

# **Impact of Remittances on Child Health**

*A Case Study of Pakistan*



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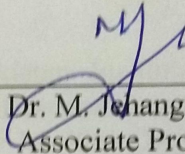
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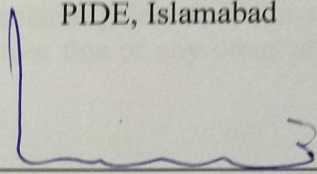
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This is to certify that this thesis entitled: "**Impact of Remittances on child health. A case study of Pakistan**", submitted by Mr. Akhtar Ali Shah is accepted in its present form by the Department of Health Economics, Pakistan Institute of Development Economics (PIDE), Islamabad as satisfying the requirements for partial fulfillment of the degree of M. Phil in Health Economics.

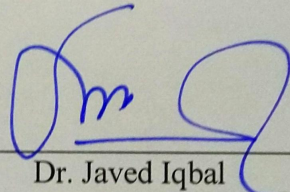
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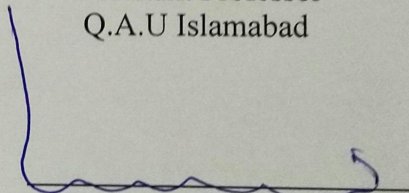
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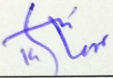
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**AKHTAR ALI SHAH**

## **Abstract**

This study attempts to investigate the impact of remittances on child health in Pakistan. To investigate this our study uses Pakistan Panel Household Survey (PPHS) 2010, and employs the Ordinary Least Square (OLS) method. For an in-depth analysis, three different z-scores, i.e., weight-for-age, Height-for-age, and Weight-for-height are constructed. Additionally, the study also develop an overall year, index of the three z-scores Principle component analysis (PCA) to the impact of remittances on child health. The finding of the study suggests that remittances inflow to households significantly affect child health. Remittances are directly related with overall child health and other anthropometric indicators (WHZ, WAZ, and HAZ) for households receiving remittances compared to non-receiving households.

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# Chapter 1

## 1.1 Introduction

Human migration is the movement from one place to another with the intentions of settling permanently or temporarily. The movement often occur over long distances, from one country to another, nevertheless the internal migration also takes within the territories of the country. Migration has become a priority for most people (particularly in less developed economies) in order to find better living conditions. In recent decades, urbanization and globalization are considered the main triggering factors to accelerate future migration (Lucas, 1997; Massey et al., 1998). The flow of people from developing world to economically well-off countries are expected to increase in millions. The number of migrants as a fraction of the population residing in high-income countries rose from 9.6% in 2000 to 14% in 2017 (International Migration, 2017). The migrant workers usually transfer money to their home country, this money is called remittances. Remittances are one of the largest financial inflows to developing countries especially labor-exporting countries (Al-Assaf et al., 2015). Remittances sent back by migrants to their origin state, low and middle income economies likely to increase by 3.5 percent in 2018 to \$466 billion, while the global remittances are more likely to grow up by 3.4 percent amounting \$616 billion in 2018 (world bank, 2017).

Beyond liquid assets' definition of various scholars such as Levitt (1998) consider the term foreign remittances as "social transfers", which take into account the transmission of ideas, behaviors, and social capital, from host community to the origin society. Such flow of socio-economic activities is good for remittances receiving economies as it can increase private enterprise, political harmony and society formation. Albeit, constructive and destructive dimensions are mutually associated

with foreign flow of money, however a progressive impact to inclusive societal development is made by any form of foreign wealth such as the interchange of health, educational and communal practices and relocation of different business expertise (Mara et al., 2012).

The remittances also enhances the economies of developing world, i.e. improve insurance and financial markets by raising investment in both the human and physical capital (De Haas, 2007), and hence, labor-exporting economies expected to experience higher growth level over the time. However, the question arises that besides macroeconomic outcomes, do remittances also effect the citizens' health dimensions positively or negatively? The practical feature found in the existing literature has shown varied results by asserting, the positive and negative features.

Child health is a state of physical, mental, intellectual, social and emotional well-being and not merely the absence of disease or infirmity<sup>1</sup>. Wellbeing incorporates both physical and psychological (emotional & cognitive development) aspects and is central to belonging, being and becoming. Wellbeing includes good physical health (development, and safety), feelings of happiness, satisfaction and successful social functioning. It influences the way children interact in their environments.

Infants (under-five-years) are unable to attain health life standard. As matter of fact, child under-five-years are dependent on their family and general environment delivering the required surroundings where they can learn and grow successfully. Healthy children live in families,

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<sup>1</sup> Definition of Health by WHO

environments, and communities that provide them with the opportunity to reach their fullest developmental potential. Prior to the view, money flow to the households keep the child nutrition consistent, decrease infant mortality rate and assist better health care services (Dorantes et al., 2007 and Dorantes and Pozo,2009; Daniel and López, 2012), as in Mexico, 1% increase of remittances, increased the life expectancy by 0.03% and decreased child mortality rate by 0.15% (Zhunio et al., 2012).

The behavioral researchers reveal that comparison to non-migrant, the migrant household tends to spend more portion of money on nutritional food, medical care, and better housing. For instance, the child born at migrant households are less probable to decease in early week of birth i.e. 3% than non-migrant households. Furthermore, the infant mortality falls in remitted households. The impact of remittances on nutrition can be positive, since it makes the household income higher, and so better access to food (Taylor et al., 2003). On the other hand, the effect can remain negative for controlled household income because migration probably condense household food availability caused by decrease in family labour. (Sesabo, 2001; Azam and Gubert, 2006).

