RESEARCH ARTICLE

Association of women's literacy and children's mortality rate among countries in southeast Asia 2015-2019: a cross-sectional study [version 1; peer review: 1 approved with reservations]

Fauzi Budi Satria ¹, Rahayu Lubis², Yi-Hsin Elsa Hsu³, Usman Iqbal¹

¹Global Health and Health Security, College of Public Health, Taipei Medical University, Taipei, Taiwan

²Faculty of Public Health, Universitas Sumatera Utara, Medan, Indonesia

³School of Health Care Administration and College of Management, Taipei Medical University, Taipei, Taiwan

V1 First published: 14 Feb 2022, 11:178
<https://doi.org/10.12688/f1000research.109133.1>
 Latest published: 13 Apr 2022, 11:178
<https://doi.org/10.12688/f1000research.109133.2>

Abstract

Background: Women's literacy is often associated with the health status of family members, especially children. Unfortunately, in some regions of Southeast Asia, the rates of women's literacy are still very low, and in these areas, children's mortality rates are also very high. This study aims to identify the association of women's literacy and children's mortality rates among countries in the Southeast Asian region from 2015 to 2019.

Methods: In this cross-sectional study, children's mortality rates were defined as mortality rates in newborns and under-fives. Besides women's literacy (WL), we also assessed the Human Development Index (HDI), Freedom Status (FS), Government Effectiveness (GE), and the proportion of births assisted by skilled health staff (BASHS) as the independent variables in this study. First, we describe the profiles of WL as well as newborn and under-five mortality rates among 11 countries in Southeast Asia from 2015 to 2019, and then we assess the correlations.

Results: Between 2015 to 2019, Myanmar, Lao, and Timor-Leste had the highest child mortality rates. In addition, these four countries were the countries with the lowest WL rates compared to other countries. Children's mortality rates were significantly associated with WL, GE, HDI, and BASHS. Meanwhile, this study found that the FS of a country was not significantly associated with the children's mortality rate of countries in the Southeast Asia region.

Conclusion: This study found that there's an indication that the better the WL rate, as well as the governance, the HDI, and maternity services in a country, the lower its children's mortality rates. Therefore, improvement in multiple sectors such as governance, economy, health system, education, and gender equality is required

Open Peer Review

Approval Status ?

1

version 2

(revision)
13 Apr 2022

version 1

14 Feb 2022

1. Siow Li Lai , University of Malaya, Kuala Lumpur, Malaysia

Any reports and responses or comments on the article can be found at the end of the article.

to help countries in this region achieve the United Nations' Sustainable Development Goals target by 2030.

Keywords

women's literacy, child mortality, newborn mortality, under-five mortality, Southeast Asia, Regional health, Sustainable Development Goals, gender equality, social determinants of health

This article is included in the **Sociology of Health** gateway.

Corresponding author: Rahayu Lubis (rahayu@usu.ac.id)

Author roles: **Satria FB:** Conceptualization, Formal Analysis, Methodology, Resources, Writing – Original Draft Preparation, Writing – Review & Editing; **Lubis R:** Project Administration, Supervision, Writing – Original Draft Preparation, Writing – Review & Editing; **Hsu YHE:** Software, Supervision, Writing – Review & Editing; **Iqbal U:** Conceptualization, Supervision

Competing interests: No competing interests were disclosed.

Grant information: The author(s) declared that no grants were involved in supporting this work.

