

# **Delivery of Mobile Phone Aided Health Services in Rural Bangladesh: A Study on Two Upazilas**

**Submitted By**

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*Dedicated. . . .*

*To my great Nana Bhai and my  
loving parents.*

*Just wanted to say "I love you".*

## Abstract

This dissertation contains the study conducted by the researcher as a part of her master's thesis. The study examined the status and effectiveness of the mobile phone aided health services (m-Health) delivery in rural Bangladesh based on the experiences of two Upazilas. m-Health services are very new in the context of Bangladesh. Yet, it has already changed the way services are used to be delivered at grass root level. m-Health and more generally e-Health are the components of e-Governance in the health sector that is considered to be cheaper, more efficient, inclusive, transparent, and bring more population under existing health service network. So, the purpose of this study is to identify the extent to which these goals of providing m-Health services are achieved. By closely observing the internal processes at DGHS, the researcher received the fundamental ideas of how it is viewed centrally. The researcher conducted a survey on the sampled recipients of the services in two Upazilas having diverse socio-geo-economic profile. A part of the survey was also conducted on the grass root level service providers. Phone calls were made in the guise of clients to verify the data collected from different sources. The researcher developed a theoretical framework to analyze the collected information on the basis of Actor-Network Theory and e-Governance Model. An initial hypothesis was also developed. Later the theoretical framework was used to determine the extent of justification of the proposed hypothesis.

Analysis of primary data revealed that most of the service recipients were satisfied with the mobile phone aided health services as the service was more accessible and available. Besides, the service recipients found this service useful as it was made available in emergency and also as it was less costly and hassle free. The mobile phone aided health services also reduced wastage of time in emergency. So, the service recipients felt secured that they would be able to access medical advices at any time, 24 hours and 7 days a week. Though the service providers informed about extra work load for continuing mobile phone health services, in most of the cases they were cordial and responsive to their clients as most of the service recipients informed to the researcher. While comparing the findings of two different Upazilas located in two different districts it was revealed that the variation of educational background and socio-economic profile of these two Upazilas led to the variations in the awareness level of the service seekers about the availability of the service and this ultimately contributed to the overall effectiveness of the service.

## Table of Contents

	Page No.
Dedicated To	ii
Abstract	iii
Table of Contents	iv
List of Tables	vii
List of Figures	viii
List of Abbreviations	x
Acknowledgement	xii
<b>Chapter One: Introduction</b>	1
1.1 Background	2
1.2 Significance of the Study	2
1.3 Problem Statement	2
1.4 Objectives of the Study	2
1.5 Research Question	3
1.6 Hypothesis	3
1.7 Scope of the Study	3
1.8 Limitations of the Study	3
1.9 Structure of the Thesis	4
<b>Chapter Two: Literature Review</b>	5
2.1 Introduction	5
2.2 Conceptualizing e-Governance	5
2.3 Evolution of e-Governance in Bangladesh	6
2.4 e-Services in e-Government	8
2.5 Overview of e-Health Services	9
2.6 Mobile Phone Aided Health Services in National Context	11
2.7 Mobile Phone Aided Health Services in International Context	14
2.8 Conclusion	15
<b>Chapter Three: Theoretical Framework</b>	16
3.1 Introduction	16
3.2 Actor-Network Theory	16

	Page No.	
3.3	Model of e-Governance	18
3.4	Stages of e-Governance	19
3.5	Forms of E-Governance Interactions	20
3.6	Analytical Framework	22
3.7	Operational Definitions of the Variables and Indicators	23
3.8	Conclusion	24
<b>Chapter Four: Research Method</b>		<b>25</b>
4.1	Introduction	25
4.2	Source of Data	25
4.3	Study Area	26
4.4	Sample Size	27
4.5	Data Validation	28
4.6	Data Analysis Tools	28
4.7	Conclusion	28
<b>Chapter Five: Structure and Operation of DGHS: Perspective e-Health</b>		<b>29</b>
5.1	Introduction	29
5.2	Programs and Activities of DGHS	29
5.3	Coordination	30
5.4	Other Programs of MIS-Health	31
5.5	Conclusion	35
<b>Chapter Six: Mobile Phone Health Service Delivery System</b>		<b>36</b>
6.1	Introduction	36
6.2	m-Health Services	36
6.3	Mobile Phone Aided Health Services of DGHS	36
6.4	SMS Advices for Safe Pregnancy	37
6.5	Bulk SMS	38
6.6	More m-Health Services	38
6.7	Telemedicine	38
6.8	Conclusion	39
<b>Chapter Seven: Data Presentation and Analysis</b>		<b>40</b>
7.1	Introduction	40
7.2	Source of Awareness of the Service Seekers	40
7.3	Frequency of Service Access	42