Besides, the financial flow, the remittances also has positive impact on health, by relaxing liquidity constraints, if not restrict access to health care. Kanaiaupuni and Donato (1999) analyzed, regardless of the early unsettling influence on household (separation), subsequently, as migration becomes “institutionalized” and the household gets money assistance, child mortality considerably drops. Undesirable association concern the adverse health consequences of remittances through shared and social channels as Kanaiaupuni and Donato (1999) has related, infant mortality (under-five-years) tends to increase because of separation within the family. Since, transfer of social ideas can document some adverse effects, adopting to new life standards (Levitt, 1997). Migrated

people can bring about communicable diseases and disseminate them to the environment in general, diseases like tuberculosis and HIV aids can cause social unrest in society (Kanaiaupuni and Donato, 1999; Perez-Stable et al., 1986).

The rapid development of the concepts of globalization and migration, both internal and external migration in case of Pakistan has been increasing since inception of the idea. Currently, the number out-of-country people is nearly 8 million and expected to significantly increase further over the course of coming years. The recorded money inflow from people living abroad in 1976 were \$412 million and were steadily increasing year after year, crossing a billion dollars in 2000, and from here, on average over a billion dollars registered each year, in 2014 Pakistan total remittances stood at \$16 billion. With these huge economic blessing the researchers has mainly focus the magnitude and demographic timelines of the out-migrants. Moreover, recently the effects of the remittances have also been investigated at macroeconomic side by side; that is, employment level, Gross national product, private savings, private investment, and balance of payment. Nevertheless, in country like Pakistan which receives billions of dollars each year in the form of remittances, the researchers fail to explore its impact on health outcomes. The aim of this work is to determine the impact of remittances on health outcomes (child health) in Pakistan, which remained the neglected part of research agenda.

## **1.2 Problem statement**

Pakistan is a developing country and stand low at human capital index and it is estimated might lose 8.2% of GDP due to poor child growth. This is three times, more than spending on health as a percentage of GDP (2.8%). One-fifth of newborns are low birth weight, and 38% of the below

five year age are underweight. Nutrition status of less than five years children have shown no improvement from last 46 years (Ayesha Khan). The debilitate development of child at early stage significantly costs countries. Moreover the poor health of child adversely effects the economic activities of a child in later years of life. Pakistanis living abroad sending \$19.622 billion of remittances annually (SBP, 2018). The child health linked to remittances cannot be overlooked owing to the fact of its long-term consequences for the child. This issue has not been properly addressed in the past, therefore this study investigates the impact of remittances on child health status in Pakistan.

### **1.3 Objectives of the study**

Specifically objectives of the study are:

1. To calculate and compare z-scores of child health status for remittance receiving and non-receiving household.
2. To examine the effects of remittances on child health in Pakistan.

### **1.4 Significance of the study**

Remittances have far reaching effects in developing economies. Not only as a liquid transfer, but also a social transfer, remittances promote flow of ideas, behaviors, identities, social capital, entrepreneurship, political integration and community formation from destination community to the migrant. With all these effects, remittances could leave a strong effect on standard of living and thus on health status of the remittance receiving individuals. However, the health outcome of remittances remains of the neglected part of research. The present study contributes to migration literature by exploring the health effects of remittances on child health status in Pakistan, as they might be more conscious about the children health. We inquired that how remittances effect

various dimensions of child health, and how this effect varies across the urban and rural areas of Pakistan. This whole analysis enhances our understanding about the true health effect of remittances in Pakistan.

### **1.5. Organization of the Study**

The structure of this study is set out in five thematic frameworks such as; Chapter 1 discussed the Introduction with the concept to the background of the study and knowhow of the problem under consideration. Review of related empirical research is demonstrated in the Chapter 2. Data sources and methodology has been reported in Chapter 3. Results and discussions has been testified in Chapter 4. However the finale of this study reports conclusion and policy recommendations.

## **Chapter 2**

### **Literature Review**

There is a huge literature that discuss various dimensions of remittances. In this chapter we present the literature which discuss the consequences of remittances on health outcomes, around the world.

#### **1.1. Literature Review**

The determining factors in the literature of remittances are influenced by number of incentives to send money to origin state i.e., insurance (Agarwal and Horowitz 2002; Gubert, 2002), altruistic (Solimano 2002; Treman 2007), loan payment (Ilahi and Jafarey 1999; Porine 1997) and importantly self-interest motives (Lucas and Stark 1985). Diverse theories of remittances has shown contrary results, not only for the economies depending on the welfare and utility of the households but also has shown diverse nature towards micro-economics and macroeconomics; more or less central factors for the former are migrants' income level, education, marital status, stay period abroad, the number of dependents at home (Melkonyan and Grigorian 2012; Rapoport and Docquier 2006; Lucas and Stark 1985), but the macroeconomics has depicted differences in wage rate and economic environments by home and migrated country (McNabb 1999; Ahmad *et al* 2005), and the differences of income differentials, real interest rate policy, inflation rate, political stability of home and home countries, and the affluence of money transfer from countries as foremost determinants of remittances (McNabb 1999; chami *et al* 2003; Akkoyunlu and Siliverstovs 2013; Gupta 2006).



Human have very volatile nature which respond positively to change which make their life better and improve their socio economic and social well-being; people search for better job and migrate to different place within the country or out of country for good earning and better life. There are few studies found on the impact of remittances on child health outcomes exclusively. The study of Frank and Hummer (2002) revealed that the remittances improve the newly born babies especially new born has high birth weight, they also discussed that the remittances also improve overall health of family. Similarly, the study conducted in Mexico multiple cities by Cordova (2005) using time series data discuss that those household who receive remittances have low infant mortality rate as compared to those households which do not receive any remittances because those households which receives remittances spends more on nutritional food medical care, and improved housing. Which is why infants born in migrant households are 3% less likely to die than in non-migrant households and are approximately 5% less likely to be born underweight.

