Cash Transfers to Promote Safe Motherhood: Evidence from Bangladesh's Maternity Allowance Program

by

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Abstract

This study examines the efficacy of Bangladesh's Maternity Allowance Program (MAP), a monthly cash transfer to rural mothers for the promotion of maternal health. Using primary data, the analysis assesses the impact of the MAP on its four objectives: increasing breastfeeding rates, increasing maternity service uptake, enhancing nutrition, and promoting safe infant upbringing. The quantitative component of the study uses propensity score matching. This technique isolates the effect of the program by matching control and treatment observations by their estimated probabilities of program participation. Focus group discussions and informant interviews were conducted to substantiate the quantitative findings and expand on the operational efficiency of the program. Drawing on the empirical findings, the study concludes by presenting a series of policy recommendations. These recommendations seek to enhance the effectiveness of the MAP and aim to increase its importance as a substantive element of Bangladesh's system of social protection.

Keywords: cash transfer; Bangladesh; nutrition; maternal health; propensity score matching

Dedication

To my family.

And to the mothers of rural Bangladesh.

Acknowledgements

Conducting research in Bangladesh was an emotional rollercoaster and required a "whole village" of wonderful people to see it through. My friends, family, and girlfriend, Christina, deserve sincere thanks. Without their unwavering support and uplifting words I would have never persevered and achieved something I am truly proud of.

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List of Acronyms

ANC	Antenatal Care
ATET	Average Treatment Effect on the Treated
BDHS	Bangladesh Demographic Health Survey
BMI	Body Mass Index
CSBA	Community Skilled Birth Attendant
DORP	Development Organization of the Rural Poor
DOWA	Department of Women Affairs
FAO	Food and Agriculture Organization
FGD	Focus Group Discussions
FWV	Female Welfare Visitor
JSY	Safe Motherhood Scheme
KN	Komol Nagar
LS	Lakshmipur Sadar
MAP	Maternity Allowance Program
MDG	Millennium Development Goal
MHVP	Maternal Health Voucher Program
MOWCA	Ministry of Women and Child Affairs
PNC	Postnatal Care
PSM	Propensity Score Matching
SA	South Asia
SDIP	Safe Delivery Incentive Program
SPI	Social Protection Index
UNDP	United Nations Development Program

Executive Summary

Pregnant and lactating women in Bangladesh are the demographic group with the second greatest risk of under nutrition – led only by preschoolers (Ahmed, 1993). A mother's risk profile is heightened if the woman is a member of a poor, rural household. To reduce adverse pregnancy outcomes and address vulnerabilities hindering capability expansion for these mothers, the Bangladesh government legislated the Maternity Allowance Program (MAP) in 2007. This program provides a Tk. 350 (~$4.50) monthly stipend for 24 months to beneficiaries who are selected based on a proxy means test.

This study assesses the efficacy of Bangladesh's Maternity Allowance Program. This is achieved by examining the operational efficiency of the program and evaluating the MAP's impact on the use of maternity services, breastfeeding practices, health and nutrition indicators, and anthropomorphic measurements. The study's second objective is to use the findings from the impact evaluation to identify possible reforms to enhance the program's ability to generate sustained benefits to recipients. The evaluation draws on both quantitative and qualitative primary survey information from a sample of current MAP beneficiaries and a control group of eligible non-recipients from three sub-districts in the district of Lakshmipur. The quantitative evaluation uses the quasi-experimental propensity score matching methodology to create a counterfactual group while minimizing potential selection bias.

The evaluation identified five positive impacts of the MAP:

- Due to the program's conditionality requiring beneficiaries to have no more than two children, the MAP reduced the birth rate of recipients. The conditionality also caused spillover effects, as non-beneficiary mothers reduced the number of children they conceived to remain eligible for future program selection.
- The MAP contributed to women's empowerment and improved beneficiaries' status within the household by freeing them from verbal and physical abuse and increasing mother's autonomy, participation in decision-making, and access to and control over resources.
- The MAP improved women's education by creating knowledge transfers between local government officials and beneficiaries.

- The MAP had a substantial positive impact on health and nutrition. The Allowance increased the number of women citing positive health perceptions (increase of 15.2 percentage points), and levels of food adequacy (increase of 10.2 percentage points). Diet diversity food scores increased by 0.24 points, meaning that the program impacted both quality and quantity of food intake. The MAP increased the amount spent on total medical treatment by approximately Tk. 100 per month. It is conjectured that the increased expenditure is the result of substitution away from public into private care. Finally, impact estimates show that the MAP increased the use of calcium, iron, and vitamin supplementation (increases of 12, 9, and 10 percentage points respectively).
- The MAP improved beneficiaries' use of maternity services. Antenatal and postnatal care use increased by 16 percentage points and 7 percentage points respectively. In addition, the probability of MAP mothers receiving more than two antenatal care visits was 7 percentage points higher than control mothers.

Despite these findings, the program did not affect a number of indicators that were assumed ex-ante to be positively impacted. There was no significant difference between the control group and the experimental group in the following categories: breastfeeding rates, anthropomorphic measurements, incidence of disease, the use of skilled birth attendants, and deliveries in public hospital facilities. Problems that occurred during the program's implementation are speculated to be the reason for these program failures.

The study outlines six reforms to improve the program's implementation and overall effectiveness. Cognizant of the trade-offs between benefit size and coverage, the first recommendation calls for an increase in the number of beneficiaries to expand the current low coverage and reach the poorest mothers. Other recommendations include mandating that the selection process be done by union councilwomen; disbursing the stipend at the union level to minimize recipients' travel costs; legislating random audits to confirm that the selection process was fair; ensuring that beneficiaries receive their first MAP payment before they give birth; and revising program objectives and eligibility criteria to reduce ambiguity and to make them up-to-date, measurable, and specific.

Chapter 1. Introduction

When designing a system of social safety nets, the question that invariably arises is, how can a government provide a minimum livelihood support for its poor while still satisfying fiscal, administrative, and information constraints? For developing countries, this question proves difficult to answer; resource limitations are severe, constraints are binding, and yet the system is expected to reach a large number of risk prone, destitute individuals.

Empirical studies that remove confounding factors to identify causal relationships between outcome variables and a program intervention are key in formulating a well functioning system of safety nets. These impact evaluation studies are an essential part of the program design, feedback, and improvement process (Blomquist, 2003).

Bangladesh has a wide range of social policies that provide cash or in-kind stipends to millions of disadvantaged people living in precarious situations. This study assesses one scheme, the Maternity Allowance Program (MAP), a means-tested, cash transfer that distributes monthly stipends to pregnant mothers living in rural areas. The objective of the study is to measure the impact of the MAP on maternal health outcomes and identify possible measures to improve the policy's implementation and effectiveness. Specifically, the evaluation isolates the effect of the MAP on the following indicators: uptake of maternity services, breastfeeding practices, health and nutrition, and anthropomorphic metrics of mothers and children. It is hoped that the information generated by this evaluation will enhance the ability of policy makers to better design social protection programs in Bangladesh.

This report is organized into seven chapters. Following this introductory chapter, the second chapter provides a general background that includes a conceptual overview of social protection and cash transfer schemes, a study of three existing maternal health schemes in South Asia, and information on the case study country of Bangladesh.

Chapter Three introduces the Maternity Allowance Program and includes a summary of its implementation process. Chapter Four presents descriptions of both the quantitative and qualitative evaluation techniques applied in the study. Chapter Five outlines the sample characteristics for the MAP beneficiary group and for the group of non-beneficiaries. Chapter Six discusses the results of the MAP evaluation. Chapter Seven concludes by assessing the key results, and detailing various policy reforms to enhance the effectiveness of the program.

Chapter 2. Background

2.1. Social Protection – Conceptual Issues and Empirical Evidence

"Social protection" is an umbrella term for policies and programs that provide essential social services and basic income security as a means to reduce systemic poverty among vulnerable members of a population. The term, introduced by the International Labour Organization and the United Nations, has been emphasized as an essential precondition to lifting a population out of poverty (UNESCAP, 2011).

The ideological foundation supporting the provision of social protection is based on a commitment to universal human rights that manifests itself as an implicit social contract between a government and its citizens. Social protection seen as a right and an entitlement as opposed to an act of compassion or charity places onus on the state to ensure an acceptable basic standard of livelihood, healthcare and education to its citizens (Devereux, 2009).

Besides being a requisite to the realization of human rights, social protection is also recognized as being a necessity for economic development. At a micro level, livelihood support and cash stipend programs allow households to escape the poverty trap, while at a macro level they serve to increase aggregate demand and the size of the spending multiplier. Through insurance and assistance policies, social protection strengthens individuals' capabilities and empowers them to contribute back to society (ILO, 2009). Non-contributory public programs that insure the poor against exogenous risky events provide families the ability to invest for the future with greater confidence and to look beyond basic daily sustenance. A robust system of social protection creates a strong platform for the advancement of inclusive economic growth and should be recognized as an investment for future prosperity (UNESCAP, 2011).

2.1.1. Types of Social Protection Policies

Social protection exploits different types of policy instruments to pursue a variety of objectives. There are four common sub-categories of social protection policies: social assistance, social insurance, social services, and labour market programs (UNESCAP, 2011).

Social Assistance programs transfer cash or in-kind benefits to vulnerable segments of the population most in need of support. Generally these programs are funded by government, civil society, or the international donor community and are given to recipients based on targeting criteria, such as persons with disabilities, widowed mothers, orphans, the homeless, or in the case of the Maternity Allowance Program, poor, pregnant mothers.

Social Insurance refers to contributory policies by individuals or employers. These are mostly utilized in middle or high-income countries where informal employment is less prevalent. Characteristics of social insurance programs include compulsory participation and the use of a special fund for accumulated contributions. The rationale for social insurance is that access to a program benefit is a function of past contributions and not financial need. Unemployment pay, occupational pensions, and other programs that spread risk among different agents are all examples of social insurance policies (Barrientos, 2010).

Social Services include equitable access to essential services such as health, education, safe water, sanitation, and rule of law. Stipulating that access should be universally guaranteed attempts to address the problem of missing markets in private provision of these goods. Social service programs often involve subsidies, reduced tariffs, or free provision via public supply (UNESCAP, 2011).

Labour Market Programs are designed to protect workers (e.g. minimum wage laws, occupational safety), increase employment (e.g. public works programs), and/or promote efficient labour markets (e.g. job training programs) (Barrientos, 2010).

2.1.2. Social Protection in South Asia

Despite enviously high growth rates, staggering foreign remittance inflows, and important strides taken to meet the Millennium Development Goals, South Asia (SA) has not witnessed a sustained and inclusive reduction in poverty (Devereux, 2009). Instead, globalization has exacerbated income inequality, widening disparities in health and social indicators between socio-economic groups (Ghosh, 2013). Extreme poverty in the region runs rampant, afflicting some 500 million people who live on less than $1.25 a day, or nearly half of the world's poor (Aziz, 2011). Nascent financial markets have limited the expansion of universal access to financial services thus restricting the expansion of credit, and hampering investment opportunities (Fernando, 2007). Enduring discrimination and social exclusion plague minorities (Jodhka, 2010). Other challenges include high labour informality, poor governance, natural disasters, and the gradual inversion of population pyramids, a problem that is beginning to impact countries with earlier demographic transitions (Bloom, 2011). The totality of these characteristics is summarized by South Asia's low standing in inter-regional aggregate poverty and wellbeing indicators shown in Table 2.1.

Poor performance on social indicators does not imply that social protection in South Asia has been absent. All eight South Asian countries currently possess social assistance programs to support marginalized groups. Several countries have gone further by adopting employment guarantee schemes and social insurance (Köhler, 2009). In fact, South Asia has a long-standing history of social protection, dating as far back as colonial rule. The last two decades have seen a renewed interest and commitment to social security via the prominent role of social protection policies embodied in the iterative five-year national economic plans (Kabeer, 2009). The rich experience of providing social programs has led to many laudable policy innovations that have their origins in the region, including the renowned Mahatma Gandhi National Rural Employment Guarantee Act.

Table 2.1. Regional Poverty Indicators

Region	Human Development Indicator 2012 (UNDP)	Poverty Headcount Ratio 2010 ($1.25/day PPP)	GDP per Capita 2012 (Current US $)
Eastern Europe and Central Asia	0.771	0.7%	$6,940
Latin America and the Caribbean	0.741	5.5%	$9,192
East Asia and the Pacific	0.683	12.5%	$5,187
Middle East and North Africa	0.652	2.4%	$4,616*
South Asia	0.558	31%	$1,386
Sub-Saharan Africa	0.475	48.5%	$1,417

Source: World Bank Indicators, World Bank and 2012 UNDP HDI Dataset
Note. * indicates 2011 data

While commendations are necessary surely so are consternations. Lack of capacity and inadequate coordination among government agencies and between programs has resulted in unsustainably high administrative and targeting costs. In addition, many schemes are prohibitively narrow in their coverage. Furthermore, leakages due to insufficient monitoring and non-transparent delivery result in a net benefit that is often much too low to be effective (Köhler, 2009). In general, a comprehensive, interlinked system of social protection has yet to be institutionalized, which presents an opportunity for the region to build systems that are holistic and complete.

The Social Protection Index (SPI), a creation by the Asian Development Bank, provides evidence of South Asia's under-investment in protection policies. The SPI uses 2009 data to chart the extent of coverage provided by a country's social insurance, social assistance, and labour market programs. The index is calculated by standardizing the ratio of total expenditure on social protection to total intended beneficiaries. Table 2.2, taken from the Asian Development Bank's 2013 Social Protection Index report, presents a listing of South Asian countries and their respective SPIs. South Asia's under investment in SPI is apparent when comparing inter-regional index results (Figure 2.1).

Average SPI in SA is 0.61 and social protection expenditure as a percentage of GDP in South Asia is 2%, the lowest of the five Asia and Pacific regions.

Table 2.2. SPI, SP Expenditure as a % of GDP, and GDP per Capita for SA Countries (2009)

Country	SPI	SP Expenditure as a % of GDP	GDP per Capita
India	0.051	1.7	1,043
Bangladesh	0.043	1.4	617
Nepal	0.068	2.1	463
Bhutan	0.036	1.2	1,852
Pakistan	0.047	1.3	926
Maldives	0.073	3.0	6,174
Afghanistan	0.046	2.0	488
Sri Lanka	0.121	3.2	2,057

Note. Source: Asian Development Bank, 2013

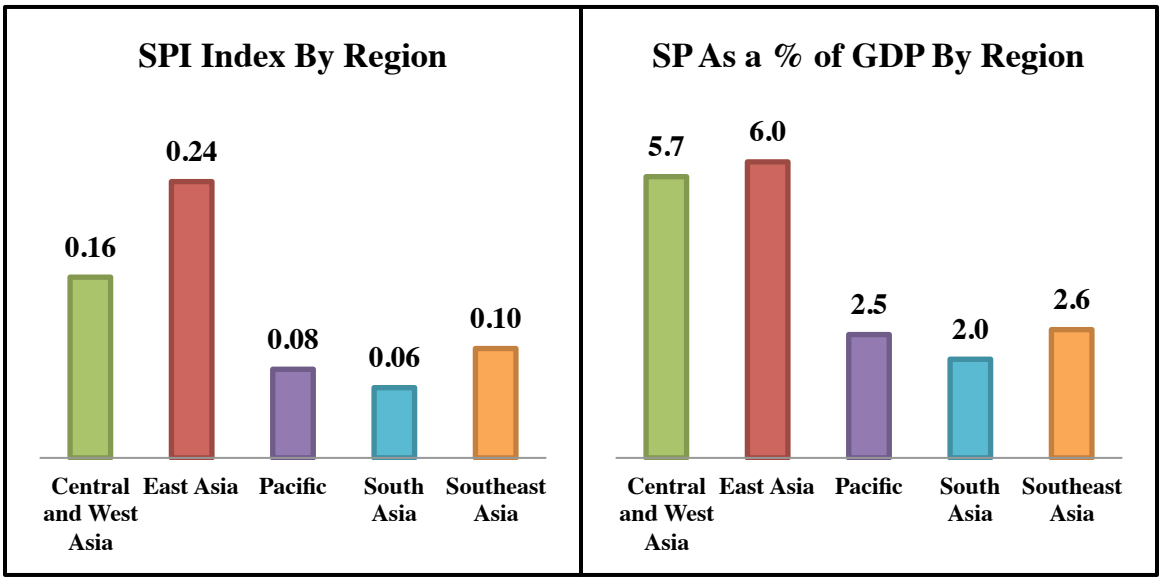

Figure 2.1. Inter Region Social Protection Comparisons (2009)
Note. Source: Asian Development Bank, 2013

2.2. Cash and In-Kind Transfer Schemes

Over the past two decades, cash transfer programs, which deliver small regular payments to the ultra-poor, have become an increasingly popular vehicle to provide

social assistance. Bangladesh's Female Education Stipend, introduced in 1994, was one of the world's first conditional cash transfer programs, granting female students a monetary stipend and tuition-free education. The program's effectiveness at reducing gender disparities, as well as its innovativeness at achieving these outcomes, paved the way for future cash transfer policies (Fuwa, 2001). Transfer programs truly became a mainstay of development practice in 1997 as a result of the positive evaluations of Mexico's conditional cash transfer program, PROGRESA (IFPRI, 2000). This program garnered the attention of both policy practitioners and development economists alike and became the predecessor for the rapid proliferation of cash transfer programs throughout the world. Today, over one billion of the world's poor are beneficiaries of such schemes and new innovations continue to expand the reach of transfer programs to cover different contexts and respond to new needs (Haushofer, 2013).

