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Healing Hands Abroad: Role of Foreign Aid and Health Crisis in Pakistan

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ABSTRACT

Developing nations, specifically lower developed nations, are becoming aid dependent in the health sector.Health is a critical factor contributing significantly to economic growth. This study aims to examine the criticality of the of Foreign Aid and Health Crisis in Pakistan.This study investigates the impact of foreign aid on Pakistan's health sector using time-series data from 2000 to 2020.To assess the stationarity of variables, the Augmented Dickey-Fuller (ADF) test is applied, while the Johansen Cointegration Test is employed to determine the short-run and long-run relationships between the variables.The findings show that the impact of foreign aid on health sector has a positive impact in Pakistan.As foreign aid increases, then there will be improvement in the health sector. The results also show that as foreign aid increases, then the child mortality rate decreases.The study also reveals that foreign aid has a negative relationship with maternal mortality rate, and it has positive relationship with GDP per capita and mother literacy.Foreign Aid do contribute to development and enhancement of healthcare infrastructure in Pakistan foreign aid can support initiatives for disease prevention and control, including vaccination campaigns, awareness programs and the establishment of public health system. Foreign aid do provide the main support during the serious health crises such as epidemics or natural disasters, helping the response to emergency situations.

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1. Introduction

Many developing and least-developed nations heavily rely on foreign aid to support their health sectors. The World Bank plays a significant role by funding numerous health and nutrition projects across these countries. Official Development Assistance (ODA) serves as a crucial factor in driving economic progress and prosperity in these nations (Wood, 2024). Developing countries often struggle with limited resources, which hinder their ability to foster sustainable economic growth. Foreign aid broadly defined as the transfer of funds, goods, and services from developed nations to developing ones (Maruta, Banerjee, & Cavoli, 2020) gained prominence following the end of World War II.Two key institutions the International Monetary Fund (IMF) and the World Bank were established with the primary purpose of supporting these nations. Since their inception, these organizations have played crucial roles in assisting poor and developing countries (Appiah, Onifade, & Gyamfi, 2022; Gupta et al., 2021). However, institutional barriers remain a significant challenge for these nations (Chandra, Paul, & Chavan, 2020). Sometime foreign aid and the other type Official development Assistance are known as a same meaning, but in reality a small difference exists between there nature and use. Foreign aid has different classifications, firstly, government of the developed nations helps the foreign aid recipients nation directly which is supplied by the resource rich nations to developing nations. On the other hand foreign aid impact for for allocation reforms, correcting that crisis and flops to do so could have important

impacts (Khan, Khurshid, & Cifuentes-Faura, 2023). The adverse conditions in the health sector in Pakistan due to many aspects like inadequate allocation of resources and rapid population growth rate in health sector in developing countries. The poor performance of Pakistan's health sector remains a critical challenge. To address this issue, Pakistan must increase investments and ensure that foreign aid is efficiently allocated. The country faces severe resource constraints, lacking both infrastructure and the means to implement short-term health initiatives effectively. Foreign aid can have both positive and negative impacts on recipient countries (Anwar, Khan, & Anwar, 2020). Programs aimed at governance reforms are rarely evaluated in coordination with other aid initiatives, even though their goals and actions often overlap. Acknowledging the importance of context is essential, but it raises the question of whether governance programs adequately consider the efforts of other aid agencies. Effective donor coordination is particularly vital in environments where governance is weak, authority is fragmented, and external donors operate in unstable or volatile conditions. In such situations, collaboration and alignment between aid agencies are crucial to ensure meaningful and sustainable improvements. The objectives of this study are as follows:

1. To unleash the criticality of foreign aid in improving health crisis of Pakistan.
2. To unleash the linkages between aid and performance of health sector.
3. To provide the recommendations for leveraging foreign aid to enhance health outcomes in Pakistan.

This study also explores that foreign aid has a relationship with maternal mortality rate, along with GDP per capita and mother literacy.Foreign Aid plays a role to development and the betterment of healthcare infrastructure in Pakistan. Foreign aid help the initiatives for disease prevention and control, including vaccination campaigns, awareness programs and the establishment of public health system.Foreign aid do provide the main support during the health crises, helping the response to emergency situations.The study explain that the effect of the foreign aid on health sector in Pakistan,resulting the improvement in the health sector.