A study conducted by Amuendo-Dorantes and Pozo (2009) from Mexico examined the relationship between remittances and healthcare expenditure. They used 2001 household data from Mexico. Their study reveals that remittances have a positive impact on health care utilization. They also concluded that in low-income households the health care expenditure is less responsive to remittance income as compare to high income-level households. Lindstrom and Munoz-Franco (2006) estimated the impact of remittances and health care expenditure in Guatemala. The study concluded that remittances is having a positive effect on health care expenditure. They also concluded that rural areas households are keener to use remittances money on health care expenditure. Frank (2009) study explore the relation between Remittances and health care expenditure in Mexico. He used cross-sectional data for the period of

2006 and used logistic approach for the estimations. His results reveals that increase in remittances improved the health care utilization in Mexico. Another study conducted in Mexico by Valero-Gil (2008) estimated the impact of remittances on health care expenditure also reveals positive relationship between health care utilization and remittances. It discussed that due to remittances the health care expenditure rises almost 11.3%.

The study of Kanaiaupuni and Donato (1999) reveals that in short run the infant mortality rate increases due to the migration of the household members, but with the passage of time this effect positively impacted infant mortality rate as communities experienced long term migration patterns. The study of McKenzie (2006) discussed the increase in infant mortality of migrant household member that infant faces the consequences like the migration of members can cause trouble in breast feeding infants may possibly not be breastfed appropriately and may be less likely to be vaccinated accordingly on the given schedule.

The study of Duryea *et al.* (2005) found that the remittances have positive effect on infant survival through improvements in living conditions. The study of Zhunio et al. (2012) which was conducted in Mexico revealed the positive impact of remittances on health outcomes. They discovered that 1% increase in remittances per capita and reduced infant mortality rate by 0.15% and increased the life expectancy by 0.03%.

The study of Thoumi (2016) analysis the impact of remittances on health expenditure by household who earn money from overseas by using secondary data and uses multivariate analysis and dynamic GMM approach. His study explains that remittances do not have direct impact on health

expenditure of government and by individual to reduce but it has certain positive impact on health outcome like decrease in infant mortality rate and under-five mortality rate. Amuedo-Dorantes and Pozo (2009) discover in their study that estimated 100 Mexican peso increases in remittances cause an increase in health expenditure of 5 or 6 Mexican peso. The Cen Camal (2012) conducted study in Mexico which revealed that Mexican households use remittances to pay off health related debt, suggesting that remittances can be used at the household level to prevent catastrophic health payments that can push a household further into poverty. Amuedo-Dorantes et al. (2007) discovered that higher income remittance receiving households spent 7% of remittances on health compared to 4% in lower income remittance-receiving households. Others estimates suggested that households that do not have access to formal health insurance is to spend 11% of remittances on health compared to 8% for households with formal health insurance.

Migration improve household survival with time as they become part of institute and community life, the study of Ponce et al. (2011) evaluate the remittances impact on health outcomes in Ecuador. They study explain that remittances do have impact on health expenses and shows that remittances have significant effect on medical expenses, remittances income are used in both in emergency and preventive situation, and remittances has significant and positive impact on health knowledge. Secondary data and OLS methods are used for study analysis; the study used some instrumental variable for robust result. The study shows that almost people spend half of the remittances on medicine when they get ill and receive complete treatment which is expensive and not possible for general people.

The study of Farooq (2015) explain the impact of migration and remittances on socio-economic life of people, the study analysis the differences in expenditure among migrated people who receive remittances and people who do not receive remittances. The study utilized primary data Remittances & Health Survey (RHS) and secondary data Pakistan Social and Living Standard Measurement Survey (PSLM), and used exploratory data analysis, Bi-variate, Multi-variate analysis has been done for remittances health nexus and propensity score matching done for RHS to see the welfare impact of remittances on health. The study result showed expenditure on health is higher for recipient, who gets money out of the country as compare to those recipient, who receiving remittances within the country and from non-recipient. People receive remittances from abroad seek good health facilities and take good nutrition as compare of other two group; education and family size also have positive effect on remittances. Facilitating remittance inflow government of Pakistan Ministry of overseas, Ministry of Finance and State Bank of Pakistan (SBP) introduced new scheme Pakistan Remittances Initiative (PRI), with aim to make the inflow of remittances easier, faster and cheaper in short term and in long term goals to create investment opportunities for overseas; the study of Qureshi (2016) explains that PRI main purpose was to make remittances inflow through formal channel from informal. The study says that remittances increase aggregate demand in the economy, it can facilitate small businesses and entrepreneurs, it also enhances the ability of household who are depended on remittances income to fulfil basic needs and necessities. Remittances help to spend more on health, education and make consumption possibly easy.

The study of Regmi and Paudel (2016) estimate secondary data, using Ordered Probit regression model, to analysis the impact of remittances on food security of a household. The study result

shows that remittances have significantly negative impact on health outcomes, and while remittances have positive impact on education and literacy. The study further discussed male operating head of household and wage earn out of farm in Bangladesh. The result shows that remittances indirectly have impact on health expenses, it increases household disposable income and enhance ability to improve their socioeconomic conditions, to spend more on food to improve food security, to improve health by taking good nutrition and decrease mortality rate and also have access to better health facilities

## Chapter 3

### Data and Methodology

This chapter present data sources, variables description, and econometric methodology, used to cover the objectives of the study.

#### 3.1. Data

The data for this study is taken from Pakistan Panel Household Survey (PPHS) 2010 conducted by Pakistan Institute of Development Economics (PIDE). In 2001 PIDE conducted the first round of survey and named it, Pakistan Rural Household survey (PRHS). It consisted a total of 16 districts from four provinces. In 2004 its second round was concluded whereas third round was completed in 2010 with additional urban sample, and as Pakistan Panel Household Survey (PPHS). In third round (PPHS) the urban sample was included in 2010 for all 16 districts covering entire country and strengthen the representation.

The total number of households were increased from 2721 in 2001 to 4142 in 2010. A total of 2800 rural households were interviewed from four provinces. 1342 urban households were added increasing the PPHS 2010 to a total of 4142 households.