Cash transfers have also precipitated an influx of sophisticated evaluation techniques that researchers use to judge the effectiveness of programs (Rawlings, 2005). Empirical results from such evaluations have been mostly positive; cash transfers tend to provide vulnerable groups with additional financial security and allow a mechanism for demand side financing of goods and services that the market would otherwise not be able to provide (Fiszbein, 2009). Transfers are thus seen by proponents as a way to mitigate short-term disadvantage and improve human capabilities in the long run. Direct re-distribution by transfers is especially important when investment in public infrastructure fails to reach the poor and when private markets prevent impoverished individuals from being as productive as possible (Fiszbein, 2009).

Not all evaluations have been glowing. When failures in policy design and implementation occur, cash transfer programs can become ineffective or, if they provide adverse incentives, even destructive. In addition, there are a variety of theoretical objections against such programs that further the degree of contentiousness. Some critics suggest that conditional cash transfers are paternalistic. Others believe transfers lead to reductions in the supply of labour, are inflationary, or inherently ineffective when the supply of services is weak (Standing, 2012). Although many of the criticisms have been disproven empirically, pundits agree that cash transfer programs are no panacea

for poverty (Shah, 2008). Instead, they should be seen as an important piece of a larger social safety net pie.

2.2.1. Features of Cash Transfer Program Design

There is no universal blueprint for designing cash transfer programs; different contexts require different approaches. Transfers can be disaggregated according to three fundamental design dichotomies: conditional/unconditional, targeted/universal, and cash/in-kind. Policy makers must make design decisions based on assessments that identify the priority needs of vulnerable groups as well as take into account current administrative and financial capacities. Table A.1 in the Appendix presents a description of each of the three core policy design options including the inherent trade-offs involved between each pair. In addition to the core design decisions there are peripheral options that further influence a policy's effectiveness. Examples of these include tying payments to financial infrastructure, utilizing technology such as biometric identification cards to minimize leakages, and finding the optimal size and schedule of benefits.

2.2.2. Cash Transfers for Maternal and Child Health

The renowned antecedent cash transfer policies – PROGRESA in Mexico, and Bolsa Familia in Brazil – both invoked maternal health features in the conditionalities they imposed. PROGRESA explicitly aimed to reduce maternal mortality by mandating that beneficiary women complete a series of four antenatal care visits, two postnatal care visits, and attend a maternal health education program (IFPRI, 2000). Similarly, Bolsa Familia beneficiaries receive payments contingent on their utilization of antenatal and postnatal care (Glewwe, 2010). These two programs became the predecessors of contemporary cash transfer schemes and also prompted the use of redistributive transfers to incentivize maternal and child health.

Coinciding with the scientific revelations of the importance of early childhood health and nutrition, as well as the push to achieve Millennium Development Goals (MDGs) 4 and 5 (reducing child mortality and improving maternal health), greater emphasis on maternal and child health has been integrated into policy formulation.

Currently in South Asia, India, Pakistan, Nepal, and Bangladesh, all employ demand-side financing cash transfer schemes that include conditionalities on ante-natal care, delivery at public facilities with skilled personnel, or other mechanisms to increase the uptake of maternity services. The region is also home to innovative cash transfer policies that go beyond demand-side financing to include provisions that address the supply of services (Jehan, 2012).

Aside from the Maternity Allowance Program, two other prominent cash transfer schemes in South Asia also have safe motherhood and maternal health as a core focus. These are Nepal's Safe Delivery Incentive Program (SDIP) and India's Safe Motherhood Scheme (JSY). In addition to its Maternity Allowance Program, Bangladesh has a second scheme, the Maternal Health Voucher Program (MHVP), which is a hybrid of a voucher program and a conditional cash transfer. Appendix B provides descriptions of the features as well as evaluation results for the three case study programs, the SDIP, JSY, and MHVP.

2.3. Bangladesh Country Profile

Located on the Ganges Delta, surrounded by India to the west and north and sharing a roughly 200 km border to Myanmar lies the People's Republic of Bangladesh. Together with the Indian state of West Bengal, Bangladesh forms the Bengal geographic and ethno-linguistic region, home to the country's major ethnic group, the Bengalis. Although a relatively small country of 56,977 square miles, the population of Bangladesh is estimated to be around 155 million people, making it one of the most densely populated countries in the world[1]. Approximately 5% of the population live precariously on Chars, sandbanks that form from silt deposits of the great Ganges and Brahmaputra rivers (Kabir, 2006). From largest to smallest, the administrative geography of Bangladesh is divided into seven divisions, 64 districts, and 483 sub-districts. Sub-districts are further split into 4,498 unions, which are the smallest and most decentralized unit of government in the country. Each union consists of nine wards[1].

[1] Bangladesh Health Bulletin, 2011

Figure 2.2. Geography of Bangladesh
Note. Source: Brief History of Bangladesh[2]

The history of Bangladesh is tumultuous. Following a brutal nine-month "liberation war" pitting East against West Pakistan, the country finally gained independence after the invasion of the Indian army in East Pakistan in December 1971[3]. Since then, the country has faced droughts, cyclones, famines, an arsenic public health disaster, military coups, and intense political discord (UNICEF, 2008). Following the restoration of democracy in 1991, the country achieved macroeconomic stability in spite of continued political tension. Owing to steady growth rates, large foreign remittance

[2] "Geography for Kids: Bangladesh." *Ducksters*. Technological Solutions, Inc. (TSI).
[3] Bangladesh Bureau of Statistics, 2011

inflows, and stable inflation, interest rates, and domestic debt, Bangladesh has been identified as a "Next Eleven" economy (Lawson, 2007). Although the agricultural sector remains the largest employer, the manufacturing and service sector have slowly increased in importance. The most spectacular success has been growth of the ready-made garment sector. In 1971, this sector did not exist. Four decades later, Bangladesh is the world's second largest garment exporter, and ready-made garment accounts for 80% of the country's total exports (Ahamed, 2013). Table 2.3 compares demographic, economic, and education indicators from the World Bank for Bangladesh and three other South Asian countries.

Table 2.3. Indicators for Select South Asian Countries

Indicator	Year	Bangladesh	Nepal	India	Sri Lanka
Demographic:					
Population (million)	2012	155	28	1,237	20
Life Expectancy (years)	2011	70	68	66	74
Urban Population (%)	2012	29	17	32	15
Economic:					
GDP per capita PPP (constant 2005 US $)	2012	1,622	1,276	3,340	5,384
Poverty Headcount Ratio (%) (2$ per/day PPP)	2010	77	57	69	24
Gini Coefficient	2010	32	33	34	36
Education:					
Adult Literacy Rate	2012	58	57	no data	no data

Note. Source: World Development Indicators, The World Bank

2.3.1. Poverty and Malnutrition

Bangladesh has experienced steady reductions in poverty and sustained improvements in livelihood standards since its liberation in 1971. Over the past decade the number of total poor living below 2$ a day or consuming less than 2100 calories decreased by 16 million, from 63 million in 2000 to 47 million in 2010. During the same period, there was an extraordinary 40% decline in the number of extreme poor (below

$1.25) from 44 million in 2000 to 26 million in 2010. Through this progress Bangladesh has ensured its ability to meet many of the indicators set forth under the first MDG goal to eradicate extreme hunger and poverty. Regrettably, the progress in poverty reduction has been largely unequal (World Bank, 2013). Disparities are most pronounced between rural and urban comparisons (see Table 2.4).

Table 2.4. Poverty Headcount Ratios

	2000	2005	2010
Urban (% urban population living below the urban poverty line)	35	28	21
Rural (% rural population living below the rural poverty line)	52	44	35

Note. Source: World Bank Development Indicators

Coinciding with the reductions in poverty, there have been impressive improvements in the livelihood status of the poor. The poor live with more durable goods, better access to services, and own relatively larger landholdings. Nutrition indicators, on the other hand, tell a more discouraging tale. Bangladesh is not on track to meet target 1.9 of the first MDG, to reduce the proportion of the population below the minimum level of dietary energy consumption (2,122 calories) to 24%. Thirty-eight percent of the population experienced modest food deficiency in 2010 (World Bank, 2013).

2.3.2. Maternal and Child Health

While many developing countries have struggled to achieve Millennium Development Goals 4 and 5, Bangladesh has made significant strides in reducing child mortality and improving maternal health. The country is one of only six in the world that have managed to halve child mortality since 1999[4]. Table 2.5 charts Bangladesh's progress in achieving MDGs 4 and 5.

[4] UNICEF – National Launch of the State of the World Children 2008

There remain impediments to maternal and child health that demand additional attention. One obstacle is the low uptake of maternal health services. 2011 Bangladesh Demographic Health Survey (BDHS) data report that 71% of births occur at home, thus exacerbating the risk of infection due to septic conditions. Delivering a child in the presence of a skilled health professional is considered the most effective measure to reduce maternal mortality. 15% of all births involve serious, but treatable complications, which can cause direct obstetric death through eclampsia, haemorrhaging, hypertension, or obstructed labour. The presence of competent professionals can minimize mortality by expediting the delivery of emergency obstetric care when potentially damaging complications arise[5]. Yet, professionals in Bangladesh attend only 31% of all births[6].

Table 2.5. Bangladesh MDG 4 & 5 Progress

Goals, Indicators	Base Year (1990)	Current Status	Target by 2015	Status of Progress
Goal 4 – Reduce Child Mortality				
4.1 Under 5 Mortality Rate (per 1,000 live births)	146	53	48	On track
4.2 Infant Mortality Rate (per 1,000 live births)	92	43	31	On track
4.3 % of 1 year olds immunized against measles	54	88	100	On track
Goal 5 – Improve Maternal Health				
5.1 Maternal Mortality Rate (per 100,000 live births)	574	194	143	On track
5.2 % of Births Attended by a Skilled Health Personnel	5	32	50	Needs Attention
5.3 Antenatal Care Coverage (at least one visit) (%)	28	68	100	Needs Attention
5.4 Antenatal Care Coverage (at least four visits) (%)	5.5	26	50	Needs Attention

Source: UNDP, Bangladesh's Progress on the MDGs
Note: The UNDP used data from the 2011 Bangladesh Demographic and Health Survey (DHS), the 2011 Sample Vital Registration System, and the 2010 Bangladesh Maternal Mortality and Health Care Survey

[5] UNFPA – http://www.unfpa.org/public/mothers/pid/4383
[6] BDHS 2011

Antenatal care (ANC) and post-natal care (PNC) are also severely underutilized. These are important services that help screen complications and treat infections. According to the WHO, from 2005 to 2011, only half of mothers in Bangladesh attained one ANC check-up, while just over a quarter were covered by the WHO recommended four ANC visits. Over the same time period, 73% of mothers did not receive a PNC check-up within two days following childbirth[7].

In Bangladesh, perinatal mortality (stillbirths or deaths during the first week of life) and neonatal mortality (deaths occurring during the first four weeks of life) are of great concern. 36.4 stillbirth deaths occur for every 1,000 births, the third worst in a 2009 WHO country ranking[8]. A Bulletin of the World Health Organization in 2000 examined the determinants of perinatal death in Bangladesh. The report identified labour complications as the cause for nearly a third of perinatal deaths and emphasized the need for increased utilization of maternity services, especially delivering under the observation of qualified staff (Kusiako, 2000).

Exclusive breastfeeding, despite being a low-hanging fruit, is not a universal practice. 2011 Demographic Health Survey data identify that although 98% of children born are breastfed, only 64% are breastfed exclusively for the first six months. The use of infant formula as a breast milk substitute is also growing in numbers, having almost doubled in consumption since the year 2000. Additionally, 30% of infants aged two to three months are bottle-fed, which increases the risk of diarrhea due to bacterial build-up in non-sterile bottles (UNDP, 2013).

Malnutrition has pronounced adverse effects on a child's ability to grow and develop. While nutrition has improved marginally in the past decade, 43% of children under five are moderately to severely stunted[9]. Children in Bangladesh also disproportionately suffer from anemia, a deficiency that hampers growth and brain development (Farque, 2006).

[7] WHO - World Health Statistics 2011
[8] 2009 WHO World Health Statistics
[9] UNICEF 2009 – Tracking Progress on Child and Maternal Nutrition

Cultural barriers, poor quality of public services, poverty, gender inequality, and lack of education are all culprits in the fight for safe motherhood. Policy that is legislated to tackle these problems must target the poorest populations that disproportionately suffer from child morbidity and mortality. Further educational interventions are needed at the community level, especially with regard to exclusive breastfeeding, nutrition, and child drowning.

2.3.3. Social Protection in Bangladesh

Over the past 40 years, the safety net programs in Bangladesh have undergone substantial evolution and development, courtesy in large part to the international donor community and non-governmental actors such as the Bangladesh Rural Advancement Committee. During these four decades, social protection policies have shifted focus from being predominantly emergency relief oriented towards a more holistic emphasis on poverty reduction, education, and employment (World Bank, 2013).

During the past decade, the Government of Bangladesh has made a concerted effort to expand its social protection floor by introducing a diverse range of innovative policies. From 2008 to 2011 expenditure on social programs has increased almost 80 percent rising from 1.5% to 2.64% of GDP (World Bank, 2013). This increase has paid dividends in expanding the reach of social safety nets, both in terms of number of beneficiaries and geographic coverage. Household Income and Expenditure Survey data from 2010 show that the share of households that received social protection benefits almost doubled from 13% in 2005 to 25% in 2010.

Although progress in the past decade has been positive, the absolute number of poor covered by programs, and adequacy of the benefits provided, leave much to be desired. World Bank (2013) figures show that only one third of the poor were beneficiaries of at least one social protection program in 2010. Other problems include eroding real values of cash transfers due to inflation, large leakages in in-kind food transfer programs, high administrative expenses, and program targeting errors that cause the exclusion of the extreme poor and inclusion of those in upper income quintiles. Table 2.6 illustrates the magnitude of these targeting inaccuracies. In 2010, ten

percent of those in the richest expenditure quintile were beneficiaries of at least one social protection program. Compared to 2005, there were 30% more beneficiaries of programs in the top three income quintiles, which proves that the targeting efficiency of these programs has been deteriorating over time.

Table 2.6. Proportion of Households Covered by Safety Net Programs as a Function of Expenditure Quintiles

Quintile	2005	2010
I	24%	39%
II	16%	32%
III	14%	25%
IV	8%	20%
V	4%	10%
TOTAL:	12.6%	24.6%

Note. Source: World Bank, 2013

Currently, Bangladesh has approximately 30 in-kind or cash based social programs. Table A.2 in the Appendix provides a listing of the sixteen largest social assistance and labour market programs in the country. Included in the table is information regarding the type of social protection program, objective, ministry responsible, targeting criteria, number of beneficiaries, and the amount and nature of the benefit. The listing highlights the need for a drastic consolidation of social programs. Specifically, Bangladesh must reduce the number of agencies governing programs and better coordinate among ministries so that implementation, delivery, and administration can be enhanced.

Chapter 3. Maternity Allowance Program Overview

3.1. Program Overview

The Maternity Allowance Program is the result of advocacy by a Bangladeshi NGO and illustrates the power of grassroots organizations to realize innovation in government policy. The Development Organization of the Rural Poor (DORP), an NGO working to empower the poor and advance their socio-economic state, created the Maternity Allowance in 2005. Following a two-year period of piloting, DORP was successfully able to lobby the then care-taker government to legislate the MAP in 2007.

The program is intended to reduce maternal mortality by providing a cash stipend to poor pregnant mothers in rural areas. According to the program's stated objectives set by the Department of Woman Affairs (an agency under the Ministry of Women and Child Affairs), the MAP aims to improve maternal health outcomes by:

- Reducing maternal mortality
- Increasing the rate of lactation
- Enhancing mother's nutritional uptake
- Increasing the use of maternity related services
- Ensuring safe motherhood and sound upbringing of infant

MAP recipients are entitled to a sum of Tk. 350 (~ $4.50 USD) each month for a period of two years. Recipients obtain the stipend in three or six-month instalments to minimize the travelling costs associated with collecting the payment from the sub-district Department of Women Affairs Office. The twelve Union Council officials governing each union select a pre-determined number of pregnant women in their constituency, usually 10 to 30, as MAP beneficiaries during the beginning of each fiscal year in July. For the

2013-2014 financial year, approximately 120,000 mothers in Bangladesh received the Allowance[10]. The exact process of selection differs among Union Councils, but the proxy means-test governing selection is universal. To be an eligible recipient, a rural mother is required to meet at least four of the following criteria, including the first two mandatory requirements:

- Pregnant with her first or second child
- At least 18 years of age
- Total household income of less than Tk. 1500 (~ $20 USD)
- Poor mother of a female headed household
- Poor mother with a disability
- Owning no land holdings other than their homestead
- Owning no productive assets, such as agricultural land, livestock, etc.

Along the continuum between a pure Unconditional Cash Transfer and a detailed Conditional Cash Transfer, the Maternity Allowance falls somewhere in the middle. Prospective beneficiaries are subject to a family planning condition requiring them to have a lifetime maximum of two children. However, since this is a verbal commitment, isn't actively monitored, and cannot be enforced, the MAP is de facto an Unconditional Cash Transfer. Interestingly, despite the lack of verification, there is very little anecdotal evidence of beneficiaries violating the conditionality imposed. Local officials speculate this is partly a result of community levied stigma and scorn directed towards MAP violators, which may damage social capital enough to outweigh any potential benefit of an additional child. Implicit community monitoring is an interesting unintended by-product of the policy, and it demands additional study to assess whether it could be a mechanism to enforce conditionalities without incurring monitoring costs.

3.2. The Logistical Process

The government officials interviewed in the study routinely used the euphemism "processing delays" to describe the inefficiencies of the MAP's implementation. This

[10] Ministry of Finance budget for 2013-2014. MOWCA, Chapter 12 (page 107)

phrase refers to all stages of the Allowance's implementation, from the initial budget allotment, to the beneficiary selection process, and to the final stipend disbursement. One central challenge is the slow and overly bureaucratic movement of information between the national government in Dhaka and the decentralized local Union Councils scattered throughout Bangladesh. The following description of the MAP implementation process is used as an illustrative means to reveal the extent of these "processing delays".

