

SPILOVER EFFECTS OF DEMAND SIDE FINANCING PROJECTS ON  
HEALTH CARE UTILIZATION IN AFGHANISTAN

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A Thesis Submitted in Partial Fulfillment of the Requirements  
for the Degree of Master of Science Program in Health Economics and Health Care Management  
Faculty of Economics  
Chulalongkorn University  
Academic Year 2012

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เป็นแฟ้มข้อมูลของนิสิตเจ้าของวิทยานิพนธ์ที่ส่งผ่านทางบัณฑิตวิทยาลัย

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ต่อการใช้บริการสาธารณสุขในประเทศอัฟกานิสถาน

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วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต

สาขาวิชาเศรษฐศาสตร์สาธารณสุขและการจัดการบริการสุขภาพ

คณะเศรษฐศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

ปีการศึกษา 2555

ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

Thesis Title                    SPILLOVER EFFECTS OF DEMAND SIDE  
FINANCING PROJECTS ON HEALTH CARE  
UTILIZATION IN AFGHANISTAN

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Field study                        Health Economics and Health Care Management

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##5485700429: MAJOR HEALTH ECONOMICS AND HEALTH CARE MANAGEMENT

KEYWORDS: SELF-UTILIZATION /FAMILY UTILIZATION/EFFECT /CASH INCENTIVE PROGRAM /WOMEN OF REPRODUCTIVE AGE/ DEMAND SIDE FINANCING/FOUR PROVINCES/AFGHANISTAN

ABO ISMAEL FOSHANJI: SPILLOVER EFFECTS OF DEMAND SIDE FINANCING PROJECTS ON HEALTH CARE UTILIZATION IN AFGHANISTAN. ADVISOR: NOPPHOL WITVORAPONG Ph.D., 64 pp

Based on Demand Side Financing programs in Afghanistan in 2009-2011, this study aims to assess the spillover effects of programs in the areas other than targeted areas of institutional delivery and vaccination. Socio economic factors associated with general health care utilization among 6677 women who were older than 18 years old in Afghanistan are explored.

The ordered probit model is used for analyzing the relationship between cash incentives, socio economic factors and health care utilization (including self and family utilization). The Demand Side Financing programs end-line survey data set in 2011 is used for analyzing.

According to the main findings of this study relationship between the cash incentive programs and health care utilization is positive at 5% significant level. The rationale behind this relationship might be due to relaxation of family income constraints as transportation cost was covered as well as the positive relationship could be due to referral effort by Community Health Worker who received cash incentive from the program too. Women's education has a positive relationship with health care utilization, along with some other education program like reproductive health and family planning health education programs.

Cash incentives are recommended to increase health care utilization at formal facilities and to improve the referral system especially at the primary health care level.

Field of Study :Health Economic and Health Care Management Student Signature.....  
 Academic Year: 2012 Advisor Signature.....

## ACKNOWLEDGEMENTS

I would like to express my deepest appreciation to my thesis advisor, Lecturer Noppol Witvorapong, Ph.D. for his enormous guidance, valuable time and kind support from the primal to final level at every step of my thesis completion.

I would like to express my profound gratitude to my thesis committee, Associate Professor Narathip Chutivongse, lecturer Kanittha Tambunlertchai, Ph.D., Lecturer Touchanun Komonpaisarn, Ph.D. for their valuable suggestions and revisions for my thesis.

I also would like to express my sincere thanks to Faculty of Economics, Center for Health Economics and staff for their helpfulness during my study time. Specially, thanks Mrs. Kingthong for her kind support during all process.

I would like to thank Health Economic and Health Care Management directorate of Ministry of Public Health in Afghanistan for their valuable support. Special thanks go to my sponsors (USAID) for financial support for the entire course in Chulalongkorn University.

Lastly but not least, I would like to express my gratitude and love to my family. Their constant love and encouragement have motivated me to complete this program.

## CONTENTS

	Page
ABSTRACT(THAI) .....	iv
ABSTRACT (THAI).....	v
ACKNOWLEDGEMENTS .....	vi
CONTENTS .....	vii
LIST OF TABLES .....	ix
LIST OF FIGURES .....	x
LIST OF ABBREVIATION.....	xi
CHAPTER I INTRODUCTION.....	1
1.1 Problems and its Significance .....	1
1.2 Country Background .....	2
1.3 The Issue of Maternal Health in Afghanistan .....	4
1.4 Questions.....	5
1.5 Objectives.....	6
1.6 Scope .....	6
1.7 Hypothesis (es).....	6
CHAPTER II DEMAND SIDE FINANCING PROJECT IN AFGHANISTAN.....	7
2.1 Overview of projects .....	7
2.2 Socioeconomic and health status of the four DSF provinces.....	9
2.3 Pilot DSF projects technical detail .....	14
CHAPTER III LITERATURE REVIEW .....	18
3.1 Demand Side Financing Theory.....	18
3.2 Demand Side Financing (DSF) Effect on the Target Population.....	18
3.3 Spillover Effect of Demand Side Financing .....	20
CHAPTER IV RESEARCH METHODOLOGY .....	23
4.1 Conceptual framework .....	23
4.2 Source of Data.....	25
4.3 Baseline Survey.....	25

	Page
4.4 End line Survey .....	29
4.5 Household Awareness and Decision Making Process .....	29
4.6 Comparison between End line and Baseline Surveys .....	31
4.7 Sample.....	31
4.8 Definition of Key Variables .....	32
4.9 Summary Statistics of Key Variables: .....	36
4.10 Method of Analysis .....	43
4.10.1 Ordered Probit: .....	43
4.10.2 Econometric Specification .....	43
CHAPTER V RESULT AND DISCUSSION .....	44
6.1 Ordered Probit Analysis .....	44
CHAPTER VI CONCLUSION AND RECOMMENDITION .....	55
6.1 Summary .....	55
6.2 Limitation of the Study .....	55
6.3 Recommendations .....	56
REFERENCES .....	57
APPENDICES .....	59
Appendix A .....	60
Appendix B .....	62
BIOGRAPAHY .....	64



## LIST OF TABLES

	Page
Table 1 Health indicators according to different Surveys Source .....	3
Table 2 Health Indicators according to Afghanistan Mortality Survey 2010.....	3
Table 3 location and Population of four Demand Side Financing program provinces .....	9
Table 4 Main health and socio-economic indicator in four Demand Side Financing program provinces in 2011 .....	10
Table 5 Number of Health Facilities in four Demand Side Financing program provinces .....	11
Table 6 Proportion of main indicator trend according to Basic Package of Health Services in four Demand Side Financing program provinces.....	12
Table 7 Summary of proportion of main indicators trend according to Basic Package of Health Services in the four DSF program intervention provinces.....	14
Table 8 Pilot districts with incentive scheme .....	15
Table 9 Summary of main variables in the baseline survey .....	27
Table 10 Self-Utilization versus Family Utilization.....	28
Table 11 The one who made the final decision about women where for delivery ....	30
Table 12 The one who made the decision about whether to vaccinate child.....	30
Table 13 Base line and End line Survey difference .....	31
Table 14 Key variable definition and character in statistical model.....	33
Table 15 Percentage of Outcome variables (Self-Utilization and Family Utilization) at Provinces level .....	36
Table 16 Percentage of Outcome variables (Self-Utilization and Family Utilization) based on type of intervention .....	37
Table 17 Summary of explanatory variables .....	37
Table 18 Result of ordered probit model .....	44
Table 19 Result of Marginal Effect of explanatory variables on Self-utilization.....	48
Table 20 Result of Marginal Effect of explanatory variables on Family utilization .	50
Table 21 Propensity Score Matching Results .....	56

**LIST OF FIGURES**

	Page
Figure 1 Geographical location of Pilot Demand Sid Financing Projects in Afghanistan Map.....	8
Figure 2 Conceptual Framework .....	24

## LIST OF ABBREVIATION

Afs	(Unite of money in Afghanistan)
AHS	Afghanistan Health Survey
AMS	Afghanistan Mortality Survey
BPHS	Basic Package of Health Services
BSC	Balance Score Card
CCT	Conditional Cash Transferring
CHW	Community Health Worker (i.e. Volunteer health worker from community)
CSO	Central Statistical Office, Afghanistan
DSF	Demand Side Financing
GAVI	Global Alliance for Vaccine and Immunization
HWW	Hope Worldwide
MOPH	Ministry of Public Health
NRVA	National Risk and Vulnerability Assessment 2007/8 A profile of Afghanistan
NHSPA	National Health Service Performance Assessment
PRB	Population Reference Bureau
RAMOS	Reproductive Age Mortality Survey
SWOC	State of World Children, UNICEF

## CHAPTER I

### INTRODUCTION

#### 1.1 Problems and its Significance

Demand Side Financing (DSF) is a means of transferring purchasing power to specified groups for the purchase of defined goods or services (Standing, 2004). Poor supply side performance and failure of supply side mechanisms is one of main driver behind focusing on demand side approaches. DSF can increase utilization by influencing of household determinants of health seeking behavior through empowerment of women in the family or tackle family income constrain.

Ministry of Public Health from 2004 up to 2009 focus on supply side approaches to increase utilization, though in much area utilization remains low, for instance institutional delivery and DPT3 vaccination. MOPH have piloted many projects in order to increase health care services utilization especially among women. There have been ideas of transferring cash incentive for women who used health facility for reproductive problem; and transferring cash incentive to the Community Health Workers (CHWs) who refer the patient to the health facility for main reproductive problem. CHWs don't entitle any kind of salary or incentive according to Afghanistan national salary policy for primary health care services staff (Ministry of Public Health, 2011). Therefore MOPH piloted DSF projects in the four provinces in Afghanistan; the projects intervention took place during 2009 up to 2011 for two years to see the effect of cash incentives to the target services like institutional delivery and DPT3 vaccination. As mentioned focus of DSF pilot projects were only on targets area like institutional delivery and DPT3 ,while the projects assume to have effect on non- target area other than institutional delivery and DPT3 ,like self – utilization and family utilization that need to be measured as well. Finding of spillover effect of cash incentive transferring approaches to the family and CHWs help MOPH to make decision and develop policy regarding cash incentive transfer to consumers of primary health care and CHW for referral system improvement in Afghanistan.

In this chapter first; country background and the positive trend of health indicator from 2001 up to 2011 in Afghanistan is described (the period after collapse of the Taliban regime and establishment of new regime). Objectives and scope of the study along with research questions which focus on spillover effect of projects will discuss later.

## **1.2 Country Background**

Islamic republic of Afghanistan is located in southwestern Asia, bounded on the north by Turkmenistan, Uzbekistan, and Tajikistan; on the east by China and the part of territory of Jammu and Kashmir that are controlled by Pakistan; on the south by Pakistan; and on the west by Iran, it covers an area of 652,225 sq. km or 251,825 sq. mi (Microsoft Corporation, 2005). Afghanistan's total population is 26.5 million with GDP per capita of USD 715 (Central Statistics Office, 2011).