Total rural household	Urban household	Total sample
2800	1342	4142

*Source: PPHS 2010*

Two sets questionnaire were directed for male and female in PPHS 2010 to congregate inclusive information about household socio-demographic dynamics that is Roster education, income, employment, migration, consumption, housing and health etc. Female's questionnaire collected

information with special focus on health, housing, livestock ownership and shocks and coping strategies whereas male questionnaire gather information from all males about migration, employment and consumption. The information about migration, remittances and child health, being the only data available on household characteristics to prospect the impact of remittances on child health outcomes.

Exclusion ranges recommended by the WHO for anthropometric variables are: values for, WHZ below -5 or above +5, WAZ below -6 and above 5, and HAZ below -6 or above +6. After applying the exclusion range, during data cleaning process, we were left with final sample of 1,062 observations for the analysis.

## **3.2. Description of variables**

### **3.2.1. Measurement of Remittances**

The PPHS has complete information about domestic and foreign remittances received by household. This study incorporates only foreign remittances to analyze its effect on child health outcomes. The question for availability of foreign remittances is being asked in part 2 (out migration and return migration) of section 6 using dummy variable (0 for household not receiving remittances and 1 for house hold that receiving remittances).

### **3.2.2. Gender of Household Head**

It's important variable to know about the inflow of remittances. Diverse studies have depicted significant relationship between sex of household head and inflow of remittances. This study

analyzes this relationship and how it effects the inflow of remittances to household, headed by male or female. It is 1= male and 2=female.

### **3.2.3. Region**

This study captures the child health in analysis of both urban and rural region. Region plays key role in shaping child's health. This is be classified as rural and urban (Reference category).

### **3.2.4. Education of Household Head**

Education is important variable in term of household characteristics to figure out the impact of remittances on children health. It's generally accepted perception that educated people spent more of their income on in comparison with people having no education.

### **3.2.5. Child health (Dependent Variable)**

Child health is used as a dependent variable in the analysis. We determine the child health according to body weight and height of the children that whether the remittances are positively affecting the child weight for age and child height for age. Child health is defined on the following indicators:

Weight for height (WHZ), weight for age (WAZ) and height for age (HAZ) is calculated for the children under 5 years of age, which represent short-, middle-, and long-term indicators of under 5 nutritional status, respectively.



### 3.2.5.1 Dependent Variables Construction

To find the effects of remittances on child health, the commonly used technique is the construction of anthropometric indicators, based on height, weight, and age from a healthy population sample. Basically, there are three ways to express the evaluations with reference group; z-scores or standard deviation, median percentage, and percentiles (Cogill, 2003). O'Donnell *et al.* (2008) stated that z-scores are mostly preferred anthropometric measures, whereas apart from other two measures, it is used in summary statistics, meanwhile percentiles do not capture the large variations in height or weight at the extreme level, and the percent of median do not reflect large changes in reference population. In this regard we use z-scores for the analysis, which is expressed as ratio between the value of an indicator (weight or height) and median for same indicator, and for the same age and sex or height and the standard deviation of reference population. Z-scores calculated as:

$$z - score = \frac{(observed\ value) - (median\ reference\ value)}{(standard\ deviation\ of\ reference\ population)}$$

Three anthropometric indicators are generally used to access the nutritional status of children under five years, WAZ, HAZ, and WHZ showcasing body mass relative to height and age. WHZ shows short-term changes in child health, its low value indicate “wasting”, and extreme low values is linked with malnourishment. HAZ identifies long-term changes in child health, and is associated with chronic malnutrition. WAZ specifies body-weight relative to age, and is related with middle-term changes in child health. These z-scores have been commonly used in economics as dependent variable for evaluating short-, middle-, and long-term changes in health of a child (Morales,

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<sup>2</sup> Underweight: weight for age < -2 standard deviations (SD) of the WHO Child Growth Standards median  
Stunting: height for age < -2 SD of the WHO Child Growth Standards median  
Wasting: weight for height < -2 SD of the WHO Child Growth Standards median  
Overweight: weight for height > +2 SD of the WHO Child Growth Standards median

Aguilar, and Calzadilla, 2004; Alves, and Belluzo, 2004; Acosta, Fajnzyber, and Lo'pez, 2007; Duflo, 2003).

### 3.3. Model Specification

$$ChH = \alpha + \beta Remit + \gamma HH Edu + \phi M Edu + \theta Ch Gender + \nu M Age + \lambda HH Age + \epsilon(1)$$

In the above equation, *ChH*= a child health variable, which is used as a dependent variable. It represents overall child health, combining three child health indicators (WHZ, WAZ, and HAZ) through Principal Component Analysis.

*Remit* = the remittances to a household. This variable is dummy which takes the value of 1 for the household receiving the remittances and 0 otherwise.

*HH Edu* = is the education level of the household head in years.

*M Edu* = is the mother education.

*M age* = is the mother age.

*HH age* = Household Head age

*Ch Gender* = sex of the child. This variable is dummy which takes the value of 1 for the male household and 0 otherwise.

$\epsilon$  = is the error term.

Equation 1 is estimated for our final sample 1,062.

#### Models:

Model 1: In model 1 we used the average of three indicators (WHZ, WAZ, and HAZ) computed through PCA as dependent variable for child health. This model show the impact of remittances on over-all child health.

$$ChH = \alpha + \beta Remit + \gamma HH Edu + \phi M Edu + \theta Ch Gender + \nu M Age + \lambda HH Age + \epsilon$$

Model 2: In model we analyze Height-for-age (HAZ) showing long-term changes in child health in relation to remittances.

$$HAZ = \alpha + \beta Remit + \gamma HH Edu + \phi M Edu + \theta Ch Gender + \nu M Age + \lambda HH Age + \varepsilon$$

Model 3: Through this model the impact of remittances on weight-for-age (WAZ) is examined, describing the middle-term health status of a child.

$$WAZ = \alpha + \beta Remit + \gamma HH Edu + \phi M Edu + \theta Ch Gender + \nu M Age + \lambda HH Age + \varepsilon$$

Model 4: Model 4 identifies the remittances impact on weight-for-height (WHZ), showing the short-term changes in child health.

$$WHZ = \alpha + \beta Remit + \gamma HH Edu + \phi M Edu + \theta Ch Gender + \nu M Age + \lambda HH Age + \varepsilon$$

In the above models, HAZ, WAZ, and WHZ are used as dependent variable for investigating child-health-status.