Setting the Budget: Before the new fiscal year, the national Ministry of Women and Child Affairs (MOWCA) in Dhaka determines the number of prospective beneficiaries to allocate for each union in Bangladesh. This calculation is made subjectively based on the union's population and poverty metrics. Once the total number of nationwide beneficiaries is known, a provisional budget is created and sent to the Finance Ministry for ratification.

The Puriputro: Following ratification, the Ministry of Women and Child Affairs Office composes a letter, known as the Puriputro. The Puriputro contains information specifying the rules of the Maternity Allowance Program including the number of beneficiaries per union, the size of the benefit, the seven means test criteria, and other information regarding the process of selection. This letter is sent from the national offices in Dhaka to each district level MOWCA. Upon receipt, the district offices forward the letter to each sub-district MOWCA offices.

The sub-district MOWCA arranges a meeting for all Union Chairmen residing in the sub-district. Presiding over this meeting is the head of the sub-district, the Executive Officer. He officially "declares" the Puriputro by informing the union officials about the rules of the MAP outlined in the document. Upon completion of the meeting, the sub-district Department of Women Affairs (DOWA) officer sends each Union Chairman the Puriputro and requests him to send back a letter with the list of beneficiaries chosen from the union within a week's time.

Intra-Union Selection Process: The selection process within each union is done according to the discretion of Union Councils. The most common method involves allocating the number of beneficiaries to be chosen between the three women members

of each Union Council. Other variations involve giving the selection task to all members of the Union Council, to one member, or even outsourcing the selection to a non-council member. This procedure is the most common source of “processing delays” as it is highly uncommon for the Union Council to compile a list of eligible beneficiaries within the one-week deadline.

After selection, the Union Chairman sends the list to the sub-district DOWA officer who checks the list, signs it, and gives it to the sub-district Executive Officer. The Executive Officer signs it and sends it to the district level DOWA officer, who again signs it and mails it to the national Department of Women Affairs, under the MOWCA in Dhaka. Following approval from the national agency, the DOWA sends all of the union lists to the Ministry of Finance.

Fund Disbursement: The Ministry of Finance sends the full two-year payment for all beneficiaries to each sub-district’s bank account. Following receipt of the money, the sub-districts call a second meeting with the Union Chairmen to set a distribution date for the first instalment of the MAP. On the scheduled day of collection each beneficiary goes to the sub-district DOWA office. There they receive a Maternity Allowance Card, which includes a photocopy of their national ID, a picture, their pregnancy certificate, and address. After signing the card, the recipients receive their stipend from the DOWA officer. Following payment, the Executive Officer makes a speech giving educational advice on safe motherhood, suggesting what to do with the money, and emphasizing the stipulation that mothers have no more than two children.

Chapter 4. Methodology and Data

To measure the Maternity Allowance Program's impact, the present study relies on quantitative and qualitative analysis of primary data collected in the district of Lakshmipur during August 2013. The quantitative portion draws primarily on the results of a closed ended questionnaire administered to seven hundred beneficiary and non-beneficiary mothers. To estimate the treatment effects of the program, responses were analyzed using the impact evaluation technique of propensity score matching.

Qualitative data were gathered through focus group discussions with beneficiary mothers, and by informant interviews with government officials at the union, district, and sub-district levels. The purpose of undertaking the qualitative research was to substantiate the quantitative findings, learn more about the operational efficiency of the program, and determine possible policy recommendations to enhance the MAP's ability to tackle adverse maternal and child health outcomes.

This chapter is divided into summaries of the Quantitative and Qualitative analysis. Beginning with the former, the first section presents a general overview of impact evaluation methodology, an introduction to propensity score matching, and provides detail regarding the data collection and sampling methods. The latter section outlines the two qualitative methods used in the study: focus group discussions and informant interviews.

4.1. Quantitative Analysis

4.1.1. "The Fundamental Problem of Causal Inference"

Consider a model with a group of individuals, an outcome indicator of interest, and a binary treatment variable that takes the value of 1 if an individual receives the

treatment (D_i = 1) and 0 otherwise (D_i = 0). By defining a potential outcome indicator as Y_i, we can write the treatment effect for an individual, i, as:

$$\boldsymbol{\tau_i = Y_{i,1} - Y_{i,0}}$$

When conducting an impact evaluation over a given sample, usually the parameter of interest is the causal effect among those who get the treatment. This is known as the "Average Treatment Effect on the Treated" (ATET) and is written as:

$$\boldsymbol{\tau_{ATET} = E[Y_1|D = 1] - E[Y_o|D = 1]}$$

The central problem in evaluating these treatment effects is that it requires differencing the outcome indicator from a treatment beneficiary with the outcome indicator from the same beneficiary if they had not received the treatment. Unfortunately, only one of these outcomes can be observed at any given time, since an individual is either given the treatment or not. Therefore it is impossible to calculate the second term of the ATET equation. This is known as the fundamental problem of causal inference.

The way to remedy this quandary is to use observable data from a group of non-beneficiaries to create a "counterfactual group" that is able to substitute for the unobservable term. Using this strategy we are able to compute an estimate of the true causal effect:

$$\boldsymbol{\widehat{\tau_{ATET}} = E[Y_1|D = 1] - E[Y_o|D = 0]}$$

The difference between the ATET and the estimated ATET is called, "selection bias", which is equal to the difference in average Y_o between the treated and untreated:

$$\textbf{Selection Bias} = \boldsymbol{E[Y_o|D = 1] - E[Y_o|D = 0]}$$

Selection bias implies that any observed difference in the measured outcome indicators between those who receive the program and those who do not cannot be attributed to the program itself; it could simply mean that the program participants were purposely selected. The common example of this type of bias is with job training programs, where

those individuals that sign up for a training program may be the more motivated individuals, who are more likely to find a job even in the absence of the treatment.

The goal of impact evaluation methodologies is to overcome the "Fundamental Problem of Causal Inference" by creating a counterfactual control group in a way that ensures the selection bias is equal to zero. Many alternative evaluation methodologies can be used to estimate the outcome indicator of interest without bias. In experimental methods, such as Randomized Control Trials, individuals are assigned randomly to treatment and control groups, thus eliminating selection bias. In quasi-experimental studies, qualifying assumptions must be made before estimating the ATET.

4.1.2. Propensity Score Matching

Propensity Score Matching (PSM) is a quasi-experimental methodology that has been growing in popularity in recent years (Caliendo, 2005). PSM creates a counterfactual control group by matching beneficiary observations with non-beneficiary observations that have similar probabilities of participating in the treatment. The probability of participating in the treatment is known as the propensity score and is calculated using a vector of pre-treatment, observable characteristics.

$$\textbf{Propensity Score} = \boldsymbol{P(X)} = \boldsymbol{Pr(D = 1|X)}$$

The matching methodology relies on two assumptions. If both assumptions hold then PSM provides an unbiased method for estimating $E[Y_o|D = 1]$.

1. **Conditional Independence** – There is a vector of observable covariates X, such that after controlling for these covariates, the potential outcomes are independent of the treatment status.

   $$(\boldsymbol{Y_1}, \boldsymbol{Y_o}) \perp \boldsymbol{D} | \boldsymbol{X}$$

   If this assumption holds then it follows that after controlling for P(X) outcomes will also be independent of the treatment status. It is important to note that Conditional Independence assumes that the outcome indicator of interest and the assignment into a treatment group does not depend on any unobservable differences.

2. **Common Support** – For all possible values of the vector of covariates X, there must be a positive probability of finding a match. This requirement necessitates sufficient overlap in the distribution of propensity scores for treated and control observations.

$$\mathbf{0} < \boldsymbol{P}(\boldsymbol{D} = \mathbf{1}|\boldsymbol{X}) < \mathbf{1}$$

PSM estimation utilizes four main steps. The first is to calculate the propensity scores using a discrete choice model (probit model) as a function of factors that affect the likelihood of participation into the program (the observed covariates). The second step is to ensure a common support by tailoring the distributions of the control and treated propensity scores so that they maximize overlap. This is done by dropping observations with extreme propensity score that are unable to be adequately matched. The next step is to match treated observations with control observations by using a predetermined matching algorithm. This study utilizes the nearest neighbour matching technique as per the *teffects* command in STATA. The final step is to use the matched observations to calculate the average treatment effect on the treated.

4.1.3. Data Collection and Sampling

Quantitative data were collected using a household survey administered to both beneficiary and non-beneficiary mothers. Specifically, the treatment group and control group consisted of respondents who met the following criteria:

Treatment Group: Mothers who were beneficiaries of the Maternity Allowance Program during the 2011 fiscal year (selected by Union Council members in July of 2011). Beneficiary mothers would give birth to their child at any time in the interval between, August 2011 at the earliest and March 2012 at the latest. At the time of the survey, the treatment group would have been in the last month of their twenty-four month stipend.

Control Group: Mothers who gave birth to a child during the same interval as treatment mothers, August 2011 to March 2012. The control group must have never been beneficiaries of the Maternity Allowance Program but had the same probability of being selected during the 2011 fiscal year. Thus, eligible mothers must have given birth to either their first or second child, been over the age of twenty at the time of birth, and belong to families that are comparably poor and own no other land besides their homestead.

Seven hundred total respondents were surveyed. 350 belonged to the treatment group and 350 to the control group. Sample size was dictated primarily by time and budgetary constraints.

The case study region was located 150 km south of Dhaka in Lakshmipur, a district located along the Maghna River in the Chittagong Division, adjacent to Noakhali on the east and Chandpur on the west. Of the five sub-districts located within Lakshmipur, three were chosen as primary sampling locations, Lakshmipur Sadar (LS), Komol Nagar (KN), and Ramgati (R) (Figure 4.1). These three sample sub-districts were selected on the basis of the partner NGO's sub-regional offices in Lakshmipur and the subsequent strong working presence of the NGO in the area. Even more crucially, the Development Organization of the Rural Poor (DORP), the partner NGO, was able to liaison with the district and local governments in Lakshmipur to provide beneficiary lists for LS, KN, and R.

According to a 2011 census, Ramgati has a population of approximately 260,000 residents located in seven unions, Komol Nagar has a population of 223,000 residing in nine unions, and Lakshmipur Sadar has a population of 684,425. The study was able to acquire beneficiary lists from thirty-one unions: four from Ramgati, nine from Komol Nagar and eighteen from Lakshmipur Sadar.

To allocate the 350 beneficiaries to each of the sub-districts, a variant of proportional allocation was utilized. The primary sampling unit was unions, and the total number of unions surveyed was 31. The four unions in Ramgati make up 13% of the total number of unions and therefore 46 respondents should be sampled (350x0.13). The nine unions from Komol Nagar constitute 29% of the total, thus a sample of 102 (350x0.29) respondents would be proportional. Similarly for Lakshmipur Sadar, the 18 unions should represent 203 respondents.

Figure 4.1. Map of Lakshmipur District
Note: Source: Maps of Bangladesh[11]

These figures were altered commensurate with the number of enumerators in each sub-district and by a multiple of 35, the total number of treatment group

[11] Image can be found at: http://mapofbangladesh.blogspot.ca/2011/09/laksmipur-district.html

observations that each enumerator was tasked to survey. As such, the total number of treatment respondents in each of the three sub-districts sampled was: 70 for Ramgati, 105 for Komol Nagar and 175 for Lakshmipur Sadar. Table A.3 in the Appendix indicates the unions that were surveyed in each of the three sub-districts, as well as the total number of beneficiaries per union in 2011, and the number that were selected as part of the survey.

The intra-union sampling scheme utilized simple random sampling to select the respondents from the lists provided. In this process each beneficiary had the same probability of being selected, and the final selection process involved simply picking every other beneficiary on the list until the required number was chosen.

The Control Group was allocated similarly to the Treatment Group; 70 non-beneficiaries were selected in Ramgati, 105 in Komol Nagar, and 175 in Lakshmipur Sadar (see Table A.4 in Appendix A). Since there wasn't a government list of eligible mothers that didn't receive the program in 2011, the Control Group was identified by the enumerators according to the criteria indicated above. The enumerators were easily able to identify Control Group respondents. This was in part because the enumerators were themselves local to the area, but also because Union Council members helped in the search, and there were many eligible control group women to select from.

4.1.4. Questionnaire Design

Two questionnaires were designed, one for the Treatment Group and another for the Control Group. Both consisted of 36 questions and were translated into Bangla by a qualified personal contact. Complete transcripts of the two questionnaires are included in Appendix C.

The questionnaire solicited information related to six areas: household characteristics, economic status, maternity services, breastfeeding practices, nutrition and health, and anthropometric measurements of woman and children.

Household Characteristics: Questions were asked to ensure that non-beneficiary mothers met the criteria required to be an eligible control group member and to confirm

that beneficiary group mothers did in fact receive the Maternity Allowance Program. Treatment group mothers were also directly asked how the MAP impacted their quality of life and health. Other questions pertained to household demographics, including number of family members, educational attainment, disabilities, religion, hours worked, and occupation of head of household.

Economic Status: To properly use PSM and match beneficiary and non-beneficiary observations, the wealth and socioeconomic status of households must be controlled for. Along with a categorical income question, a simple asset score of durable goods was created using equal weighting of assets. Other proxies of socioeconomic standing included the type of sanitation facility utilized, the material of the household's roof, land ownership, and ownership of livestock. To ensure accurate matching, it was imperative that these questions assessed pre-program levels.

Maternity Services: Commensurate with the MAP's objective of increasing the uptake of maternity related services, this section assessed the utilization of services such as pre and post-natal care, having a skilled attendant present during birth, and delivery at a public health facility.

Breastfeeding Practices: Related to the objective of increasing the rate of lactation, the questionnaire investigated rates of exclusive breastfeeding and the use of breast milk substitutes, particularly infant formula. A knowledge-based question was also included that asked respondents to select the healthiest option for feeding infants among breast-milk, infant formula, or a mix of the two.

Nutrition and Health: This section dealt with varying aspects of nutrition and health. The goal was to get a comprehensive understanding of the diversity and adequacy of the diet as well as the consumption of micronutrients. To capture diet diversity, the study created an individual diet diversity score replicating the methodology proposed by the Food and Agriculture Organization (FAO) in their publication, "Guidelines for Measuring Household and Individual Dietary Diversity" (Kennedy, 2011). Regarding health, outcome measures were used such as the frequency of diarrhea and fever, number of doctor visits in the past month, and total treatment expenditure.

Anthropometric Measurements: Using a set of non-digital weight-scales and tape measures, enumerators measured the height and weight of respondents. Weight measurements were also taken for children were born between August 2011 and March 2012. Using this information, mother's BMI was calculated and weight/age metrics were computed for children.

4.1.5. Survey Administration

The survey instrument was tested in Kaliganj, a sub-district located in Gazipur, an hour north of Dhaka. The questionnaire was finalized after incorporating observations from the pilot test. Surveying began in Lakshmipur on August 18th, 2013 and was concluded on August 30th. Ten local enumerators were hired to administer the questionnaires, five from Lakshmipur Sadar, three from Komol Nagar, and two from Ramgati. Prior to the fieldwork, one full day was taken to train the enumerators on the questionnaire design and on surveying methods. Quality control was ensured throughout the twelve days by overseeing interviews and ensuring proper completion of questionnaires. Subsequently, data were transcribed and checked for logical inconsistencies.

4.2. Qualitative Analysis

Qualitative information was gathered from two sets of stakeholders: local government officials and program beneficiaries. Open-ended interviews sought to gather normative opinions and anecdotal evidence from the stakeholder perspective. Questions probed three general topics: implementation, outcomes, and recommendations. Six focus groups were also conducted

4.2.1. Focus Group Discussions

A total of six focus group discussions were conducted; two from each of the three sub-districts. Focus groups were facilitated by a team of two experienced female researchers and followed a semi-structured open-questionnaire format. Hired enumerators identified FDG participants by asking (non-randomly) beneficiary mothers if

they would be willing to participate. Discussions were held at various locations including households, Union Councils, and schools. FGDs lasted approximately an hour and participants were paid Tk. 100 to reimburse their time and travel expenditure. Snacks and drinks were also provided.

4.2.2. Informant Interviews

Nine local government officials (7 Union Councilwomen, 1 sub-district Department of Women Affairs officer, and 1 district Department of Women Affairs officer) were queried regarding the bureaucratic workings and implementation of the MAP. Participants were also questioned about their perception of the program, its effectiveness, and what policy measures they would take, if any, to bolster the success of the program. Questions were asked by a team of three researchers, including the principal researcher, and followed a semi-structured template.

Chapter 5. Profile of Survey Households

This chapter presents descriptive statistics for the mothers surveyed in Komol Nagar (KN), Lakshmipur Sadar (LS), and Ramgati (R). Included are respondents from both the treatment group of MAP beneficiaries and the comparison control group of non-beneficiaries. Since selection bias has not been controlled for, the mean difference in outcome variables between treatment and control groups does not provide the true impact of the MAP. Therefore, the discussion below does not reveal the actual efficacy of the program. The results of the impact evaluation, using the Propensity Score approach, are discussed in the subsequent chapter.

5.1. Household Characteristics

Table 5.1 details household characteristics of the 700 survey respondents, disaggregated by the three sub-districts, Ramgati (R), Komol Nagar (KN), and Lakshmipur Sadar (LS), as well as by treatment and control group. As mentioned, control group respondents include women who met the MAP eligibility criteria in 2011, gave birth during the same interval as MAP beneficiary women, and have never received the MAP.

