Investigating Low Birth Rates and High Infant Mortality Rate in Developing Countries: The Rising Infant Mortality Rate

Saranya Kumaran[1], Priyanka[2]

[1]Statistician, Department of Community Medicine, Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India

[2]Lecturer in statistics, Institute of Community Medicine, Madras Medical College, Chennai, Tamil Nadu, India

Abstract: *The study looks into the phenomenon of increasing infant mortality rates and declining birth rates that have been evident in underdeveloped and developing countries worldwide. It was identified that multiple variable aspects included social, economic and healthcare conditions of developing and underdeveloped countries that are linked to negative development of birth rates and increasing the hazard of infant mortality. There are several issues that have an immense impact on the decline of birth rate and increasing trends of infant mortality. Among these, the major aspects of social condition, economic inequalities and instability along with lack of healthcare related accessibility and quality are some of the correlated factors. The study had implemented a survey of 51 participants for gaining a quantifiable understanding of this staggering phenomenon. The findings suggest that the identified variables regarding social, economic and healthcare issues have a significant correlation with the aspect of birth rate decline and infant mortality increase. The study supported the inferences that poor economic stability, socioeconomic habits and lack of medical facilities have further hindered progress of healthy birth rates and infant mortality. Possible solutions seem to be needing to spread awareness and improve social, economic, and healthcare infrastructures for improving the situation.*

Keywords: birth rate, infant mortality, social, economic, healthcare

1. Introduction

1.1. Background

Infant mortality and birth rates have been seeing a dynamic and challenging development in recent years. Asian, and Latin American and Caribbean countries have been observing rapidly declining birth rates from 79.33 million and 10.65 million births respectively in 2014 to 65.65 million and 9.35 million births respectively in 2023 [1]. It has been noted that over 2.3 million newborns had died in 2022 and over 47% of child deaths accounted for neonatal deaths [2]. Birth rates have been disproportionately decreasing with increasing infant mortality rates with countries belonging to developing regions being most affected.

Asian and African countries are prone to high infant mortality, with Afghanistan having the highest rate of 103.06, and African countries like Somalia, Central African Republic, Sierra Leone, and many others from the central and western regions having infant mortality as high as 85.06 (Somalia) [3]. The crude birth rates for Asian, African and Latin American countries have dropped from 21.1, 38.4, and 22.2 respectively in 2000 to 13.9, 31.3, and 14.2 respectively in 2024 [4]. Sub-Saharan African countries accounted for the highest infant mortality rate at 27 deaths per 1000 live births, with central and southern Asian countries coming second at 21 deaths per 1000 live births [2]. Professional midwifery care and educated regulations to women is capable of reducing infant deaths by 16% [2], indicating connection of infrastructural lack as a major issue to infant mortality.

Increasing need for recognising declining health and health systems among developing and underdeveloped countries is imperative. African countries have some of the poorest health system rank and score in the world, with central and west African countries including Central African Republic (lowest ranking, i.e. 167), South Sudan (166), Niger (143), South Africa (129), and others [5]. Asian countries including Yemen (136), Mongolia (110), Afghanistan (153), Pakistan (124), Nepal (118), India (112), along with Latin American countries including Haiti (148), El Salvador (98), Venezuela (97) and so on [5]. This notes the poor medical health of these countries have been affecting proper accessibility to necessary healthcare and medical facilities such as birth control and neonatal care.

Global condition of poverty and income inequality has only worsened in recent years. Only 1.9% of the global wealth is held by the poorest 50% of the world [7]. A vast majority of these poor populations belong to underdeveloped and developing countries. South Africa has the highest inequality in income distribution in 2023, at 63 Gini Index rate, with multiple African countries having a similar trend [6]. Latin American countries such as Brazil (52) also have poor income distribution [6]. Additionally, Latin America is identified to be facing a massive wealth distribution gap [7]. Global poverty has worsened from 676.71 million poor in 2018 to 711.87 million poor in 2022 unable to afford living on less than 2.15 USD per day [8]. These further provide an inkling of the income, financial and socio-economic situation of the developing and underdeveloped countries.