Copyright: © 2022 Satria FB *et al.* This is an open access article distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

How to cite this article: Satria FB, Lubis R, Hsu YHE and Iqbal U. **Association of women's literacy and children's mortality rate among countries in southeast Asia 2015-2019: a cross-sectional study [version 1; peer review: 1 approved with reservations]** F1000Research 2022, 11:178 <https://doi.org/10.12688/f1000research.109133.1>

First published: 14 Feb 2022, 11:178 <https://doi.org/10.12688/f1000research.109133.1>

Introduction

Globally, the under-five mortality rate declined by 59% between 1999 and 2018; from 93 deaths per 1000 live births to 39 per 1000 live births.¹ However, this number needs to be improved as the United Nations' Sustainable Development Goals (SDGs) target for 2030 is to reduce preventable under-five mortality to at least as low as 25 per 1000 live births. Moreover, achieving this goal becomes more challenging as most under-five mortality occurs in low and lower-middle-income countries, especially countries within Africa and South Asia,^{1,2} where children's health can be affected by several factors such as healthcare service quality, family wealth status, and social status, including mother's education level.³

Many kinds of research had been conducted to identify the association between a mothers' education level and their children's health status. The evidence has shown that the mother's education is an important determinant of the health of children.⁴ It's stated that even after accounting for household income, the number of siblings, health environments, and other socioeconomic variables, the mother's literacy is still a major factor that influences children's health status.⁴ A study conducted in the Kashmir valley has shown an inverse relationship between women's literacy rate and children's mortality rate. This study found that women's literacy has an immense contribution in declining the infant mortality rate (IMR) and maternal mortality rate (MMR) and thus can help in improving the health status of both women and children.⁵ In sub-Saharan Africa, a study found that the decline in mortality rates of children under five years was much higher among the children born to mothers who have never received formal education.⁶ In Indonesia, child vaccination rates were increased from 19% when mothers have no education, compared to 68% when mothers have at least secondary school education.⁷ A study in India also showed that the female literacy rate is a good predictor of infant mortality rate in India. The study's results showed that infant mortality rate was inversely related to women's literacy rate, while men's literacy was not.⁸

Proper education is the first step in empowering women and young girls and providing women with the best possible chance for a prosperous and healthy life.⁹ For women who go on to have families, education can also aid in household and family management.¹⁰ Lastly, educating girls saves lives and builds stronger families, communities, and economies. In addition, an educated female population increases a country's productivity and promotes economic growth.¹¹ According to an International Labor Organization report, educating girls has proven to be one of the most important ways of breaking poverty cycles and is likely to have significant impacts on access to formal jobs in the longer term. Moreover, it's reported that some countries lose more than \$1 billion a year by failing to educate girls to the same level as boys. Therefore, it's believed that educating women will increase their opportunity to get a better job and receive a higher wage. Furthermore, this also may address gender imbalances especially in the labor force.¹¹ By looking at the importance and benefits of women's literacy in non-health sectors and regions, therefore, we conducted this study to identify the association between women's literacy and children's mortality rates among countries in Southeast Asia.

Methods

Study aims and design

This cross-sectional study aimed to identify the association between women's literacy and children's mortality rate in Southeast Asia from 2015 to 2019. There are eleven countries in the region and all of them are members of the Association of Southeast Asian Nations (ASEAN); Brunei Darussalam, Myanmar, Cambodia, Timor-Leste, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand, and Vietnam.

Variables

Independent variables in this study were the children's mortality rates. It was defined as newborns' mortality rate (NMR) and under-five mortality rate (UFMR). The NMR is the number of neonates dying before reaching 28 days of age, per 1000 live births each year. Meanwhile, the UFMR refers to the probability of a child born in a specific year or period dying before reaching the age of five and is defined as a probability of death derived from a life table and expressed as a rate per 1000 live births. We collected the data about the **NMR** and the **UFMR** of these 11 countries during the 2015 to 2019 period from the website of Our World in Data and World Health Organization (WHO) respectively.^{12,13}

Next, for the dependent variables in this study, besides women's literacy (WL), we also employed other variables for comparison such as Human Development Index (HDI), Freedom Status (FS), Government Effectiveness (GE), and the percentage of births assisted by skilled health staff (BASHS). We selected these variables to align with the SDGs' targets on child mortality rates, but also because these indicators not only measure child survival, but also reflect the social, economic, and environmental conditions in which children live. We collected the data from various online databases from 2015 to 2019.