The average age difference in the sample between spouses, 6 years, reflects national trends in spouse age differentials. According to the 2011 DHS, 40% of Bangladeshi couples have an age disparity between 5 to 9 years. Household sizes of control and treatment groups are similar (4.5 and 4.4), and are also comparable to the national average (4.6). The dependency ratio is calculated by the following formula:

$$\frac{(\#\ people\ aged\ 0-14\ +\ \#\ people\ aged\ >\ 65)}{\#\ of\ people\ aged\ 15-64}$$

The dependency ratio for the treatment group is higher than the control group (0.84 versus 0.79). Higher dependency ratios imply an increased burden on productive household members to provide support for the young and the aged (File, 2009).

Table 5.1. Household Characteristics of Survey Respondents

Characteristic	Treatment Group				Control Group			
	R	KN	LS	Total	R	KN	LS	Total
Respondent's age	25.8	25.3	25.3	25.4	24.5	24.4	25.3	24.9
Husband's age	31.9	30.2	31.7	30.8	31.7	29.2	31.3	31.3
Household size	4.6	4.7	4.2	4.4	4.6	4.8	4.2	4.5
Number of children	1.6	1.7	1.6	1.7	1.6	1.4	1.6	1.5
Dependency ratio	0.81	0.88	0.83	0.84	0.87	0.74	0.78	0.79
Respondent literate (%)	40.6	46.7	70.0	57.1	57.1	57.7	52.3	54.8
Husband literate (%)	47.8	24.5	55.9	44.9	50.7	35.7	33.9	37.8
Respondent's highest class completed	3.4	2.5	4.9	3.9	4.5	3.3	4.1	4.0
Husband's highest class completed	4	1.7	3.7	3.1	5.6	2.4	2.7	3.2
Household's highest class completed	5.0	3.3	5.9	4.9	5.6	4.2	4.8	4.8
Religion								
Muslim (%)	94	99	98	98	100	100	96	98
Hindu (%)	6	1	2	2	0	0	4	2
Female headed household (%)	0	2.9	3.5	2.6	1.4	4.8	7.3	5.4
Respondent disability (%)	1.5	0.0	1.2	0.9	1.4	1.0	1.1	1.1
Husband disability (%)	2.9	1.0	0.0	0.9	2.9	0.0	0.6	0.8
Own their home (%)	71.0	59.0	79.8	71.8	82.9	44.8	79.6	69.8
Own other land (%)	0.0	1.0	2.3	1.4	15.7	0.0	1.7	4.0

One (non-mandatory) MAP selection criterion is that beneficiaries be women from female-headed households. In this sample, only 2.6% of treatment mothers were in households headed by a female. This is lower than the control group (5.4%) and the national average (11%). Since this criterion is non-mandatory, it does not necessarily reflect problems in selection, although the relatively large difference is surprising. Another of the five non-mandatory MAP criteria is that beneficiary families own no land holdings besides their homestead. On average only 1.5% of treatment mothers owned

alternate land holdings before receiving the MAP. The proportion of Ramgati control group mothers owning non-homestead land holdings is atypically high at almost 16%.

The descriptive statistics imply substantial variation in education levels between sub-districts:

- The educational attainment and literacy rates of respondents from the treatment group in Lakshmipur Sadar are much higher than the other values. This reflects higher urban relative to rural education levels in Bangladesh.
- Treatment educational outcomes are similar to the control outcomes once aggregated by sub-district.

5.2. Economic Indicators

To match respondents based on propensity scores, questions that surveyed a respondent's economic status had to be measured at pre-program levels. For beneficiaries, questions queried economic indicators before receipt of the MAP. For non-beneficiaries, questions asked mothers for their economic status prior to the birth of the child they delivered between August 2011 and March 2012. Table 5.2 shows the indicators used to assess household's economic standing.

Comparable figures exist between the treatment and control groups for the percent of mothers who worked. This is in spite of mothers in the Ramgati treatment group who worked almost three times more than the second highest sub-district. Besides the Ramgati treatment outlier, the other five values were all under the 13% national employment figure for married women aged 15-49. The majority of the employed women in the sample worked in cottage textile industries. The dominant occupation for the husband was as a daily labourer, which in this context included individuals who worked as a daily agricultural labourer.

Table 5.2. Economic Indicators (Pre-MAP treatment, Pre-birth control)

Characteristic	Treatment Group				Control Group			
	R	KN	LS	Total	R	KN	LS	Total
Total hours worked in household	9.2	10.8	6.6	8.4	9.2	12.1	6.6	8.7
Respondent worked (%)	17.4	1.9	1.7	4.9	5.7	6.7	3.4	4.8
Husband occupation (%)								
Daily laborer	85.5	51.0	73.5	69.2	66.2	68.0	66.7	67.0
Small business worker	7.3	5.9	5.3	5.9	10.3	9.0	4.6	7.0
Rickshaw driver	4.4	13.7	11.2	10.6	10.3	10.0	14.4	12.3
Fisherman	0.0	20.6	1.2	6.7	4.4	10.0	2.9	5.3
Other	1.5	7.8	7.1	6.2	5.9	2.0	8.1	5.9
Not working	1.5	1.0	1.8	1.5	2.9	1.0	3.5	2.6
Durable asset score	2.6	2.2	2.2	2.3	2.3	2.6	2.2	2.3
Total livestock holdings	4.4	1.9	2.3	2.6	3.3	1.5	1.8	2.0
Monthly Income (%)								
<Tk. 1000	0.0	0.0	2.9	1.4	0.0	1.9	0.6	0.9
Tk. 1001-1500	5.8	2.9	2.9	3.5	2.9	3.8	7.4	5.4
Tk. 1501-2000	18.8	8.6	9.3	11.0	42.9	21.9	14.2	22.2
Tk. 2001-2500	37.7	21.9	26.0	27.1	28.6	10.5	13.1	15.4
>Tk. 2500	37.7	66.7	59.0	57.1	25.7	61.9	64.8	56.1
Roof								
Plastic	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.3
Metal	71.0	89.5	93.1	87.6	90.0	99.0	93.2	94.3
Straw	29.0	10.5	4.1	11.0	7.1	0.0	4.0	3.4
Bamboo	0.0	0.0	0.6	0.3	0.0	0.0	1.1	0.6
Coconut Leaf	0.0	0.0	2.3	1.2	0.0	0.0	1.7	0.9
Cement	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.6
Toilet								
"Here and there"	1.5	1.0	2.3	1.7	1.4	1.0	7.4	4.3
Open hole	43.5	28.6	12.1	23.3	41.4	37.1	19.3	29.0
Pit with cement	1.5	0.0	0.6	0.6	0.0	0.0	0.6	0.3
Ring Slab	53.6	48.6	79.2	64.8	54.3	48.6	69.3	60.1
Other home's toilet	0.0	21.9	5.8	9.5	2.9	13.3	3.4	6.3

The durable asset score aggregates equally weighted household ownership of 12 assets (potential maximum score, 12; minimum, 0). These assets include a sewing machine, fishing net, electricity connection, wardrobe, table, mattress, radio, television, cell-phone, mosquito net, bicycle, and motorbike. A wide dispersion of asset ownership exists among households, with recorded values ranging from 0 to a maximum of 7. Ownership of mosquito nets (96% of all respondents) is the most common asset. No major variation in durable asset scores exists between treatment and control groups. The average household in both groups owned 2.3 assets out of the possible 13. Total livestock holdings, consisting of chickens, goats, and cows, was highest in Ramgati, the most agriculturally dependent of the three sub-districts. The treatment group owned 0.6 more livestock holdings than the control group (2.6 vs. 2.0).

Monthly income was assessed by a categorical dummy variable, decomposing income into five wealth classes. One of the non-mandatory MAP eligibility criteria is that households earn less than Tk. 1500 a month. Relatively few households meet this criterion; in part, this is because the requirement was established at the time of the program's inception and has not been indexed to inflation or rising living standards. Allowing for inflation since 2005, the real value of the original threshold is now in the Tk. 2001-2500 interval. While roughly half the MAP beneficiaries report income above Tk. 2500 and are probably not below the $1.25/day poverty threshold, they are all below the $2.00/day threshold.

5.3. Maternity Service Utilization

To reiterate, the following comparative figures outline the descriptive statistics for the control and treatment groups. They are not adjusted using the PSM methodology and therefore do not give the true impact of the MAP.

The gap between the proportion of treatment and control group mothers seeking antenatal care during pregnancy is almost 17 percentage points (Table 5.3). The percentage of mothers in the sample receiving at least one pre-birth check up is much higher then the national average (72% vs. 50%). Of those who received ANC, the

average number of check-ups obtained is roughly two, and is similar for both treatment and control.

The statistics provide a portrait of the typical birthing practice employed by respondents. Most mothers deliver at home and pay community skilled birth attendants (CSBA), family welfare visitors (FWV), or dais to provide obstetric assistance. LS is the anomaly however; over half of the births are presided over by relatives or untrained attendants. For approximately 11% of mothers in control and treatment groups, a qualified doctor attended their delivery. This is below the 24% figure found in the DHS for mothers aged 20-34. Doctors must be attending home births given the low propensity for delivery in a clinic or hospital. Hospital birth is slightly more common for MAP beneficiaries than the control group.

Table 5.3. Maternity Service Utilization

Characteristic	Treatment Group				Control Group			
	R	KN	LS	Total	R	KN	LS	Total
Used ANC (%)	100.0	78.1	74.0	80.4	74.3	73.3	54.0	63.8
Average number of ANC visits for those that used ANC	2.1	1.8	2.3	2.1	2.6	2.3	2.0	2.2
Delivery attendance (%)								
No one/ Relatives	11.6	7.6	58.4	33.7	5.7	9.5	68.2	38.2
NGO worker	0.0	1.0	1.2	0.9	1.4	0.0	1.7	1.1
Dai (traditional birth attendant)	37.7	41.9	26.0	33.1	34.3	27.6	23.9	27.1
CSBA/ FWV	39.1	27.6	9.3	20.8	41.4	41.0	4.0	22.5
Doctor	11.6	21.9	5.2	11.5	17.1	21.9	2.3	11.1
Location of Birth (%)								
Family's home	94.2	94.3	86.7	90.5	97.1	98.1	89.2	93.5
Health provider's home	0.0	0.0	1.7	1.4	0.0	0.0	0.0	0.0
Health provider's clinic	0.0	0.0	1.2	0.6	0.0	0.0	0.6	0.3
Government hospital	2.9	2.9	7.5	4.6	1.4	1.0	6.3	3.7
Non-government hospital	2.9	2.9	2.9	2.9	1.4	1.0	4.0	2.6
Used PNC (%)	75.4	74.0	61.2	70.1	77.1	73.3	59.7	67.2

5.4. Nutrition and Health

Due to the overwhelmingly positive health perception of MAP beneficiaries in LS, the respondents in the treatment group were much more likely to profess their current health as positive (63.7%) compared to the control group (49.0%) (see Table 5.4). The superior health perception among MAP beneficiaries may well be due to their relatively positive food adequacy perceptions. Among MAP beneficiaries over a third (37.2%) reported having sufficient amounts of food; among the control group the equivalent statistic is below a quarter (23.7%). Although intra-household equity in food distribution was not measured, the diversity of food intake was measured using the FAO diet food score. Results show a modestly greater average diversity among MAP beneficiaries relative to the control sample (5.6 vs. 5.2).

Table 5.4. Nutrition and Health

Characteristic	Treatment Group				Control Group			
	R	KN	LS	Total	R	KN	LS	Total
Health perception (%)								
Positive	39.1	53.3	79.8	63.7	32.9	41.9	59.7	49.0
Negative	60.9	46.7	20.2	36.3	67.1	58.1	40.3	51.0
Current food adequacy (%)								
Sufficient	50.7	23.8	39.9	37.2	34.3	16.2	23.9	23.7
Not sufficient	49.3	76.2	60.1	62.8	65.7	83.8	76.1	76.3
Food Score	5.6	5.4	5.7	5.6	4.8	5.2	5.4	5.2
Number of times child sick in past month (%)								
0 times	21.7	10.6	30.8	22.9	12.9	13.3	27.3	20.2
1 or more times	78.3	89.4	69.2	77.1	87.1	86.7	72.7	79.8
Number of times respondent sick in past month (%)								
0 times	31.9	47.6	47.4	44.4	25.7	54.3	48.3	45.6
1 or more times	68.1	52.4	52.6	55.6	74.3	45.7	51.7	54.4
Respondent went to doctor in past month (%)	66.7	89.5	79.8	80.1	82.9	74.3	78.4	78.1
Total money spent on doctor treatment (Tk.)	570.8	690.1	898.0	770.0	752.3	504.9	842.8	727.8

Diarrhea, leading to excessive dehydration, is the main cause of morbidity and mortality among children. The overall incidence of fever or diarrhea during the past thirty days was very high among children and respondents. Over the entire sample 78% of children and 55% of mothers had at least one incident during the past month. While the prevalence was high in both groups, the share of children with more than one incident of diarrhea or fever was less in the treatment group than in the control group (77.1% vs. 79.8%). Conversely, the treatment group mothers experienced a slightly greater prevalence of illness than those in the control group (55.6% with more than one incident vs. 54.4%).

Conceivably, as a result of the high prevalence of morbidity, doctor visits were a common occurrence. The amount of monthly expenditure on treatment for maladies was extremely high relative to respondent's monthly income. The average expenditure over the entire sample was Tk. 750 per month, with treatment observations spending 40 more taka on treatment than control observations. A household that earns Tk. 2500 per month spends 30% of their income on medical treatment!

5.5. Micronutrient Supplementation

The consumption of micronutrient supplements (Table 5.5) displays large variation between sub-districts. For example, out of the 210 women surveyed in KN, fewer than 5% in either treatment or control group are regularly using any of the three supplements listed. In R, regular users of each supplement exceed 20%. There are also large differences between treatment and control groups. The regular users of each supplement in the treatment group comprise a share two to three times larger than in the control group.

Table 5.5. Micronutrient Consumption

Characteristic	Treatment Group				Control Group			
(%)	R	KN	LS	Total	R	KN	LS	Total
Calcium supplement								
Regularly	34.8	0.0	23.1	18.4	30.0	0.0	5.1	8.6
Not regularly	18.8	32.4	18.5	22.8	18.6	24.8	14.8	18.5
When pregnant	4.3	12.4	14.5	11.8	4.3	14.3	18.8	14.5
Never	42.0	51.4	39.9	43.8	47.1	60.0	56.9	55.8
Don't know	0.0	3.8	4.0	3.2	0.0	1.0	4.6	2.6
Iron supplement								
Regularly	34.8	2.9	22.5	19.0	11.4	3.8	5.1	6.0
Not regularly	13.0	47.6	16.2	25.1	30.0	36.2	18.2	26.0
When pregnant	14.5	5.7	19.7	14.4	11.4	13.3	21.0	16.8
Never	36.2	39.0	39.3	38.6	47.1	43.8	50.6	47.9
Don't know	1.5	4.8	2.3	2.9	0.0	2.9	5.1	3.4
Vitamin supplement								
Regularly	17.4	1.0	21.4	14.4	22.9	1.9	4.6	7.4
Not regularly	20.3	38.1	19.1	25.1	22.9	37.1	11.9	21.7
When pregnant	8.7	2.9	17.9	11.5	8.6	8.6	14.8	11.7
Never	53.6	58.1	38.7	47.6	45.7	50.5	65.3	57.0
Don't know	0.0	0.0	2.9	1.4	0.0	1.9	3.4	2.3

5.6. Breastfeeding

Table 5.6 presents encouraging results for breastfeeding practices among those surveyed in Lakshmipur. Children are near universally breastfed and almost 90% are exclusively breastfed for the first six months, a great improvement from the national exclusive average of 64% (BDHS, 2011). There was a slightly less chance of a baby in the survey being fed infant formula if the baby was part of the treatment group as opposed to the control group. However, even in the control group only 9% were fed formula. The positive breastfeeding indicators results from the knowledge mothers have with regard to the health merits of breast-milk. This is proven from the results of the knowledge question asking the optimal food for infants less than 6 months old. An initial hypothesis was that increased income from the intervention would mean greater

consumption of breast-milk substitutes for the treatment group. Clearly, the extent of children fed formula as well as the results of the knowledge question proves that this hypothesis is unsubstantiated.

Table 5.6. Breastfeeding Practices

Characteristic	Treatment Group				Control Group			
(%)	R	KN	LS	Total	R	KN	LS	Total
Child been breastfed	98.6	99.0	98.3	98.6	100.0	98.1	100.0	99.4
Exclusive breastfed	89.9	95.2	86.7	89.9	81.4	89.5	90.3	88.3
Child given infant formula	2.9	3.8	11.6	7.5	10.0	9.5	8.0	8.8
Money spent on infant formula								
Tk. 0	97.1	96.2	88.4	92.5	90.0	90.5	92.0	91.2
<Tk. 250	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tk. 251-500	0.0	1.0	0.0	0.3	0.0	1.9	0.0	0.6
Tk. 501-1000	1.5	0.0	1.2	0.9	1.4	0.0	1.1	0.9
Tk. 1001-1500	0.0	0.0	2.3	1.2	0.0	1.9	0.0	0.6
Tk. 1501-2000	0.0	1.9	0.6	0.9	0.0	1.9	1.1	1.1
Tk. 2001-2500	1.5	0.0	0.6	0.6	1.4	0.0	2.3	1.4
>Tk. 2500	0.0	1.0	6.9	3.8	7.1	3.8	3.4	4.3
Which is healthier knowledge question								
Breast-milk	100.0	95.2	97.1	97.1	98.6	94.3	89.8	92.9
Infant formula	0.0	0.0	0.6	0.3	0.0	0.0	1.7	1.1
Mix of breast-milk + formula	0.0	4.8	2.3	2.6	1.4	5.7	8.5	6.0
How soon after birth did breastfeeding start?								
Within 1st hour	84.1	72.8	66.9	72.1	82.9	87.4	64.8	75.1
After 1st hour within 1st day	14.5	24.3	30.8	25.6	12.9	8.7	31.8	21.2
After 1st day within first three days	1.5	1.9	2.3	2.3	4.3	1.9	2.3	2.6
After three days within first week	0.0	1.0	0.0	0.3	0.0	1.9	1.1	1.2

5.7. Anthropomorphic Measurements

Body Mass Index is calculated by:

$$\frac{weight\ (kg)}{[height\ (m)]^2}$$

The mean BMI[12] across the entire sample is 20.7, which is within the normal healthy range. Table 5.7 shows that the BMI results were close to constant across sub-districts and between treatment and control groups. BMIs did show large variances between respondents. One hundred forty-two mothers had BMIs below the healthy threshold, 18.5, with the treatment group containing marginally more of these women than the control. Approximately 58% of mothers with BMIs below 18.5 lived in Lakshmipur Sadar.