### 3.3.1 Estimation Methodology

For estimating the effect of remittances on child health in both equation (1 & 2), we have used the linear regression analysis with ordinary least square method (OLS) for estimations. The reason for using OLS method is that our dependent variable (child health) is continuous variable (Gujarati, 2009). OLS is a very fundamental model used in economic analysis. Eq 2 mentioned above used in the process of estimations using OLS technique. However, we are working on cross sectional data; therefore, we might face the problem of Heteroscedasticity. The OLS estimators and regression predictions based on them remains unbiased and consistent. The OLS estimators are no longer the BLUE (Best Linear Unbiased Estimators) because they are no longer efficient, so the regression predictions are inefficient too (Greene, 2003). To handle this issue we have used robust corrected standard error regression.

## Chapter 4

### Results and Discussion

#### 4.1 Descriptive Analysis

The final sample of the study covers information about 1063 households, different characteristics of the household are taken, with the additional constructed anthropometric variables (WHZ, HAZ, WAZ) indicating child health in the analysis. Among these variables, Remittances measures through Dummy (0=not receiving and 1= receiving). The lowest average value 0.098 with variation of 1.540 linked to HAZ (anthropometric variable). Furthermore, the average values for the variables; Household head age, Household size, mother-age, weight for age, weight for height, and weight for age, are 45.82674, 9.791902, 30.83522, 0.515, 0.134 respectively with variation of 14.047, 4.369, 6.841, 1.032, and 1.161. Most of the numbers are very close to the average value of weight for height with variation of 1.032.

**Table 4.1 Descriptive statistics overall.**

	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<b>HH-age</b>	45.82	14.047	21	88
<b>HH-size</b>	9.79	4.369	3	33
<b>M-age</b>	30.83	6.841	16	64
<b>WHZ</b>	0.51	1.032	-5.52	5.52
<b>HAZ</b>	0.09	1.540	-6.63	6.63
<b>WAZ</b>	0.134	1.161	-5.50	5.96
<b>Remittances</b>	0.432	0.743	0	1

*Source: Author's own calculations*

Table 4.2 shows the non-remittance household Out of total sample; 773 observations are non-recipient households after constructing Dummy variables for remittances. Amongst these variables the maximum mean value 45.80 is associated with Head of household age with variation of 13.57 meanwhile the lowest mean value 0 is shown by remittances, with variation of 0, the reason being,

the households are non-recipients. The remittances show the same lowest pattern 0 value for the standard deviation while the highest standard deviation is related with household head age.

**Table 4.2 Descriptive statistics non-remittances receiving households**

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<b>HH-age</b>	45.08	13.57	21	88
<b>HH-size</b>	9.32	3.64	3	20
<b>M-age</b>	31.31	6.95	20	64
<b>WHZ</b>	0.49	1.04	-5.52	4.97
<b>HAZ</b>	0.09	1.55	-6.63	6.63
<b>WAZ</b>	0.17	1.23	-5.50	5.96
<b>Remittances</b>	0	0	0	0

*Source: Author's own calculations*

**Table 4.3 Descriptive Statistics for Remittances Receiving households**

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<b>HH-age</b>	47.82353	15.08978	22	81
<b>HH-size</b>	11.02768	5.711763	3	33
<b>M-age</b>	29.54671	6.356214	16	47
<b>WHZ</b>	0.577055	0.996167	-5.39067	5.528889
<b>HAZ</b>	0.102874	1.502254	-6.63585	5.905908
<b>WAZ</b>	0.03107	0.919791	-5.50333	3.577167
<b>Remittances</b>	1	0	1	1

*Source: Author's own calculations*

Table 4.3 shows the descriptive statistic of receiving remittances. The total sample size of the study is 1062 households, where the receiver of remittances are only 289 households. The results show, that, weight for age average value is 0.031 with standard deviation of 0.9197. The average mean for the remaining variables; household head age, household size, mother education, weight for height, and height for age, are 1, 11.02, 29.54, 0.57, 0.102 respectively, furthermore the standard deviation for the above-mentioned variables are 0, 5.71, 6.35, 0.99, 1.50 respectively.

## 4.2 Correlation Matrix

Variables	CH	WHZ	HAZ	WAZ	MEDU	REM	C_G	H_E	H_G	HMS	H_AG	M_AG	HHS
CH	1.0000												
WHZ	0.4469	1.0000											
HAZ	0.8392	0.0526	1.0000										
WAZ	0.7794	0.0644	0.5486	1.0000									
MEDU	0.0311	0.0051	0.0252	0.0332	1.0000								
REM	0.5419	0.2985	0.4522	0.3757	-0.0654	1.0000							
C_G	0.0152	-0.0749	0.0619	0.0193	-0.0058	0.0008	1.0000						
H_EDU	0.0200	-0.0207	0.0036	0.0593	0.1857	-0.3731	0.0620	1.0000					
H_G	0.0547	0.0406	0.0423	0.0330	-0.0011	0.0278	-0.0122	0.0029	1.0000				
HMS	-0.0034	-0.0046	0.0063	-0.0119	0.0952	0.0354	0.0154	0.0220	0.4777	1.0000			
H_AGE	0.0313	0.0392	0.0252	0.0034	-0.0753	0.0337	0.0137	-0.0718	0.0462	0.2146	1.0000		
MAGE	0.0440	0.1263	-0.0178	0.0122	-0.1653	0.0143	0.0460	0.1123	-0.0466	-0.0675	0.0536	1.0000	
HHS	0.004	0.0230	-0.0047	-0.0133	-0.1128	0.1304	-0.0722	-0.1826	-0.0472	0.1073	0.4750	0.1636	1.0000

Source: Author's own calculation

Correlation matrix is constructed to look for strength and direction between variables, the result of the above table is confirmed in the analysis where almost all the variables indicated positive and significant relationship.