Up to 2001 Afghanistan health care system had been functioning poorly; there was little coverage of curative and preventive care due to a civil war, lack of staff and population health not being the priority agenda of the previous governments. In 2001 the infant mortality rate was estimated at 165 per 1000 live births and under-five mortality rate was estimated 257 per 1000 live births (Linda A Bartlett, 2005).

**Table 1: Health indicators according to different Surveys Source**

Indicator	Value	Year	Source
Total Fertility Rate (TFR)	7.2	2008	SWOC
Use of some method of family planning	15.4%	2006	AHS
Antenatal care (ANC)	32.3%	2006	AHS
Institutional Delivery	20%	2006	AHS
Under 5 Mortality Rate (Excluding the South Zone)	129 per 1000 live births	2006	AHS
Infant Mortality Rate (Excluding the South Zone)	191 per 1000 live births	2006	AHS
Maternal Mortality Ratio	1600 per 100,000 live births	2003	RAMOS
Male Life Expectancy	47 years	2003	PRB
Female Life Expectancy	45 years	2003	PRB

**Source:** Afghanistan Health Indicators, Fact Sheet-Aug2008 (MOPH, 2008)

After the collapse of the Taliban and the establishment of the new regimes, the Ministry of Public Health (MOPH) by the support of the international community have launched many activities that culminate in significant improvements in the health status of the people especially women and children in Afghanistan(See table 2).

**Table 2: Health Indicators according to Afghanistan Mortality Survey 2010**

Total Fertility Rate (TFR)	5.1
Use of some method of family planning	22%
Antenatal care (ANC)	68%
Institutional Delivery	32%
Under 5 Mortality Rate (Excluding the South Zone)	97 per 1000 live births
Infant Mortality Rate (Excluding the South Zone)	77 per 1000 live births
Maternal Mortality Ratio	327 per 100,000 live births
Male Life Expectancy	62 years
Female Life Expectancy	64 years

**Source:** AMS (Calverton, Maryland, USA:APHI/MoPH, CSO, ICF Macro, IIMR and WHO/EMRO., 2011)

The values of indicators in two above mentioned tables shows that the Ministry of Public Health's endeavors along with support from its major stakeholders like World Bank, USAID and European Community during the last decade have led to a significant improvement in the major health indicators. As can be seen the Maternal Mortality Ratio, under five Mortality Rate and Infant Mortality Rate are decreased significantly. Maternal Mortality Rate is decreased from (1600 per 100,000 live births) to (327 per 100,000 live births), Under 5 Mortality Rate is decreased from (129 per 1000 live births) to (97 per 1000 live births) and Infant Mortality Rate is decreased from (191 per 1000 live births) to (77 per 1000 live births).

### **1.3 The Issue of Maternal Health in Afghanistan**

Despite significant improvement in Maternal Mortality Ratio (MMR) in the last decade (MMR decreased from 1600 in 2003 to 327/100,000 live births in 2010) low utilization is so far a key barrier to the health status of women in Afghanistan. According to the 2006 Afghanistan Health Survey, a majority of births (80%) occurred at home. While a number of demand and supply-side factors contribute to low coverage of services, income is one of the strongest factors of service utilization. Women in the wealthiest income quintile are six times more likely to give birth in the presence of a physician (MOPH, 2006). Based on Afghanistan Mortality Survey report (AMS 2010) only nearly 67% of deliveries took place at home and 32% took place at a health facility i.e. 13 % decrease in home delivery compared to the 2006 Afghanistan Health Survey.

To stimulate demand for services and increase utilization Afghanistan MOPH in collaboration with Global Alliance for Vaccine and Immunizations (GAVI) launched a demand-side financing pilot project in 2009. The aim of program were to test the effect of cash incentive transferring on increasing institutional delivery and DPT3 vaccination to women and CHWs for above referral case as well as effect of socio demographic factors associate with cash incentive program (Afghanistan, 2011). Intervention of such pilot project seems to effect on behavior of women to use more health facility for their own or family problem and change their health seeking

behavior. These interventions encourage CHWs who are not entitled of any kind of payment to improve referral case by receiving cash incentive (Ministry of Public Health, 2011).

This thesis are included the following topics: In the second chapter the detail of DSF piloted projects, socio economics and health status of interventions provinces and mechanism of spillover effect of DSF project in Afghanistan are describe. In the third chapter literature review about theory of DSF in the world, direct effect of DSF projects and spillover effects are described. In the fourth chapter research methodology including; conceptual framework, source of data, definition of dependent and independent variables and model specification are explained. The result and discussion are described in the chapter fifth and conclusion in the chapter sixth.

#### **1.4 Questions**

1. Does the Demand Side Financing program (DSF) have a spillover effect on health care utilization of women who are the targeted population in areas other than institutional delivery and DPT3?
2. Does the Demand Side Financing program (DSF) have a spillover effect on health care utilization of other family member who are associated with women who are the targeted population in areas (i.e. Family utilization) other than institutional delivery and DPT3?
3. Do set of associated socioeconomic factors affect the demand for health care among Afghanistan women who reside in the DSF implementation area?



## **1.5 Objectives**

1. To assess the spillover effect of the cash incentives program on self –utilization and family utilization
2. To explore socioeconomic factors associated with self –utilization and family utilization

## **1.6 Scope**

The scope of the study focuses on target population of DSF program i.e. the women of reproductive age (6,677) women between the ages of 18-49 who used health facilities either for herself or with other members of the family during the intervention of cash incentives in four provinces from May 2009 up to Jun 2011.

## **1.7 Hypothesis (es)**

1. Cash incentives have a significant spillover effect on self-utilization and family utilization.
2. Socio-economic factors have a significant effect on self-utilization and family utilization.

## CHAPTER II

### DEMAND SIDE FINANCING PROJECT IN AFGHANISTAN

#### 2.1 Overview of projects

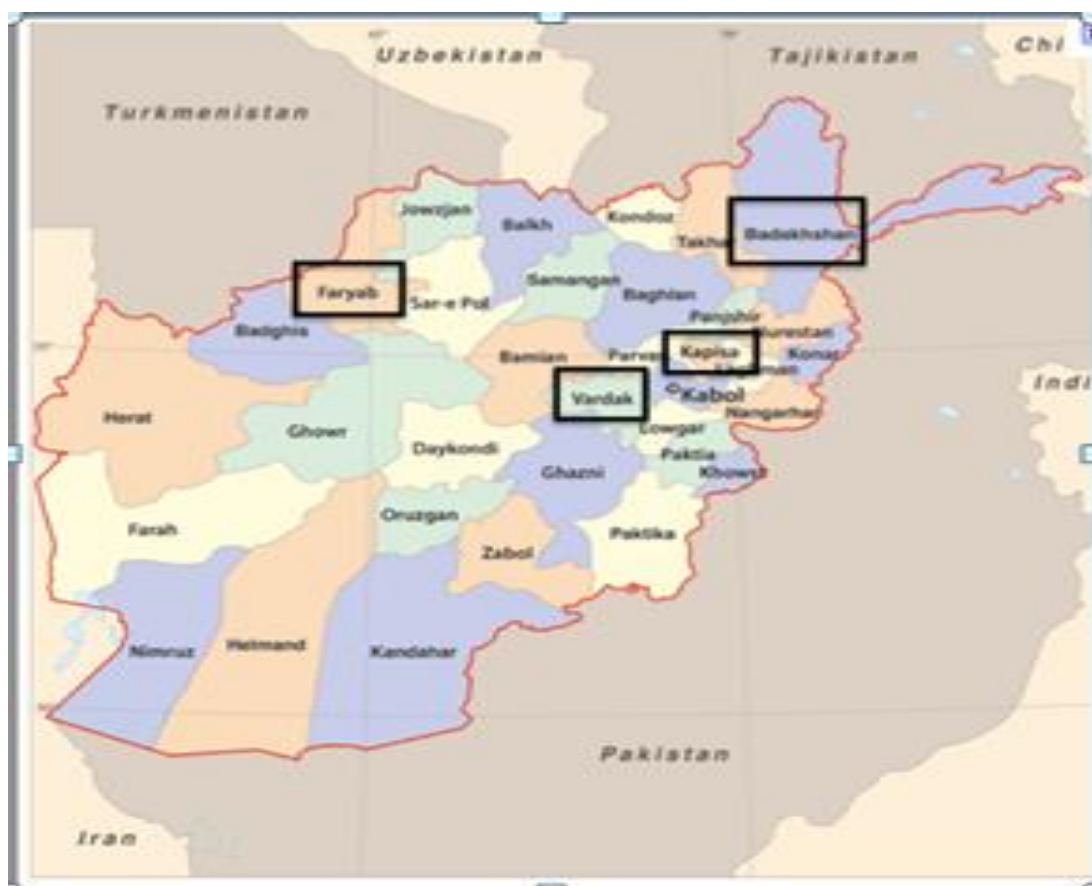
To stimulate demand for services, Afghanistan MOPH in collaboration with Global Alliance for Vaccine and Immunizations (GAVI) launched a demand-side financing pilot project in 2009. The objectives of the pilot study were (1) To test the effect of cash incentives to increase institutional delivery and completion of DPT3 vaccination series (2) To test of intervention appears to be more effective (e.g., family, community health worker or both) (3) To find socio -demographic factors that may be associated with cash incentive (Afghanistan, 2011). Hope Worldwide (HWW) an international NGO based in Kabul was selected to implement and evaluate the program.

Below are the schemes of cash incentives in the projects (Afghanistan, 2011):

- In the household arm, households were given 300 Afs (~ \$6 USD) for delivering at a government health facility and 150 Afs (~ \$3 USD) for bringing a child to the health facility for DPT3 vaccination.
- In the community health worker incentive arm, 150 Afs were paid to CHWs per institutional delivery at a government facility and per DPT3 vaccination referral.
- In the combined arm, both households and CHWs are provided incentives: households were given 300 Afs for delivering at a government health facility and 150 Afs for DPT3 vaccination, and CHWs were given 150 Afs per referral.
- Finally, in the control arm, no cash incentives were provided.

Intervention occurred in four provinces of Afghanistan that located in north and central region which are Kapisa, Wardak, Badakhshan and Faryab (see figur1).