	Page No.
7.4 Adequacy of Human Resources	42
7.5 Availability of Equipments	43
7.6 Record Maintenance	44
7.7 Coordination & Monitoring	44
7.8 Availability of the Service over Phone	46
7.9 Experience of Service Recipients during Consultation of the Problem	48
7.10 Types of Received Medical Service over Mobile Phone	50
7.11 Usefulness of and Satisfaction about the Received Medical Advices: Service Receiver's Perspective	51
7.12 Demand Fulfillment and Satisfaction of the Service Recipients	52
7.13 Factors behind Satisfaction or Dissatisfaction	56
7.14 Assessment of Mobile Phone Health Service Program from Service Providers' Perspective	58
7.15 Comparative Analysis between Two Upazila Health Complexes	60
7.16 Is the General Scenario That Much Rosy in other UHCs?	63
7.17 Conclusion	63
<b>Chapter Eight: Conclusion</b>	64
8.1 Introduction	64
8.2 General Findings	64
8.3 Specific Findings	64
8.4 Further Research Area	66
8.5 Conclusion	66
8.6 Policy Implications	67
 <b>Bibliography</b>	 69
 Appendix I: Tables	 74
Appendix II: Figures	81
Appendix III : Case Studies	86
Appendix IV: Questionnaires & Check-list	87

## List of Tables

	Page No.
Table 1: Method of Data Collection	25
Table 2: Respondents Distribution for Primary Data Collection	27
Table 3: Required Equipments	43
Table 4: Status of Record Maintenance	44
Table 5: Coordination Method	45
Table 6: Effectiveness from Service Provider's Perspective	60
Table 7: Table of Dependent and Independent Indicators	74
Table 8: Level of Satisfaction of the Service Recipients due to Less Service Cost	75
Table 9: Education Level of the Respondents of Naria and Savar	75
Table 10: Educational Background of the Service Recipients and their Satisfaction on Language	76
Table 11: Satisfaction of the Service Recipients due to Less Service Cost and Distance	76
Table 12: Satisfaction of the Service Recipients due to Saving Time and Distance	77
Table 13: Findings of the Study	78
Table 14: Deviation in Responses during Measuring Satisfaction Rates	79
Table 15: Calling Experiences of the Researcher in Ten UHCs for Data Validation	80

## List of Figures

	Page No.
Figure 1: Actor-Network Theory	17
Figure 2: Model of e-Governance	18
Figure 3: Analytical Framework	22
Figure 4: Source of Information	40
Figure 5: Frequency of Receiving Calls	42
Figure 6: Behavior of the Call Receivers	46
Figure 7: Experiences of Calling at Night	47
Figure 8: Listening Tendency of the Service Providers	48
Figure 9: Frequency of Understanding the Problem	49
Figure 10: Form of Medical Advices	50
Figure 11: Usefulness of the Medical Advices	51
Figure 12: Level of Satisfaction of the Service Recipients in Terms of Less Cost for Getting the Services	53
Figure 13: Satisfaction Scale of Naria UHC's Service Recipients	54
Figure 14: Satisfaction Scale of Savar UHC's Service Recipients	55
Figure 15: Change in Number of Outdoor Patients	59
Figure 16: Satisfaction of the Received Medical Advices	81
Figure 17: Frequency of Receiving Calls at Night in a Week	81
Figure 18: Satisfaction of the Service Recipients on Received Medical Advices	81
Figure 19: Opinions of the Satisfied Service Seekers for Improvement of the Program	82
Figure 20: Satisfaction Scale of the Service Recipients on Received Medical Advices	82
Figure 21: Combined Satisfaction Scale of the Service Recipients in Two UHCs	82
Figure 22: Distances of the Dwelling Places of the Service Recipients as the Hospitals	83
Figure 23: Comparative Figure of Educational Background of the Service Recipients of Two Upazilas	83
Figure 24: Variation in Understanding the Conversation	83



	Page No.
Figure 25: Received Medical Advices over Phone	84
Figure 26: Usefulness of the Received Medical Services from Service Receivers' Perspective	84
Figure 27: Frequency of Monitoring by Head Office	84
Figure 28: Adequacy of Human Resources	85
Figure 29: Adequacy of Equipments	85