The **WL** is the percentage of women aged 15 years and over who can read and write by understanding simple short statements about everyday life. The literacy rate is an outcome indicator to evaluate educational attainment. Therefore,

literate women are considered capable of understanding written information and using it to improve the health, nutrition, and education of household members. We collected the data from the current World Bank published report and then calculated the average WL rate of each country during the observed period.¹⁴

The BASHS are defined as the proportion of deliveries attended by personnel trained to give the necessary supervision, care, and advice to women during pregnancy, labor, and the postpartum period; to conduct deliveries on their own, and to care for newborns. We collected the BASHS data from the [WHO website](#) and calculated the average of BASHS among countries in Southeast Asia between 2015 and 2019.¹⁵

The HDI is a summary measure of average achievement in three key dimensions of human development: a long and healthy life, level of education, and having a decent standard of living. The health dimension is assessed by life expectancy at birth, while the education dimension is measured by the mean of years of schooling for adults aged 25 years and expected years of schooling for children of school entering age. The standard of living is measured by gross national income (GNI) per capita. We selected the HDI as one of the variables in this study because it can also be used to question national policy choices, asking how two countries with the same level of GNI per capita can end up with different HDI outcomes. We collected the [HDI](#) data from the Human Development Report 2020 report on the [UNDP website](#), and then calculate the average HDI score of the eleven study countries in the period between 2015 to 2019 period.^{16,17}

The [FS](#) described the freedom status of countries based on the annual global report on political rights and civil liberties composed by [Freedom House](#). There are seven main topics covered by this report, including freedom of expression and belief (media freedom, religious freedom, academic freedom, and free private discussion). The score ranges from 0 to 100, where the country with a score of 70 to 100 is labeled as a “free” country. Meanwhile, the country with scores 40 to 69 will be labeled as “partially free (PF)” and score 0 to 39 as “not free (NF)”. In this study, we calculated the average freedom scores of all eleven countries between 2015 to 2019.^{18–20}

The GE was selected as a variable in this study since it may reflect perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. The score of GE ranges from -2.5 (weak) to 2.5 (strong). We collected the [GE](#) data from the [Worldwide Governance Indicators](#) (WGI) project 2020 reports and calculated the average GE scores of the selected countries from 2015 to 2019.²¹

Data analysis

First, we described the profiles of children's mortality rates and women's literacy among the eleven countries in Southeast Asia region from 2015 to 2019. Next, after conducting a normality test, we conducted paired t-test to assess the association between our independent (NMR and UFMR) and dependent variables (WL, GE, FS, HDI, and BASHS) to identify which independent variables were mostly associated with the mortality rates.

Results

First, we developed [Figures 1 and 2](#) to describe the children's mortality rates and women's literacy rates across the eleven countries in Southeast Asia during 2015 to 2019 period. [Figure 1](#) showed that three countries with highest newborn mortality rates (NMR) was the Myanmar (2.36), Lao (2.31), and Timor-Leste (2.05). Meanwhile, the countries with the lowest NMR in the region were Singapore (0.1), Malaysia (0.44), and Brunei Darussalam (0.56). Similar with NMR, Lao (4.94), Myanmar (4.82), and Timor-Leste (4.74) were also the three countries with the highest UFMR in the Southeast Asia. Meanwhile, the countries with the lowest UFMR were Singapore (0.26), Malaysia (0.83), and Thailand (0.99). Then, as shown in [Figure 2](#), we found that the Philippines (97.55), Brunei Darussalam (96.3), and Singapore (95.68) were the three countries with the highest rate of WL across countries in the Southeast Asia region. Meanwhile, the WL rates in this region were the lowest in Timor-Leste (64.21), Cambodia (75.03), Myanmar (79.06), and Lao (79.39).