**Figure1: Geographical location of Pilot Demand Sid Financing Projects in Afghanistan Map**



## 2.2 Socioeconomic and health status of the four DSF provinces

**Table 3: location and Population of four Demand Side Financing program provinces**

<b>Province</b>	<b>Badakhshan</b>	<b>Faryab</b>	<b>Kapisa</b>	<b>Wardak</b>
<b>Location</b>	Northeast	North	Central	Central
<b>Population</b>	874800	915800	406200	549200

**Source:** Afghanistan Provincial Health Profile (HMIS,MOPH, 2011)

**Table 4 : Main health and socio-economic indicator in four Demand Side Financing program provinces in 2011**

Provinces	Badakhshan	Faryab	Kapisa	Wardak	Sources
Indicator					
Total Literacy rate	28.5%	19%	32.5%	30%	2007-2008 ,NRVA
Access to Land*	75%	50%	2%	71%	2007-2008 ,NRVA
Access to health facility within one hour by foot or Animal	70%	49%	N/A	71%	2007-2008 ,NRVA
Fully Immunized (Children between 12-23month)	40%	25%	2%	78%	2007-2008 ,NRVA
Skilled birth attendance	2%	16%	N/A	60%	2007-2008 ,NRVA
Access to safe drinking water	20%	25%	18%	9%	2007-2008 ,NRVA
Health service provider satisfaction rate(Health services employee)	68%	79.8%	80%	62%	1387, NHSPA(BSC)
Client satisfaction rate(Patient)	85.5%	91.8%	84%	67.4%	1387, NHSPA(BSC)
Percentage of health facilities employed with at least one female staff	91%	80%	65%	76%	1389,HMIS

**Source:** Afghanistan Provincial Health Profile (HMIS,MOPH, 2011)

NB: \* **Access to land;** households' access to land means that the household either owns land or farms land based on renting, sharecropping or mortgaging arrangements. (ICON INSTITUTE GmbH & Co. KG Consulting Group, 2009)

**Table 5: Number of Health Facilities in four Demand Side Financing program provinces**

Type of Health Facility	Provinces			
	Badakhshan	Faryab	Kapisa	Wardak
Regional Hospital	0	0	0	0
Provincial Hospital	1	1	1	1
District Hospital	1	2	1	3
Basic Health Center	35	21	16	26
Comprehensive Health Center	13	16	8	9
Health Sub-Center	21	11	16	26
Mobile Health Team	13	11	1	1
<b>Total</b>	84	62	43	66

**Source:** Afghanistan Provincial Health Profile (HMIS,MOPH, 2011)

**Table 6: Proportion of main indicator trend according to Basic Package of Health Services in four Demand Side Financing program provinces**

Province	Badakhshan				Faryab			
	1386 (2008)	1387 (2009)	1388 (2010)	1389 (2011)	1386 (2008)	1387 (2009)	1388 (2010)	1389 (2011)
Proportion of client using BPHS facility according to population	0.7%	1.1%	1.5%	1.9%	0.5%	1.1%	1.1%	1.2%
Proportion of DPT3	96%	94%	84%	108%	83%	112%	109%	119%
Proportion of Institutional delivery	12%	18%	22%	27%	21%	27%	25%	27%
Proportion of skilled antenatal care (one time)	32%	50%	59%	59%	41%	66%	64%	60%
Proportion of new case of TB patient with sputum positive	36%	39%	35%	40%	42%	37%	28%	30%

...Continue of table 6:

Province	Kapisa				Wardak			
	1386 (2008)	1387 (2009)	1386 (2008)	1387 (2009)	1386 (2008)	1387 (2009)	1386 (2008)	1387 (2009)
Proportion of client using BPHS facility according to population	1.3%	1.8%	1.3%	1.8%	1.3%	1.8%	1.3%	1.8%
Proportion of DPT3	100%	108%	100%	108%	100%	108%	100%	108%
Proportion of Institutional delivery	15%	17%	15%	17%	15%	17%	15%	17%
Proportion of skilled antenatal care (one time)	62%	73%	62%	73%	62%	73%	62%	73%
Proportion of new case of TB patient with sputum positive	40%	45%	40%	45%	40%	45%	40%	45%

**Source:** Afghanistan Provincial Health Profile (HMIS, MOPH, 2011)

Table 3 shows population of provinces that located in the north area (Faryab and Badakhshan) is higher compare to central area.

Based on information in the table 4 Kapisa has the lowest access to land while Badakhshan and Wardak have the highest access to land, despite these two mentioned provinces located in different locations. Access to safe drinking water is very low and worse in Wardak provinces while in three other provinces seem to be in a similar status. Fully immunization of children between ages 12-23 month is worse in Kapisa province but seem better in Wardak, though both provinces located in central area. Skilled birth attendances are high in Wardak province but are very low in the three other provinces. Client satisfaction rate and percentage of health facilities with at least one female staff are high in the four provinces but seem to be different from north provinces to central region. All in all, the variations figures are by regions in the DSF pilot provinces not at provinces level.

According to BPHS policy the criteria for selecting numbers of health facilities are according to population of the provinces and geographical situation of people, therefor based on information in the table 5 Badakhshan has the highest number of health facilities and Kapisa has the lowest number. (MOPH, A Basic Package of Health Services for Afghanistan – 2010/1389, 2010)

Based on information in the table 6 the ranges of the trend of main indicators according to BPHS policy in the four DSF program provinces indicate positive change. In case of proportion of new case of TB patient with sputum positive which are negative in Wardak and Faryab provinces indicates improvement but it is neutral in Kapisa and worse in Badakhshan. The proportion of DPT3 shows significant change in the three provinces (Badakhshan, Faryab and Kapisa) excluding Wardak, though proportion of institutional delivery is higher in Wardak province. Summary of mentioned trend depicted in the table 7.



**Table 7: Summary of proportion of main indicators trend according to Basic Package of Health Services in the four DSF program intervention provinces**

BPHS main indicators	Range of main indicator between 2008-2011				
	Badakhshan	Faryab	Kapisa	Wardak	Maximum
Proportion of client using BPHS facility according to population	1.2%	0.7%	0.7%	0.3%	1.2%
Proportion of DPT3	12.0%	36.0%	15.0%	4.0%	36.0%
Proportion of Institutional delivery	15.0%	6.0%	8.0%	16.0%	16.0%
Proportion of skilled antenatal care (one time)	27.0%	19.0%	18.5%	3.0%	27.0%
Proportion of new case of TB patient with sputum positive	4.0%	-12.0%	0.0%	-1.0%	4.0%

### 2.3 Pilot DSF projects technical detail

The intervention started in May 2009 and continued until Jun 2011 in the four provinces of Afghanistan. As mentioned before within each province, one district was selected and assigned to one of the following intervention arms: control, household arm, community health worker's arm, and combined arms. In total, 16 districts (4 per province) participated in the program (Afghanistan, 2011). At the beginning of the program, a baseline survey was launched and at the end, an end line survey was carried out. The two surveys were collected to compare the effects of cash incentives in all intervention and control districts. Criteria for the selection of the above provinces were availability of active health facilities, availability of active community health worker system, staffing of target areas with midwives and/or physicians

(Female medical staff), relative security from violence and the availability of DPT3 current stock (Afghanistan, 2011) . DPT is combination of vaccines against three infectious diseases: diphtheria, pertussis (whooping cough) and tetanus .DPT is given to children three times to reach the peak of immunization.DPT1 is vaccinated in the 6<sup>th</sup> week of age, DPT2 is vaccinated in the 8<sup>th</sup> week of age and DPT3 is vaccinated in the 14<sup>th</sup> week of age (MOPH ,EPI Department, 2013).

The household arm, community arm and combined arm intervention are collectively known as “Cash Incentives” arms, and will be referred to as such throughout this study.

**Table 8: Pilot districts with incentive scheme**

<b>Pilot Provinces and Districts</b>				
	<b>Family arm</b>	<b>CHW arm</b>	<b>Combined arm (Family and CHW)</b>	<b>Control arm</b>
<b>Incentive Scheme</b>	300Afs /Delivery 150 Afs /DPT3	150Afs/ Delivery Referral and DPT3	Both approaches	No incentive
Badakhshan	Teshkan	Shuhada	Keran Menjan	Khash
Faryab	Korghan	Khowaja sabz posh	Gorziwan	Shirin Tagab
Kapisa	Hesa Awal Kohistan	Hisa Dowom Kohistan	Koh Band	Nijrab
Wardak	Chak	Jalrez	Hisa yek Behsood	Sayd Abad

(Afghanistan, 2011)

The final finding report of DSF program through using base line and end line household survey data set was prepared by group of advisors using a logistic regression, and time-series trends were plotted and analyzed. The analyzing of above data sets focus on impact of project on institutional delivery and DPT3. The confounding factors in analysis of baseline and end-line surveys data set were selected based on review of literature. However, the final finding was quite restricted due to the limited number of questions that were asked in the baseline household survey. The data of Health Management Information System (HMIS) of four provinces were also used for preparing of final finding of DSF project (Afghanistan, 2011).

The final findings of the Demand Side Financing (DSF) study by the aforementioned group of experts are as follows:

1. The strong effect of Cash incentives for institutional delivery and a moderate effect on DPT3 were outstanding in the combined intervention arm namely family plus CHW arm (Afghanistan, 2011).
2. Differences in the level of provinces indicate that some contextual factors may have significantly impacted on the outcome of the program, for example, given the difficult geographical situation in some of the pilot districts, varying incentive amounts to account for transportation cost may warrant consideration. (Afghanistan, 2011).
3. Supply side factors also affect institutional delivery and DPT3 vaccination based on women delivery at health facilities and the number of times that the women brought their children to the clinics. These supply side factors consisted of human resource supply especially female health service providers, quality of care, working time, availability of drugs and supplies and security in the area (Afghanistan, 2011).

It should be noted that, based on the analysis of these projects the focus was on the utilization of target women and children in the areas of institutional delivery and DPT3, while the DSF program may have affected many other types of treatment among women who used BPHS health care services. Also it is assumed that the program might also have some indirect effects on areas which were not a target of the

program. There are two types of BPHS facility utilization; first, self-utilization where women use the facility for their own health problems which are not necessarily limited to institutional delivery and, second, family utilization where women and other member of family use health facilities to treat their own problem which are also not necessarily limited to institutional delivery and DPT3. The information of these two types of utilizations may be used to identify whether the DSF program has an impact on facility utilization of services that are not included in the program itself. The effect here is denoted as the ‘spillover’ effect.

Examples of how the DSF project may have spillover effects are as follows. First, women who received cash incentives from the program may now have an increased awareness on the value of health services through first using the available (and DSF-subsidized) health services of BPHS and then increasing their knowledge about other services provided in BPHS facilities. The learning process may induce their demand. Second, the DSF program also expanded the budget constraint among women in the intervention areas (i.e. by subsidizing transport costs). Based on Afghanistan culture, men are breadwinners (Behgam, 2012) and this gives men more power in the family. However, this project, by transferring cash incentives to women, allowed women to take part in the decision making process within the family, empowering them to make decisions about health utilization of other members in the family too. Third, giving cash incentive to community health workers in case of institutional delivery and DPT3 encouraged them to fulfill their important responsibilities: to refer emergency and severe case patients and those who need preventive services to a higher level of BPHS, which may improve the referral process and increase utilization rates in the CHW intervention area.

## **CHAPTER III**

### **LITERATURE REVIEW**

#### **3.1 Demand Side Financing Theory**

Demand side financing is a relatively new term. It was introduced by the World Bank in relation to experiences with vouchers in the education sector (Standing, 2004). Demand side financing in health is a means of transferring purchasing power to specified groups for the purchase of defined goods or services' (Pearson 2001). DSF focuses on an individual, household or epidemiological target group. The rationale of demand side financing intervention is that consumer participation in health services is often based not only on “supply” constraints but also on “demand” constraints caused by a lack of information or many other factors (Standing, 2004). Demand side financing prove to have effect on increasing utilization, empowering users, stimulates provider competition; promoting public private partnership as well as increasing health seeking behavior (Standing, 2004).