## 4.2 Z-Score for different observable characteristic

**Table 4.4 Z-score**

<b>Variables</b>	<b>WHZ</b>	<b>WAZ</b>	<b>HAZ</b>
<b>Child Gender</b>			
<b>Male</b>	0.587	0.0091	0.113
<b>Female</b>	0.433	0.200	0.158
<b>Child Age</b>			
<b>≤ 2 years</b>	0.563	0.011	-0.120
<b>&gt; 2years</b>	0.475	0.173	0.351
<b>Mother Education</b>			
<b>No Education</b>	0.456	0.003	0.043
<b>Below Matric</b>	0.611	0.211	0.274
<b>Above Matric</b>	0.497	0.253	0.133
<b>Location</b>			
<b>Urban</b>	0.429	0.78	0.172
<b>Rural</b>	0.559	0.108	0.115

*Source: author's own calculation*

## 4.3 Location Wise Remittances

**Table 4.5 Location Wise Remittances**

<b>Remittances</b>	<b>Urban</b>	<b>%</b>	<b>Rural</b>	<b>%</b>	<b>Total</b>	<b>%</b>
<b>No Rem</b>	307	86.24	468	66.29	775	72.98
<b>Below 100K</b>	16	4.49	67	9.49	83	7.82
<b>101K - 200K</b>	11	3.09	81	11.47	92	8.66
<b>201K - 1000K</b>	21	5.9	81	11.47	102	9.6
<b>Above 1000K</b>	1	0.28	9	1.27	10	0.94
<b>Total</b>	<b>356</b>	<b>100</b>	<b>706</b>	<b>100</b>	<b>1,062</b>	<b>100</b>

*Source: Author's own calculations*

To look for location-wise tendency of remittances in rural and urban areas, remittances were categorized into five categories: no rem, below 100k, 101k – 200k, 201k – 10,00k and above 10,00k; in which 72.98% of the households are not receiving any remittances in both rural and urban areas. The highest trend is followed in rural areas, shown in the 5<sup>th</sup> column of table 4.5.

## 4.4 Household Head Literacy and Remittances

**Table 4.6 Household Head Literacy and Remittances**

Remittances	Literate	%	Illiterate	%	Total	%
<b>No Rem</b>	2	0.86	773	93.24	775	72.98
<b>Below 100K</b>	65	27.9	18	2.17	83	7.82
<b>101K - 200K</b>	82	35.19	10	1.21	92	8.66
<b>201K - 1000K</b>	75	32.19	27	3.26	102	9.6
<b>Above 1000K</b>	9	3.86	1	0.12	10	0.94
<b>Total</b>	<b>233</b>	<b>100</b>	<b>829</b>	<b>100</b>	<b>1,062</b>	<b>100</b>

*Source: Author's own calculations*

In the final sample 1,062, 233 households head are literate while the remaining 829 are illiterate. The 1<sup>st</sup> column shows different categories of remittance in which the highest trend is shown in 3<sup>rd</sup> column for literate household heads similarly the percentage for illiterate household heads is given in 5<sup>th</sup> column.

## 4.5 Models Results

### 4.5.1 Model 1: OLS Regression for Overall Anthropometric Indicators

To find out the association of overall child health i.e. Height-for-age, weight-for-age, and weight-for-height in Pakistan, for analysis we use <sup>3</sup>Principal component analysis (PCA). Table No 4.7 shows all the variables are positively and significantly linked with overall child health, apart from child gender, showing significant, but negative association -0.043 with dependent variable, the probable justification for this negative connection is that in developing countries, male infants are more favored in comparison with female infants. The coefficient of remittances (1.04), highly significant in household receiving remittances with better overall child health as compared to non-

<sup>3</sup> Principal Component Analysis (PCA) is used to explain the variance-covariance structure of a set of variables through linear combinations. It is often used as a dimensionality-reduction technique.



recipient household. In case of variables related to education i.e. mother education (0.136) and household-head-education (0.461), both shows positive and significant relation with child health.

**Table No. 4.7: OLS Regression for Overall Anthropometric Indicators**

Child Health	Coefficient	Significance level
Remittances	1.049	*
Household-Head Education	.461	*
Mother Age	.005	**
Mother Education	.136	***
Child Gender	-.040	***
Household-Head Age	.266	***
Constant	-.642	*

Number of Obs = 1,062  
 F(6, 1055) = 92.89  
 Prob > F = 0.0000  
 R-squared = 0.3411

\* Indicates Significant at 1 confidence level

\*\* Indicates Significant at 5 % confidence Level

\*\*\* Indicates Significant at 10 % confidence Level

\*\*\*\* Indicates Insignificant, P value greater than 10 %

Model Estimation is Perform Through STATA. See Detail Results in Appendix

*Source: Author's own calculation*

Likewise, mother-age and household head age also follow the same pattern, showing positive significant relations with dependent variable.

#### 4.5.2 Model 2: OLS regression for Height-for-age

For the analysis of child health indicator i.e. Height for age (HAZ) illustrating a long-term measure of nutritional status of child in relation with explanatory variables, remittances, Household Head education, Mother-age, Mother-education, Child Gender, and household-head age. The results are shown in Table 4.8 which illustrates that all variables are statistically significant in this regard, the remittances has positive relation with height for age (HAZ) which is confirm by its magnitude 1.647, the possible reason for it, as increasing the remittances leads to increase better child health status. This outcome is consistent with the study of (Antón José-Ignacio 2010) whose results also



information, education is necessary in dealings with child health problems, and they are more accessible to modern medical treatments (Behrman and Wolfe, 1984; Behrman, 1990; Thomas, Strauss, and Henriques, 1991; Glewee, 1999).