Next, we developed [Table 1](#) to describe the profile of the eleven study countries from 2015 to 2019. The weakest GE was found in Cambodia (-0.64), Lao (-0.55), Myanmar (-1.1), and Timor-Leste (-0.98). Meanwhile, the three countries that have the strongest GE were Singapore (2.22), Brunei Darussalam (1.17), and Malaysia (0.94). Next, none of the countries in this region were labeled as free countries, with six countries labeled as not-free (FS<40), and the remaining five countries labeled as partially free (FS=40-69). Lao was the country with the lowest (12.67) freedom score, while Timor-Leste was the highest (67.5). Moreover, among the eleven countries, HDI was very high in Singapore (0.93), Brunei Darussalam (0.84), and Malaysia (0.8), while Myanmar (0.57) and Cambodia (0.58) were the lowest. Then, in this region, the proportion of births attended by skilled health staff (BASHS) was the highest in Brunei Darussalam, Malaysia, Singapore, and Thailand (BASHS>99). Meanwhile, BASHS was the lowest in Timor-Leste (56.7), Myanmar (60.2), and Lao (64.4).

Figure 1. Average of children's mortality rates (NMR and UMR) among eleven countries in Southeast Asia from 2015 to 2019.

Figure 2. Average of women's literacy (WL) rates among eleven countries in Southeast Asia from 2015 to 2019.

Table 1. The profiles of eleven study countries in Southeast Asia from 2015 to 2019.

	GE	FS	HDI	BASHS
Brunei Darussalam	1.17	28.83	0.84	99.93
Cambodia	-0.64	29.17	0.58	89.00
Indonesia	0.03	63.50	0.71	93.54
Lao PDR	-0.55	12.67	0.61	64.40
Malaysia	0.94	47.33	0.80	99.50
Myanmar	-1.10	29.33	0.57	60.20
Philippines	0.03	62.17	0.71	84.40
Singapore	2.22	51.00	0.93	99.55
Thailand	0.36	31.67	0.77	99.10
Timor-Leste	-0.98	67.50	0.60	56.70
Vietnam	0.03	20.00	0.70	93.80

Table 2. Association of WL, GE, FS, HDI, and BASHS and children's mortality rates in Southeast Asia from 2015 to 2019 (*p>0.05).

Independent variables	Children's mortality rates	
	Newborn	Under five years
Women's literacy (WL)	-0.73	-0.76
Government Effectiveness (GE)	-0.92	-0.89
Freedom Status (FS)*	-0.13	-0.07
Human Development Index (HDI)	-0.93	-0.90
Births attended by skilled health staff (BASHS)	-0.91	-0.95

Lastly, **Table 2** was developed to describe the results of the correlation analysis. From the five variables, the FS of a country was the only variable that was not significantly associated with children's mortality rates in the countries studied. Meanwhile, out of the four variables that were significantly associated with children's mortality rates, all of them were negatively associated. The association between women's literacy and children's mortality rates was (-0.73 and -0.76), while the association between other variables and children's mortality rate was more than 90%.

Discussion

Based on the results of our study, we found that no country in the ASEAN region has a children's mortality rate above the global average during the 2015 to 2019 period. This finding is in line with the previous report which showed that children's mortality rates above the global average were more commonly found in the African region²² and not in Southeast Asia. Even Myanmar, which had the highest average newborn mortality rate, and Lao which had the highest average of under-five mortality rate in this region, had only 2.36 deaths and 4.82 per 1,000 live births from 2015 to 2019 respectively, compared to 17 deaths²² and 38 deaths per 1000 live births²³ globally. Furthermore, our study found that the three countries (Myanmar, Lao, and Timor-Leste) with the highest children's mortality rate in this region were lower-middle-income countries.²⁴ This finding is also coherent with the previous report that showed that the highest burden of under-five mortality is reported to be mostly found in low-income or lower-middle-income countries.²³ In addition, previous evidences had shown that the income level of the country was extremely correlated with the children's mortality rate. The poorest countries have the highest levels of child mortality, and the countries with the highest income have the lowest rates.¹² The results of our study showed that countries like Singapore, Brunei, and Malaysia were among the countries with the lowest children mortality rates. Moreover, our study also found that the correlation between HDI and children's mortality rates was very high (NMR: -0.93, UFMR: -0.90).