## List of Abbreviations

A2I	Access to Information
ANT	Action-Network Theory
BANBEIS	Bangladesh Bureau of Educational Information and Statistics
BBC	British Broadcasting Corporation
BDHS	Bangladesh Demographic and Health Survey
CDAC	Centre for Development of Advanced Computing
CDC	Communicable Disease Control
CHT	Chittagong Hill Tracts
CS	Civil Surgeon
DAFH	Department of Animal Production and Health
DC	Deputy Commissioner
DGDA	Directorate General of Drug Administration
DGFP	Directorate General of Family Planning
DGHS	Directorate General of Health Services
DNS	Directorate of Nursing
ECG	Electrocardiogram
e-Governance	Electronic Governance
e-Health	Electronic Health
EMO	Emergency Medical Officer
EOC	Emergency Obstetric Care
ESD	Essential Service Delivery
e-Services	Electronic Services
G2B	Government to Business
G2B	Government to Employees
G2C	Government to Citizens
G2G	Government to Government
GIS	Geographical Information System
GP	Grameen Phone Company Ltd.
GPS	Global Positioning System
GR	Geographical Reconnaissance
HNPSP	Health, Nutrition and Population Sector Programme
ICMH	Institute of Child and Mother Health

ICT	Information and Communication Technology
IDSAS	Infectious Disease Surveillance and Analysis System
IEDCR	Disease Control and Research
IMCI	Integrated Management of Childhood Illness
IPH	Institute of Public Health
IRIN	Integrated Regional Information Networks
MBDC	Mycobacterium Disease Control Program
MDG	Millennium Development Goal
m-Health Service	Mobile Phone Aided Health Service
MIS	Management Information System
MS	Micronutrient Supplementation
NCD&OPHI	Non-communicable Diseases and other Public Health Interventions
NID	National Identification Number
NIPSOM	National Institute of Preventive and Social Medicine
NNP	National Nutrition Program
OPD	Out-patient Department
PHC	Primary Healthcare
PMO	Prime Minister's Office
RMO	Resident Medical Officer
SICT	Support to ICT
SIM	Subscriber identity module
SMS	Short Message Service
SPSS	Statistical Package for the Social Sciences
UHC	Upazila Health Complex
UK	United Kingdom
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
USA	United States of America
WHO	World Health Organization
24/7	24 hours a day, 7 days a week

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# Chapter One: Introduction

## 1.1 Background

The health sector of Bangladesh is experiencing significant advances and continuing since recent years. The changes are taking place from different dimensions. In a recent interview (Sen 2011), the Nobel laureate economist Professor Amartya Sen argued that Bangladesh more significantly succeeded than her neighboring countries on life expectancy, under-5 mortality. Besides, Bangladesh has been able to increase the numbers of healthcare professionals and building new infrastructures. More importantly, government has started a new era in the health sector by introducing Information and Communication Technology (ICT) for health service delivery. The government has developed a Health Management Information System (MIS) department under the Directorate General of Health Services (DGHS). The purpose of this department is to ensure the best use of ICT to build and maintain nation wide health information system of Bangladesh (DGHS 2012). This system works as the backbone of the e-Health service network of Bangladesh. Stepping into this new generation healthcare service is a significant achievement for any nation regarding any economic standing. A very important component of e-Health or ICT based healthcare system is m-Health<sup>1</sup> or mobile-health. m-Health is a healthcare service rendered using the national wide mobile phone network. The health professionals provide basic health advices and initial diagnosis when the service recipients contact through specialized 24/7<sup>2</sup> call center. In May 2009, the government of Bangladesh brought each of the 482 Upazila health complexes under the m-Health call center network (DGHS 2012). These cell phone numbers are circulated among the surrounding community. Since then people mainly in rural areas are making first contact with the health professionals through this pervasive network. As the 99% of the population is under cellular network coverage (GP 2012), this m-Health service has brought virtually everyone in touch with registered certified health professionals in the cheapest possible way. Since it has been running for three years, a comprehensive study on the

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<sup>1</sup> m-Health is a term used for the practice of medicine and public health, supported by mobile phone devices. This term broadly encompasses the use of mobile telecommunication and multimedia technologies in health care delivery. In this study, the term “m-Health” is used for the mobile phone aided health service program of DGHS in Upazila health complexes. Under this program 482 Upazila health complexes are given a mobile phone from DGHS where the service seekers make phone calls for medical advices and the Emergency Medical Officers are assigned to attend the phone calls to deliver health services in 24/7.

<sup>2</sup> 24 hours a day, 7 days a week

effectiveness of the m-Health services will help the policy makers to develop a more inclusive and responsive policy for the health sector of Bangladesh.

## **1.2 Significance of the Study**

Mobile phone aided health service aims to provide medical advices and services to the hard-to-reach areas. Mobile phone is an easy informatics component which is available in almost everywhere of Bangladesh. As a public service, mobile phone health service seems to have more expectation to be delivered to the clients properly. But there could have some loopholes in delivering medical advices, or problem with logistics, or coordination among different levels of administration in implementing mobile phone aided health service program. As it is a new intervention, it is important to explore the loopholes of this program if there is any so that the authority can fix the issues for further improvement. As there was no previous study conducted on this area, the study seeks to explore the loopholes or measure the effectiveness of this e-Health service program with a specific focus on the mobile phone aided health service delivery.