During analysis, dummies were developed for child gender, 0 for male, and 1 for female, as per the coefficient 0.160 of child gender, showed the male children were better-off than girls with positive and significant relation with height-for-age (HAZ). About gender, some researchers analyzed the presence of disadvantages for female infants in developing countries because they can be overlooked in comparison with females infants, for example, having worse access to health-care facilities or suffering other kinds of discriminations that negatively affect their diet (Osmani and Sen, 2003). However, most studies in Latin America indicated that male infants, other things being equal, have worse anthropometric indicators outcomes than girls (Rubalcava and Teruel, 2004; Borooah, 2005, Alves and Belluzo, 2004).

#### **4.5.3 Model 3: OLS regression for Weight-for-Age**

Table 4.9 presents the results of Model 3 in which we consider the weight-for-age is the dependent variable for child health. The weight-for-age depicts the middle-term nutritional level of children under five year. All the explanatory variables shows direct relation with weight-for-age (WAZ). Again the remittances has shown the significant relation with child health indicator with coefficient value of 1.77. This effect is well-matched with the works, Antón José-Ignacio (2010) found the same conclusion through instrumental variable technique, and Hildebrandt and McKenzie (2005) also found a positive effect on the reduction in child mortality and an increase in birth weight with and mother education (0.047) are positively associated with WAZ, these findings are in line with

**Table No. 4.9: OLS regression for Weight-for-Age**

			Number of Obs = 1062
			F(6, 1055) = 91.05
			Prob > F = 0.0000
			R-squared = 0.3320
<b>Weight-for-Age</b>	<b>Coefficient</b>	<b>Significance level</b>	
Remittances	1.775	*	
Household-Head Education	.778	*	
Mother Age	.010	**	
Mother Education	.047	**	
Child Gender	-.061	****	
Household-Head Age	.391	***	
Constant	-1.73	*	

\* Indicates Significant at 1 confidence level  
\*\* Indicates Significant at 5 % confidence Level  
\*\*\* Indicates Significant at 10 % confidence Level  
\*\*\*\* Indicates Insignificant, P value greater than 10 %  
Model Estimation is Perform Through STATA. See Detail Results in Appendix

Source: Author's own calculation

**Table No. 4.10: OLS regression for Weight-for-Height**

			Number of Obs = 1062
			F(6, 1055) = 22.22
			Prob > F = 0.0000
			R-squared = 0.1202
<b>Weight-for-Height</b>	<b>Coefficient</b>	<b>Significance level</b>	
Remittances	.690	*	
Household-Head Education	.235	*	
Mother Age	.017	*	
Mother Education	.105	****	
Child Gender	-.179	*	
Household-Head Age	.324	**	
Constant	-.438	*	

\* Indicates Significant at 1 confidence level  
\*\* Indicates Significant at 5 % confidence Level  
\*\*\* Indicates Significant at 10 % confidence Level  
\*\*\*\* Indicates Insignificant, P value greater than 10 %  
Model Estimation is Perform Through STATA. See Detail Results in Appendix

Author's own calculation from PPHS 2010

the remittances. Explanatory variables related to education i.e. Household head education (0.778), Glewwe (1999), and Alves, Denisard, and Walter Belluzzo (2004), furthermore WAZ is also positively linked with mother-age (0.104) and household-head-age 0.391.

#### **4.5.4 Model 4: OLS regression for Weight-for-Height**

The weight-for-height describes the short-term nutritional level of children under-five-year. In Table 4.10 we tabulated the results of Model 4 all the explanatory variables show direct relation with weight-for-height (WHZ) except child gender, which is inversely related to weight for Height. Again, the remittances have shown the significant relation with child health indicator with coefficient value of 0.69. From the results we concluded that increase in remittances leads to better the Weight for Height for children whose age are under five. The study of Antón José-Ignacio (2010) and Hildebrandt and McKenzie (2005) also confirmed the same results i.e. the study found that more remittances have positive effect on the reduction in child mortality and an increase in birth weight. Furthermore, WHZ is positively associated with mother-age (0.017) and household-head-age 0.391 which shows that older the mother and household head the healthier are the children. Explanatory variables related to education i.e. Household head education (0.235), and mother education (0.324) are positively associated with WHZ, these findings are also confirmed in the study of Glewwe (1999), and Alves, Denisard, and Walter Belluzzo (2004) which shows that higher education of mother and household head leads to better health for children whose age are under five.

In this chapter we discuss the results of all Models estimated through OLS, all Models provide the positive and significant rule of foreign remittance in child health. In the next chapter we focus on

the conclusion of our study, in context of literature and provide some policy recommendation for improving the child health through remittances level.

## Chapter 5

### Summary and Conclusion

#### 5.1 Summary

Human migration is the movement from one place to another with the intentions of settling permanently or temporarily in a new location. Migration has become a priority of most of the people (particularly in less developed economies) to find better living conditions. The migrant workers usually transfer money to their home country, called remittances. Remittances are one of the largest financial inflows to developing countries especially labor-exporting countries (Al-Assaf et al., 2015). Remittances sent back by migrants to their origin state, low- and middle-income economies likely to increase by 3.5 percent in 2018 to \$466 billion, while the global remittances are more likely to grow up by 3.4 percent amounting \$616 billion in 2018 (world bank, 2017). In case of Pakistan Currently, the out-of-country people is nearly 8 million and expected to significantly increase further over the course of coming years. The recorded money inflow from people living abroad in 1976 were \$412 million and were steadily increasing year after year, crossing a billion dollars in 2000, and from here, on average over a billion dollars registered each year, in 2014 Pakistan total remittances stood at \$16 billion. Recently it received a total of \$19.622 billion (SBP, 2018). For the role of remittances on health outcomes different studies has been conducted thoroughly. The study of Frank and Hummer (2002) revealed that the remittances improve the newly born babies especially new born has high birth weight, they also discussed that the remittances also improve overall health of family. Similarly, the study conducted in Mexico multiple cities by Cordova (2005) using time series data discuss that those household who receive remittances have low infant mortality rate as compared to those households which do not receive any remittances because those households which receives remittances spends more on nutritional

food medical care, and improved housing. Which is why infants born in migrant households are 3% less likely to die than in non-migrant households and are approximately 5% less likely to be born underweight. The child health linked to remittances cannot be remain overlooked owing to the fact of its long-term consequences for the child. So far, this issue has not properly been addressed in the existing literature. Thus, this study investigated the impact of remittances on child health status in Pakistan.