Table 5.7. Anthropomorphic Measurements

Characteristic	Treatment Group				Control Group			
	R	KN	LS	Total	R	KN	LS	Total
Respondent's Body Mass Index	20.8	20.6	20.9	20.8	20.9	21.2	20.2	20.6
Number of mothers below 18.5 BMI	15	24	35	74	9	11	48	68
Child weight for age								
Male	0.54	0.61	0.44	0.51	0.58	0.59	0.49	0.54
Female	0.59	0.57	0.40	0.49	0.56	0.56	0.47	0.51

Weight for age metrics indicate a child's chronic or acute malnutrition (Ahmed, 2009). This data, decomposed into male and female metrics, was calculated by dividing the weight of the child in kg by the age of the child in months. For both treatment and control groups, the child measured was the one that was born during the interval from August 2011 to March 2012. Similarly to respondent's BMI, mean statistics for the child's weight for age are lowest in the LS sub-district. This is surprising given the relatively encouraging nutrition and health descriptive statistics presented above. The other surprising result is that the weight for age data for the control group is higher by 0.03

[12] Pregnant women were excluded from BMI calculations

than the treatment. However, a means difference t-test shows that this difference is not statistically significant at the 5% significance level.

5.8. MAP Specific Questions

Table 5.8 presents the descriptive results of two questions asked to the group of mothers receiving the intervention. The first question assessed how receiving the MAP impacted their overall wellbeing. The MAP had a positive influence on recipients, 80% suggested that it greatly improved the quality of their lives while the remaining 20% said it slightly improved their wellbeing. Whether mothers received the first MAP payment before or after giving birth is more discouraging and seems to corroborate the "processing delay" anecdotes mentioned previously. Only half of the beneficiaries received their first instalment before they gave birth as they were supposed to. This has serious implications on the aforementioned indicators, especially the uptake of maternity services. More will be discussed about this in Chapter 7.

Table 5.8. MAP Specific Indicators (Treatment group only)

Characteristic	Treatment Group			
(%)	R	KN	LS	Total
How has the MAP impacted quality of life				
Greatly improved	91.3	88.6	69.4	79.5
Slightly improved	8.7	11.4	30.6	20.5
Not improved	0.0	0.0	0.0	0.0
Worsened	0.0	0.0	0.0	0.0
Receive MAP payment after birth	47.8	64.8	42.2	50.1

Chapter 6. Results

This chapter presents the estimated impact of the MAP on maternity service uptake, breastfeeding, nutrition and health, as well as anthropomorphic measurements of the respondents and their children. As mentioned in Chapter 4, the approach used to isolate the impact of the program is propensity score matching (PSM). Recall that PSM generates a "propensity score" (a probability between 0 and 1) for all observations (treatment and control) based on a series of observable characteristics. The propensity scores indicate the probability of receiving the intervention. PSM then matches members of the treatment group with control group members having similar propensity scores. Based on these matches, PSM identifies the average treatment effect for the treatment observations (Average Treatment Effect on the Treated). Performing this technique ensures that the assignment into the treatment group is effectively random and thus minimizes erroneous selection bias.

6.1. Estimating Propensity Scores and Ensuring a Common Support

An important step in the application of PSM is selecting the observable covariates to use when estimating the propensity score. The variables to include in the model are those that determine program participation and influence outcome indicators. These covariates are either time invariant measures (such as a mother's education level) or pre-program levels (such as income and assets). Covariate selection in this study was based on the MAP's eligibility criteria, anecdotal information from informant interviews, previous literature, and general economic theory. It is important to note that the inclusion of non-significant covariates will not bias the results (Caliendo, 2005). Table 6.1 identifies the 24 matching covariates used.

Table 6.1. PSM Matching Covariates

Household Demographic Characteristics:	
Religion	Female headed household
Respondent's age	Husband's age
Mother literate	Husband literate
Class respondent	Class husband
Head of household disability	Respondent disability
Dependency ratio	Household size
Pre-food adequacy	
Economic Indicators	
Total hours worked	If respondent worked
Head of household occupation	Material of roof
Type of toilet facility	If household owned their home
If household owned other land	Monthly income of household
If household received another stipend	Durable goods asset score
Livestock asset score	

Following determination of the covariates, propensity scores matching is undertaken using the STATA 13, *teffects* command. This command performs three tasks. First, it calculates propensity scores using a probit binary choice model. The dependent variable in the model is whether an individual was a treatment or control observation and the independent variables are the matching covariates. Second, *teffects* matches treatment and control observations together based on their estimated propensity scores. This is done using the matching specification of "nearest neighbour", where each treatment observation is matched to five control observations with the nearest propensity scores. Lastly, the STATA command calculates the average treatment effect for those receiving the intervention (ATET).

To ensure robust application of PSM, estimated propensity scores must satisfy the common support assumption outlined in Chapter 4. This means there must be sufficient overlap in the distributions of propensity scores for treatment and control groups (Caliendo, 2005). Figure 6.1 graphically depicts the frequency distributions of propensity scores for the control group (blue histogram) and treatment group (red histogram). A common support is ensured due to the high degree of overlap between the distributions. To further enhance the quality of the matching, treatment observations

were dropped if they had propensity scores greater than 0.8. Following matching, the mean propensity score was 0.54 for the treatment group and 0.46 for the control group, thus indicating the matching was successfully balanced. The number of observations used in the evaluation, net of sample trimming, was 677.

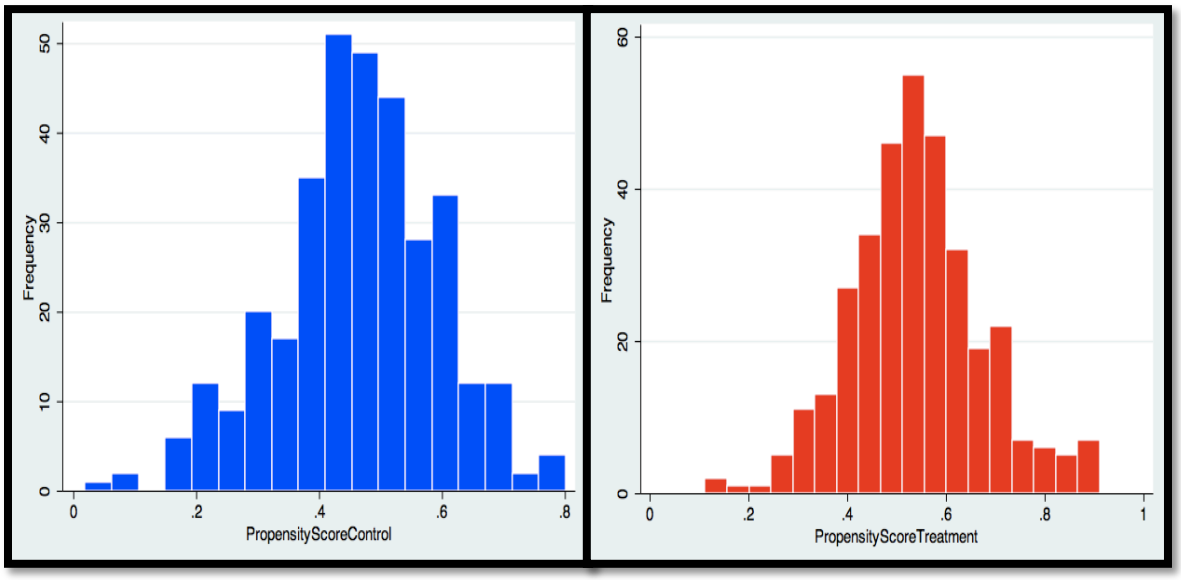

Figure 6.1. Distributions of Estimated Propensity Scores

6.2. Impact on Maternity Service Uptake

The first set of results assesses the MAP's impact on utilization rates of maternal services. To simplify the interpretation of results, categorical indicator variables were transformed into binary variables prior to evaluation. For example, the average number of ANC visits was replaced with a binary variable having the value 1 if the mother attended more than two ANC check-ups and 0 otherwise. The location of delivery has the value 1 if the birth took place at a clinic or hospital and 0 if it took place at home. The categorical skilled birth attendant variable assumed the value 1 if an NGO worker, traditional attendant, CSBA, FWV, or doctor attended the birth, and 0 if a respondent gave birth with no attendant present. Table 6.2 presents the PSM impact estimates for maternity services.

Table 6.2. Propensity Score Matching Impact Estimates of Maternity Service Indicators

Indicator	ATET (MAP's effect)	z-Statistic	P-value
Antenatal Care	0.158	4.08	0.000***
More than 2 ANC visits	0.067	2.07	0.038**
Postnatal care	0.091	2.30	0.022**
Birth at a clinic or hospital	0.032	1.62	0.106
Birth with attendant	0.044	1.09	0.274

Note. *** denotes significance at 1%, ** at 5%, * at %10

Results of the matching exercise indicate that the MAP has significant and substantial positive effects on whether a mother received antenatal and postnatal care. Compared to the control group, those who receive the monthly MAP stipend were 16 percentage points more likely to have undertaken an ANC visit. Restricting the sample to those who did have an ANC check-up, MAP mothers were 7 percentage points more likely than non-MAP mothers to have more than 2 ANC visits. This finding is significant at the 5% alpha level. Also significant at the 5% level was the usage of postnatal care, which was 7 percentage points higher for beneficiary mothers.

The treatment effect for the variables, delivery at a medical facility and in the presence of a skilled attendant were both positive, indicating that mothers were more likely to deliver in a safer environment. However, since both variables were insignificant at conventional alpha levels, the null hypothesis of identical means between groups cannot be rejected.

Overall, the MAP's effect on the use of maternity services is encouraging. The increased use of ANC is somewhat surprising given that half the MAP beneficiaries receive their first cash instalment after giving birth. This might indicate that the MAP affects increased usage through ways other than simply lowering the financial barriers to access. One important mechanism, corroborated from the qualitative data, was the positive gender-related impacts that the MAP instigated. For example, many of the focus group discussion respondents mentioned that their intra-household standing increased upon receipt of the MAP, so much so that they were finally able to seek medical care without prior approval of their spouses. The positive gender impact does not diminish the

role of the MAP as a tool for demand-side financing. Mothers who received the first cash instalment after birth indicated that the assurance of a future income stream made them willing to consume in the present. Thus, despite the delays in MAP disbursement, the program reduced the financial barrier to access of maternity services.

An interesting yet intuitive finding from the qualitative data is an understanding of how the rural poor view healthcare. Respondents in the focus group viewed care strictly in treatment terms, instead of prevention. A mother aptly summarized this sentiment by saying, “if they are sick, they treat; if they are not sick, they don’t treat”. The increased usage of ANC and PNC caused by the MAP may be a result of a change in mentality brought on by education imparted by government officials at the time of stipend collection.

Harder to explain are the lower values and insignificant results for the variables capturing the actual delivery practices: attendance of a skilled personnel and delivery at a medical facility. One explanation for the latter variable, alluded to earlier, is that rural birthing is predominantly done at home and that this may be a cultural practice. Also, there may be other non-cost factors such as stigma or poor service quality that impede delivery at a health facility.

6.3. Impact on Breastfeeding

Descriptive statistics in the previous chapter show that general breastfeeding indicators for the three sub-districts were well above national averages. Given that exclusive breastfeeding rates hovered around 90% in the sample, it is little surprise that the MAP does not dramatically enhance breastfeeding. The impact estimates of the MAP in Table 6.3 show that the program actually reduces general breastfeeding and exclusive breastfeeding by modest amounts (1.1 and 1.2 percentage points respectively). Correspondingly, the MAP also causes modest increases in the use of and the amount spent on infant formula. However, these results are all insignificant at the 1%, 5%, or 10% levels.

The data depicts an interesting and significant result for the breastfeeding knowledge question. Recall that the question tested mothers to see if they thought breast-milk, formula, or a mix of the two is the ideal food for children under six months. To assess whether the MAP has an underlying impact on knowledge surrounding breastfeeding practices, the question is decomposed into a binary variable (0 = formula or a mix of breast-milk and formula, 1 = only breast-milk) and its effect is evaluated using PSM. The results, significant at the 5% level, report that the MAP causes a roughly 3-percentage point increase in the number of people who believe that breastfeeding is the healthiest option for children below six months. The result, although seemingly innocuous, tells a story about one of the main merits of the MAP program; increased education on behalf of beneficiaries. This is a result of advice and knowledge that is transferred between local government officials and beneficiaries over the course of their selection and receipt of funds.

Table 6.3. Propensity Score Matching Impact Estimates of Breastfeeding Indicators

Indicator	ATET (MAP's effect)	z-Statistic	P-value
Breastfed	-0.011	-1.51	0.131
Exclusively breastfed	-0.012	-0.55	0.584
Infant formula	0.005	0.26	0.792
Money spent on infant formula (> Tk. 2000)	0.007	0.35	0.729
Breastfeeding knowledge question	0.028	1.98	0.048**

Note. *** denotes significance at 1%, ** at 5%, * at %10

6.4. Health and Nutrition

The MAP's most pronounced benefit is revealed in Table 6.4, the estimated impact on health and nutrition indicators. Highly significant is the MAP's effect on beneficiary's health perception. The intervention increased the number of people with positive health perceptions by 15.2 percentage points as compared to the control group. The better health perception outcome may be a result of the program's impact on increasing the amount and quality of food intake. In relation to the control group, the

MAP program caused a 10.2 percentage point increase in levels of reported food adequacy (statistically significant at the 1% level). The diversity of food consumption, measured by the 24-hour diet recall, shows that the FAO food score is 0.24 points higher for MAP participants (statistically significant at the 5% level).

Table 6.4. Propensity Score Matching Impact Estimates of Health and Nutrition Indicators

Indicator	ATET (MAP's effect)	z-Statistic	P-value
Health perception	0.152	3.40	0.001***
Current food adequacy	0.102	2.62	0.009***
FAO food score (diet diversity)	0.238	2.23	0.025**
Child sick in past month	-0.007	-0.18	0.853
Mother sick in past month	0.018	0.44	0.661
Saw doctor in past month	0.042	1.22	0.222
Total money spent on doctor treatment in past month (Tk.)	102.1	1.79	0.074*

Note. *** denotes significance at 1%, ** at 5%, * at %10

Qualitative data support the nutrition impact estimates. The foremost answer to the FGD question, what did you spend the MAP payment on, was emphatically and universally increased food purchases. Mothers mentioned that prior to receiving the MAP they weren't able to afford enough rice to consume it three times a day; however following the intervention, they were able to purchase enough rice as well as local fruits such as bananas, guavas, pineapples, and mangos. Beneficiary respondents also claimed that, because of the MAP, they were able to enhance the regularity of meat, egg, and milk consumption – although these "luxury" food items were still consumed infrequently.

Table 6.4 also shows whether the child and respondent were sick with either fever or diarrhea during the past month. Differences between treatment and control groups for these two variables are not statistically significant at the 10% level. Since mothers and children of the treatment and control groups have very similar probabilities of illness, we would expect that the stipend, either through increases in purchasing power or through increases in gender equity, would allow the beneficiaries to visit the

doctor more frequently than their control counterparts. Surprisingly though, while the variable “saw doctor in past month” has a positive average treatment effect on the treated, it is not significant.

The estimates imply that the MAP causes an increase in total treatment expenditures per month of Tk. 102 (significant at the 10% level). This is a substantial amount of money and means that almost 30% of the monthly MAP payment (Tk. 350) goes to expenditure on medical treatment. Therefore, although the MAP doesn’t increase the number of doctor visits it does influence how much is spent at the doctor. Beneficiaries must either go to more expensive private doctors or spend greater amounts at the pharmacy. Qualitative evidence supports the tendency for MAP beneficiaries to shift from public to private hospitals. Respondents mentioned that in public hospitals the government doctor is usually not available and, although they provide free pharmaceuticals, the quality of the drugs are usually poor. A respondent even accused doctors of distributing “poor” medicine to poor women and keeping “good” medicine for themselves. Anecdotally, it is found to be common practice for public doctors in rural areas to siphon hospital supplies to open their own private clinics while still receiving a government paycheque. In a 2003 study commissioned by the World Bank, the authors made unannounced visits to public health clinics to quantify the fraction of medical professionals absent from their assigned post. They found that mean absenteeism rates for doctors were over 40% thus validating narratives that lambast rural public healthcare (Chaudhury, 2003).

6.5. Impact on Micronutrient Supplementation

To enhance the interpretation of results, the micronutrient variables were transformed to a binary variable taking the value 1 if the respondent consumed and 0 if they didn’t. Whether because government officials tout the use of supplements or the increased money reduces the barrier to access, supplementation saw significant and large gains because of the MAP program. The MAP increased the consumption of calcium, iron, and vitamins by 12, 9, and 10 percentage points respectively. The results for calcium are statistically significant at the 1% level, while iron and vitamins are both significant at the 5% level. Focus groups at Mandari in Lakshmipur Sadar revealed that

mothers in this union bought calcium and iron tablets with the MAP money and divulged that sub-district officers told them to do so.