Next, our study found that out of eleven countries in the region, the majority (eight countries) had BASHS coverage above the global average (83%).²⁵ Moreover, even the BASHS coverage in Brunei, Malaysia, Singapore, and Thailand reached more than 99%. On the other hand, our results showed that three other countries whose BASHS coverage was below the global average also had the highest children's mortality rates in the region. Those three countries were Myanmar (60.2%), Lao (64.4%), and Timor-Leste (56.7%). This study results did not only show disparities in the Southeast Asia region but also confirm the United Nations International Children's Emergency Fund (UNICEF) report which states that although BASHS coverage continues to increase in 2020 globally, the coverage continues to be uneven with significant disparities between regions.²⁵ In our study, the correlation between BASHS and children mortality rate were significantly high (NMR: -0.91, UFMR: -0.95).

Women who have literacy are believed to be able to use their knowledge and understanding to improve the welfare of their families.¹⁴ Our study showed that the WL rates of seven countries in the Southeast Asia region from 2015 to 2019 were above the global average (83%) in 2019. Moreover, this study also found that the children's mortality rates among these seven countries were much lower than the global average.^{22,23} In addition, the previous study had been proven that better education of women might reduce mortality among children.²⁶ However, our result showed the association between WL and children's mortality rates among countries in Southeast Asia was only around 70% (NMR: -0.73, UFMR: -0.76). The implication of this finding can be seen from the low children's mortality rates in Cambodia. While the WL there was the second lowest (75%) in the region after Timor-Leste (64.2%) and also below the global average,^{23,22} the mortality rates among children in Cambodia were only slightly different from Indonesia and the Philippines which had much higher WL rates than Cambodia in the same period.

The governance of a country may have widespread effects on the health of its population.²⁷ A previous study showed that the better the governance, the lower children's mortality rates. In another study, it's mentioned that the quality of governance is even more critical in determining a good outcome for both mother and child.²⁸ This evidence was coherent

to our finding that showed the strong negative association between governance and mortality rate among newborns (-0.92) and children under-five (-0.89). In our study results, Myanmar, Lao, Timor-Leste, and Cambodia were the four countries with the lowest government effectiveness, and also the countries with the highest children's mortality rates in the Southeast Asia region during the 2015 to 2019 period.

Finally, our study showed a consistent negative association between all of our independent variables (WL, GE, FS, HDI, and BASHS) and both of our dependent variables (NMR and UFMR). However, we found that the relationship between the freedom status of a country (FS) and children's mortality rates among countries in Southeast Asia from 2015 to 2019 was not statistically significant. Then, we also highlighted the association between WL and children's mortality rates in this study which was only around 70%. This association is quite high but relatively low compared to other variables that we assessed in this study which correlate around 90% and above. Based on this study results, we assume that children's mortality rates can be reduced and potentially achieve the SDGs target by 2030 with the improvement in multiple sectors such as governance, the economy, health care, and education, as well as by strengthening gender equality. Accelerated improvement in various sectors is urgently needed, considering that the latest SDG report mentions that many SDG indicators have experienced setbacks due to the impact of the COVID-19 pandemic.²⁹

Conclusion

The results of our study found that there's a significant association between women's literacy and children's mortality rates among countries in the Southeast Asia region during the 2015 to 2019 period. Moreover, the HDI, GE, and BASH also had a significant correlation with children's mortality rates in the same period. However, among eleven countries in the Southeast Asia region from 2015 to 2019, there were 3 countries whose indicators were all below the global average, while there were also many countries whose all indicators were much better than the global average. In order to achieve the SDGs 2030 target which does not want to leave anyone behind, this kind of disparity must be addressed immediately. Therefore, we consider that it is necessary to re-strengthen the ASEAN as a binding organization for countries in the Southeast Asia region, by expanding the field of cooperation in ASEAN by including the health sector. The goal is that countries in the region will work together to achieve the SDGs targets by 2030.