#### **3.2 Demand Side Financing (DSF) Effect on the Target Population**

In 2005 government of India in order to reduce maternal and neonatal deaths launched a conditional cash transferring program named India's Janani Suraksha Yojana CCT (Conditional Cash Transferring). The aim of intervention was to increase institutional delivery, antenatal and prenatal care in health facilities during period of 2007-08. The two nationwide studies conducted in India, at district level of household surveys. The first survey carried out in 2002-2004 and second study accomplished in 2007-2009. These studies were focused to assessing the effect of the intervention on institutional delivery, antenatal, prenatal and maternal death. Three methods of analyzing were used in this study (difference in difference, matching, with-versus- without comparison). The results of the Janani Suraksha Yojana CCT program shown there

was a significant improvements from the baseline of less than 5% , it dramatically increment to 44% of services utilization in women who giving birth at health facilities and received cash incentives from the program. The program had significant effect on antenatal care and facility birth. (Stephen S Lim, 2010).

Nepal Safe Delivery Incentive Program (SDIP) introduced in 2005 in order to increase utilization of professional care (or provision of care) at child birth. In Nepal Delivery Incentive Program (SDIP) cash incentive provided for both women who giving birth at health facilities and health provider who served for each delivery either at home or health facility along with providing free health care services. The study conducted in 10 districts of Nepal and purposively sampled two mountainous districts, were selected Four out of ten health facilities were located on hilly districts and four out to ten were selected in plains districts of Nepal. The aims of this study were to find out the variation in the safe delivery incentive program package of benefits across the three different regions. Method of study was qualitative in nature and data collected by using of key informant interview, focus group discussion from facility staff, district health office and other stockholders. The result showed that many constrain and problems were found that affected the implementation of the program at the district level such as; bureaucratic procedure like late disbursement of funds, difficulties in communicating the policy, both to implementers and the wider public and the complexity of the program design (Timothy Powell-Jackson, 2009).

Similar methods were experienced in Latin America and the Caribbean, where the malnutrition was a major health problem, causing infant and child mortality and morbidity high and provision of health services was costly, all the causes put together to decreased the demand and accessibility to health services. Therefor CCT program was trialed in order to reduce poverty, improve the nutrition status of children, and strengthens school attendance and equitable use of primary health care. The program was launched in seven countries in Latin America (Glassman, 2007), and it attempted to encourage poor mothers to seek preventive health services and attend health education sessions by providing a cash incentive. The study showed that financial incentives increased utilization of key services by the poor and had a significant effect

on the targeted population, although the studies had little attention on health-related behaviors, attitudes, and household decision-making or how these factors contribute to or limit effect on health outcomes (Glassman, 2007).

### **3.3 Spillover Effect of Demand Side Financing**

The evaluation of the different demand side financing programs in different countries shows that spillover effect exist for non-targeted population whom seem to be indirectly received benefit from DSF intervention. The program interventions vary from health, nutrition to education and environment. Four types of spillover effect can be seen according to health and economic literature (Maro, 2010):

- i. **Externalities:** These effects come from the treated target to the un- treated population, in particular health interventions (Maro, 2010).
- ii. **General equilibrium effects:** These are the effects that an intervention, which targets only part of the ‘local economy,’ can affect the entire population. For example, Active labor market policies or any intervention can affect equilibrium prices (Maro, 2010).
- iii. **Interactions:** The non-target population indirectly gets benefits through any social and economic interaction with the treated population. For example, the recipients of CCTs may share resources with ineligible households who live in treated localities (Maro, 2010).
- iv. **Behavioral effects:** Intervention may affect the behavioral or social norms within the locality, For example, CCT in rural Mexico has been shown to affect the social norm. Husbands before CCT used to oppose their spouses being screened for cervical cancer by male doctors, but because the number of eligible women increased during CCT intervention, the husband showed less resistant due to the lower cost of the screening test (Maro, 2010).

CCT programs such as Progresa in Mexico which were designed for food consumption among cash recipient family showed an increase in food consumption among families that did not receive cash incentives. The reasons behind high food consumption were; first due to increase demand for goods and service which respectively provided opportunity of employment among ineligible families who were engaged in business. Second the program affect domestic agriculture, livestock and small business. Third, the program increased informal food gift from eligible to ineligible family (Christian Lehmann, 2009).

Brazil had one of the first and the largest CCT program in the world 2006-2009, named Bolsa Família. In this program families received government payments upon the fulfillment of schooling and other requirements. Study has been done to see if there is any association between the payment and decline in the number committed of crimes . The data collected from INFOCRIME database which are belongs to state law enforcement agency. The database included location of occurrence, type of crime, estimated time of occurrence, and, sometimes, characteristics of the suspected offender, such as age and gender. Another source of secondary data was collected from schools database which including ; type of school, number of students who received cash incentives, demographic characteristics of teachers and students, and school infrastructure, the variables such as; education of teachers, gender, race, and current grade of students; and number of classrooms, availability of treated water, sanitation, and TV, and number of computers. The dependent variable focused on middle and high schools (from 5th to 11th grade) and were started by generating the number of crimes per school in the three different samples: only high, secondary, and primary schools all together. In this study a kind logistic regression model used to estimate the relationship between cash incentives and crime as below:

$$\ln(\text{crime}_{it}) = \alpha + \beta(\text{CCT}_{it}) + \gamma'X_{it} + \theta_i + \delta_t + \varepsilon_{it},$$

where crime  $it$  stand for the number of crimes in school  $i$  and year  $t$ ;  $\text{CCT}_{it}$  is the number of students receiving CCT;  $X_{it}$  is a set of school variables related to infrastructure, and teachers and students characteristics; and  $\theta_i$  and  $\delta_t$  are,



respectively, school and year fixed-effects. The result of program showed a strong negative effect on crime ,for example during the expansion of Bolsa Família between 2006 and 2009, it was shown that about 59 more students covered per school caused a 21% reduction in crime in school neighborhoods (Chioda, 2012).

Another program in Malawi was designed to test whether regular cash payments averaging \$10 per month could decrease HIV infection. The program's conditional arm (CCT) improved schooling outcomes while the unconditional arm (UCT) delayed marriage and fertility .Both arms experienced a decrease in HIV incidente while the program was in operation. The finding of spillover effects to be relatively muted at the cluster level but more potent within households (Baird, 2012).

According to literature review of study of India Janani Suraksha Yojana CCT program and Nepal Safe Delivery Incentive Program (SDIP), shown that CCT interventions had direct significant effect on institutional delivery. Both countries context are similar to Afghanistan .The outcomes and explanatory variables in JSY and SDIP CCT projects almost similar with Afghanistan DSF projects. In the above both studies targeted group were women of reproductive age and the aim of program were to see if cash incentive would increase number of institutional delivery. Afghanistan cash incentive projects had limitation on baseline survey data collection which described in chapter II in detail. The methodology of JSY program were difference in difference, matching, with-versus- without comparison and in SDIP of Nepal using qualitative methods, while in Afghanistan the impact of program measured through quantitative method.

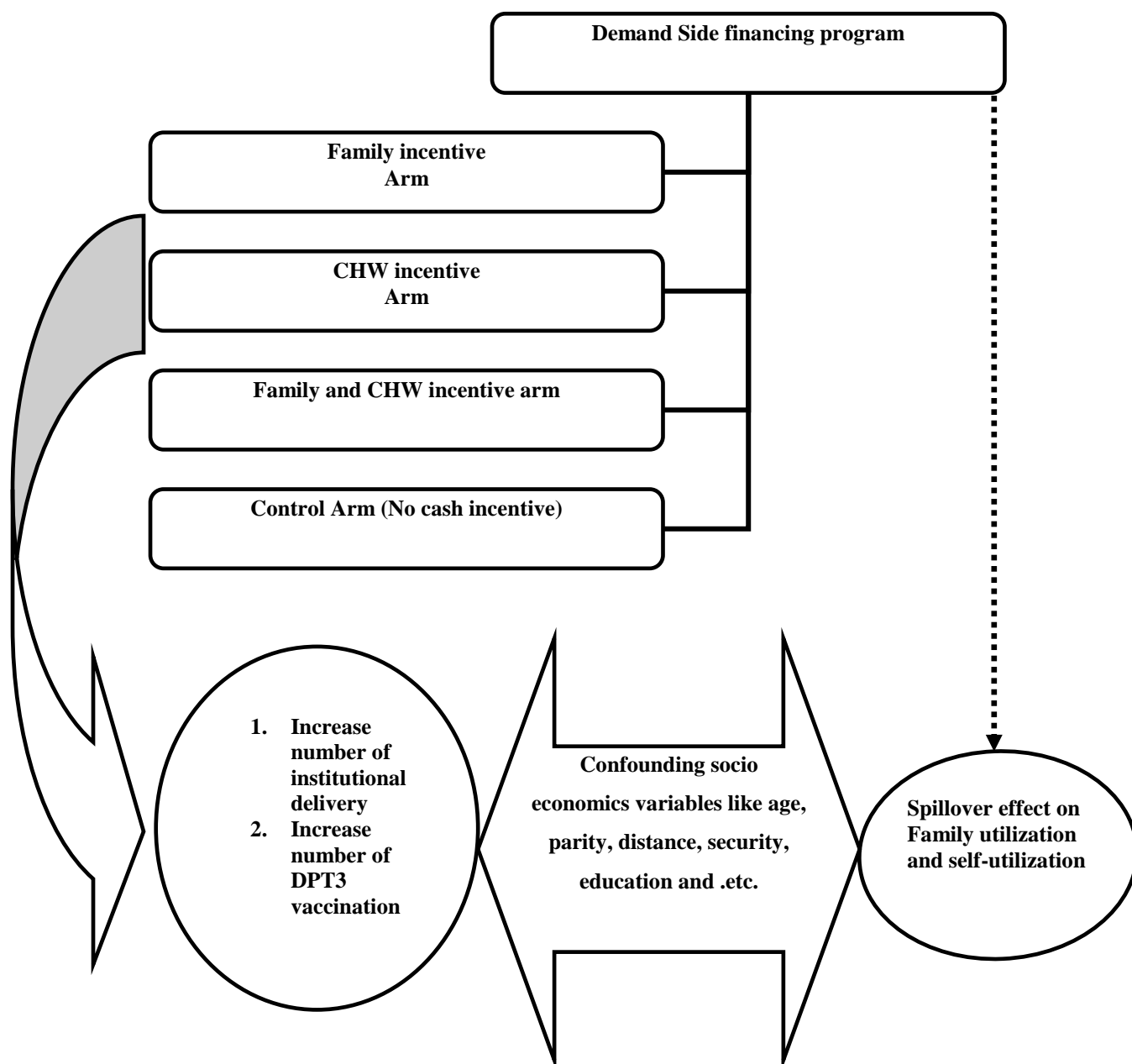
In this study the methodology of research are similar to Brazil named Bolsa Família(2006-2009). In the Brazil Bolsa Família program a kind logistic regression used for analysing socio economic factor effect on program spillover side,while in this thesis the orderd probit model are used for analysing of socio economic factors associated with cash incentive program. The calculation of socio economic factors in Brazil Bolsa Família program which were measured through proxy variables like number of TV and computer are followed in this thesis as well.