## **1.3 Problem Statement**

DGHS has started providing health services in 482 Upazilas of the country through mobile phone since 2009. It is a new intervention of the government. Mobile phone aided health program is a step by the government to reach out to the people in remote areas with medical information so that they can avail health services such as telephonic consultation, advice or draw immediate medical attention of the Upazila Health Service providers for medical emergency or an outbreak of epidemic. While this government intervention and innovation makes a huge impact or potential in terms of connectivity with the under served remote areas with the Upazila health service providers, the benefits from such intervention is yet to be assessed both by the government and by academic researchers. This study aims to explore its potential to what extent the mobile phone aided health services of DGHS is benefiting to the end users.

## **1.4 Objectives of the Study**

The general objective of this study is to assess the effectiveness of Mobile Phone aided Health Services provided by DGHS. The specific objectives of this study are-

- To examine the effectiveness of the mobile phone aided health services provided by DGHS.
- To identify and analyze the factors contributing to the effectiveness of the mobile phone aided health services.

### **1.5 Research Question**

In view of the broader objective of this study, the following research question was raised:

- To what extent, the mobile phone aided health services in Bangladesh are effective?

### **1.6 Hypothesis**

Mobile phone aided health services provide opportunities for greater access to health services at Upazila level or rural Bangladesh.

### **1.7 Scope of the Study**

The study focuses on the usage of mobile phones by rural people for accessing the healthcare. In order to do so it has made an attempt to collect information from both of the service providers (supply side) and the service recipients (demand side). The study covered health points at two Upazilas in different districts. The Savar Upazila health complex under Dhaka district was chosen as DGHS claims that the performance of this Upazila is commendable as far as e-Health service is concerned. The researcher has deliberately chosen Naria Upazila under the district of Shariatpur as it was located in a remote area and also as it was far from the Dhaka city. Two different districts of different geographical features were chosen as the initial assumption was that this would help the researcher to compare and understand the dynamics and variations related to the e-Health delivery in areas having diverse socio-economic and geographical profiles.

### **1.8 Limitations of the Study**

Due to limitations of time and resources the study does not

- cover all the services provided by DGHS
- cover all the health points at district and Upazila level
- cover all the ICT based health services available in Bangladesh by other organizations

- focus on engineering aspects of the service delivery framework

## **1.9 Structure of the Thesis**

The thesis comprises of eight chapters. First chapter provides an introduction to the study. It focuses on background and context of the study, problem statement, objectives, research question, hypothesis, scope and limitations of the study. Chapter two explains e-Governance, evolution of e-Governance in Bangladesh, e-Services in e-Government, overview of e-Health services, and mobile phone aided health services in national and international context. This chapter provides background information to the reader on the subject which researcher dealing with next chapters. Chapter three presents theoretical background, analytical framework, and operational definitions of the variables and indicators. Chapter four discusses research method. Chapter five presents the e-Health programs and activities of DGHS. Chapter six explains m-Health Services and existing mobile phone aided health services of DGHS. Chapter seven presents the findings of the questionnaire survey, interviews, and case studies on service recipients and service providers' perception regarding mobile phone aided health services of DGHS. Chapter eight presents a summary, conclusion of the study and policy implications.



## **Chapter Two: Literature Review**

### **2.1 Introduction**

This chapter covers the contemporary works regarding healthcare aspects of e-Governance, i.e. e-Health, m-Health with special attention. The relationship among the concepts of electronic public service delivery and healthcare services are also discussed in details. A brief history of the evolution of e-Governance is also given with due importance. For clarity and justification of this study the evolution is described in three stages. The roles and responsibilities of each stakeholder are explained with context. Electronic service delivery in the context of Bangladeshi is also discussed from a general point of view. Then a comparative study of different contemporary works on the mobile phone health service is also presented. The local study is accompanied by a contemporary study of the mobile phone health services provided in other countries.

### **2.2 Conceptualizing e-Governance**

The concept of ‘e-Governance’ explains the introduction of information and telecommunications technologies in governance. E-Governance thus implies the replacement of the Weberian principles of bureaucratic governance with the trends of horizontal, leaner, dynamic and networked governance. E-Governance refers to governance processes in which Information and Communications Technology (ICT) plays active and significant roles for efficient and effective governance, and for making government more accessible and accountable to the citizens. The concept has become an integral part of public sector transformation as ICT have helped to deliver more modern services for citizens and businesses. It stimulates the emergence of Information Society, drives public sector transformation and help governments prepare for future models of public administrations (Monem & Hasan 2012).

