. We have found that by 23 April 2020 the total number of confirmed cases is higher in India, followed by South Korea, and Indonesia. But the countries like Thailand and Sri Lanka where the health system is far better than India, show less confirmed cases.



**Fig. 1 Total confirmed COVID-19 cases in SEAR**

Similarly, Figure 2 presents the total death rate from total COVID-19 cases. Here, we found surprising results that there is a huge increment in the death rate in Indonesia and India.

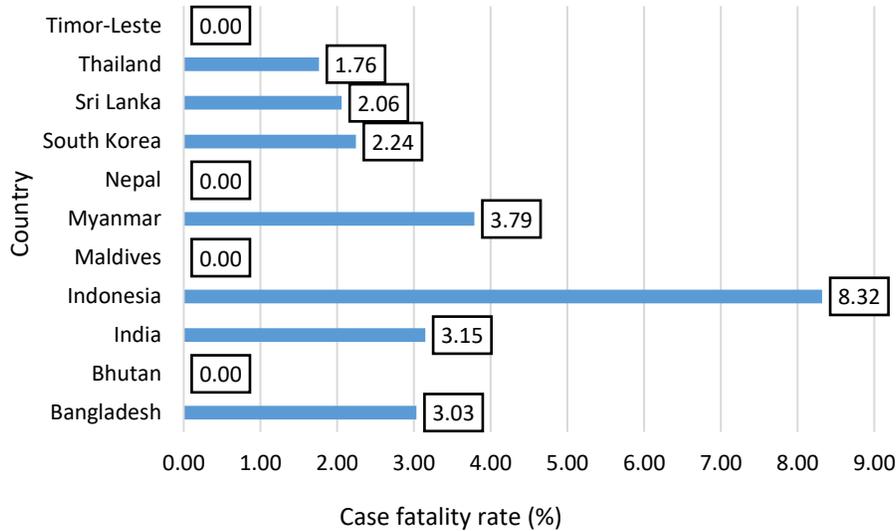


**Fig. 2 Total death from the total COVID-19 cases in SEAR**

### 3. The COVID-19 Case Fatality Rate in SEAR

The absolute number – total number of confirmed cases and the total number of deaths could not provide a clear picture- how dangerous disease is for people infected which is called the case fatality rate (CFR). It can be calculated as  $CFR = [(Number\ of\ people\ who\ died\ of\ COVID-19 / total\ number\ of\ people\ who\ got\ infected) * 100]$ .

Figure 3 shows the case fatality rate in SEAR. It shows that the Indonesia and Myanmar the CFR rate is higher than in other countries where the number of confirmed COVID-19 cases. While countries like India and South Korea have shown improvement in the reduction of a death rate. But the CFR calculation in the context of COVID-19 has some problems because many people having mild-symptoms. For example, if 500 more people were infected but had symptoms that were so mild that they went undiagnosed. In this situation, a more accurate case fatality would add 500 to the denominator and get the actual CFR. This is a constant challenge for public policymakers to do the rapid testing across the population because it requires huge funding and tip-top health infrastructure to detect more confirmed COVID-19 case.



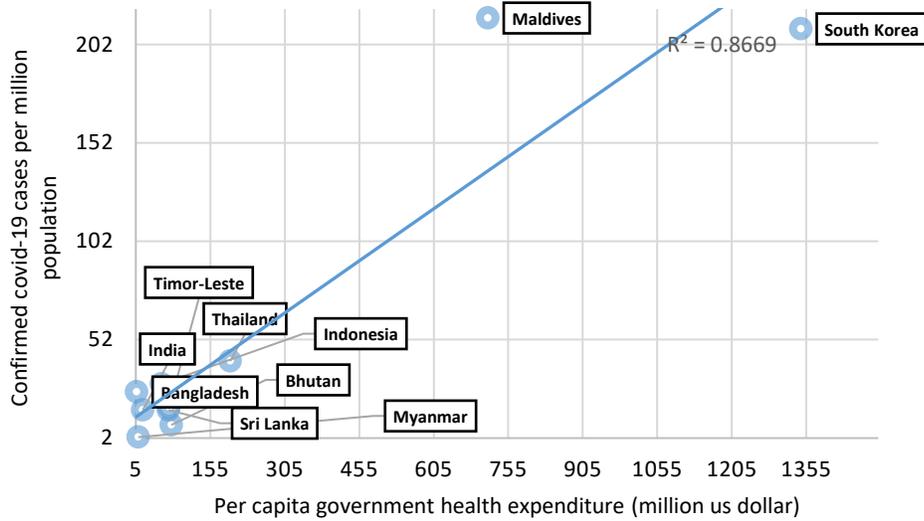
**Fig. 3 The case fatality rate in SEAR**