This study analyzed the impact of remittances on child health in Pakistan across urban and rural areas. Secondary data is used in this study, the data is retrieved from PPHS (2010). Total 1062 households were observed from four provinces. Ordinary least square method (OLS) is used for the estimation.

## **5.2 Conclusion**

This study analyzes the propose objectives; how the remittances effects the child health, to compare the magnitude of child health status across rural and urban areas, and to a give policy suggestion, how remittances can be used for positive health status. For the analysis we constructed three z-scores i.e. weight-for-age, Height-for-age, and Weight-for-height. For overall child health we used Principal component analysis (PCA), constructed from WAZ, HAZ and WHZ. To check the impact of remittances on child health, other factors like mother and household head education, child gender and mother and household age were also considered. From the results it is observed that the remittances are directly related with overall child health and other anthropometric indicators (WHZ, WAZ, and HAZ) for households receiving remittances compared to non-receiving households. The probable explanation is that by increasing the level of remittances the child health is better-off.



### **5.3 Policy Recommendations**

This study concludes that there is a positive and statistically significant effect of remittances on different indicators of child health. The households receiving remittances have children with positive child health. Based on the importance of the conclusion drawn, there are some key roles contributed by the remittances in providing better health, which are recommended here to be focused by the policy makers in devising policies for the migrants.

1. Address hindrances to remittances markets resulting from the money transfer regulations.
2. Project suitable guidelines, based on realistic objectives, tools and timeframes that aim to facilitate the flow of remittances more reliably and at the lowest cost, develop remittances-related products (i.e. savings, insurance contributing to social protection for households).
3. Build on association with migrants and Diasporas, with respects to their rights, and improve their quality of life.

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Appendix Results

OLS regression for overall anthropometric Indicators

Linear Regression					Number of Obs	=	1,062
					F(6, 1055)	=	92.89
					Prob > F	=	0.0000
					R-squared	=	0.3411
					Root MSE	=	.67909
Child Health	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]		
Remittances	1.049131	.0446358	23.50	0.000	.9615461		1.136716
Household-Head Edu	.4612183	.0517322	8.92	0.000	.3597086		.5627279
Mother-Age	.0054076	.003184	1.70	0.090	-.0008401		.0116552
Mother Edu	.1368799	.1055508	1.67	0.105	-.0702334		.1439933
Child Gender	-.0403952	.0423194	-0.95	0.340	-.123435		.0426446
Household-Head Age	.2669686	.1504709	1.77	0.076	-.0282876		.5622248
_Constant	-.6422184	.1111546	-5.78	0.000	-.8603277		-.4241091

OLS regression for Height-for-age

Linear regression					Number of obs	=	1,062
					F(6, 1055)	=	56.97
					Prob > F	=	0.0000
					R-squared	=	0.2448
					Root MSE	=	1.3426
<sup>1</sup> Height-for-age	Coef.	Robust Std. Err.	T	P> t	[95% Conf. Interval]		
Remittances	1.647668	.0906069	18.18	0.000	1.469878		1.825458
Household Head Edu	.7515509	.1102281	6.82	0.000	.5352597		.9678421
Mother-age	-.0107245	.0067148	-1.60	0.111	-.0239003		.0024513
Mother-edu	.2314276	.1485599	1.56	0.102	-.0600789		.5229341
Child Gender	.1602459	.0823488	1.95	0.052	-.0013401		.3218319
Head-age	.2004297	.217912	0.92	0.358	-.2271606		.62802
Constant	-.9416735	.2388125	-3.94	0.000	-1.410275		-.473072

OLS regression for Weight-for-age

Linear regression				Number of obs	=	1,062
				F(6, 1055)	=	91.05
				Prob > F	=	0.0000
				R-squared	=	0.3320
				Root MSE	=	1.1697
Weight-for-age	Coef.	Robust Std. Err.	t	P> t	95% Conf. Interval	
Remittances	1.775346	.0762482	23.28	0.000	1.625731	1.924962
Household head edu	.7787275	.0907177	8.58	0.000	.6007199	.9567351
Mother-age	.0104176	.0054065	1.93	0.054	-.0001911	.0210263
Mother-edu	.047461	.0217349	2.18	0.029	.0048125	.0901094
Child gender	-.061377	.0728754	-0.84	0.400	-.2043742	.0816202
Household head age	.3916078	.2393292	1.64	0.102	-.0780077	.8612232
Constant	-1.733035	.2033049	-8.52	0.000	-2.131963	-1.334107

Linear regression				Number of obs	=	1,062
				F(6, 1055)	=	22.22
				Prob > F	=	0.0000
				R-squared	=	0.1202
				Root MSE	=	.97133
Weight-for-height	Coef.	Robust Std. Err.	T	P> t	[95% Conf. Interval]	
Remittances	.6905633	.0636539	10.85	0.000	.5656607	.8154659
Household head edu	.2355431	.0773847	3.04	0.002	.0836978	.3873885
Mother-age	.0179188	.0040911	4.38	0.000	.0098912	.0259463
Mother edu	.1054078	.1772535	0.59	0.552	-.2424016	.4532173
Child gender	-.1799143	.0610328	-2.95	0.003	-.2996737	-.0601549
Household head age	.3248862	.2067713	1.57	0.106	-.0808436	.7306161
constant	-.4389792	.1461752	-3.00	0.003	-.7258064	-.1521519