In a detailed explanation while describing a closely related but not to be interchanged concept, the World Bank aptly opines that e-Government is-

“the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that has the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of

different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions”. (Monem & Hasan 2012)

Thus, the emphasis here is on the use of information technologies in improving citizen-government interactions, while adopting cost-cutting approach to administration and evolving dependable cum most rewarding modes of revenue generation that can conduce to efficiency, accountability and transparency in public business (Monem & Hasan 2012).

### **2.3 Evolution of e-Governance in Bangladesh**

Utilization of technology in service delivery is not a new phenomenon in Bangladesh. Initiatives were evident even more than one and a half decade ago. Since then, the concept of e-Governance seems to have conceived much better than ever before. Initially, there was a clear emphasis on building ICT infrastructure, possibly deemed as a pre-requisite to the delivery of e-Citizen services. However, despite some successes, many of these e-Government projects did not sustain in the long run due to lack of long-term visions for those projects, and myriad other challenges. Over time, the government modified its approach and undertook strategies to address some of those challenges. Increasing number of citizen centric e-Service projects was gradually undertaken. The evolution of the concept of e-Governance in Bangladesh can be viewed as the continuum of the three distinct phases as described below.

#### **2.3.1 Phase I (Late 1990s to 2006): Infrastructure Building**

Early efforts started in mid 1990s, when the government automated the railway ticketing system. Another notable project from this period was the e-Birth registration project under Rajshahi City Corporation in 2001, which made the process significantly faster and more efficient. Another early success was the automation of BANBEIS, which included GIS mapping of all schools and detailed information regarding them (including logistics, teachers, etc.), enabling unprecedented efficiency in education planning (Monem & Hasan 2012).

This trend of infrastructure building and process automation continued in a more coordinated manner from 2002-03, with the formation of the Support to ICT (SICT) Task Force Project, a publicly funded implementation arm of the National ICT Task Force based at the Planning Commission. SICT functioned like an internal facilitator which conceptualized, planned and prioritized projects, and provided funding and technical assistance to line ministries to implement them. Many of the projects initiated by the SICT or the line ministries themselves during this period did not sustain in the long run. It can easily be noticed, however, that each of these projects were essentially the automation of existing government processes. While these increased efficiency in the respective agencies, they were not necessarily targeted towards empowerment of citizens through easy and open access to information and government services (Monem & Hasan 2012).

### **2.3.2 Phase II (2006 to 2009): Isolated e-Services**

Since 2006, with the caretaker government taking over, a gradual shift was noticed in the approach to e-Government. The top-down approach to planning was gradually being replaced by more participatory approach within different entities of the government. It was increasingly realized that without internal demand and ownership generated through a planning process, success with such projects, which required extensive change management, could not be achieved. An entity, which played an important role in this shift, was the Access to Information (A2I)<sup>3</sup> Programme at the Prime Minister's Office (PMO). Although A2I was not directly in charge of implementing e-Government projects, it took significant initiatives to generate internal bureaucratic demand for e-Government, such as the series of workshops which led to 53 e-Citizen services being committed to by the secretaries of various ministries and divisions in June 2008. Similarly, 64 e-Citizen services were later identified by Deputy Commissioners (DCs) for implementation. A2I also provided continuous technical support and consultation to these projects.

Despite this trend towards the provision of information and services to citizens, the e-Services designed and implemented during this period were hardly adequate. Besides, the focal points for e-Government at the ministries were all at the Joint Secretary level, with relatively little decision making power, and insufficient incentives for initiating e-Government projects since they get transferred frequently (Monem & Hasan 2012).

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<sup>3</sup> The programme was initiated in 2006 with help of UNDP to support the e- government Cell at the PMO.

### **2.3.3 Phase III (2010 and onward): Beyond the Concept of Isolated Services**

After all the efforts to provide electronic services in an isolated manner, it seems that the government has realized that e-Governance is not only about providing e-Services to citizens. The holistic picture is being dominant under the circumstances of advancements in other countries. Recent developments yield indications that e-Government is moving to the next phase in Bangladesh, away from isolated e-Services towards more integrated, connected and transactional e-Services. The present government came to power with the pledge of building a "Digital Bangladesh", and has tried to keep consistent focus on this promise so far. This has resulted in a political climate highly supportive of and conducive to e-Government projects. A recent initiative (in 2010), the Digital Innovation Fair, born out of the Access to Information (A2I) program at the Prime Minister's Office (PMO), took this opportunity and showcased the various successful and ongoing projects undertaken by the Ministries, effectively putting government agencies in a competitive environment and giving citizens an unprecedented opportunity to witness what services the Government is providing, thereby creating a demand for these services. Although one might term the initiative as a political showdown, the awareness building aspect as well as the positive competition among various ministries that entailed such effort can never be underestimated (Monem & Hasan 2012).