#### **4. Relationships between Health Spending and COVID-19 in SEAR**

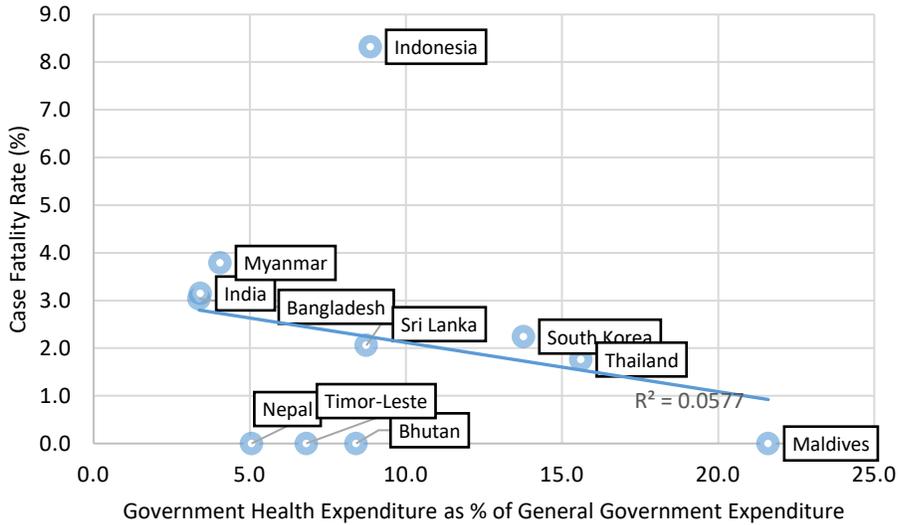
On this above backdrop, we want to analyse the relationships between per capita government health expenditure and the spread of COVID-19 infected cases in SEAR. Figure 4 shows a scatter plot between per capita government health expenditure (million US dollars) and a total number of confirmed COVID-19 cases (per million population). It shows there is a positive association between higher per capita government health expenditure and the total number of COVID-19 confirmed cases. It confirms that the country having equal distribution financial resources on the health system leads to more testing of COVID-19 suspected cases. There may be other factors that could contribute to the increment of testing such as availability virology labs and virology experts but we cannot ignore the mobilization of finance towards the reduction of diseases (Behera and Dash, 2020).

Secondly, we examine the relationships between the COVID-19 case fatality rate and the prioritization of public health spending in SEAR using a scatter plot. Figure 5 shows that there is a negative association between the death rate and government health expenditure as a ratio of general government expenditure. It implies that an increase in the share of government health expenditure to total budget leads to a reduction in the rate of COVID-19 death. It exhibits in countries like Thailand, South Korea. Similarly, a lower share of government health expenditure to total budget leads to a higher death rate in countries like India and Bangladesh. On average, the

country shows a higher share system financing leads to more detection of confirmed cases and able to reduce the death rate, and eventually it will reduce the speed of spreads due to COVID-19.



**Fig. 4 Relationship between COVID-19 confirmed cases and per capita government health expenditure**



**Fig 5. Relationship between COVID-19 death rate and government health expenditure**

## **5. Conclusions**

We found that the stronger health system financing countries reduce the spreads of COVID-19 sooner than the lower spending country. The suggestion could be increased funding on health infrastructure as well as human resources lead to enhance the detection and testing capacity of any health system irrespective of any infectious disease.

## **Acknowledgment**

I would like to thank Professor Pinaki Panigrahi and Professor Aruna Panda, AIPH University, Bhubaneswar for their feedback on the earlier draft of the paper. All views are personal and errors are the sole responsibility of the author.

## **References**

- Behera, D. K., & Dash, U. (2019). Prioritization of government expenditure on health in India: A fiscal space perspective. *Socio-Economic Planning Sciences*, 68, 1-13.
- Behera, D. K., & Dash, U. (2020). Is health expenditure effective for achieving healthcare goals? Empirical evidence from South-East Asia Region. *Asia-Pacific Journal of Regional Science*, 4 (2), 593-618.
- McIntyre D. and Kutzin J. (2016). Health financing country diagnostic: a foundation for national strategy development. Geneva: World Health Organization.
- World Bank (2020). World Development Indicator (WDI). World Bank.
- Worldometers (2020). Coronavirus Live Update; <https://www.worldometers.info/coronavirus/>.