In the present time, the developing and underdeveloped countries have been observing a declined and poor socio-economic condition in terms of hunger and nourishment. There is a massive poor condition in terms of nourishment in African countries the most, countries including Central Africa Republic (42.3), Madagascar (41), Nigeria (28.3), Sierra Leone (31.3), Ethiopia (26.2) in Africa have been showing weak performance regarding people having access to primary

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nourishment [9]. Asian countries including Yemen (39.9), Afghanistan (30.6), India (28.7), Pakistan (26.6), Syria (26.1), Korea PDR (27.8) and Latin American countries including Haiti (31.1), have been observing strong cases of malnourishment among their mass population as in the recent years [9]. Poor accessibility to nourishment and worsening trends of hunger further indicates the scarcity and threat of pregnant women suffering from malnourishment, indirectly contributing to the development of weak infants pre-birth.

The worsening trends of economic disparity, poor socio-economic status along with the looming problem of medical accessibilities have played an undeniably influencing role in the development of increasing infant mortality and declining birth rates. Among more specific factors such as the economic condition or healthcare system situation of diverse countries, also lie a diverse range of more subjective issues. More often than not, these issues are connected with social conditions and practices among people. For instance, religious beliefs and practices are some of the more concerning factors that have an effect on both fertility and birth rates of these developing countries. India is among the countries that observe religion being one of the significant factors affecting maternal health [10]. Religious beliefs affecting maternal health could be even more risky for the development and potential healthy development of pregnancy towards a healthy live birth.

Socio-demographic conditions of people from the developing countries could be seen to affect the development of birth rates and infant mortality. Several regions such as Nigeria are influenced by religion influenced-community practices in terms of pre-birth and midwifery care. Religion is also considered as a hindering issue towards required healthcare service being provided in several developing countries [11]. Some religious communities hold communal beliefs of medical interventions such as blood transfusion [11]. The lack of accessibility and hindrances in terms of social backwardness is identified to be some of the most disturbing contributors to risky maternal health and obstruction to immediate neonatal health measures, further adding to medical complication-associated development of infant mortality and birth rate demise. Moreover, studies have mentioned that socioeconomic situation of the families also have an impact on the child health [10] and potential mortality of infants. That means, families and parents that are from educationally sound and economically secure status have a better opportunity towards better medical education, accessibility and healthier live birth and neonatal care.

These socioeconomic groups also hold the potential for being more potentially prepared for better family planning and birth care. Unfortunately, developing and underdeveloped countries are not as adept and are not open to much of these socioeconomically developed dispositions. The growth of contraceptives, as one of the more modern aspects, has become a sort of "cognitive threshold to reproductive decision-making" [12]. Birth control and contraceptives have been introduced and used as an effective measure for checking unwanted and unplanned pregnancies and for avoiding pregnancy risks. However, potential overdependence on such methods could be possible to indirectly affect birth rates to decline in it. Also, increasing acceptance of "birth control within marriage" is often associated with declining fertility

rates [1], further influencing in inherent decline of birth rate as one of the initial conditions. Moreover, there are potential links to socio-economic development could also be associated with the decline of birth rates.

Development of parent planning have been increasing awareness among people that are becoming exposed to socioeconomic development for reproductive decision-making for conception in better socioeconomic environment. There have emerged certain "preconditions" to becoming such as "economic stability, personal and relational readiness" along with parental social status and personal fulfilment [13]. Developing and underdeveloped countries are prone to poor socioeconomic stability and facility, prompting people to be discouraged from conception due to insecurity to provide for quality child support health and care. Though there has been decline of birth rates overall, high populations and increased reproduction conditions add to the complication of socioeconomic issues such as increase of poverty and decline in life expectancy including "mother and child health" [14]. Risks of poor family planning could add to complications of poor health, malnourishment and impoverished care of infants, possibly increasing the issue of infant mortality. Awareness programs are essential for spreading awareness against societal pressures, close spaced deliveries, child mortality and malnutrition [14] for potentially reducing negative impacts.