## **CHAPTER IV**

### **RESEARCH METHODOLOGY**

#### **4.1 Conceptual framework**

The conceptual frame work depicted in figure 2.2 .In the left side of the figure the direct effect of four kinds of intervention are shown on the target areas which are institutional delivery and DPT3 ,while the program assume that have spillover effect in non-targeted areas like self-utilization and family utilization ,therefor the direction is depicted at the right side. The socio and economics factors which assume to be associated with direct and spillover effect of cash incentive intervention is shown in reciprocal direction.

**Figure 2: Conceptual Framework**

## 4.2 Source of Data

The baseline and end line household survey data sets are used for this study. Both surveys, one conducted at the beginning and the other at the end of program, were carried out in the intervention and control districts (May13, 2009 and June 15, 2011). During both surveys, interviews were conducted by trained female staff at the woman's house at a time favorable for the family.

## 4.3 Baseline Survey

The baseline survey had been done by Hope Worldwide (HWW). The numbers of baseline interviews were 11,646 women between ages of 10 to 50. In the survey twelve-questions with a consent form were prepared and filled by 11,646 families in all four provinces and the questionnaire were translated into two local languages which are Dari and Pashto.

The questionnaire included the following questions: 1) Do you have deliveries at BPHS facility? 2) Why do you go to the BPHS facility for delivery? 3) Why did you come to the BPHS facility for DPT3 vaccination? 4) What distance did you travel to reach the BPHS facility? 5) How did you reach to the BPHS facility? 6) How much does it cost you to reach BPHS facility and get home? 7) Have you vaccinated or planned to vaccinate your youngest child? 8) If No, what is the main reason for not vaccinating your child? 9) The second reason why you didn't use the health care facility to have your child vaccinated? 10) Was your last child delivered at health facility? (Do not answer if you had no previous births) 11) If the answer is No please indicate the main reason why you did not use the health care facility for delivery? 12) Second reason why you didn't use the health care facility for delivery?

Summary statistics for the baseline survey are reported in table 9. It is worth mentioning that for women who were asked about the number of her children and replied that they had more than 10 children, it is decided that the figure 12 would be

used, as according to (National Risk and Vulnerability Assessment 2007/8 A profile of Afghanistan) page 12 the maximum number of family size was 14 persons minus the parent making the number of children being 12 (ICON INSTITUTE GmbH & Co. KG Consulting Group, 2009). Also, based on Afghanistan Mortality Survey report, the mean size of household is 7.8 (Calverton, Maryland, USA: APhi/MoPH, CSO, ICF Macro, IIHMR and WHO/EMRO, 2011) while in the NRVA report it is between 7.2- 7.3 and 7.6 from rural up to urban and nomad families.

**Table 9: Summary of main variables in the baseline survey**

Variable	Obs	Mean	Std. Dev.	Min	Max
Ag1(0-10)	11646	0	0	0	0
Ag2(11-20)	11646	.0594	.2364	0	1
Ag3(21-30)	11646	.456	.498	0	1
Ag4(31-40)	11646	.374	.484	0	1
Ag5(41-50)	11646	.096	.294	0	1
Ag6(51-60)	11646	.0124	.110	0	1
Total_Birth	11646	5.216	2.612	0	12
Total_ Alive	11646	4.565	2.291	0	12
Number of children under 5 live with woman	11646	1.693	.898	0	5
Number children completed DPT3	11646	2.114	1.777	0	12
Self -Utilization(Using health facility for herself)	11646	1.414	.756	0	3
Family Utilization(Using health facility with other member of family)	11646	1.433	.907	0	3
Deliveries at BPHS facility	11646	.290	.453	0	1
Number of delivery at BPHS facility	11646	.588	1.176	0	12
Number of delivery at home	11646	4.590	2.793	0	12
Other	11646	.0304	.171	0	1
Method of travel taken to reach the BPHS facility					
On foot	11646	.680	.466	0	1
By Oxcart or other animal driven cart(without payment)	11646	.009	.096	0	1
By Donkey, Horse, Camel or other animal	11646	.125	.331	0	1
By private car(without payment)	11646	.031	.174	0	1
By paid taxi, van or bus or other paid means of travel	11646	.153	.360	0	1
Cost of travel to and from BPHS facility					
No cost	11646	.648	.477	0	1
1-100 Afs	11646	.107	.309	0	1
101-150 Afs	11646	.056	.230	0	1
More than 150 Afs	11646	.187	.390	0	1
Vaccinated or plan to vaccinate her youngest child	11646	.881	.323	0	1

The brief findings of baseline survey data set regarding of the Demand Side Financing program are as follow: 1) 71 % of women give birth at home. 2) 29% women gave birth at BPHS facilities. 3) The majority of women who used BPHS facility for delivery answered firstly that they went because of their own belief, and secondly because of the advice of CHW. 4) The first reason for not using BPHS for the last delivery was the distance to health facilities and second reason was because they were not permitted by their husbands. 5) 86% of children completed DPT3. 6) The outstanding reasons for DPT3 vaccination are advice of CHW and the women own beliefs. 7) Outstanding reason for not doing vaccination was the distance to health facilities. 8) The mean of distance from the woman's house to health facilities is 0.0261892Km. 9) The majority of women traveled to health facilities either by foot or by paid taxi, van, bus or other paid means of travel. 10) Most of the women who traveled to health facilities did not incur any cost. 11) In self- utilization (Using health facility for women own health problems) and family utilization (Using health facility with other member of family) there are four categories as shown in (table 10). As can be seen in the table 10, there are variation in different categories, for instance in the category of more than 10 times using health facilities family utilization is higher ,while in the categories (1-5 times and 6-10 time) using health facilities self-utilization is higher than family utilization. In general family utilization is lower than self-utilization.

**Table 10: Self-Utilization versus Family Utilization**

# of time	Self -Utilization	Family Utilization
<b>0</b>	7.39	14.33
<b>1-5 time</b>	52.83	42.48
<b>6-10 time</b>	30.7	28.67
<b>10+ time</b>	9.08	14.52
<b>Total</b>	100	100

To conclude the majority of household before intervention did not have their deliveries at the BPHS facilities.

#### **4.4 End line Survey**

When the DSF program ended, the end-line survey was conducted in June 2011; it was one month after the incentives ended (May 2011). The total number of interviews was 7,131 women between the ages of 15-49 years who gave birth to at least one child during the intervention period (May2009- May2011).

The end line survey includes two parts: The first part contains household level data, including the size of the household, family relations, out-of-pocket spending on health, health service utilization patterns, and household assets. For the second part, one woman from each household was selected randomly and was asked about her reproductive history, maternal and child health service utilization process, distance to the facility, and cost of utilizing the services. Furthermore, respondents were asked to present their information about community health programs as well as cash incentive programs.

It should be noted that during the entire process of the end line survey Health System 20/20 (USAID funded project) advisers for MOPH were involved in developing questionnaires, monitoring of data entry and analysis of data. The number of existing observations in the data set and the number of observations in the final finding report of the DSF program in Afghanistan are different, which might be due to the fact that some observations are discarded during data analysis. Summary statistics for variables in the end line survey will be described later when the sample size is discussed.

#### **4.5 Household Awareness and Decision Making Process**

In this study, women are the main focus. However they are not culturally decision-makers in the household. In order to assess the awareness and decision making process of women with regard to the DSF program, a simple analysis of the baseline survey and the end line survey data sets is needed.



In the baseline survey, awareness of women regarding services provided in BPHS facilities was not asked directly. However it could be inferred:

- In the base line survey analysis, outstanding reasons for not using BPHS facilities for the last delivery were first the distance to health facilities and second because they were not permitted by their husbands.
- The outstanding reason for not having vaccinated or planning to vaccinate their children was the distance to health facilities.

In the end line survey, decision-making was asked regarding institutional delivery as well as DPT3 vaccination. Table 11 shows the outstanding role of husbands in decision making process regarding the delivery place and Table 12 Shows the outstanding role of mothers on the decision to get DPT3 vaccination for children. Despite these two variable were not included in base line survey and make limitation on measuring the difference if the behavior of women regarding decision making role in the location of delivery is changed or not, though it assume that decision of women are changing after intervention of cash incentive program as tackled the distance problem by covering transportation cost through program.

**Table 11: The one who made the final decision about women where for delivery**

<b>Decision Making on delivery</b>	<b>Percentage</b>
My self	23
Husband	<b>57</b>
In-law	17
Other(Specify)	3
<b>Total</b>	100

**Table 12: The one who made the decision about whether to vaccinate child**

<b>Decision Making on DPT3</b>	<b>Percentage</b>
My self	<b>54</b>
Husband	38
In-law	7
Other(Specify)	1
<b>Total</b>	100

#### 4.6 Comparison between End line and Baseline Surveys

The baseline survey and the end line survey contain different socio- economic and demographic variables and the baseline survey is so limited that it does not include most variables included in the end-line survey. The two surveys are also not linked by any identification and therefore any panel data analysis is not possible. Instead, the baseline survey will be used to assess the choices made by women in the DSF implementation areas prior to intervention and it will provide a comparison point to which results, based on the end line survey, may be compared. The difference between the two surveys is shown in table 13.

**Table 13: Base line and End line Survey difference**

<b>Survey</b>	<b>Baseline Survey</b>	<b>End line Survey</b>
<b>Date</b>	May13, 2009	June 15, 2011
<b>Number of Observation</b>	11,646	7,131
<b>Number of questions</b>	Twelve-questions with a consent form	Detailed questionnaire
<b>Age of interviewee</b>	10 to 50	15-49
<b>Stockholder</b>	Hope Worldwide MOPH	HWW and HS 20/20, MOPH

#### 4.7 Sample

Based on the end line survey, the sample has 7,131 observations. Sample selection criteria include:

- The fact that 408 observations were deleted out of the original 7,131 observations. These were families that either were not available during the interview time or refused to be interviewed or were not able to answer any questions.
- The fact that 18 years old was used as the cutoff point for respondents to be included in the analysis. 46 observations (below the age of 18 years old) were dropped. In Afghanistan people below this age are not allowed to participate in voting or be employed in civil service.