Apart from the political will, which is undoubtedly a critical element for success, several other favorable factors have also propitiously converged in recent times. Most ministries have undergone extensive internal process automation and infrastructure development projects, which are usually the most resource consuming, and most of these projects have been completed. There have also been demonstrated successes in the creation and deployment of e-Services. All this sets the stage for integrating the front-end services with automated back-end processes, through holistic planning, and improving the quality and efficiency of e-Services (Monem & Hasan 2012).

## **2.4 e-Services in e-Government**

Electronic government forms the foundation for digital or electronic service (e-Service) and depends upon a sound technology infrastructure. However, e-Service is not a technical exercise, but rather an attempt to improve the political and social environment and to drive a fundamental change in the ways in which functions are performed. e-Services form an emerging field which is rapidly gaining attention and importance. Citizens expect and

demand governmental services with a high degree of quality, quantity, and availability in a 24-hour, seven-days-a-week, and year-round fashion. Governments all over the world are developing information systems and electronic services that have the capacity to meet these emerging service needs and demands of citizens and other clients. The introduction of ICT in order to automate government functions and introduce e-Service will not automatically create a better or more open government - unless it is based on policies to promote the effective utilization of technology. There have been suggestions concerning the potential for more efficient and user-centered methods for delivering e-Services. Thus, user awareness of these services, their willingness to use them, and ease of use- all are important factors for the further development of e-Government (Lofstedt 2005). Today, e-Services appear in various shapes and forms. Typical applications (within both local and national governments) can include:

- Providing access;
- Connecting to a service or a process;
- Facilitating consultation; and
- Enabling active citizen participation (Eid 2009).

## **2.5 Overview of e-Health Services**

e-Health is a recent term refers for healthcare practice supported by Information and Communication Technology. But the term is not only about electronic processes. The term also covers some psycho-socio factors. In that context, Gunther Eysenbach has defined e-Health as-

“e-health is an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve healthcare locally, regionally, and worldwide by using information and communication technology.” (Eysenbach 2001)

This definition is broad enough to apply to a dynamic environment such as the Internet and at the same time acknowledges that e-health encompasses more than just "Internet and

Medicine". As such, the "e" in e-health does not only stand for "electronic," but implies a number of other "e"s, which together perhaps best characterize what e-health is all about.

In the broader aspect, there are 10 e's in "e-health". Those are given below-

**Efficiency** - one of the promises of e-health is to increase efficiency in healthcare, thereby decreasing costs. One possible way of decreasing costs would be by avoiding duplicative or unnecessary diagnostic or therapeutic interventions, through enhanced communication possibilities between healthcare establishments, and through patient involvement.

**Enhancing** quality of care - increasing efficiency involves not only reducing costs, but at the same time improving quality. E-health may enhance the quality of healthcare for example by allowing comparisons between different providers, involving consumers as additional power for quality assurance, and directing patient streams to the best quality providers.

**Evidence** based - e-health interventions should be evidence-based in a sense that their effectiveness and efficiency should not be assumed but proven by rigorous scientific evaluation. Much work still has to be done in this area.

**Empowerment** of consumers and patients by making the knowledge bases of medicine and personal electronic records accessible to consumers over the Internet, e-Health opens new avenues for patient-centered medicine, and enables evidence-based patient choice.

**Encouragement** of a new relationship between the patient and the health professional, towards a true partnership, where decisions are made in a shared manner.

**Education** of physicians through online sources (continuing medical education) and consumers (health education, tailored preventive information for consumers)

**Enabling** information exchange and communication in a standardized way between healthcare establishments.

**Extending** the scope of healthcare is beyond its conventional boundaries. This is meant in both a geographical sense as well as in a conceptual sense. e-Health enables consumers to easily obtain health services online from global providers. These services can range from simple advice to more complex interventions or products such a pharmaceutical.

**Ethics** - e-Health involves new forms of patient-physician interaction and poses new challenges and threats to ethical issues such as online professional practice, informed consent, privacy and equity issues.