Table 6.5. Propensity Score Matching Impact Estimates of Micronutrient Supplementation

Indicator	ATET (MAP's effect)	z-Statistic	P-value
Consumed calcium supplements	0.121	2.90	0.004***
Consumed iron supplements	0.094	2.42	0.015**
Consumed vitamin supplements	0.098	2.48	0.013**

Note. *** denotes significance at 1%, ** at 5%, * at %10

6.6. Impact on Anthropomorphic Measurements

Although the MAP increases a mother's BMIs by 0.26, the impact is not statistically significant (Table 6.6). Weight/age measurements for both boys and girls show negative ATET magnitudes, but again, these measures are not significant. In summation, the MAP has no real effect on anthropomorphic measurements. This is not surprising; the transfer is too small to significantly change body compositions. A study by the International Food Policy Research Institute used PSM to isolate the impact of four social protection schemes. They found BMI differences between each scheme and a control group was insignificant at the 5% level and that PSM estimates for height for age, weight for age, and weight for height were also insignificant (Ahmed, 2009).

Table 6.6. Propensity Score Matching Impact Estimates of Anthropomorphic Measurements

Indicator	ATET (MAP's effect)	z-Statistic	P-value
Mother's BMI	0.255	1.13	0.258
Weight/age (boy)	-0.027	-1.53	0.134
Weight/age (girl)	-0.025	-1.43	0.153

Note. *** denotes significance at 1%, ** at 5%, * at %10

Chapter 7. Discussion and Recommendations

This study aimed at providing an in-depth evaluation of Bangladesh's Maternity Allowance Program (MAP). The underlying objective of this research was twofold: to measure the intervention's efficacy at improving maternal and child health outcomes, and to identify possible measures to enhance the policy's effectiveness. This chapter synthesizes the quantitative and qualitative findings to address both of these objectives.

7.1. Main Findings

Six key findings related to the program's impact on health outcomes were identified. The first five summarize components of maternal and child health positively impacted by the MAP: family planning, gender empowerment, education, nutrition and health, and maternity services. The first three findings derive from focus group discussions and informant interviews; the latter two from the PSM impact assessment results detailed in the previous chapter. The final key finding is a negative one: health indicators that were not improved by the program and why this was the case.

7.1.1. Family Planning

As discussed in Chapter 3, the MAP imposed a loose conditionality on beneficiaries mandating no more than two children during their lifetime. Current recipients of the allowance disobeying the requirement will have their MAP allowance terminated. Those that complete the program and subsequently disobey the condition will not be retroactively punished.

Rates of infraction are low. As mentioned this is partially due to informal community monitoring but is also due to family planning knowledge transferred to beneficiaries by councilwomen and sub-district officials. For example, a councilwoman mentioned that she dissuaded first-time pregnant MAP recipients against having a

second child and counselled that the recipient employ sufficient birth spacing if she still wanted a second child. Mothers in the focus groups were adamant that they had no intention of disobeying the stipulation. Citing a lack of income, those receiving the MAP for their first child expressed an unwillingness to conceive a second. Beneficiaries with two daughters were asked if they would renege on the condition for the birth of a son. They answered a resounding no, and pointed to the two female enumerators leading the focus group saying that these women were educated and they proved there was no need for a son.

In addition to changing the behaviour of beneficiaries, the MAP conditionality impacted non-recipients as well. Councilwomen found that prospective beneficiaries reduced the number of children to remain eligible for the program. Given Bangladesh's very high population density, the MAP plays a role in reducing fertility rates to levels that are socially optimal.

7.1.2. Gender Empowerment

A fundamental, yet understated, determinant of maternal health is a women's status in her household and community. Although questions posed in the survey didn't assess the MAP's effect on gender-related behaviours, the qualitative research was designed to capture anecdotal evidence on this topic.

Information gathered from FGDs and informant interviews suggest the generation of a steady income stream provided by the MAP improved recipients' status and value within the household. Specifically, the MAP improved a number of gender-related indicators such as autonomy, participation in decision-making, access to and control over resources, and freedom from physical or verbal abuse.

- **Autonomy:** The increase in respondents' autonomy has been described in the previous chapter in the context of healthcare. FGD participants stated that since receiving the program they were more willing to not only disclose illnesses to spouses when previously they wouldn't but also to seek treatment without consent or accompaniment.
- **Participation in decision-making:** In rural Bangladesh, cultural convention dictates that men, not women, go to village markets to purchase food and other goods. Whereas previously respondents had little say on consumption

decision making, following receipt of the MAP, mothers would give husbands their own shopping lists and provide them the money required to purchase the goods.

- **Access to and control over resources:** The overwhelming majority of mothers indicated that they had complete control over their stipend and were able to govern its use. Incidence of family members appropriating the stipend was not supported in the data; however, one mother described how she willingly ceded the entire stipend to her husband.
- **Freedom from physical and verbal abuse:** Anecdotes described an end to beatings by husbands and mothers-in-law among recipients selected into the MAP. In particular, women identified mothers-in-law as major perpetrators of abuse. It was common for respondents to use a portion of the MAP stipend to purchase a gift for their in-laws, such as a dress, which solidified a mother's standing in the household.

Gender empowerment is inherently a multi-faceted and complex issue. The positive effect of the MAP on the indicators explored does not necessarily mean that gender roles have been redefined. Also unknown is whether the program instigates a sustained shift in the status of respondents following conclusion of the program. Further research is warranted to assess the longevity of gender impacts, as well as the status of beneficiaries at the community level. Regarding the latter, few beneficiaries indicated increased respect from neighbours because of MAP selection; however there may also be negative effects due to jealousy. In spite of the limitations, the qualitative findings provide a strong preliminary indication that the MAP has a significant positive impact on gender empowerment.

7.1.3. Education

While the MAP doesn't explicitly include provisions for educating recipients, an unintended benefit of the intervention is knowledge transfers between government officials and beneficiaries. As mentioned in chapter three, the Executive Officer gives a short speech to recipients during the disbursement of the first MAP payment. In his speech, the Executive Officer reinforces the conditionality and imparts advice on matters related to health and livelihood. The full extent of the knowledge transfer depends on the relationship between union councilwomen and the beneficiary as well as the level of involvement of the sub-district Department of Women Affairs Officer.

Many union councilwomen offered nutrition and birthing advice from the moment selection occurred. In one union in Ramgati, councilwomen stressed the importance of breastfeeding to beneficiaries. The outcome was that all 18 of the recipients surveyed in the union answered the breastfeeding knowledge question correctly and initiated breastfeeding immediately following birth. In some instances, councilwomen form a mentor/mentee relationship. Many of the councilwomen interviewed described giving stern informal guidelines on how to spend the MAP stipend. Some councilwomen suggested that beneficiaries use the money only for food and treatment. Others counselled the mothers to save the stipend and invest the money on income-generating assets such as a goat. Interviews with sub-district Department of Women Affairs Officers reveal that they too inform beneficiaries of health and livelihood best practices during the periodic disbursement of MAP funds.

Clearly the dispensing of piecemeal advice may not be the most effective means of education and questions remain whether all the advice given by local officials is productive. However, given the dearth of opportunities to obtain basic health and livelihood education, the information imparted is likely to be at least somewhat responsible for the positive impact evaluation results estimated in the previous chapter.

7.1.4. Nutrition and Health

The average treatment effect estimates of nutrition and health indicators reported in the previous chapter provide the most encouraging quantitative evidence to support the MAP. To summarize, the MAP increased the number of women citing positive health perceptions (increase of 15.2 percentage points), and levels of food adequacy (increase of 10.2 percentage points). Diet diversity food scores increased by 0.24 points, meaning that the program impacted both quality and quantity of food intake. Although the number of doctor visits didn't increase, the MAP increased the amount spent on total medical treatment by approximately Tk. 100. The increased expenditure is probably the result of substitution away from public into private care. Finally, impact estimates show that the MAP increased the use of calcium, iron, and vitamin supplementation (increases of 12, 9, and 10 percentage points respectively).

7.1.5. Maternity Services

The matching estimates gave convincing evidence that the MAP significantly reduced barriers to essential maternal services. Specifically, it increased both the probability of ANC and PNC (increase of 16 percentage points and 7 percentage points respectively). In addition, the probability of MAP mothers receiving more than two ANC visits was 7 percentage points higher than control mothers.

7.1.6. Program Limitations

The program is not a panacea for the ills that beset poor mothers in rural locals. Neither is its intention to do so. However, the program does have ambitious objectives, and the PSM estimates reveal that to some extent the MAP fails to fulfill its entire mandate. Four results in particular support this conclusion.

Breastfeeding: Contrary to the program aim of increasing rates of lactation, the MAP did not have a positive effect on breastfeeding or exclusive breastfeeding. As mentioned, further study on this outcome is needed to confirm the exclusive breastfeeding results due to the abnormally high sample rates vis-à-vis the national average.

Anthropomorphic Measurements: MAP beneficiaries and their children do not have statistically different anthropomorphic measurements compared to their non-recipient counterfactual. If the program did increase exclusive breastfeeding rates, then as a result of the increased caloric expenditure associated with nursing, recipients would be expected to have slightly lower, or similar, BMIs than non-recipients. If exclusive rates do not increase, it is hypothesized that mothers have higher BMIs due to the MAP's positive effect on increased food uptake. Results prove that neither of these outcomes occurred; the MAP failed to increase exclusive breastfeeding, and it did not result in increased BMIs. Weights of children, standardized by their ages, also showed no statistical increase for MAP recipients. This indicates that the monthly Tk. 350 payment did not improve prenatal, or neonatal nutrition enough to influence their current nutritional status. A reason for this, confirmed from the interviews, is that the payment is simply too small to drastically impact these outcomes.

Delivery Services: Although the MAP had a significant impact on the use of certain maternity services, it did not impact whether mothers had skilled health personnel attending their delivery. Since the presence of a birth attendant is the most important measure to reduce maternal mortality, this is a major failure of the MAP. The reasons for this failure are several. It may be that beneficiaries simply aren't provided enough education to enable them to make this decision, or professional attendants are considered too expensive.

Incidence of Disease: The MAP does not decrease the incidence of disease. This is a surprising result given the positive impacts on nutrition, specifically the increases in food adequacy, diet diversity and micronutrient supplementation. The result might indicate that there are other important determinants that the program fails to address. One possibility is environmental enteropathy, a condition of chronic intestinal inflammation caused by fecal-oral contamination that reduces the body's ability to absorb food (Korpe, 2012).

While stipend size, educational deficits, and environmental enteropathy may all be plausible causes for the program's shortcomings, a simpler explanation may be endogenous to the program itself, implementation failures.

7.2. Implementation of the MAP

Implementation can be decomposed into three parts: program selection, benefit disbursement, and general "processing delays." Various failures of implementation have serious ramifications on the efficacy of the program. The next section proposes policy recommendations that attempt to remedy the failures discussed here.

7.2.1. Program Selection

Pivotal to implementation is that the program selection be done in a fair, transparent, and unbiased manner. This relates not only to beneficiary selection by union councils but also to the determination of the number of prospective beneficiaries

per district, sub-district, and union done by the Ministry of Women and Child Affairs. Anecdotal evidence reveals several issues.

First is the issue of corruption. Every 12 member union council contains 3 councilwomen, who are the optimal beneficiary selectors. As mentioned, the process of intra-union selection differs for each union council. In many instances council members other than councilwomen are tasked with selection. This is problematic for three reasons. First, male officials can't realistically ask women sensitive questions surrounding their pregnancy. Second, when councilwomen are not selecting beneficiaries, the time to compile a list of recipients usually takes much longer. The third problem is increased incidence of corruption. When Union councilmembers other than councilwomen select beneficiaries the risk of extortion and bribery rises. The most egregious outcome is when non-council members are commissioned to perform the selection. In one union, for example, the guard of the union council was delegated the task of selection. In this instance, all seven of the beneficiaries selected by the guard were extorted, three of the women paid the guard Tk. 2000; two women gave Tk. 1,000, and another was unsure of the exact amount because her husband furtively paid the bribe. There were no reported instances of extortion when councilwomen determined beneficiaries.

The second problem with program selection is errors in targeting. Errors that include mothers who don't need the program and exclude those that do are inevitable given the nature of the means test. Selection problems are exacerbated by the seven out-dated and vague eligibility criteria. Although a comprehensive evaluation of targeting was not performed, the sample descriptive statistics show that very few mothers met the criterion of female-headed household (3%), and even fewer met the respondent disability criterion (1%). Additionally, the income criterion (< Tk. 2500) was also violated more often than it was met. Only 43% of beneficiaries surveyed had income less than Tk. 2500. While only 2% of beneficiaries owned land other than their household, roughly half owned agricultural livestock, violating the criterion mandating no productive assets. The beneficiaries were no doubt poor mothers, but they were not the poorest.

7.2.2. Benefit Disbursement

Mothers must travel from their respective unions, usually in remote villages, to the sub-district Department of Women Affairs office. Travel is far from easy. Women often must travel alone, either while pregnant or with their newborn child, over long distance, through bumpy and difficult terrain, at significant cost (both monetary cost and opportunity cost). For example, from Chor Badam, a union in Ramgati, to the sub-district Department of Women Affairs Office in the union Alexandar, a motorized rickshaw (CNG) took one hour and cost Tk. 300. Beneficiaries queried in the focus group discussions repeatedly mentioned their disdain at travelling so far at such a vulnerable time. Many told anecdotes of birthing complications and unnecessary morbidity and expense from travelling over bumpy roads to the sub-district. As a result of the high cost associated with stipend collection, the monthly payment is actually given in 3 month or 6 month lump sum instalments.

7.2.3. "Processing Delays"

The final problem is the extensive processing delays throughout the MAP's logistical process. As this has been extensively detailed in Chapter 3, it need not be retold here. The impact of delays is that many beneficiaries – half in this study's sample – receive their first cash instalment *after* they give birth.

7.3. Recommendations for Policy

Despite its limitations the MAP has substantial merit in increasing the capabilities of rural pregnant mothers. The culmination of this assessment is six recommendations, intended to scale up the program and enhance its efficacy.

Enhance coverage rates of the MAP: Efforts should be made to increase the coverage rates of the MAP. Any superfluous or extraneous expense associated with program administration should be redirected for this purpose. Inevitably fiscal constraints impose a trade-off between size of the benefit and coverage of the program. Any attempt to scale up the program should be directed to increasing coverage rates of the MAP as

opposed to increasing the stipend size. This is because of the limited relative coverage of the program and the positive externalities associated with being a MAP beneficiary that are largely independent of the size of the stipend (e.g. gender empowerment, knowledge transfers, family planning, etc.). The coverage ratio of the MAP can be roughly calculated. In the 2011-2012 fiscal year there were 101,200 beneficiaries[13]. Using the 2012 birth rate, population size, and rural urban ratio[14], it is estimated that the 101,200 beneficiaries accounted for approximately 4% of all mothers who gave birth in rural areas during that year. Although this calculation doesn't compare the number of beneficiaries to the total number of eligible women, it still provides sufficient indication that the program's coverage is woefully low.

Send the MAP funds to the Union Council: Instead of sending the full amount of the stipend to each sub-district's bank account, the Ministry of Finance could reroute the payments to the union councils. This will increase the number of bank transfers the Ministry must send by 3,968 (= 4,451 unions – 483 sub-districts) and entail additional banking and administrative costs. However, the benefit program recipients will realize from this change will dwarf the incremental costs for the Ministry of Finance. Benefits will accrue from reducing transit costs and curtailing medical expenses associated with transit morbidity.

Legislate that the 3 union councilwomen select beneficiaries: To ensure transparency, expedite implementation, reduce corruption, and minimize targeting errors, the government should legislate that the 3 councilwomen be the sole beneficiary selectors in each union. This administrative requirement should be announced in the annual Puriputro and be reiterated by the sub-district executive officers during the first sub-district MAP meeting. This is a contentious recommendation given intra-union political dynamics. Union chairmen may be opposed to this selection rule as it affords an opportunity for councilwomen to canvass for future elections. However, the importance of this decree in guaranteeing a credible and sound MAP selection process supersedes any associated political strife at the union level.

[13] Rahman, S. (2012, June 8). Social Safety Net Shrinks. *The Daily Star* [Dhaka]
[14] 2012 CIA World Factbook data

Conduct random selection audits: Mandate that the National Department of Women and Child Affairs conduct random audits to verify that sub-union level selection was done fairly and abided by the previous recommendation.

Ensure that the first MAP payment is given before birth: The efficacy of a cash transfer aimed at increasing the purchase of maternity services relies on beneficiaries having money in their pockets, as opposed to future financial guarantees. The MAP needs to disburse payments to recipients prior to birth. If the three union councilwomen decide beneficiary selection, this will expedite the implementation process, but further measures should be made. Computerizing documents and utilizing electronic modes of mailing to minimize intra-governmental communication costs would be ideal. Other options are to start the implementation process earlier, or to impose a financial penalty on union councils that chronically delay their selection.

Revise Program Objectives and Eligibility Criteria: To minimize ambiguity in selection criteria and provide measurable, clear, and realistic program objectives, the criteria and objectives need to be re-stated. This recommendation does not imply changes to the eligibility criteria; however they must be made more specific. Remove the vague word "poor", specify mothers with one to two *live* births, clarify productive assets, and update the out-dated Tk. 1500 maximum monthly income to the currently used cap of Tk. 2500. Similarly, the objectives of the program must be set out clearly with outcomes that can be easily measured.

7.4. Conclusion

This study has found that the MAP expands the capabilities of rural, pregnant mothers by increasing their household status and enabling better health and education outcomes. Two caveats must be made. The first relates to limitations of external validity. Specifically, there exists substantial heterogeneity in the program implementation within Bangladesh. In other unions, NGOs play a role in MAP beneficiary selection and in providing recipients with education. This evaluation was limited to three sub-districts that may not be representative of outcomes for the 480 other Bangladeshi sub-districts. The second caveat is that although the MAP is an important initiative to help poor, vulnerable

households, the program is not a cure-all solution for reducing poverty. The MAP should be seen as one element in a coordinated and holistic system of government social safety nets.