#### **4.8 Definition of Key Variables**

Drawing on the end-line survey, variables used for this study are divided into two categories; outcome variables and explanatory variables which are depicted in table 14:

**Table 14: Key variable definition and character in statistical model**

#	Variables	Definition	Categories	Statistic model (Expected sign)
1	Self –utilization	Indicates that how often a woman use BPHS facility for herself	0=0 1-5time=1 6-10=2 10+ =3	Outcome
2	Family utilization	Indicates that how often a woman use BPHS facility with other member in her family	0=0 1-5time=1 6-10=2 10+ =3	Outcome
3	CHW incentive	CHW who received cash incentive after referring family for delivery and vaccination	No=0 Yes=1	Explanatory (+)
4	Family incentive	Family who received cash incentive after delivery and vaccination	No=0 Yes=1	Explanatory (+)
5	Combined incentive	CHW incentive+ Family incentive	No=0 Yes=1	Explanatory (+)
6	Total number of people live in the household	Number of people live in the household	Number	Explanatory (+)

#	Variables	Definition	Categories	Statistic model (Expected sign)
7	Education	Reading	No=0 Yes=1	Explanatory (+)
8	Ethnicity	Pashtoon	No=0 Yes=1	Explanatory
9	Distance	The distance that women travel to reach the health facility in Kilo meter up to 40 km	Number	Explanatory Up to 40Km (-)
10	Distance missing dummy	Whether the distance is missing	No=0 Yes=1	Distance missing dummy variable (-)
11	Security	Feeling safe during travel to health facilities all the time	No=0 Yes=1	Explanatory (+)
12	Reproductive health education	Availability of reproductive health education in the community	No=0 Yes=1	Explanatory (+)
13	Family planning education	Availability of family planning health education program	No=0 Yes=1	Explanatory (+)
14	Parity	Total number of sons and daughters living with Women	Number	Explanatory (+)

#	Variables	Definition	Categories	Statistic model (Expected sign)
15	Wardak	The women who live in Wardak	No=0 Yes=1	Explanatory (+)
16	Badakhshan	The women who live in Badakhshan	No=0 Yes=1	Explanatory (+)
17	Kapisa	The people who live in Kapisa	No=0 Yes=1	Explanatory (+)
18	Percentage of children who died	Total number of children not alive / Total number of birth *100	Percentage	Explanatory (+)
19	Economic status: It is included proxy variables like; number of room, roof material(Plastic carpet, simple carpet, Iranian/Turkish rug, thread woven carpet, Afghan woven carpet) ,external wall material, cooking fuel(electricity, liquefied petroleum gas, natural gas, natural gas , biogas, Kerosene), electricity, generator, bicycle ,mobile phone ,animal cart, car, radio, television, bank account and having toilet.			Explanatory  First and second quintile (-) Third and fourth quintile (+)



**Table 16 : Percentage of Outcome variables (Self-Utilization and Family Utilization) based on type of intervention**

# of time	End line Survey			
	Percentage of Self -Utilization			
	Family cash incentives	CHW cash incentives	Combined cash incentive	Not given cash incentive
0	8.47	19.13	5.25	23.85
1-5 time	78.07	63.17	64.97	60.39
6-10 time	10.77	11.59	21.1	10.81
10+ time	2.69	6.1	8.67	4.95
# of time	Percentage of Family-Utilization			
0	26.82	25.4	11.03	42.84
1-5 time	61.12	61.67	71.45	47.01
6-10 time	10.07	9.37	8.84	7.18
10+ time	1.99	3.55	8.67	2.97

**Table 17: Summary of explanatory variables**

Explanatory Variables	Faryab		Wardak		Badakhshan		Kapisa	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
CHW incentive	0.429	0.495	0.109	0.311	0.381	0.486	0.204	0.403
Family incentive	0.033	0.178	0.336	0.473	0.084	0.277	0.099	0.298
Combined incentive	0.258	0.438	0.077	0.266	0.104	0.305	0.271	0.445



Explanatory Variables	Faryab		Wardak		Badakhshan		Kapisa	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Total number of people live in the household	8.508	3.609	7.690	2.929	8.231	3.206	8.080	2.959
Ability to read	0.050	0.217	0.228	0.419	0.105	0.307	0.161	0.367
Ethnicity	0.031	0.173	0.674	0.469	0.001	0.036	0.038	0.192
Distance up to 40km	2.761	5.272	5.977	4.868	10.915	11.136	2.836	4.041
Distance missing dummy	0.364	0.481	0.006	0.078	0.065	0.247	0.231	0.422
Security	0.816	0.387	0.179	0.384	0.773	0.419	0.668	0.471
Reproductive health education	0.720	0.449	0.867	0.340	0.417	0.493	0.550	0.498
Family planning education	0.685	0.465	0.651	0.477	0.356	0.479	0.532	0.499
Parity	4.566	2.705	4.492	2.534	4.914	2.660	4.582	2.763
Number of room	2.428	1.179	2.601	1.149	2.393	1.347	2.477	1.054
Roof material	2.537	1.108	2.469	0.864	2.679	1.201	2.560	0.705
External wall material	2.006	0.665	1.702	0.911	1.004	0.770	2.090	0.495
Cooking fuel(electricity)	0.010	0.098	0.004	0.059	0.002	0.044	0.001	0.036

Explanatory Variables	Faryab		Wardak		Badakhshan		Kapisa	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Cooking fuel( liquefied petroleum gas )	0.092	0.289	0.023	0.151	0.001	0.025	0.064	0.244
Cooking fuel( natural gas)	0.006	0.076	0.003	0.050	0.002	0.044	0.005	0.071
Cooking fuel(biogas),	0.001	0.025	0.000	0.000	0.001	0.025	0.000	0.000
Cooking fuel(Kerosene)	0.000	0.000	0.001	0.032	0.000	0.000	0.000	0.000
Electricity	0.673	0.469	0.135	0.342	0.765	0.424	0.165	0.371
Generator	0.066	0.248	0.047	0.212	0.016	0.127	0.048	0.215
bicycle	0.271	0.444	0.472	0.499	0.024	0.153	0.301	0.459
Mobile	0.772	0.420	0.897	0.304	0.495	0.500	0.912	0.283
Animal Cart	0.007	0.084	0.005	0.071	0.006	0.079	0.007	0.083
Car	0.025	0.157	0.152	0.359	0.040	0.196	0.082	0.274
Radio	0.253	0.435	0.733	0.443	0.479	0.500	0.796	0.403
Television	0.483	0.500	0.113	0.317	0.377	0.485	0.469	0.499
Bank account	0.009	0.095	0.033	0.180	0.041	0.199	0.100	0.300

<b>Explanatory Variables</b>	<b>Faryab</b>		<b>Wardak</b>		<b>Badakhshan</b>		<b>Kapisa</b>	
	<b>Mean</b>	<b>Std. Dev.</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Mean</b>	<b>Std. Dev.</b>
Toilet	1.414	0.813	1.378	0.589	0.856	0.782	1.021	0.742
Faryab ,Wardak, Badakhshan and Kapisa provinces	0.232	0.422	0.296	0.457	0.236	0.425	0.235	0.424
First quintile	0.180	0.385	0.103	0.304	0.481	0.500	0.060	0.237
Second quintile	0.238	0.426	0.153	0.360	0.244	0.430	0.187	0.390
Third quintile	0.172	0.378	0.239	0.426	0.150	0.357	0.220	0.415
Fourth quintile	0.188	0.391	0.259	0.438	0.081	0.273	0.256	0.437

Table 15 contains information on outcome variables. In general self-utilization and family utilization at the BPHS facilities vary at the province level. For instance:

- In the base line survey self-utilization and family utilization are higher in Kapisa and Wardak and lower in Badakhshan and Faryab provinces
- In the end line survey self-utilization and family utilization are higher in Kapisa and Faryab and lower in Badakhshan and Wardak provinces

Most people used health facilities once or none at all. Women when asked that how often they used a BPHS facility during 12 months either alone or with other members of family answered that they don't know, this response recoded to the category of 1-5 times. In total 217 observations in the self-utilization and 248 in the family utilization variable were changed.

Table 16 shows percentage of outcome variable based on type of intervention .As can be seen the combined cash incentive indicate high health care utilization compare to CHW and family cash incentive interventions.

Table 17 contains information on explanatory variables. Three dummy variables are developed out of four dummy variables below which are: 1) Cash incentive after delivery to the family. 2) Cash incentive after DPT3 vaccination to the family. 3) Whether CHW referred with regard to delivery and 4) Whether CHW referred with regard to DPT3 vaccination. The first two dummy variables are turned into one .The other two dummy variables are also combined into one variable. The cross tabulation of the generated dummies give us the following:

1. Family cash incentive dummy
2. CHW cash incentive dummy
3. Combined cash incentive dummy.

The total numbers of people who live with the women who were interviewed similar in the four provinces. The mean of distance either up to 40km or distance missing

dummy (some observation are missing information on the distance) shows variation due to geographical situation of the four provinces.

Education is available but the ability to read is used as proxy variable in this study. In Afghanistan even conservative people allow their daughters between the age 5-10 years old to go to Masjid (Muslim temple) and learn the holy book Quran and other religious books, which become their main source of education. In the Masjid the method of learning is only reading and not writing. This is also reflected in the end-line survey that shows the number of women who can read is much higher than the percentage of women with education (Reading 14.15% > Writing 8.81%). Reproductive health education and family planning health education program are available at the community run by CHWs. The two variables mean shows vary at provincial level due to number of CHWs available at the community level.

Wealth quintile are constructed based on the Principle Component Analysis .The list of variables that are used to find wealth quintile include : number of room, roof material(Plastic carpet, simple carpet, Iranian/Turkish rug, thread woven carpet, Afghan woven carpet) ,external wall material, cooking fuel(electricity, liquefied petroleum gas, natural gas, natural gas , biogas, Kerosene), electricity, generator, bicycle ,mobile phone ,animal cart, car, radio, television, bank account and having toilet. Each household was then assigned a score for each asset and the sample divided into 5 quintiles (Calverton, Maryland, USA: APhi/MoPH, CSO, ICF Macro, IHMR and WHO/EMRO., 2011).

The new variable which controls the health status of the family is percentage of children who died. This variable generated from dividing the total number of children who are not alive per total of birth.

## 4.10 Method of Analysis

**4.10.1 Ordered Probit:** The ordered probit model is a generalization of probit where the dependent variable consists of more than two discrete outcomes. This model is estimated using maximum likelihood. As outcome variables (Self-utilization and Family utilization) in this study consist of more than two discrete categories in ordinal scale, ordered probit will be run to estimate the relationship between outcomes and explanatory variables considering 5% significance level. After running ordered probit model the marginal effect will be also calculated.