2. Review of the literature

The effectiveness of foreign aid varies across countries and circumstances. Developing nations often struggle with inadequate infrastructure, which necessitates increased government budgets for constructing hospitals, providing free medicines, and training healthcare staff. A review of existing studies indicates that financial resources significantly influence health outcomes. Moreover, it is evident that the health sector’s performance improves in open societies compared to closed ones. Thikeo, Rittirong and Voelker (2017) utilized Binary Logistic Regression to explore the relationship between infant mortality (the dependent variable) and factors such as the language, size of the family, household gender , education of the household. Their findings revealed that infant mortality rates were positively correlated with the number of children under five years old. Research focusing on Pakistan identified numerous factors contributing to infant mortality and highlighted the connection between health investments and economic growth (Akram et al., 2008). Using ECM analysis from 1972 to 2006, Akram found that life expectancy, mortality rates, and age dependency positively impacted economic growth. However, physical health expenditures had minimal effects on growth.

Pakistan faces significant developmental challenges due to its high debt repayment obligations, which consume a substantial portion of the national budget. This leaves limited funds for developmental projects, exacerbating budget deficits and necessitating further borrowing (Qureshi, 2010). Borrowing, in turn, has adverse effects on development. Mishra and Newhouse (2007) conducted a cross-country study across 118 nations. Additionally, their analysis of 50 developing countries revealed modest improvements in the allocation of health and education sector spending, emphasizing the importance of scale and efficiency in resource distribution. Filmer and Pritchett (1997) analyzed data from UNICEF to explore child mortality and female education. Their study concluded two factors collectively accounted for over 90% of the variation in child mortality rates. Likewise the study of Banchani and Swiss (2019), highlights the positive effects of government investment to improve the social standards, especially in the health zone. His study shows that increased in the investment of health zone has direct and positive impacts on health developments. According to the study of Thiele, Nunnenkamp and Dreher (2007), there is an affiliation between the Millenium Development Goals and the subsidies provided to aspecific area. The result of his study shows that there is clash between the preference of the aid provider

and the actual distribution of that subsidies in the developing countries. A positive relationship between the subsidies of health and the result of these subsidies in domain of education, healthcare (Jack & Lewis, 2009; Wolf, 2007). However, this study also describes some of the unpredictable effects of this aid . The association between foreign aid, economic and prosperity (Arndt, Jones, & Tarp, 2010). They found that aid supported growth through mechanisms like investment and institutional development. However, corruption was identified as a significant barrier, often limiting aid's effectiveness. Winters (2024) argued that aid distribution should prioritize efficiency, economic needs, and political considerations, particularly when examining donor-recipient dynamics and multilateral trade relationships. Krasachat (2023) focused on the Human Development Index (HDI), analyzing income, health, and education indicators. The study noted substantial improvements in all three dimensions but also observed a correlation between economic growth, human development, and increased carbon emissions.

Kundu et al. (2023) used cross-sectional health survey data to analyze disparities in neonatal mortality trends. Their study found a negative correlation between infant mortality and living standards, with factors such as child gender and urban versus rural settings playing significant roles. Murad et al. (2023) employed GLS random effects to study infant mortality determinants in developing countries. Their results showed a positive relationship between fertility rates and infant mortality, while higher GDP was associated with lower infant mortality rates. Moreover, the study of Serván-Mori et al. (2023) describes the aspects of socio-economic that has significant influence on new-born mortality.They also emphasized the role of maternal education for the improvement of new-born survival. Similarly, the study of Soofi et al. (2023) analyzed the maternal behavior, particularly in Pakistani context. Their findings show that higher infant and child mortality rates were more likely experienced by the mothers who are under the age of twenty. Their study also put emphasis on the key role of mother's education to improve the new-born survival rates too.