Data availability

Underlying data

This project contains the following underlying data from the sources linked below:

- Newborn mortality rate ([Our World in Data](#))
- Under-five mortality rate ([WHO](#))
- Women's literacy ([The World Bank](#))
- Births attended by skilled health staff ([WHO](#))
- Human development index ([UNDP](#))
- Freedom status ([Freedom House](#))
- Government effectiveness ([The World Bank](#))

Extended data

Figshare: Underlying Data-Association of Women's Literacy and Children's Mortality Rate Among Countries in Southeast Asia 2015-2019.XLSX³⁰

<https://doi.org/10.6084/m9.figshare.18904481.v1>

This project contains the following extended data:

- Master Data.XLSX

Data are available under the terms of the [Creative Commons Attribution 4.0 International license](#) (CC-BY 4.0).

References

1. WHO: **Child health**. 2021 [cited 2021 Nov 8].
[Reference Source](#)
2. WHO: **SDG Target 3.2| Newborn and child mortality: By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality and under-5 mortality**. 2021 [cited 2021 Nov 8].
[Reference Source](#)
3. WHO: **Child health**. 2021 [cited 2021 Nov 8].
[Reference Source](#)
4. Chen Y, Li H: **Mother's education and child health: Is there a nurturing effect?**. *J. Health Econ.* 2009 Mar 1; **28**(2): 413–426.
[PubMed Abstract](#) | [Publisher Full Text](#)
5. Batool N, Shah SA, Dar SN, *et al.*: **Impact of female literacy on infant mortality and maternal mortality in Kashmir valley: a district level analysis**. *GeoJournal*. 2020 Dec 1; **85**(6): 1545–1551.
[Publisher Full Text](#)
6. Bado AR, Sathiya SA: **Women's Education and Health Inequalities in Under-Five Mortality in Selected Sub-Saharan African Countries, 1990–2015**. *PLoS One*. 2016 Jul 21; **11**(7): e0159186.
[PubMed Abstract](#) | [Publisher Full Text](#)
7. PRB: **The Effect of Girls' Education on Health Outcomes: Fact Sheet**. PRB; 2015 [cited 2021 Nov 8].
[Reference Source](#)
8. Saurabh S, Sarkar S, Pandey DK: **Female Literacy Rate is a Better Predictor of Birth Rate and Infant Mortality Rate in India**. *J. Family Med. Prim. Care*. 2013; **2**(4): 349–353.
[PubMed Abstract](#) | [Publisher Full Text](#)
9. Eduvoice India: **Women Literacy and Empowerment: A Review | Eduvoice. The Voice of Higher Education**. 2021 [cited 2021 Nov 14].
[Reference Source](#)
10. Kaur R: **Why to educate women? – Advantages**. MyIndia; 2013 [cited 2021 Nov 14].
[Reference Source](#)
11. Theirworld: **Girls' education**. Theirworld; 2021 [cited 2021 Nov 14].
[Reference Source](#)
12. Roser M, Ritchie H, Dadonaite B: **Child and Infant Mortality. Our World in Data**. 2013 May 10 [cited 2021 Nov 7].
[Reference Source](#)
13. WHO: **Indicator Metadata Registry Details**. 2021 [cited 2021 Nov 8].
[Reference Source](#)
14. The World Bank: **Literacy rate, adult female (% of females ages 15 and above)| Data**. 2021 [cited 2021 Nov 3].
[Reference Source](#)
15. **Births attended by skilled health personnel (%)**. [cited 2022 Jan 31].
[Reference Source](#)
16. UNDP: **Human Development Index (HDI) | Human Development Reports**. 2021 [cited 2021 Nov 19].
[Reference Source](#)
17. UNDP. | **Human Development Reports: 2020** [cited 2021 Nov 19].
[Reference Source](#)
18. Freedom House: **FAQ - Freedom in the World**. Freedom House; 2021 [cited 2021 Nov 19].
[Reference Source](#)
19. Freedom House: **Freedom in the World Research Methodology**. Freedom House; 2021 [cited 2021 Nov 19].
[Reference Source](#)
20. Freedom House: **Freedom in the World**. Freedom House; 2021 [cited 2021 Nov 19].
[Reference Source](#)
21. The World Bank: **Worldwide Governance Indicators. Worldwide Governance Indicators**. 2021 [cited 2021 Nov 19].
[Reference Source](#)
22. UNICEF: **Neonatal mortality**. UNICEF DATA; 2021 [cited 2021 Nov 14].
[Reference Source](#)
23. UNICEF: **Child Mortality**. UNICEF DATA; 2021 [cited 2021 Nov 14].
[Reference Source](#)
24. Lower middle income | **Data**: [cited 2022 Feb 2].
[Reference Source](#)
25. Delivery care: **UNICEF DATA**. [cited 2022 Feb 2].
[Reference Source](#)
26. Mondal MNI, Hossain MK, Ali MK: **Factors Influencing Infant and Child Mortality: A Case Study of Rajshahi District, Bangladesh**. *J. Hum. Ecol.* 2009 Apr 1; **26**(1): 31–39.
[Publisher Full Text](#)
27. Lin R-T, Chien L-C, Chen Y-M, *et al.*: **Governance matters: an ecological association between governance and child mortality**. *Int. Health*. 2014 Sep; **6**(3): 249–257.
[PubMed Abstract](#) | [Publisher Full Text](#)
28. Hall S, Lopez M, Murray S, O'Hare B: **Government revenue, quality of governance and child and maternal survival**. *Appl. Econ. Lett.* 2021 Sep 9; **0**(0): 1–6.
[Publisher Full Text](#)
29. Child mortality (under 5 years): [cited 2022 Feb 2].
[Reference Source](#)
30. **Underlying Data-Association of Women's Literacy and Children's Mortality Rate Among Countries in Southeast Asia 2015-2019.XLSX**. figshare. 2022 [cited 2022 Feb 3].
[Reference Source](#)