Further research on the Maternity Allowance Program is warranted to supplement the findings in this study and address additional issues. In particular, studies must research the longevity of the MAP's impact. Does the program create sustained shifts in the livelihood of beneficiaries or is the program a once off betterment with no persistent effects? Do the gender empowerment and educational transfers stop immediately following termination of the two years? Another important future consideration is to assess the degree of heterogeneity between implementation of the MAP in other rural locals in Bangladesh. Studies should include in their samples beneficiaries from different divisions to attain some degree of external validity. These studies should use different impact evaluation methodologies that control for observable and unobservable differences between treatment and control groups. A limitation of the Propensity Score Matching method of impact evaluation is its inability to control for unobserved differences between beneficiaries and non-beneficiaries. Longitudinal studies that use difference-in-differences methodology with baseline and endline surveys would be ideal. Furthermore, to aid policymakers, future evaluations of the MAP should attempt cost-benefit exercises to describe the trade-offs between the MAP and other Bangladeshi social protection schemes such as the Maternal Health Voucher Program.

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Appendix A. Supplemental Tables

Table A.1. Cash Transfer Design Options

Policy Choice:	Definition:	Pros/Cons Choice 1	Pros/Cons Choice 2
Conditional (CCTs) vs. Unconditional (UCTs)	Conditionality requires that beneficiaries perform certain actions or fulfill a given set of criteria before they are entitled to the welfare programs benefits. (ex. Bangladesh Primary Education Stipend) Unconditionality provides the welfare benefits without any mandates on the beneficiary's actions. (ex. Bangladesh Old Age Allowance)	**CCTs:** • Deprive poor the freedom to choose (paternalistic) • Burden of conditionalities often falls on women • Politically more palatable to those who oppose "welfare handouts" • Incentivizes beneficial behaviour • Reduces likelihood of expenditure on "societal bads". • Increased demand risks worsening supply-side service delivery • Greater administrative and implementation costs	**UCTs:** • Less susceptible to corruption • Less costly to administer • More fair to beneficiaries who can't access services • Designed to have less of a role in long term poverty, greater role in immediate poverty • Inline with Declaration of Human Rights – no conditions should be placed on income grants • UCTs may influence the same set of outcomes as CCTs
Universal vs. Targeted	Universal programs entitle the entire population, or a population of a specific social category, to social benefits. Targeted programs provide social benefits to a sub-section of a population or a sub-section of a specific social category.	**Universal:** • Greater financial investment • Removes administrative and implementation costs of targeting (easier to administer) • Minimizes Exclusion Error – risk of the poor not receiving benefits (misidentification) • Increases Inclusion Error – "leakage" of benefits to those who do not need it • Greater political support from middle class	**Targeted:** • Increases Exclusion Error – risk of the poor not receiving benefits • Decreases Inclusion Error – "leakage" of benefits to those who do not need it • Allocates resources to those in greatest need (less financial investment) • Higher administrative and implementation costs • Indirect costs to beneficiaries

Policy Choice:	Definition:	Pros/Cons Choice 1	Pros/Cons Choice 2
		beneficiaries • More successful at reducing poverty • Reduces stigmatization of the poor • Less moral hazard	• Possible political cost • Poor targeting can create distortions and adverse incentives • Political stigmatization of beneficiaries • More effective at providing benefits when poor is only a small percentage of the population
Cash vs. In-Kind Benefits	Cash programs give monetary stipends. (ex. Bangladesh Maternity Allowance Program) In-Kind programs give non-cash benefits, usually food. (ex. Bangladesh Vulnerable Group Development)	**Cash:** • Less costly to administer • May be inflationary – reduce purchasing power • Freedom for beneficiaries to purchase goods they desire • Capitalize on banking to minimize leakages and provide direct benefit transfer • Misuse of money • Purchasing power subject to price fluctuations • Greater vulnerability of women, elderly, and children • Generally more favorable to beneficiaries	**In-Kind:** • Paternalistic – removes agency of beneficiaries • May achieve some "self-targeting", to separate rich from poor • Reduces consumption of "social bads" • More politically palatable • Food transport costs increase the cost of program • Can be used to increase the nutritional status of a HH • Increases supply of goods and decreases prices • Goods can depreciate/ spoil

Note. Various Sources. Standing, 2012; Villanger, 2008; Samson, 2009; IDEAS, 2011; Samson, 2006

Table A.2. Bangladesh Social Protection Programs

Program	Type of SP Program	Objective	Ministry	Number of Beneficiaries in 2010 ('000)	Amount and Nature of Benefit
Old Age Allowance	Social Assistance	Livelihood assistance to the poor aged	MOSW	2,250	300 Tk./ month
Allowance for Widow Deserted and Destitute Mothers	Social Assistance	Reduce vulnerability of women living without a husband	MOWCA	920	300 Tk./ month
Stipend for Student's with Disability	Social Assistance	Support the continued education of those living with disabilities	MOSW	17	300-1000 Tk./ month based on grade level
Honorarium for Insolvent Freedom Fighters	Social Assistance	Stipend for destitute, disabled Liberation War fighters	MOLWA	125	2,000 Tk /month
Primary Education Stipend	Social Assistance	Encourage primary school enrollment among poor households	MOPME	5,200	Tk. 100 (one student) Tk. 125 (more than one student)
Female Secondary School Stipend	Social Assistance	Increase the number of female students in secondary school	MOE	4,000	300-720 Tk./month based on grade level
Vulnerable Group Development	Social Assistance	Build the income earning capabilities of women and socially empower them	MOWCA	750	30 kg of food grain for 18 months + training in income generating activities.
Vulnerable Group Feeding	Social Assistance	Provides rice to the poor and gives relief to victims of disasters	MOFDM	3,148	10 kg rice/month

Program	Type of SP Program	Objective	Ministry	Number of Beneficiaries in 2010 ('000)	Amount and Nature of Benefit
Gratuitous Relief	Social Assistance	Provides short term relief to victims of disasters	MOFDM	6,400	Maximum of 20 kg's of rice or wheat
Maternity Allowance Program	Social Assistance	Ensures safe motherhood and sound upbringing of child	MOWCA	80	350 Tk./month for 2 years
Grants for Orphan Students in Non-Government Orphanages	Social Assistance	Livelihood support for orphans	MOSW	48	7,200 Tk./year
Housing Support	Social Assistance	Provide shelter for destitute disaster victims	MOFDM	235	2,000 – 20,000 Tk.
Test Relief	Labour Market Program	Employs rural poor during times of disasters and rainy season	MOFDM	100	5-6 kg of wheat per day of work
Food for Work	Labour Market Program	Generate productive seasonal employment for the rural poor	MOFDM	1000	Food transfer of varying amount
Employment Generation for Ultra Poor	Labour Market Program	Enhancing employment opportunities for the rural poor	MOFDM	6000	Cash payment of varying amount
Rural Employment and Road Maintenance	Labour Market Program	Empower women and increase employment	DLGE	1000	90 Tk./day + training in IGA

Note. Source: Asian Development Bank (2012)

Table A.3. Survey Locations (Treatment Group)

Sub-District	Union	# of MAP Beneficiaries	# of Beneficiaries Selected into T-Group
Ramgati (R)	Bara Kheri	20	18
	Char Badam	20	18
	Char Gazi	20	17
	Char Poragacha	20	17
Komol Nagar (KN)	Char Kalkini	20	12
	Shaeber Hut	20	12
	Char Martin	20	12
	Patwary Hat	20	12
	Hajirhat	20	12
	Char Lawrence	20	11
	Falcon	20	11
	Kadira	20	12
	Torabganj	20	11
Lashmipur Sadar (LS)	Uttar Hamchadi	16	9
	Dalalbazar	16	9
	Choupalli	16	9
	Char Ruhita	16	8
	Parbatinagar	16	11
	Bangakha	16	8
	Basikpur	16	9
	Datta Para	16	9
	Uttar Joypur	16	9
	Chandraganj	16	8
	Harjir Para	16	9
	Charsahi	16	12
	Dighali	16	11
	Mandari	16	9
	Laharkandi	16	12
	Shakchar	16	9
	Bhabaniganj	16	12
	Kushakhali	16	12
	Number of Treatment Observations per Sub-district: R=70 KN=105 LS=175		
	Aggregate Number of Treatment Observations Sampled: = 350		

Table A.4. Survey Locations (Control Group)

Sub-District	# of Beneficiaries Selected into C-Group
Ramgati	70
Komol Nagar	105
Lakshmipur Sadar	175
	Aggregate Number of Control Observations Sampled = 350

Appendix B. Case Studies

Nepal's Safe Delivery Incentive Program (SDIP):

In response to high maternal mortality, 281 deaths per 100,000[15], and the alarming proportion of mothers who gave birth in non-institutional settings, 81% of mothers[15], the Nepalese government legislated the Safe Delivery Incentive Program in 2005. This policy involved two central components: a cash transfer to mothers conditional on their having given birth in a public health facility, and a compensation to health workers for every delivery they attend (Jehan, 2012). These components worked in conjunction to change the behaviour of both health workers and mothers to increase both the demand and supply of health services.

Since the creation of the Safe Delivery Incentive Program there have been a series of changes that have been made to the design of the policy. One such change sought to address concerns that the policy incentivized excessive fertility by stipulating a condition that women with more than two children were ineligible to receive the program. However, this was later revoked in 2008 due to difficulties in ensuring that beneficiaries complied with the restriction. Following the repeal, the SDIP became available to all women in Nepal with no exception, thus making the program one of the rare truly universal social programs in the region (Jehan, 2012). The policy was further augmented in 2008 to include private hospitals, which introduced greater competitive pressure between health care facilities. In 2009 a third component to the program was added; mothers from the poorest 25 districts received free delivery care in addition to their cash stipend (Karki, 2012).

Several attempts at evaluation of the SDIP have been made. One thorough evaluation was conducted in 2010 (Powell-Jackson, 2010). This study used the method of propensity score matching to isolate the impact of the program on the demand for maternity service. Results found positive effects of the program amounting to a four-percentage point increase in institutional delivery care and a 4.3 percent increase in the uptake of skilled birth attendance (Powell-Jackson, 2010).

[15] Nepal DHS 2006

Despite these gains, the efficacy of the program was severely hampered by implementation issues. Only a quarter of women had knowledge of the program prior to birth and four-fifths of women who gave birth at a public health facility did not receive the cash payment following delivery when they were entitled to receive it. As a result of these implementation issues, the program was largely inequitable. Recipients of the cash transfer were disproportionately wealthier individuals who were more likely to give birth in a medical facility regardless of the program's incentives (Powell-Jackson, 2010).

India's Safe Motherhood Scheme (JSY):

The rational for India's foray into maternal health demand side financing policies echoes Nepal's experience. Under impetus from the Millennium Development Goals, India, like Nepal, worked hard to sustain drastic, albeit gradual reductions in maternal and child mortality. The maternal mortality of mothers in 1990 amounted to 327 per 100,000 live births, in contrast to 212 per 100,000 in 2007 (Randive, 2013). Despite this relative progress, the absolute numbers of maternal and neonatal deaths remained high. India accounted for 20% of worldwide maternal mortality, and 31% of total neo-natal deaths. Cognizant of the continued deficit in safe motherhood and the huge disparities in maternal health outcomes within the country, India launched the Janani Suraksha Yojana, translated as the Safe Motherhood Scheme, in 2005 (Lim, 2010).

Although the JSY is centrally sponsored, the scheme is decentralized to such an extent as to allow individual states the ability to cater program specifics to their unique needs. Despite this heterogeneity, the key, universal feature of the program is to promote institutional delivery by providing a conditional cash transfer to eligible women upon delivery in a public hospital or an accredited private facility (Jehan, 2012). The amount of the transfer and the eligibility requirements depend on the state where the delivery took place and whether it occurred in a rural of urban facility. To fight intra-state disparities, in ten "high-focused states" (Uttar Pradesh, Uttaranchal, Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Assam, Rajasthan, Orissa, and Jammu and Kashmir) the program was made universal; any woman regardless of socioeconomic standing would be eligible for the program. In these particular states, the value of the cash

incentive is also higher. In the other 18 states the program is targeted. Women are only eligible for their first two live-births, and only if they possess a “below the poverty line” (BPL) card, or are a member of a scheduled caste. The JSY also provides a modest financial payment to destitute mothers who live below the poverty line and who give birth at home (Lim, 2010).

Like the Nepalese Safe Delivery Incentive Program, the JSY also employs supply side characteristics. The implementation of the program is achieved through the use of community skilled health personnel, most notably ASHAs (accredited social health activists). In high-focused states these community health workers receive payments for each in-facility delivery they attend (Lim, 2010).

India’s Safe Motherhood Scheme is a unique policy simply due to its staggering size. In 2010 over a third of all pregnancies in the country were covered under the program. This amounted to 9.5 million women - making it the largest conditional cash transfer in the world (Jehan, 2012). A study submitted to the Lancet in 2010, conducted an empirical evaluation using the differences in differences estimation technique to estimate the effect of the program on service uptake and health outcomes (Lim, 2010). Analyzing data from two series of District Level Household & Facility Surveys (DLHS), the authors calculated that the JSY was responsible for a marked increase in health service uptake; 11% increase in the use of three antenatal care visits, 49% increase in births delivered at a health facility, and a 39% increase in skilled birth attendance. Targeting was found to be the main disparaging result. The probability that the poorest and least educated were beneficiaries of the program was consistently low across the 28 states (Lim, 2010).

Bangladesh’s Maternal Health Voucher Program (MHVP):

While the Voucher is a fundamentally different scheme than the other two programs, the rationale for legislating the intervention was largely similar. Specifically, the Bangladesh government, in collaboration with a series of international donors, launched the Maternal Health Voucher Scheme in 2004, to tackle the problems of high

maternal mortality and low utilization of maternity services in the country. The program was unveiled in a gradual fashion. Beginning initially with 21 pilot sub-districts, the program expanded significantly by 2012 to cover approximately ten million people residing in 46 sub-districts (Jehan, 2012). In 9 of the sub-districts, the Voucher acts as an almost universal program, benefits are provided to all women for their first or second live birth. Beneficiaries residing in the other 37 sub-districts are subject to additional means-tested eligibility criteria, based predominantly on land, asset, and income assessments (Ahmed, 2011).

The Voucher entitles women to receive access to three antenatal care check-ups, safe delivery at home or in a health facility with a skilled medical professional, emergency care for obstetric complications, and one post-natal check up in the six weeks post birth period. The beneficiaries of the Voucher receive an in-kind gift box as well as financial remunerations for transport costs, emergency transport costs, and a conditional payment if the mother gives birth in an accredited public or private health facility (Jehan, 2012).

Supply-side incentives are also included to exploit competitive advancements in quality of care. Community health workers receive a small incentive to identify and recruit pregnant women into the program. Payments are also given to medical providers for the package of antenatal care, delivery, and post-natal care. While private practitioners receive the payment in full, only half of the compensation for public facilities is given to the personnel; the other half is earmarked towards enhancing the institution's quality of care (Schmidt, 2010).

Evaluations of the Maternal Health Voucher Program show significant improvements in the utilization of maternity services. Relative to a control group of non-beneficiaries, mothers that received the program were over 100% more likely to give birth in the presence of a qualified health professional and give birth in an institutional setting. Equally encouraging is that despite loose monitoring of eligibility criteria, the targeting of the program has been largely successful; the poorest women in the population receive the greatest program benefits. Unfortunately, the reason for the program's success in targeting is unclear. With regards to the magnitude of demand side

financing, findings on the average out of pocket delivery expenditure show a ten-dollar savings for program beneficiaries visa vie non-beneficiaries. Given that out of pocket expenditure remains non-zero for Voucher recipients, further demand side financing is possible to fully remove fiscal barriers to access (Noor, 2013).

Appendix C. Survey Instruments

Treatment Questionnaire

District	Thana/ Upazilla	Union/ Ward	Village

Hello. My name is _____. I work for DORP, the Development Organization for the Rural Poor, a NGO working to improve the health of women in rural villages. We are doing a study in partnership with a university in Canada to find out about the health of mothers who receive the Maternity Allowance Program in the Lakshmipur sub-district. Your household was selected and we would like to ask you some questions to help DORP plan future health services.

The questions usually take about 20 to 25 minutes. All of the answers you give will be shared with no one other than members of our survey team. It is completely your choice if you would like to participate in the survey or not. If I ask any question you don't want to answer, let me know and I will go on to the next question or you can choose to stop the interview at anytime you wish. We do very much hope that you will agree to answer the questions since your views are important.

Your name will not be kept in our data and the responses you give will be held by DORP and Simon Fraser University in a confidential manner. In case you would like more information about the survey, you may contact the DORP office at the number and address listed on this card.

1. Do you agree to be interviewed?
   - ☐ YES
   - ☐ NO

   Interviewer's Initials _____

Mother and Household Information

2. How has receiving the Maternity Allowance Program impacted your family's quality of life?
   - ☐ It has greatly improved my family's quality of life
   - ☐ It has slightly improved my family's quality of life
   - ☐ It has not affected my family's quality of life
   - ☐ It has worsened my family's quality of life

3. Before you began to receive the Maternity Allowance Program how many times had you previously given birth?
   - ☐ None
   - ☐ Once
   - ☐ More than once

4. Did you receive the first Maternity Allowance payment before or after you gave birth?
   - ☐ Before
   - ☐ After

5. In general would you say your health today is:
   - ☐ Very good
   - ☐ Good
   - ☐ Okay
   - ☐ Poor
   - ☐ Very poor

6. What is your religion?
   - ☐ Muslim
   - ☐ Hindu
   - ☐ Christian
   - ☐ Buddhist
   - ☐ Other

7. We would like to know some details about everyone who is living in the same household as you:

Member of the Household	Head of Household (Check one)	Age (in years)	Can read? (Y = Yes N = No)	Highest class attended (in numbers)	Has a serious disability (Y = Yes N= No)	Hours worked per day **before receiving Maternity Allowance**	Occupation **before receiving Maternity Allowance**
Respondent							
Husband							
Child 1							
Child 2							
Other Members:							
1.							
2.							
3.							
4.							
5.							
6.							