Additionally, the study of Applegate et al. (2024) by employing Hzard model found that higher mortality risks are more faced by male newborns then the female newborns in their early first year life.This argument is also supported by the study of Pandey, Rahut and Araki (2024) who investigates the gender discriminations in Child nutrition in Indian context by employing the data of National Family Health Survey 2015-16 and 2019-21. The other factors that significantly effects new-born and child mortality rates are domestic issues, maternal care, and socio-economic issues (Kim & Jin, 2024; Sarkar & Sensarma, 2024).Jana et al. (2023) studied neonatal mortality in India and found that women in the central region faced a 28% higher risk of neonatal mortality compared to other areas. Katara (2024) investigated factors influencing neonatal mortality among 600 couples in central India. The study showed that the type of delivery attendant significantly affected neonatal mortality rates, while maternal health status was negatively associated with mortality outcomes. In short, these studies emphasize the complex nature of child mortality. They highlight critical importance of the maternal education, socioeconomic conditions, healthcare investments, and strategic aid allocation in reducing mortality rates and fostering sustainable development (Ahmed, Azhar, & Mohammad; Dler M Ahmed, Z Azhar, & Aram J Mohammad, 2024; Dler Mousa Ahmed, Zubir Azhar, & Aram Jawhar Mohammad, 2024; Mohammad, 2015a, 2015b; Mohammad & Ahmed, 2017).

3. Theoretical Framework

Particularly, to unleash the Role of Foreign Aid and Health Crisis in Pakistan, the explanatory variable is the foreign aid and the dependent variables are; Infant Mortality rate and Child Mortality rates. In this context, the dependent variables which are infant mortality rate and child mortality rate are likely to change in response to the independent variable which is foreign aid.

3.1. The General Theory of Growth and Development

This study employs the general theories related to Growth and the Development such as Biophysical Development Theory by Gesell and Theory of Erikson. The Biophysical Development Theory, proposed by Gesell, highlights the importance of physical growth and emphasizes that each child follows a unique growth pattern influenced by the interaction of genetic factors and the environment. The theory proposed that even in early pregnancy stages of the women the growth of child starts and it follows two important key patterns; cephalocaudal and proximodistal. The growth pattern where head and brain develop and grow first and then growth progress downward towards the feet,is knows as cephalocaudal growth. Meanwhile, the other main growth

patternw in which central body parts like heart develop and grow first and then growth progress towards the outer parts such as arms and legs, is known as proximodistal growth. These patterns show the systematic and organized way of child's physical growth and development. Erikson's Psycho-social Development theory put all emphasis on the psychosocial feature of human growth and development which include cognition, behavior, and personality. According to Erikson, human growth follows to eight different stages, from infancy to adulthood Each stage presents conflicting challenges that must be resolved to ensure successful development. The first stage, trust versus mistrust, occurs from birth to one year of age and is foundational for building trust in caregivers and the environment. An infant needs physical comfort and a reliable and sensitive caregiver during this stage to build a sense of trust in the world around them, by doing this they can feel the world is a safe and anticipated place.

This study aims to evaluate the causal factors of child mortality based on two theoretical perspectives. The two theoretical perspectives of this study are Modernization Theory and Social-Democratic Theory. The Modernization Theory is related with new Classical-Theory and support the argument that economic growth can reduce the gap between developing and developed countries. The quality of life can improve by economic growth and it leads to the enhancement in medical technologies and consequently the ratio of child mortality drops down. The big issue that many developing countries are currently facing is the child mortality. It is the global issue which is significantly studies and has been research. The framework of Ferreira, Schady and Baird is employed in this study. This framework highlights the factors of child mortality such as public health expenses, parent's dedicated time to childcare and the consumption of health-improving goods from the household income. This study highlights the socioeconomic factors such as health, education and environment that are necessary for the Human Development. Improving living standards and the quality of life remains a crucial goal across regional countries. This study conducts a comparative analysis of healthcare development in the region by examining key health indicators such as life expectancy at birth, infant mortality rate, maternal mortality rate, under-five mortality rate, and population growth. The focus is on developing countries, including Bangladesh, Bhutan, China, India, Indonesia, Malaysia, Nepal, Pakistan, the Philippines, Sri Lanka, and Thailand. The data for this analysis has been sourced from the World Bank.