**Equity** - to make healthcare more equitable is one of the promises of e-health, but at the same time there is a considerable threat that e-Health may deepen the gap between the "rich" and "poor". People, who do not have the money, skills, and access to computers and networks, cannot use computers effectively. The digital divide currently runs between rural vs. urban populations, rich vs. poor, young vs. old, male vs. female people, and between neglected/rare vs. common diseases. (Eysenbach 2001)

## **2.6 Mobile Phone Aided Health Services in National Context**

The present government of Bangladesh emphasizes on the increased use of ICT in rendering public services. This has had a significant impact in health sector. The current government's Digital Bangladesh by 2021 vision proposes to mainstream ICTs as a pro-poor tool to eradicate poverty, establish good governance, ensure social equity through quality education, healthcare and law enforcement for all, and prepare the people for climate change. The priority actions for health sector are to develop a nationwide integrated health record system, strengthen the fledgling telemedicine network (now available only in the private sector at a high cost), and launch mobile phone health units with simple test kits and ICT connectivity to specialized centers. ICT-enabled healthcare service delivery and capacity building of tens of thousands of semi-skilled health workers around the country can significantly reduce infant and maternal mortality, currently at 5.4% and 3.8% respectively, to the 2021 target levels of 1.5% for both rates (Karim 2010).

In this regard, very few projects on mobile phone aided health services are known to be taken, though not by DGHS, by different non government agencies. Md. Ashrafet Mahfuz and some other researchers conducted a study titled "Evaluating the Impact of Mobile Phone Based 'Health Help Line' Service in Rural Bangladesh" in 2010. The study summarized that Bangladesh suffers from lagging in the health sector including lack of medical facilities like equipment, hospitals, proper management, ample number of doctors and nurses. As a big portion of the population lives under the poverty line, it is hard for them to avail costly treatment. People from remote areas suffer from distance barrier and in case of Chittagong Hill Tracts (CHT), language barrier. The case study of GP Health Line has introduced some

hopeful scenario where callers have sought medical advices and they have been given so. Another interesting aspect is using the helpline to gather information by a health worker. It is, therefore, evident that callers are getting benefits out of the service to some extent disregarding the usual barriers. This study is mainly focused on CHT area people (Mahfuz 2010). This study is focused on an indigenous group of Chittagong hill tracts. But it is also important to know the general picture of the mobile phone aided health service provided by DGHS to all over the country.

Omar Faisal in his article titled “Mobile Phone-based Healthcare in Bangladesh” reflected some practical issues of mobile phone-based health service provided by Directorate General of Health Services (DGHS) of Bangladesh. According to Faisal, any patient can access this service by calling to a fixed mobile phone number and could get advices from doctor or nurses. Through this 24 hours service a patient can ask any health related questions and solicit suggestion over mobile phone. The DGHS have distributed mobile phone handset including SIM card to Upazila and district health complex centers to spread up mobile phone based healthcare packages. The people can access these services without paying any consultancy fees.

Faisal found out that the lack in system integration has isolated DGHS’s initiative into a mere over-the phone advices, which does not have a feasible impact on the service rendered. Also, these services only allow over-the-phone solicitation on primitive cases and a follow-up through SMS are not incorporated. Hence, the patients need to make call to doctor for every advices sought. Due to this constraint, while giving advices even to a repeat patient, the advising doctor is bound to rely on the phone conversation in that instant. Due to the absence of any provision of reviewing past history, the advices from the qualified doctors often may not lead to convalescence for the patient.

Faisal mentioned about the findings of his survey that majority doctors were available, friendly and tried to find out about the conditions and enquired on symptoms. Giving evidences of this statement, the author mentioned in the article about some experiences gathered during calling to different health points disguising of a patient. For example- at Daudkandi Upazila Health Complex under district of Comilla (on 26th of May, 2010 at local time 14.22 o’clock), the researchers asked the doctor about chest pain and doctor asked them few questions about; For how long pain keep continued, any existence of fever, gastric ulcer etc and advised a tablet for immediate relief and do ECG test if chest pain persisted for longer



on. The assigned medical advice was found to be accurate. They made another phone call to government health center at Badorgong health complex, Rangpur to explore the actual situation. The doctor was on duty and received the call. The doctor asked many questions to know the actual symptoms and gave some helpful advices. At Chilamari hospitals under the bordering district of Kurigram, one assistant medical officer received the call and he said most patients do not know about the mobile phone based advisory services. The medical officer from Dimla under the district of Nilphamari said this is really a fantastic and prolific communicating media between doctors and patients. The author could foresee its far reaching benefits for the people residing in remotest of villages and appreciated the government initiative. Most of the calls come up at night time, he added more. The overall impressions about government mobile phone based healthcare free services are positive among rural population where the surveys were conducted (Faisal 2011).

IRIN published a report of Mushfique Wadud on 23rd February, 2012 titled "Bangladesh: Mobile technology boosts healthcare" which is focused on the mobile phone health services of DGHS at Kaliakair Upazila. The reporter found some positive impact of this service there. According to a December 2011 report from the Bangladesh Telecommunications Regulatory Commission, close to 60 percent of the population (some 85 million people) use mobile phones in Bangladesh. The reporter quoted Prof. A. K. Azad<sup>4</sup>, the Additional Director General of DGHS, "There are many hard-to-reach areas where it is difficult for the people to quickly rush to the hospitals. These people are getting medical advices by the mobile phone health service". The reporter mentioned in his report that a medical officer at the Kaliakair sub-district hospital has informed that most phone calls through the free medical advices hotline come in the middle of the night (Wadud 2012).