Open Peer Review

Current Peer Review Status: ?

Version 1

Reviewer Report 28 March 2022

<https://doi.org/10.5256/f1000research.120597.r123550>

© 2022 Lai S. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Siow Li Lai

Population Studies Unit, Faculty of Business and Economics, University of Malaya, Kuala Lumpur, Malaysia

The paper requires major changes before it can be indexed. Overall, the analysis is too simple. Use the term "neonatal" mortality instead of "newborn" mortality. The authors should consider using infant mortality along with the other two mortality measures. More relevant references are required to strengthen the case study, particularly why this study focused on Southeast Asian countries, despite the relatively low child mortality rate? Please proofread the paper carefully (the authors even turn over the dependent and independent variables).

Some other comments are listed below.

1. The following citation is misleading. It sounds like child mortality is lower among uneducated than the educated ones, but the actual fact is the other way round, even though the former has experienced a slipper decline in child mortality. Since the authors are looking at a cross-sectional study, they should look at the level rather than the trend -> In sub-Saharan Africa, a study found that the decline in mortality rates of children under five years was much higher among the children born to mothers who have never received formal education.
2. Provide a citation for the following: According to an International Labor Organization report, educating girls has proven to be one of the most important ways of breaking poverty cycles and is likely to have significant impacts on access to formal jobs in the longer term.
3. Provide the present situation/statistics of child mortality and the levels of social and economic development in Southeast Asia in the Introduction section.
4. The number of observations (n=11) is too small for a firm conclusion. The authors may consider using longer time-series data.
5. The authors have proposed a normality test and paired t test in the Methodology section,

but these analyses are missing in the Results section. The type of correlation test (parametric or non-parametric) in table 2 is not mentioned in the Methodology section. Please address these issues, and provide the software used to perform the analyses.