### 4.10.2 Econometric Specification

The econometric specification is as bellow:

$$Y^* = \beta_0 + \beta_1(\text{CHW cash incentive})_i + \beta_2(\text{Family cash incentive})_i + \beta_3(\text{Combined i.e. Family and CHW cash incentive})_i - \beta_4(\text{First quintile})_i - \beta_5^*(\text{Second quintile})_i + \beta_6^*(\text{Third quintile})_i + \beta_7^*(\text{Fourth quintile})_i + \beta_8^*(\text{Total number of people live in the household})_i + \beta_9^*(\text{Ability to read})_i + \beta_{10}^*(\text{Ethnicity})_i - \beta_{11}^*(\text{Distance up to 40km})_i - \beta_{12}^*(\text{distance missing dummy})_i + \beta_{13}^*(\text{Security})_i + \beta_{14}^*(\text{Reproductive health education})_i + \beta_{15}^*(\text{Family planning education})_i + \beta_{16}^*(\text{Wardak})_i + \beta_{17}^*(\text{Badakhshan})_i + \beta_{18}^*(\text{Kapisa})_i + \beta_{19}^*(\text{Parity})_i + \beta_{20}^*(\text{Percentage of children who died})_i + \varepsilon_i$$

Where 0,  $\mu_1$  and  $\mu_2$  represent wt-offs that separate each category .The ordered probit model maximizes the likelihood, finding  $\beta$  and  $\mu$  jointly, and the categories of response are as below

$$Y^* = \begin{cases} 0 & \text{if } Y^* \leq 0, \\ 1 & \text{if } 0 < Y^* \leq \mu_1, \\ 2 & \text{if } \mu_1 < Y^* \leq \mu_2, \\ 3 & \text{if } Y^* \geq \mu_2 \end{cases}$$

## CHAPTER V

### RESULT AND DISCUSSION

#### 6.1 Ordered Probit Analysis

In order to find if the explanatory variables have any effect on both kinds of health care utilization the ordered probit regression are run. The results are depicted in the Table 18.

The pseudo R-squared in self- utilization in is 0.1131, which means that 11.31% of the dependent variable can be explained by independent variables. The pseudo R-squared in family utilization is 0.0931, it means that 9.31% of dependent variable can be explained by independent variables in the family utilization. Chi squared test of both kind of utilization are zero; there are strong associations between the outcome and explanatory variables.

**Table 18: Result of ordered probit model**

Explanatory Variables	Self-Utilization	Family Utilization
	Coefficient (Standard error)	Coefficient (Standard error)
CHW cash incentive	-0.001 (0.042)	0.211*** (0.041)
Family Cash incentive	0.174*** (0.047)	0.321*** (0.046)
Combined (CHW and Family Cash incentive)	0.383*** (0.049)	0.456*** (0.048)

<b>Explanatory Variables</b>	<b>Self-Utilization</b>	<b>Family Utilization</b>
	<b>Coefficient (Standard error)</b>	<b>Coefficient (Standard error)</b>
Total number of people live in the household	0.020*** (0.005)	0.004 (0.005)
First quintile	-0.326*** (0.054)	-0.371*** (0.053)
Second quintile	-0.131*** (0.049)	-0.220*** (0.048)
Third quintile	-0.072 (0.047)	-0.120*** (0.046)
Fourth quintile	-0.033 (0.046)	-0.086*** (0.045)
Ability to read	0.183*** (0.043)	0.174*** (0.042)
Ethnicity	0.290*** (0.056)	-0.173*** (0.055)
Distance up to 40km	0.048*** (0.002)	0.034*** (0.002)
Distance missing dummy	0.724*** (0.045)	0.587*** (0.044)
Security	0.087*** (0.036)	0.024 (0.035)
Reproductive health education	0.490*** (0.049)	0.288*** (0.048)
Family planning education	0.033 (0.044)	0.109*** (0.043)



<b>Explanatory Variables</b>	<b>Self-Utilization</b>	<b>Family Utilization</b>
	<b>Coefficient (Standard error)</b>	<b>Coefficient (Standard error)</b>
Parity	0.007 (0.006)	0.002 (0.006)
Percentage of children who died	0.001 (0.001)	0.001 (0.001)
Wardak Province	-0.226*** (0.060)	-0.226*** (0.058)
Badakhshan Province	0.004 (0.049)	-0.448*** (0.049)
Kapisa Province	0.731*** (0.045)	0.266*** (0.043)
Number of observation	6663	6663
Chi-square	0.000	0.000
Pseudo R2	0.113	0.0934

Note: \*\*\*=5% significance level

The results of coefficient of variables are described as below:

CHW cash incentive has positive effect on family utilization while family and combined cash incentives have positive relationship with self and family utilization. It is also in compliance with the process of spillover effects where cash incentive may increase the women's learning process about health care in formal setting; their demand may increase also because transport costs were subsidized. The women in the family may also have more authority with cash incentive.

The total numbers of people live in the family have a positive effect on self-utilization. It means that the health care program implementer communicated well with the families and were able to influence women about health care utilization when get sick. It is also noted that in Afghanistan, in one house, sometimes more than one family live together.

Families who are in the first and second quintile show negative relationship with both kind of utilization. Economic status of the family hindered health care utilization. It is also noted that the fifth quintile is excluded from the model due to collinearity.

Education of women had a positive effect on self-utilization; it is possible that women knew about health care programs which affected the self-utilization because they read brochure distributed during the intervention of program within the families.

Surprisingly, distance of women houses up to 40 km and missing value of distance from health facilities have a positive effect on both kinds of utilization. It shows the ability of women to travel to health facilities while got any kind of health problem.

When the women asked if they feeling safe during travel to health facilities all the time and they response yes or no, it is indicated security feeling of women .Security has a positive effect on self-utilization. It means that the more women feel secure while traveling to a health facility all the time the more they use health facility. Ethnicity has a positive effect on self-utilization but a negative effect on family utilization. The positive effect of ethnicity on self-utilization reflects that attitude of the women is changed on using healthcare service in the intervention areas.

Reproductive and family planning health education programs have a positive effect on both kind of utilization. Educations conducted by CHWs in the community affect knowledge of women and change their health seeking behavior.

Although both Kapisa and Wardak are located in the central region of Afghanistan but Kapisa state dummy shows a positive effect on both kinds of utilization compared to

Wardak which shows a negative effect on utilization. The reason behind might be regular monitoring of the health care program in Kapisa as well as security of this province. The security in Wardak province during the intervention of program was worse. In Badakhshan province family utilization has a negative correlation which might be due to blockage of road during winter and the mountainous areas in the province.

The marginal effects of explanatory variables on self and family utilization are calculated and the output data are depicted in the tables 19 and 20:

**Table 19 : Result of Marginal effects of explanatory variables on Self-utilization**

<b>Category</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Explanatory Variable</b>	<b>dy/dx</b> <b>Std. Err.</b>	<b>dy/dx</b> <b>Std.</b> <b>Err.</b>	<b>dy/dx</b> <b>Std. Err.</b>	<b>dy/dx</b> <b>Std. Err.</b>
CHW cash incentive	0.000 (0.009)	0.000 (0.000)	0.000 (0.005)	0.000 (0.004)
Family Cash incentive	-0.038*** (0.010)	-0.001 (0.001)	0.021*** (0.006)	0.018*** (0.005)
Combined (CHW and Family Cash incentive)	-0.084*** (0.011)	-0.003 (0.002)	0.047*** (0.006)	0.040*** (0.005)
Total number of people live in the household	-0.004*** (0.001)	0.000 (0.000)	0.002*** (0.001)	0.002*** (0.001)
First quintile	0.071*** (0.012)	0.003 (0.002)	-0.040*** (0.007)	-0.034*** (0.006)
Second quintile	0.029*** (0.011)	0.001 (0.001)	-0.016*** (0.006)	-0.014*** (0.005)
Third quintile	0.016 (0.010)	0.001 (0.001)	-0.009 (0.006)	-0.007 (0.005)
Fourth quintile	0.007 (0.010)	0.000 (0.000)	-0.004 (0.006)	-0.003 (0.005)

<b>Category</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Explanatory Variable</b>	<b>dy/dx Std. Err.</b>	<b>dy/dx Std. Err.</b>	<b>dy/dx Std. Err.</b>	<b>dy/dx Std. Err.</b>
Ability to read	-0.040*** (0.009)	-0.001 (0.001)	0.023*** (0.005)	0.019*** (0.005)
Ethnicity	-0.063*** (0.012)	-0.002 (0.002)	0.036*** (0.007)	0.030*** (0.006)
Distance up to 40km	-0.010*** (0.001)	0.000 (0.000)	0.006*** (0.000)	0.005*** (0.000)
Distance missing dummy	-0.159*** (0.010)	-0.006 (0.004)	0.089*** (0.006)	0.075*** (0.005)
Security	-0.019*** (0.008)	-0.001 (0.001)	0.011*** (0.004)	0.009*** (0.004)
Reproductive health education	-0.107*** (0.011)	-0.004 (0.003)	0.060*** (0.006)	0.051*** (0.005)
Family planning education	-0.007 (0.010)	0.000 (0.000)	0.004 (0.005)	0.003 (0.005)
Parity	-0.002 (0.001)	0.000 (0.000)	0.001 (0.001)	0.001 (0.001)
Percentage of children who died	0.000*** (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Wardak Province	0.050*** (0.013)	0.002 (0.001)	-0.028*** (0.007)	-0.023*** (0.006)
Badakhshan Province	-0.001 (0.011)	0.000 (0.000)	0.001 (0.006)	0.000 (0.005)
Kapisa Province	-0.160*** (0.010)	-0.006 (0.004)	0.090*** (0.006)	0.076*** (0.005)

Note: \*\*\*=5% significance level

**Table 20: Result of Marginal effects of explanatory variables on Family utilization**

Category	0	1	2	3
Variable	dy/dx Std. Err	dy/dx Std. Err.	dy/dx Std. Err.	dy/dx Std. Err.
CHW cash incentive	-0.065*** (0.013)	0.026*** (0.005)	0.021*** (0.004)	0.017*** (0.003)
Family Cash incentive	-0.099*** (0.014)	0.040*** (0.006)	0.033*** (0.005)	0.026*** (0.004)
Combined (CHW and Family Cash incentive)	-0.140*** (0.015)	0.057*** (0.006)	0.046*** (0.005)	0.037*** (0.004)
Total number of people live in the household	-0.001 (0.002)	0.001 (0.001)	0.000 (0.001)	0.000 (0.000)
First quintile	0.114*** (0.016)	-0.046*** (0.007)	-0.038*** (0.006)	-0.030*** (0.005)
Second quintile	0.068*** (0.015)	-0.027*** (0.006)	-0.022*** (0.005)	-0.018*** (0.004)
Third quintile	0.037*** (0.014)	-0.015*** (0.006)	-0.012*** (0.005)	-0.010*** (0.004)
Fourth quintile	0.026*** (0.014)	-0.011*** (0.006)	-0.009*** (0.005)	-0.007*** (0.004)
Ability to read	-0.054*** (0.013)	0.022*** (0.005)	0.018*** (0.004)	0.014*** (0.004)
Ethnicity	0.053*** (0.017)	-0.022*** (0.007)	-0.018*** (0.006)	-0.014*** (0.005)
Distance up to 40km	-0.010*** (0.001)	0.004*** (0.000)	0.003*** (0.000)	0.003*** (0.000)
Distance missing dummy	-0.181*** (0.013)	0.073*** (0.006)	0.060*** (0.005)	0.048*** (0.004)
Security	-0.007	0.003	0.002	0.002