4. Data and Methodology

The study utilizes time-series data spanning the years 2000 to 2020. This data was collected from World Development Indicators (WDI) and Economic Survey of Pakistan. To determine the stationarity of the data, the Augmented Dickey-Fuller (ADF) test is applied. For analyzing both short-term and long-term relationships, the Johansen Co-integration Test was employed. This method offers several advantages, It is well-suited for small datasets, and accommodates both the same and mixed orders of integration. The model used in this study is structured as follows:

$$CMR = f(GDP, MLR, MMR)$$

and the Econometric model is presented as:

$$CMR = \beta o + \beta 1\, GDP + \beta 2\, MLR + \beta 3\, MMR + ut$$

Where:
CHMOR = Child Mortality Rate
MLR = Mother Literacy Rate
MMR =Maternal Mortality Ratio
GDPPC= Gross Domesticper Capita
U_t = error term

In our study we have checked Role of Foreign Aid and Health Crisis in Pakistan. In which we choose the variables such as Child Mortality Rate, GDP per Capita, Mother Literacy Rate and Maternal Mortality Ratio. Our dependent variable is infant mortality rate and the Independent variables are the Gross Domestic Product per Capita, Mother Literacy Rate and Maternal Mortality Ratio. ADF has been used to test the stationarity. Johanson Co-integration Test has been used to check and explore the short-run and long-run impact.

Table 1: Variables and Data source

Variables	Source
Child Mortality rate	WDI
GDP per Capita	WDI
Mother Literacy rate	WDI
Maternal Mortality Rate	WDI

To ensure the accuracy and reliability of the variables, this study employed the Augmented Dickey-Fuller (ADF) unit root test. The findings reveal that null hypothesis is accepted in level form and in the form of first difference is rejected.It shows that that integrated order is I(1) while based on the results the Johansen Cointegration Test is employed to determine the short-run and long-run relationships between the variables.The main and core objective of the study to unleash the long run criticality of health sector of Pakistan with specific focus on child mortality and its other relevant factors.These findings indicate that the included variables share a stable and meaningful relationship over the long term.

Table 2: ADF Results

At Level	With Trend	1st difference	With Trend	Results
CMR	0.8631	ΔCMR	0.0032	I(1)
GDP	0.8114	ΔGDP	0.0240	I(1)
MLR	0.0860	ΔMRL	0.0000	I(1)
MMR	0.8424	ΔMMR	0.0397	I(1)

Table 3: Trace Test

HO	H1	Test statistics	5% critical Values
r =0	r ≥ 1	162.9546	53.87610
r ≤ 1	r ≥2	56.15116	12.91525
r ≤ 2	r ≥ 3	30.55213	25.87211
r ≤ 3	r ≥ 4	10.87218	12.51798

Table 4: Maximum Eigen Values

HO	H1	Test Statistics	5% critical values
r = 0	R= 1	32.11832	0.00000
r ≤ 1	R=2	25.82321	0.0535
r≤2	R=3	19.38704	0.0453
r ≤3	R=4	12.51798	0.0927

Initially, this study employed the ADF Test to check the validity and reliability of variables. The results are insignificant at level. And then checked the first difference, and the results were significant at the level of significance of 5% which are denoted by I (1). Then this study moves on to Johanson Cointegration Test rather than ARDL test because all the results are significant at first difference and all results are insignificant at level. The Johanson Cointegration Test used two kinds of statistics, the Trace Statistics and the Maximum Eigen Values. These two statistics showed that T values are the more than the critical statistics. As T values are the more than greater than the critical statistics, so the null hypothesis is in fact rejected by this study, consequently the existence of co-integration. Based on results, there is only one cointegrating equation in Trace Statistics and also only one cointegrating equation in Maximum Eigen Values. The Johansen Co-integration Test employs two key statistics: the Trace Statistic and the Maximum Eigenvalue Statistic. The results of both tests reveal that the T-statistics exceed the critical values, leading to the rejection of the null hypothesis. This indicates the presence of co-integration among the variables. According to the findings, there is one co-integrating equation in both the Trace Statistic and the Maximum Eigenvalue Statistic. The Co-integration Analysis in the health sector highlights a long-term negative relationship between child mortality and foreign aid, demonstrating a positive impact on Pakistan's health outcomes. Specifically, an increase in foreign aid is resulting the with major reduction in the case of child mortality rate. Additionally, foreign aid has a significant inverse effect on maternal mortality, meaning that as foreign aid increases, the maternal mortality rate decreases. Furthermore, the analysis indicates a positive relationship between foreign aid and GDP per capita, suggesting that foreign aid contributes to overall economic growth in Pakistan. It means GDP per capita and mother literacy increase with the increase in foreign aid. Later, this study used Cu-sum and Cu-sum Squares of Test to check the reliability and validity of data. This graph shows that the results are significant at the level of significance at 5%.This study shows that there are positive impacts of foreign aid on health sector. It means the improvement in the health sector increase if foreign aid increases. The child