6. The Discussion and Conclusion sections should focus on the association between women's literacy and child mortality, as proposed in the title of this study.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

No

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

No

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Population studies, public and reproductive health, gender studies

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 05 Apr 2022

Fauzi Budi Satria, Taipei Medical University, Taipei, Taiwan

Thank you for your review

I do agree with most of your suggestions and comments.

That's why we did major changes to our study which we will briefly explain below.

1. "Use the term "neonatal" mortality instead of "newborn" mortality"
"The authors should consider using infant mortality along with the other two mortality measures."

Previously I only had 2 variables, newborn and under-five mortality rate. I have changed the term of the newborn to neonatal. In the current version, instead of two, I have 3 dependent variables (infant mortality rate/IMR, neonatal mortality rate/NMR,

and under-five mortality rate/UFMR).

2. *"More relevant references are required to strengthen the case study, particularly why this study focused on Southeast Asian countries, despite the relatively low child mortality rate?"*

I had added references to strengthen the background. In brief, countries in this region were so varied in terms of economic level, the number of populations, culture, governmental system, etc.

3. *"The following citation is misleading. It sounds like child mortality is lower among uneducated than the educated ones, but the actual fact is the other way round, even though the former has experienced a slipper decline in child mortality. Since the authors are looking at a cross-sectional study, they should look at the level rather than the trend -> In sub-Saharan Africa, a study found that the decline in mortality rates of children under five years was much higher among the children born to mothers who have never received formal education."*

I have revised and rephrased most of the result and discussion parts

4. *"Provide a citation for the following: According to an International Labor Organization report, educating girls has proven to be one of the most important ways of breaking poverty cycles and is likely to have significant impacts on access to formal jobs in the longer term."*

Yes, we have done it

5. *"Provide the present situation/statistics of child mortality and the levels of social and economic development in Southeast Asia in the Introduction section."*

We modified the design of the study. The current version is only focused on women's literacy, and it's the only independent variable in this study. Previously, there were 5 independent variables (women's literacy, Human Development Index, Government Effectiveness, Birth attended by skilled health staff, and freedom status).

6. *"The number of observations (n=11) is too small for a firm conclusion. The authors may consider using longer time-series data."*

We extended the study period from 2015-2019 to 1991-2020, from previously only 5 years of data for each country, we have 30 years. So, in the current version, instead of 55 observations (11 countries in 5 years) now it has 330 observations (11 countries in 30 years).

7. *"The authors have proposed a normality test and paired t test in the Methodology section, but these analyses are missing in the Results section. The type of correlation test (parametric or non-parametric) in table 2 is not mentioned in the Methodology section. Please address these issues, and provide the software used to perform the analyses."*

We provided table 2 to describe our Shapiro-Wilk normality test result. For the correlation test, we run the Pearson correlation test as our sample size is large enough and the average is more accurately represents the center of the distribution of the data than the median.

8. *"The Discussion and Conclusion sections should focus on the association between women's literacy and child mortality, as proposed in the title of this study."*

As we redesign our study, currently we only have one independent variable (women's literacy/WL) and three dependent variables (IMR, NMR, UFMR). We rewrote the discussion part and make it more focused to highlight how WL correlated to and affected IMR, NMR, and UFMR.

Competing Interests: The authors declare that there is no conflict of interest.

The benefits of publishing with F1000Research:

- Your article is published within days, with no editorial bias
- You can publish traditional articles, null/negative results, case reports, data notes and more
- The peer review process is transparent and collaborative
- Your article is indexed in PubMed after passing peer review
- Dedicated customer support at every stage

For pre-submission enquiries, contact research@f1000.com

F1000Research