	(0.011)	(0.004)	(0.004)	(0.003)
Reproductive health education	-0.089*** (0.015)	0.036*** (0.006)	0.029*** (0.005)	0.024*** (0.004)
Family planning education	-0.033*** (0.013)	0.013*** (0.005)	0.011*** (0.004)	0.009*** (0.004)
Parity	-0.001 (0.002)	0.000 (0.001)	0.000 (0.001)	0.000 (0.000)
Percentage of children who died	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Wardak Province	0.069*** (0.018)	-0.028*** (0.007)	-0.023*** (0.006)	-0.018*** (0.005)
Badakhshan Province	0.138*** (0.015)	-0.056*** (0.006)	-0.046*** (0.005)	-0.037*** (0.004)
Kapisa Province	-0.082*** (0.013)	0.033 (0.006)	0.027*** (0.004)	0.022*** (0.004)

Note: \*\*\*=5% significance level

Based on tables 19 and 20 the marginal effects of main explanatory variables on self-utilization and family utilization are described as below:

- Probability of self-utilization equal to category two increase by 2.1% when family cash incentive is equal to category two
- Probability of self-utilization equal to category three increase by 1.8% when family cash incentive is equal to category three
- Probability of self-utilization equal to category two increase by 4.7% when combined cash incentive is equal to category two
- Probability of self-utilization equal to category three increase by 4% when combined cash incentive is equal to category three
- Probability of family utilization equal to category one increase by 2.6% when CHW cash incentive is equal to category one

- Probability of family utilization equal to category two increase by 2.1% when CHW cash incentive is equal to category two
- Probability of family utilization equal to category three increase by 1.7% when CHW cash incentive is equal to category three
- Probability of family utilization equal to category one increase by 4% when family cash incentive is equal to category one
- Probability of family utilization equal to category two increase by 3.3 % when family cash incentive is equal to category two
- Probability of family utilization equal to category three increase by 2.6 % when family cash incentive is equal to category three
- Probability of family utilization equal to category one increase by 5.7 % when combined cash incentive is equal to category one
- Probability of family utilization equal to category two increase by 4.6 % when combined cash incentive is equal to category two
- Probability of family utilization equal to category three increase by 3.7 % when combined cash incentive is equal to category three

In order to compare the difference between combined cash incentive intervention and family and CHW cash incentive interventions the ordered probit model run for two times based on below condition and the out- put data are depicted in annex A and B(see annex A and B):

In the first time the combined cash incentive variable is excluded from the model and the ordered probit model run with conditional of if  $arm_0 = 0$  ( $arm_0$  is control arm).The results of explanatory variables are described as below (See annex A):

- CHW cash incentive has negative relationship with self-utilization
- Family cash incentives has positive relationship with self and family utilization
- Total numbers of people live in the household have positive relationship with self –utilization.

- Families, who live in the first, second and third quintiles have negative relationship with both kind of utilization. Family who live in fourth quintile has negative relationship with the Family utilization
- Education has positive relationship with both kind of utilization
- Ethnicity has negative relationship with family utilization
- Distance up to 40 Km and missing value of distance due to memory have positive relationship with self and family utilization
- Security has positive relationship with self -utilization
- Reproductive health education has positive relationship with self and family utilization
- Family planning health education has positive relationship with self-utilization
- Percentage of children who died has positive effect with self –utilization
- Kapisa has positive relationship with self and family utilization
- Badakhshan has negative relationship with family utilization

In the second time a new dummy variable is generated out of three variables which are CHW cash incentive, family cash incentive, combined cash incentive. The three mentioned variables turned into one dummy variable. The ordered probit model excluding combined cash incentive variable run again with condition of new dummy variable equal to one (i.e. if new dummy variable==1). The results of explanatory variables are described as below (See annex B):

- CHW cash incentive has negative relationship with self and family utilization
- Total numbers of people live in the household has positive relationship with self –utilization.
- Families, who live in the first, second and third quintiles have negative relationship with both kind of utilization. Family who live in fourth quintile has negative relationship with the Family utilization
- Education has positive relationship with self-utilization
- Ethnicity has negative relationship with family utilization



- Distance up to 40 Km and missing value of distance due to memory have positive relationship with self and family utilization
- Reproductive health education has positive relationship with self and family utilization
- Family planning health education has negative relationship with self-utilization
- Wardak has negative relationship with family utilization
- Kapisa has positive relationship with self and family utilization
- Badakhshan has negative relationship with family utilization

## **CHAPTER VI**

### **CONCLUSION AND RECOMMENDATION**

#### **6.1 Summary**

The main finding of this study shows the relationship between cash incentives program and health care utilization at the BPHS facilities at 5% significant level. The rationale behind this relationship might be due to relaxation of family income constrains as transportation cost was covered. The positive relationship could be due to referral effort by Community Health Worker who received cash incentive from the program too. Women's education has a positive relationship with health care utilization, along with some other education program like reproductive health and family planning health education programs. Security is one of the main issues which effects on women health care utilization. Cash incentive programs in Kapisa compared to other provinces have a positive relationship with health care utilization.

#### **6.2 Limitation of the Study**

- The different number of observations between baseline and end-line surveys, socioeconomic and demographic variables makes it difficult to compare the health care utilization before and after intervention.
- Health indicator is not included in the survey tool, so health is not properly controlled in the specification, which makes it difficult to explain health care utilization.

To double check if utilization between people with cash incentive and people without cash incentive are different, propensity score match is also run .The results are shown in table 18:

**Table 21: Propensity Score Matching Results**

<b>Outcome Variables</b>	<b>Treatment</b>	<b>Control</b>	<b>ATT</b>	<b>Std. Err.</b>	<b>t</b>
<b>Self-Utilization</b>	3948	1379	0.083	0.03	2.796
<b>Family Utilization</b>	3948	1379	0.169	0.03	5.665

Note, however, that the outcome variables in this study are discrete and not continuous; therefore the method is not completely perfect. However the result is suggestive and it says the people who get incentive have a higher rate of both kinds of utilization.

### **6.3 Recommendations**

- Family cash incentives should be considered an approach to increase utilization
- Cash incentives to CHW will improve the referral system especially at the primary health care level need to be included in the national salary policy to tackle population health problems (Ministry of Public Health, 2011).
- Education of women in this study shows a strong relationship with utilization, therefore, inter-ministerial collaboration between the Ministry of Public Health, Ministry of Education and Ministry of Women Affairs should be carried out to improve the education of women in rural area.
- As the cash incentive programs have a spillover effect on area other than the targeted types of care, impact evaluation is necessary on any other kind of future pilot projects.

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## **APPENDICES**

## Appendix A

Results of ordered probit model excluding combined cash incentive variable with conditional of if arm0==0 (arm0 is control arm)

Explanatory Variables	Self-Utilization	Family Utilization
	Coefficient (Standard error)	Coefficient (Standard error)
CHW cash incentive	-0.188*** (0.042)	-0.041 (0.041)
Family Cash incentive	0.260*** (0.050)	0.194*** (0.049)
Total number of people live in the household	0.017*** (0.006)	0.010 (0.006)
First quintile	-0.294*** (0.061)	-0.357*** (0.060)
Second quintile	-0.131*** (0.055)	-0.235*** (0.054)
Third quintile	-0.133*** (0.055)	-0.142*** (0.054)
Fourth quintile	-0.036 (0.052)	-0.101*** (0.051)
Ability to read	0.175*** (0.049)	0.163*** (0.048)
Ethnicity	-0.057 (0.068)	-0.317*** (0.067)
Distance up to 40km	0.050*** (0.003)	0.037*** (0.002)
Distance missing dummy	0.986***	0.730***

Explanatory Variables	Self-Utilization	Family Utilization
	Coefficient (Standard error)	Coefficient (Standard error)
	(0.059)	(0.057)
Security	0.082*** (0.040)	0.061 (0.040)
Reproductive health education	0.743*** (0.055)	0.449*** (0.053)
Family planning education	-0.040 (0.050)	0.168*** (0.049)
Parity	-0.003 (0.007)	-0.008 (0.007)
Percentage of children who died	0.002*** (0.001)	0.001 (0.001)
Wardak Province	-0.093 (0.067)	-0.122 (0.065)
Badakhshan Province	0.083 (0.060)	-0.300*** (0.059)
Kapisa Province	1.181*** (0.057)	0.554*** (0.054)
Number of observation	5086	5086
Chi-square	0.000	0.000
Pseudo R2	0.149	0.1002

Note: \*\*\*=5% significance level



## Appendix B

Results of ordered probit excluding combined cash incentive variable with condition of new generated dummy variable equal to one i.e. if new dummy variable==1  
(New generated dummy variable=CHW cash incentive+ Family cash incentive+ Combined cash incentive)

Explanatory Variables	Self-Utilization	Family Utilization
	Coefficient Standard error	Coefficient Standard error
CHW cash incentive	-0.412*** (0.047)	-0.280*** (0.046)
Family Cash incentive	-0.113 (0.071)	-0.123 (0.069)
Total number of people live in the household	0.028*** (0.007)	0.012 (0.006)
First quintile	-0.286*** (0.070)	-0.367*** (0.069)
Second quintile	-0.158*** (0.062)	-0.302*** (0.061)
Third quintile	-0.166*** (0.061)	-0.259*** (0.060)
Fourth quintile	-0.089 (0.059)	-0.133 (0.058)
Ability to read	0.166*** (0.056)	0.125 (0.055)
Ethnicity	-0.109 (0.087)	-0.368*** (0.084)
Distance up to 40km	0.035***	0.032***

Explanatory Variables	Self-Utilization	Family Utilization
	Coefficient Standard error	Coefficient Standard error
	(0.003)	(0.003)
Distance missing dummy	0.657*** (0.061)	0.562*** (0.059)
Security	0.057 (0.048)	-0.068 (0.047)
Reproductive health education	0.606*** (0.065)	0.362*** (0.064)
Family planning education	-0.183*** (0.054)	0.025 (0.053)
Parity	-0.007 (0.008)	-0.012 (0.008)
Percentage of children who died	0.002 (0.001)	0.001 (0.001)
Wardak Province	-0.126 (0.081)	-0.185*** (0.079)
Badakhshan Province	-0.005 (0.062)	-0.371*** (0.062)
Kapisa Province	0.799*** (0.057)	0.291*** (0.055)
Number of observation	3938	5086
Chi-square	0.000	0.000
Pseudo R2	0.098	0.100

Note: \*\*\*=5% significance level

## **BIOGRAPHY**

### **PERSONAL DATA**

Nam	Abo Ismael Foshanji
Nationality	Afghan
Date of birth	March 15, 1970
Place of birth	Kabul Afghanistan
Email	hefd.foshanji@gmail.com

### **EDUCATION AND TRAINING**

1988-1995	Medical Degree from Kabul Medical University
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### **JOB EXPERIENCE**

2010 -2013	Demand Side Financing Coordinator
2004-2010	Human Resources National Consultant
2003-2004	Provincial Health Supervisors
1995-2002	Medical Officer in (102 Bed, Ibnicina and Wazir Akbar Khan) Hospitals in Kabul