Studies have suggested that increase of socioeconomic advancements and population health have a dynamic impact on the development of birth rates. Birth rate remains high with decline in mortality rates and improvement of population health [1]. Several Latin American, central and western African and middle-eastern, central and southern Asian countries have poor healthcare systems [2]-[5]. This could affect the developing and underdeveloped countries and their overall population health, contributing to all forms of mortality rate increase, including infant mortality rates. Several neonatal health complications connected to neonatal infections and birth complications have been contributors to increasing neonatal fatalities and mortality [2]. The potential that planned reproductive decision-making and planning of parenthood could avoid infant mortality through providing better infrastructural and healthcare opportunities for healthier live birth.

1.2. Research questions

RQ1: What is the different nature of issues for increasing infant mortality and decreasing birth rates in various under-developing and developing nations?

RQ2: How has the social, healthcare and economic situation impacted the decrease of birth rate and increased infant mortality?

RQ3: What are the tentative solutions that are capable of spreading awareness among the masses to resolve them?

2. Methodology

The research study has included the implementation of a quantitative research through the implementation of the

primary quantitative data collection and analysis of a survey. The study intends to expand on the subject through exploring the research questions, thereby utilising an exploratory research design, and selection of sample population through purposive sampling to suit the research design purpose. Purposive sampling is an effective measure for contributing new information [15]. This study has intended to select 51 people for conducting the online survey for the research. The participants selected belong from diverse occupational backgrounds including academic, governmental and public sector, private and business sector, self-employed and volunteering population along with others.

The sample population approached under the criteria of having an informed and adequate knowledge on the subjects of the issues and elements regarding low birth rate and high infant mortality in underdeveloped and developing countries. The research has opted for survey questionnaires as the instrument for gathering primary quantitative information. Survey could assist in expanding research towards demographically important subjects and aid in gathering statistical data from a representative sample [16]. The development of a survey questionnaire as data collection leads to acquiring numeric information using a 5-point Likert scale for measuring responses. The statistical data is evaluated using a primary quantitative data analysis method that implements an exploratory and descriptive design for interpreting numeric information for generalisation.

3. Data Analysis

As previously mentioned in this study, "primary quantitative data" has been collected by constructing an online survey by which responses from 51 participants regarding the selected context have been accumulated. In this section, the statistical analysis of the collected data has been performed which includes "descriptive statistics", "correlation analysis", "linear regression analysis" and "reliability statistics" of the variables identified. "Low birth rate and high infant mortality (BI)" has been recognised as the dependent variable (DV) while "Social issues" (IV1), "Economic issues" (IV2) and "Healthcare issues" (IV3) have been used as independent variables in this study. The statistical analysis constructed in this study critically reflects the causes behind the low birth rate and high infant mortality rate worldwide from the viewpoint of experts working in the relevant field.

3.1. Descriptive statistics

Table 1: Descriptive statistics of accumulated information

Demographic Responses	Frequency (%)
Age	
18-24 years	11 (21.6)
25-34 years	7 (13.7)
35-50 years	14 (27.5)
51-60 years	16 (31.4)
60 years and above	3 (5.9)
Gender	
Female	25 (49.0)
Male	24 (47.06)
Prefer not to say	2 (3.9)
Occupation	
Academic	4 (7.8)
Government	30 (58.8)