and mother mortality rate also fall with the increase in foreign aid. Mother literacy rate and GDP per capita increase with the increase in foreign aid.

The construction and development of the hospitals and clinics and availability of medical tools by foreign aid has played a main role to promote the development of healthcare basic infrastructures. The programs related to preventing and controlling severe diseases such as vaccination campaigns, efforts to control infectious diseases, and activities to improve public health are also supported by foreign aid. Specifically, in distant and deprived areas and regions, foreign aid by giving training to healthcare professionals and doctors, launching health facilities and construction of basic medical resources can contribute to promote and encourage the access to healthcare services. Aid programs address the specific health issues dominant in certain region and health inequities by focusing helpless populations such as children and women. Foreign aid often includes components such as training of healthcare professionals and improvement in medical education to enhance the overall quality of healthcare services in the country. The aspects such as transparency, accountability, effective monitoring and evaluation devices play vital role to analyze and unleash the foreign aid's impact on health sector. It also helps to implicate the law and regulations and sustainable strategies. Foreign aid should contribute to the growth of a sustainable and independent health sector. This involves not only addressing immediate healthcare needs but also investing in systems and policies that promote long-term development. So, at the end of this discussion, this study conclude that foreign aid is very helpful, and it has positive impacts on the economy of a country. The results also shows that foreign aid has positive impact on the health sector of Pakistan and with the increase in foreign aid there will be improvement in the health sector of Pakistan. For example, when foreign aid increases than child mortality rate decreases, maternal mortality rate decreases, and it also analyze that country's GDP per capita and mother literacy rate increases.

5. Conclusion

This study investigates the effectiveness of foreign aid in strengthening Pakistan's health sector, with a particular focus on its role in reducing child mortality rates. A cointegration model was used to estimate the relationship between foreign aid and health outcomes. ADF test is conducted for the stationarity of variables. The findings are statistically significant at the level and became even more robust after testing at the first difference, demonstrating the reliability of the findings. After this study has used the Johanson Cointegration Test because all our results are statistically significant at first difference. After confirmative order of integration, Johanson Likelihood Ratio is used to check the long term equilibrium relationship between the variables. The above given models models areanalyzed and estimated from the time period of 2000-2020 by using time series data. Johanson Cointegration test used different statistics, one is Trace Statistics and other is Maximum Eigen Values. Both these statistics show t-statistics are higher than the critical values. If t-statistics are higher than the critical values, then we reject the null hypothesis. And if we reject the null hypothesis, it means that there will be existence of co-integration. The Results show that there is only one cointegrating equation in trace statistics and only one cointegrating equation in Maximum Eigen Values. The findings indicates inverse long term linkages between the foreign aid and child mortality rate. A rise in aid leads to significant effects on the child mortality rate. The maternal mortality rate also had a negative relationship with foreign aid. It means when foreign aid increases, maternal mortality rate decreases. Foreign aid had a positive relationship with GDP per capita and Mother Literacy Rate, it means if foreign aid increases than GDP per capita and mother literacy rate increases. In the end ,we have employed model stability tests named; Cusum and Cusum Squares which are confirming the real role and effect \of the foreign direct investment on health sector in Pakistan. This study also guides the policy maker by stressing up the proper allocation and use of foreign Aid in health Pakistan and also inn other developing countries.

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