Maternity Service Uptake

For all of the following questions we would like to know information about your child that was born while you were receiving the Maternity Allowance Program

8. When you were pregnant with your child, did you receive any antenatal (pre-birth) health checkups by a health professional such as a doctor, nurse, midwife, family welfare visitor or a community skilled birth attendant?
   - ☐ YES
   - ☐ NO

9. [NOTE: Ask only if yes for question #7]
   How many times did you receive antenatal health checkups?
   - ☐ 1 time
   - ☐ 2 times
   - ☐ 3 times
   - ☐ 4 times

10. Who assisted during the delivery of your child?

    [✓ all that apply]

    - ☐ No one
    - ☐ Relatives
    - ☐ NGO Worker
    - ☐ A Nurse or a Midwife
    - ☐ A Family Welfare Visitor or Assistant
    - ☐ A Community Skilled Birth Attendant
    - ☐ A Doctor
    - ☐ Other

11. Where was your child born?
    - ☐ Mother's home
    - ☐ Health professional's home
    - ☐ Health professional's clinic
    - ☐ Government hospital
    - ☐ Non-government hospital
    - ☐ Other

12. In the two months after your child was born, did a health professional such as a doctor, nurse, midwife, family welfare visitor or a community skilled birth attendant check your health or the health of your child?
    - ☐ YES
    - ☐ NO

Breastfeeding

13. Has your child been breastfed?
    - ☐ YES
    - ☐ NO

14. [NOTE: Ask only if yes for question #12]
How soon after birth did you first begin breastfeeding your child?

- ☐ Within the first hour
- ☐ After the first hour but within the first day
- ☐ After the first day but within the first three days
- ☐ After the first three days but within the first week

15. During the first six months of your child's life was your child given anything to drink other than breast milk?

- ☐ YES
- ☐ NO

16. [NOTE: Ask only if yes for question #14]
What was your child given to drink?

[✓ all that apply]

- ☐ Infant formula mixed from a can
- ☐ Cow/ Goat/ Buffalo Milk
- ☐ Plain water
- ☐ Sugar water
- ☐ Fruit Juice
- ☐ Honey
- ☐ Rice water
- ☐ Other

17. [NOTE: Ask only if box checked for infant formula in Question #15]
During the first six months of your child's life, about how many taka did you spend on infant formula?

- ☐ No Taka
- ☐ Below 250 Taka
- ☐ Between 251 Taka and 500 Taka
- ☐ Between 501 Taka and 1000 Taka
- ☐ Between 1001 Taka and 1500 Taka
- ☐ Between 1501 Taka and 2000 Taka
- ☐ Between 2001 Taka and 2500 Taka
- ☐ Greater than 2500 Taka

18. Do you think it is healthier to feed children that are less than 6 months old only breast milk, only infant formula or a mix of breast milk and infant formula?

- ☐ Feeding only breast milk is healthier
- ☐ Feeding only Infant formula is healthier
- ☐ Feeding a mix of breast milk and infant formula

Nutrition/ Health

19. What is the overall food adequacy situation of your family/household?

Now	Before receiving the Maternity Allowance Program
☐ More than enough ☐ Enough ☐ Sometimes not enough ☐ Never enough	☐ More than enough ☐ Enough ☐ Sometimes not enough ☐ Never enough

20. Please report if you have eaten the following food types in the past 24 hours.

Food Type	Examples	Yes = Y No = N
Eggs	Eggs from chicken, duck or any other egg	
Meat	Beef, lamb, goat, chicken, duck	
Fish and seafood	Eel, carp, catfish, shellfish, shrimp	
Cereals	Rice, wheat, biscuits, bread, noodles	
Green leafy vegetables	Spinach, cassava leaves, okra	
Non-green vegetables	Squash, carrot, tomatoes, eggplant, onion	
Milk products	Milk, cheese, yoghurt	
Fruit	Mango, banana, dates, apricots, peaches	
Oils and Fats	Oil, ghee or butter added to food	
Sweets	Sugar, honey, juice, chocolate, candies, cakes	
Spices	Black pepper, salt, garlic, turmeric	
Legumes, nuts and seeds	Beans, peas, lentils, nuts, seeds	

21. Since receiving the Maternity Allowance Program have you taken any of the following nutritional supplements?

Supplements	Regularly	Not Regularly	When pregnant and nursing my child	Never	Don't know
Calcium tablets					
Vitamins (example A)					
Iron tablets or syrup					
Zinc tablet					
Other supplements or fortified foods (specify):					

22. How often has your child had diarrhea or fever in the past 30 days?

☐ 0 times ☐ 3-4 times
☐ 1-2 times ☐ More than 4 times

23. How often have you had diarrhea or fever in the past 30 days?

☐ 0 times ☐ 3-4 times
☐ 1-2 times ☐ More than 4 times

24. In the past 30 days have you or your child received any treatment from a doctor or nurse?

    ☐ Yes

    ☐ No

25. [NOTE: Ask only if yes for question #12]
    What was the total cost of the treatment you and your child have received in the past 30 days?

    _____(in Tk.)

Assets/ Wealth and Income

I would like to ask about items you owned **before** you became pregnant and before you began to receive the Maternity Allowance Program – **not** about what you own now.

26. Before you became pregnant and started to receive the Maternity Allowance Program did your household own any of the following livestock?

Type of Animal	**Numbers**
Chicken/ Duck/ Pigeon	
Goat/ Lamb	
Cow	
Buffaloes	
Other (specify)	

27. Before you became pregnant and before you began to receive the Maternity Allowance Program did your household own any of the following:

Type of Asset	**YES**	**NO**
Farm plough		
Sewing machine		
Fishing net		
Electricity in home		
Almirah/ Wardrobe		
Table		
Mattress		
Radio		
Television		
Mobile phone		
Refrigerator		
Mosquito Net		
Bicycle or Rickshaw		
Motorbike		

28. Before you became pregnant and began to receive the Maternity Allowance Program did your family own the house or homestead you were living in?

    ☐ YES

    ☐ NO

29. Before you became pregnant and began to receive the Maternity Allowance Program did your household own any land other than your homestead?

- ☐ YES
- ☐ NO

30. What was the roof of the house you were living in before you became pregnant made out of?

- ☐ Plastic
- ☐ Bamboo
- ☐ Tin/ Metal
- ☐ Cement
- ☐ Mud
- ☐ Wood
- ☐ Brick
- ☐ Cardboard
- ☐ No roof
- ☐ Other (specify) _____

31. Before you became pregnant and before you began to receive the Maternity Allowance Program what was your toilet facility?

- ☐ Here and there
- ☐ Open hole
- ☐ Drain to pond/ canal/ river
- ☐ Hanging latrine (over water)
- ☐ Pit (with cement)
- ☐ Ring slab
- ☐ Sanitary
- ☐ Other (specify): _____

32. Before you became pregnant and began to receive the Maternity Allowance Program approximately how much money did your household earn per month on average?

- ☐ Below 1000 Tk.
- ☐ Between 1001 Tk. and 1500 Tk.
- ☐ Between 1501 Tk. and 2000 Tk.
- ☐ Between 2001 Tk. and 2500 Tk.
- ☐ Greater than 2500 Tk.

33. Does any member of your household receive any additional income from government allowances or stipends - besides the Maternity Allowance?

Now	**Before receiving the Maternity Allowance Program**
☐ Yes ☐ No If yes, specify what program:	☐ Yes ☐ No If yes, specify what program:

Physical Measurements

Child	Weight with mother (in kg)	Age of child (in months)	Sex
Child born while receiving the Maternity Allowance Program			
Other child below the age of 5			

34. Weight of mother without child (in kg)? _____

35. Height of mother (in cm)? _____

36. Is the mother currently pregnant?

    ☐ YES

    ☐ NO

Control Questionnaire

District	Thana/ Upazilla	Union/ Ward	Village

Hello. My name is _____. I work for DORP, the Development Organization for the Rural Poor, a NGO working to improve the health of women in rural villages. We are doing a study in partnership with a university in Canada to find out about the health of mothers who have given birth between September 2011 and March 2012 in the Lakshmipur sub-district. Your household was selected and we would like to ask you some questions to help DORP plan future health services.

The questions usually take about 20 to 25 minutes. All of the answers you give will be shared with no one other than members of our survey team. It is completely your choice if you would like to participate in the survey or not. If I ask any question you don't want to answer, let me know and I will go on to the next question or you can choose to stop the interview at anytime you wish. We do very much hope that you will agree to answer the questions since your views are important.

Your name will not be kept in our data and the responses you give will be held by DORP and Simon Fraser University in a confidential manner. In case you would like more information about the survey, you may contact the DORP office at the number and address listed on this card.

1. Do you agree to be interviewed?
   - ☐ Yes
   - ☐ No

Interviewer's Initials _____

Mother and Household Demographic Information

2. Did you give birth to a child between September 2011 and March 2012?
   - ☐ Yes
   - ☐ No

3. Before you gave birth to your child born between September 2011 and March 2012 how many times had you previously given birth?
   - ☐ None
   - ☐ Once
   - ☐ More than once

4. Were you 20 years or older when you gave birth to your child born between September 2011 and March 2012?
   - ☐ Yes
   - ☐ No

5. In general would you say your health today is:
   - ☐ Very good
   - ☐ Good
   - ☐ Okay
   - ☐ Poor
   - ☐ Very poor

6. What is the religion of the head of household?
   - ☐ Muslim
   - ☐ Hindu
   - ☐ Christian
   - ☐ Buddhist
   - ☐ Other

7. We would like to know some details about everyone who is living in the same house as you:

Member of the Household	Head of Household (Check one)	Age (in years)	Can read? (Y = Yes N = No)	Highest class attended (in numbers)	Has a serious disability (Y = Yes N= No)	Hours worked per day **(Before you became pregnant with your child born between Sept 2011 and March 2012)**	Occupation **(Before you became pregnant with your child born between Sept 2011 and March 2012)**
Respondent							
Husband							
Child 1							
Child 2							
Other Members:							
1.							
2.							
3.							
4.							
5.							
6.							

Maternity Service Uptake

For all of the following questions we would like to know information about your child that was born between September 2011 and March 2012 and May 2013

8. When you were pregnant with your child, did you receive any antenatal (pre-birth) health checkups by a health professional such as a doctor, nurse, midwife, family welfare visitor or a community skilled birth attendant?
   - ☐ YES
   - ☐ NO

9. [NOTE: Ask only if yes for question #7]

How many times did you receive antenatal health checkups?

- ☐ 1 time
- ☐ 2 times
- ☐ 3 times
- ☐ 4 times

10. Who assisted during the delivery of your child?

[✔ all that apply]

- ☐ No one
- ☐ Relatives
- ☐ NGO Worker
- ☐ A Nurse or a Midwife
- ☐ A Family Welfare Visitor or Assistant
- ☐ A Community Skilled Birth Attendant
- ☐ A Doctor
- ☐ Other

11. Where was your child born?
   - ☐ Mother's home
   - ☐ Health professional's home
   - ☐ Health professional's clinic
   - ☐ Government hospital
   - ☐ Non-government hospital
   - ☐ Other

12. In the two months after your child was born, did a health professional such as a doctor, nurse, midwife, family welfare visitor or a community skilled birth attendant check your health or the health of your child?
   - ☐ YES
   - ☐ NO

Breastfeeding

13. Has your child been breastfed?
   - ☐ YES
   - ☐ NO

14. [NOTE: Ask only if yes for question #12]
How soon after birth did you first begin breastfeeding your child?

- ☐ Within the first hour
- ☐ After the first hour but within the first day
- ☐ After the first day but within the first three days
- ☐ After the first three days but within the first week

15. During the first six months of your child's life was your child given anything to drink other than breast milk?

- ☐ YES
- ☐ NO

16. **[**NOTE: Ask only if yes for question #14**]**
IF YES: What was your child given to drink?
[✔ all that apply**]**

- ☐ Infant formula mixed from a can
- ☐ Cow/ Goat/ Buffalo Milk
- ☐ Plain water
- ☐ Sugar water
- ☐ Fruit juice
- ☐ Honey
- ☐ Rice water
- ☐ Other

17. **[**NOTE: Ask only if box checked for "infant formula from a can" in Question #15**]**
During the first six months of your child's life, about how many taka did you spend on infant formula?

- ☐ No Taka
- ☐ Below 250 Taka
- ☐ Between 251 Taka and 500 Taka
- ☐ Between 501 Taka and 1000 Taka
- ☐ Between 1001 Taka and 1500 Taka
- ☐ Between 1501 Taka and 2000 Taka
- ☐ Between 2001 Taka and 2500 Taka
- ☐ Greater than 2500 Taka

18. Do you think it is healthier to feed children that are less than 6 months old only breast milk, only infant formula or a mix of breast milk and infant formula?

- ☐ Feeding only breast milk is healthier
- ☐ Feeding only Infant formula is healthier
- ☐ Feeding a mix of breast milk and infant formula is healthier

Nutrition

19. What is the overall food adequacy situation of your family/household?

Now	Before you became pregnant with your child born between Sept 2011 and March 2012
☐ More than enough ☐ Enough ☐ Sometimes not enough ☐ Never enough	☐ More than enough ☐ Enough ☐ Sometimes not enough ☐ Never enough

20. Please report if you have eaten the following food types in the past 24 hours.

Food Type	Examples	Yes = Y No = N
Eggs	Eggs from chicken, duck or any other egg	
Meat	Beef, lamb, goat, chicken, duck	
Fish and seafood	Eel, carp, catfish, shellfish, shrimp	
Cereals	Rice, wheat, biscuits, bread, noodles	
Green leafy vegetables	Spinach, cassava leaves, okra	
Non-green vegetables	Squash, carrot, tomatoes, eggplant, onion	
Milk products	Milk, cheese, yoghurt	
Fruit	Mango, banana, dates, apricots, peaches	
Oils and Fats	Oil, ghee or butter added to food	
Sweets	Sugar, honey, juice, chocolate, candies, cakes	
Spices	Black pepper, salt, garlic, turmeric	
Legumes, nuts and seeds	Beans, peas, lentils, nuts, seeds	

21. Since giving birth between September 2011 and March 2012 have you taken any of the following nutritional supplements?

Supplements	Regularly	Not Regularly	When pregnant and nursing my child	Never	Don't know
Calcium tablets					
Vitamins (example A)					
Iron tablets or syrup					
Other supplements or fortified foods (specify):					

22. How often has your child had diarrhea or fever in the past 30 days?

☐ 0 times
☐ 1-2 times
☐ 3-4 times
☐ More than 4 times

23. How often have you had diarrhea or fever in the past 30 days?

☐ 0 times
☐ 1-2 times
☐ 3-4 times
☐ More than 4 times

24. In the past 30 days have you or your child received any treatment from a doctor or nurse?
    - ☐ Yes
    - ☐ No

25. [NOTE: Ask only if yes for question #12]
What was the total cost of the treatment you and your child have received in the past 30 days?

_____(in Tk.)

Assets/ Wealth and Income

I would like to ask about items you owned **before** you became pregnant with your child that was born between September 2011 and March 2012 – **not** about what you own now.

26. Before you became pregnant did your household own any of the following livestock?

Type of Animal	Numbers
Chicken/ Duck/ Pigeon	
Goat/ Lamb	
Cow	
Buffalos	
Other (specify)	

27. Before you became pregnant did your household own any of the following:

Type of Asset	**YES**	**NO**
Farm plough		
Sewing machine		
Fishing net		
Electricity in home		
Almirah/ Wardrobe		
Table		
Mattress		
Radio		
Television		
Mobile phone		
Refrigerator		
Mosquito Net		
Bicycle or Rickshaw		
Motorbike		

28. Before you became pregnant did your family own the house or homestead you were living in?
    - ☐ YES
    - ☐ NO

29. Before you became pregnant did your household own any land other than your homestead?
    - ☐ YES
    - ☐ NO

30. What was the roof of the house you were living in before you became pregnant made out of?
    - ☐ Plastic
    - ☐ Bamboo
    - ☐ Tin/ Metal
    - ☐ Cement
    - ☐ Mud
    - ☐ Wood
    - ☐ Brick
    - ☐ Cardboard
    - ☐ No roof
    - ☐ Other (specify): _____

31. Before you became pregnant what was your toilet facility?
    - ☐ Here and there
    - ☐ Open hole
    - ☐ Drain to pond/ canal/ river
    - ☐ Hanging latrine (over water)
    - ☐ Pit (with cement)
    - ☐ Ring slab
    - ☐ Sanitary
    - ☐ Other (specify): _____

32. Before you became pregnant approximately how much money did your household earn per month on average?
    - ☐ Below 1000 Tk.
    - ☐ Between 1001 Tk. and 1500 Tk.
    - ☐ Between 1501 Tk. and 2000 Tk.
    - ☐ Between 2001 Tk. and 2500 Tk.
    - ☐ Greater than 2500 Tk.

33. Does any member of your household receive any additional income from other government allowances or stipends?

Now	**Before you became pregnant with your child born between Sept 2011 and March 2012**
☐ Yes ☐ No If yes, specify what program:	☐ Yes ☐ No If yes, specify what program:

Physical Measurements

Child	Weight with mother (in kg)	Age of child (in months)	Sex
Child born between September 2011 and March 2012			
Other child below the age of 5			

34. Weight of mother without child (in kg)? _____

35. Height of mother (in cm)? _____

36. Is the mother currently pregnant?
    - ☐ YES
    - ☐ No