Survey Questions	Mean	Std. Deviation
Private Sector	7 (13.7)	
Self-employment	7 (13.7)	
Other	3 (5.9)	
DV		
Developing countries are seeing a rise in infant mortality rate and a decline in birth rates lately	2.78	1.064
IV1		
Social status and religious beliefs have contributed to rising infant mortality and low birth rates. Do you believe this	3.04	1.199
Poor socioeconomic conditions like poor education, income and medical care can hurt birth and infant mortality rates from poor care	2.80	1.149
Social beliefs backing self-dependency discourage people from wanting to focus on themselves and not have children	2.75	1.426
IV2		
Poverty is one of the major economic issues that could worsen infant mortality rate	2.80	1.371
Economic instability discourages people from being parents, affecting the birth rate. Do you agree?	2.90	1.269
A disproportionate access to wealth among women, obstructs them from healthy pregnancy and quality infant care, increasing risk of infant mortality	2.96	1.248
Poor GDP and socioeconomic condition among a majority in developing countries limit people's access to quality healthcare	3.04	1.248
IV3		
Poor healthcare facilities make it difficult to provide better neonatal care, contributing to infant mortality	2.94	1.156
Do you agree that developing countries have poor healthcare infrastructure quality?	2.88	1.291
The rise of infant mortality is because of malnourishment, neonatal infections, and poor medical attention	2.98	1.191
Declining birth rate could be due to lack of birth control access and medical attention causing higher infant mortality	3.04	1.113

Summarising accumulated data in a study can be considered an effective aspect associated with understanding the trends in the collected sample. While a variable has a limited number of individual values, frequency enumeration can help create easy-to-read data summaries that can facilitate the interpretation of trends in the collected data [17]. Concerning this aspect, the above-represented table 1 can be considered as evidence regarding the trends of the collected information in this study. The difference between the mean and SD (Standard Deviation) value can be considered another effective aspect that provides understanding regarding the spread of the collected data.

In this aspect, the demographic information specifically the "occupational criteria" has a mean value of 1.51 whereas the SD value has been accounted for 1.027 which is considerably close to each other and indicates a clustered distribution of the collected data in this context. On the other hand, for instance of the collected data using DV the mean value is reported as 2.78 whereas the SD value is 1.064 which can also be

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considered to be close to each other indicating a clustered distribution of the collected data.

3.2. Correlation analysis

Table 1: Correlation analysis between dependent and independent variables

Correlation analysis		DV	IV1	IV2	IV3
DV	Pearson Correlation	1	0.618	0.669	0.575
IV1	Pearson Correlation	0.618	1	0.734	0.665
IV2	Pearson Correlation	0.669	0.734	1	0.825
IV3	Pearson Correlation	0.575	0.665	0.825	1

The foundation of correlation analysis is mainly based on the analysis of the interrelation between two variables by which a particular context can be concluded. A p-value, greater than 0.5 can be considered as an indicator of a high and positive correlation between used variables [18]. As represented in the above table, the correlation value between DV and IV1 is 0.618 while between DV and IV2 and IV3 are 0.669 and 0.575 respectively. The identified values are greater than the standard value of Pearson correlation. Considering the findings from this section, it can be considered that there is a positive and linear interrelation between DV and IV1, IV2 and IV3.

3.3. Regression analysis

Table 2: Model summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.729[a]	.532	.502	.751

a. Predictors: (Constant), A disproportionate access to wealth among women, obstructs them from healthy pregnancy and quality infant care, increasing risk of infant mortality, Poor socioeconomic conditions like poor education, income and medical care can hurt birth and infant mortality rates from poor care, The rise of infant mortality is because of malnourishment, neonatal infections, and poor medical attention

Regression analysis was performed in this study mainly to justify the linear interrelation between the DV and IVs identified in the following study. In this regard, the R-value is reported for 0.729 which can be considered as an indicator of strong and linear interrelation between the DV and the IVs. On the other hand, the R-square value is identified as 0.532 which indicates a high variance among the predictors which indicates that through the IVs the state of DV can be predicted accordingly. Apart from correlation analysis, the linear regression analysis also represents a linear and positive interrelation between the DV and IVs from the consent of this study.

Table 3: ANOVA

ANOVA[a]						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.134	3	10.045	17.820	.000[b]
	Residual	26.493	47	.564		
	Total	56.627	50			

a. Dependent Variable: Developing countries are seeing a rise in infant mortality rate and a decline in birth rates lately

b. Predictors: (Constant), A disproportionate access to wealth among women, obstructs them from healthy pregnancy and quality infant care, increasing risk of infant mortality, Poor socioeconomic conditions like poor education, income and medical care can hurt birth and infant mortality rates from poor care, The rise of infant mortality is because of malnourishment, neonatal infections, and poor medical attention

The variations between the means of the various variable groups included in the dataset are depicted in the displayed table 3. In this sense, a value less than 0.05 may be said to be an acceptable value, and the value of significance may therefore be regarded as useful evidence for comprehending the variations in the group means among the variables. A substantial difference in the length of means of data obtained in the DV and IVs section can be merged with the displayed table's significance value of 0.000, which is below the standard value.

3.4. Reliability analysis

Table 4: Reliability analysis

Reliability Statistics	
Cronbach's Alpha	N of items
0.94	15

Considering the perspective of primary data inquiry, reliability evaluation is another useful tool for addressing the validity of the research's general conclusions. The dependability of Cronbach's alpha is essential to comprehending the validity of the results. A result, greater than 0.8 may be regarded as proof of the high validity of the research's conclusions. The value of Cronbach's Alpha for this specific study is around 0.940. This suggests that the research's conclusions are legitimate in light of the wider picture and may be seen as a useful byproduct.

4. Discussion

The findings of this study highlight a strong and positive correlation between the identified variables from which it can be considered that social, economic and healthcare issues in developing countries are playing critical roles in the increasing low birth rate and high infant mortality rate. Specifically, the economic issues among the citizens in these types of countries are identified to enhance the criticality in the development of low birth rates along with enhancement in the high infant mortality rate. The low-income rate can be considered one of the major economic issues which encourage the low birth rate along with the high infant mortality rate as it restricts the use of essential resources to overcome these issues [19]. Therefore, according to the findings of this study, it can be considered that economic issues among people in developing countries critically increase infant mortality rates and also contribute to the low birth rate.

Social issues have also been identified as an effective aspect that has a direct and positive correlation with the "low birth rate and high infant mortality rate". This can therefore be considered as another reason behind the growing issues associated with the minimal birth rate and increasing infant mortality rate, especially in developing countries. In this regard, inequalities in society can be considered as a critical

aspect associated with the limited use of essential resources such as water and food to certain communities which is contributing to the low birth rate along with increasing child death in some of the developing countries [20]. Therefore, based on the findings of this study, social issues such as inequalities and limited resource availability can be considered critical reasons behind growing issues in the birth rate and infant mortality rate in developing or underdeveloped countries in the global aspect.

Apart from social and economic issues, healthcare issues have also been recognised as a key reason which is encouraging the high infant mortality rate along with the low birth rate, especially in the. According to the regression analysis results of this study, these two variables have linear interrelation which indicates that healthcare issues are another reason behind the growing infant mortality rate and low birth rate in developing countries in the global perspectives. Limited healthcare expenditure has been recognised as a critical mediator in increasing healthcare issues in several developing countries [21]. Concerning the statement and the findings of this study, this can also be considered as another censorious issue developing low birth rates along with high infant mortality rates in several developing countries.

Conclusion

This study has critically highlighted the critical aspects associated with low birth rates and high infant mortality rates, especially in developing countries. Through constructing a primary quantitative analysis this study finds a strong and positive correlation between "Low birth rate and high infant mortality" and "Social issues", "Economic issues" and "Healthcare issues". The findings of this study therefore indicate "Social issues", "Economic issues" and "Healthcare issues" in developing countries as the key reasons behind the low birth rate and high infant mortality. However, the lack of using "secondary qualitative data" can be considered as a limitation of the study as it would provide more detailed descriptive information regarding the undertaken in this study which would justify the consent more significantly.

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