In addition, an SMS-based complaint and suggestion service for all government hospitals was launched in December 2011. On 20 February 2012, a rural patient sent an SMS about how the eye doctor was often absent from the hospital, while another wrote how the district hospital where he lived was dilapidated. "We are getting such complaints every day and we are taking action immediately," Prof. A. K. Azad, and Line Director of MIS-Health and Additional

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<sup>4</sup> Prof. A. K. Azad is the Line Director of MIS-Health and Additional Director General of Director General of Health Services (DGHS). He informed in a discussion about the activity of MIS and Mobile Phone Health Service.

Director General of DGHS informed to Mr. Wadud. In case of dissemination of this service, Prof. Azad said that the local leaders and newspapers have publicized the 24-hour hotline contact numbers nationwide and there are plans to launch TV and radio advertisements (Wadud 2012).

## **2.7 Mobile Phone Aided Health Services in the International Context**

Mobile phone aided health services have introduced in south Asian countries. India has “Mobile phone based Primary Healthcare System for Rural India” program. Mobile phone ownership in India is growing rapidly; six million new mobile phone subscribers are added each month. UK-based Loughborough University's engineers have entered upon a partnership with experts of India to develop a unique mobile phone health monitoring system. The system, which was first unveiled in 2005, uses a mobile phone to transmit a person's vital signs, including the complex electrocardiogram (ECG) heart signal, to a hospital or clinic anywhere in the world. Presently, the system can transfer the signals pertaining to the ECG, blood pressure, oxygen saturation and blood glucose level. Centre for Development of Advanced Computing (CDAC), Electronics City, Bangalore has initiated the development of “Mobile phone based Primary Healthcare (PHC) Management System” for deployment in the PHCs for betterment of management of Primary Healthcare specifically in the rural and urban slums of India. The system will capture of complete information related to an individual patient treated by a PHC. The Software components under development are Patient Database management, Interaction between doctors and a patient, capture of Medical data acquisition—such as ECG, images of heart & lung, eye etc and Scheduling management (Murthy 2008).

Sri Lanka has Mobile Phone–based Infectious Disease Surveillance System. Field veterinarians reported animal health information by using mobile phones. In response to these challenges, they have developed the Infectious Disease Surveillance and Analysis System (IDSAS), a mobile phone–based surveillance system specific for animal populations in lower-resource settings. A pilot project of this system was implemented in January 2009 in partnership with the Department of Animal Production and Health (DAPH) in Sri Lanka. Capacity for electronic collection and submission of data was developed in the IDSAS to decrease the time from detecting to reporting animal health events from that of the existing method of mailed written reports. Internet access is limited in many parts of Sri Lanka, but the cellular phone network is extensive. Mobile phones were used as the data collection platform (Robertson 2010).

Mobile phone aided health services are proven to be one of the most effective medium for rendering health services among the citizens of poor and geographically challenged countries. Lai mentioned in his writing “How is ICT Working to Promote Gender Equity in Health Provision?” about a seminar note of Riddoch and Geldof titled, “Information technology, communications and infrastructure seminar” which was presented in the Commission for Africa, Bob at London in 2005. The seminar note claims that mobile telecommunication in Africa is a success story of recent years, with more than 70% of all telephone lines being mobile. The issue of health provision is covered in the notes as an element of human development, and claims that the use of information technologies could save 30 – 40 percent in healthcare budgets particularly in the distribution and use of anti-retro viral therapy. Uganda is used as an example to illustrate this (Lai 2005).

World Health Organization (WHO) also emphasized on the use of ICT to render health services globally. Zipperer developed a WHO report titled, “Knowledge and information sharing for health equity”. This report argued that in a world with increased globalization, and the realization that good health meant a healthy workforce and therefore good economy, ICT could be a powerful tool in social and economic development. It gave the example of The Virtual Health Library in Latin America as a successful case of knowledge sharing. The report maintained that the sharing of knowledge locally and globally would avoid unnecessary wrongs, and saved time and money through the dissemination of expert information and advices (Lai 2005).

## **2.8 Conclusion**

Most of the contemporary studies on the mobile phone health services in Bangladesh are positive. Most of them are resource intensive which is a practical issue for a developing nation like Bangladesh. Even comparing with the services provided in different countries world wide, it can be argued that the mobile phone health service in Bangladesh is not lagging behind at all given the resources it has.

## **Chapter Three: Theoretical Framework**

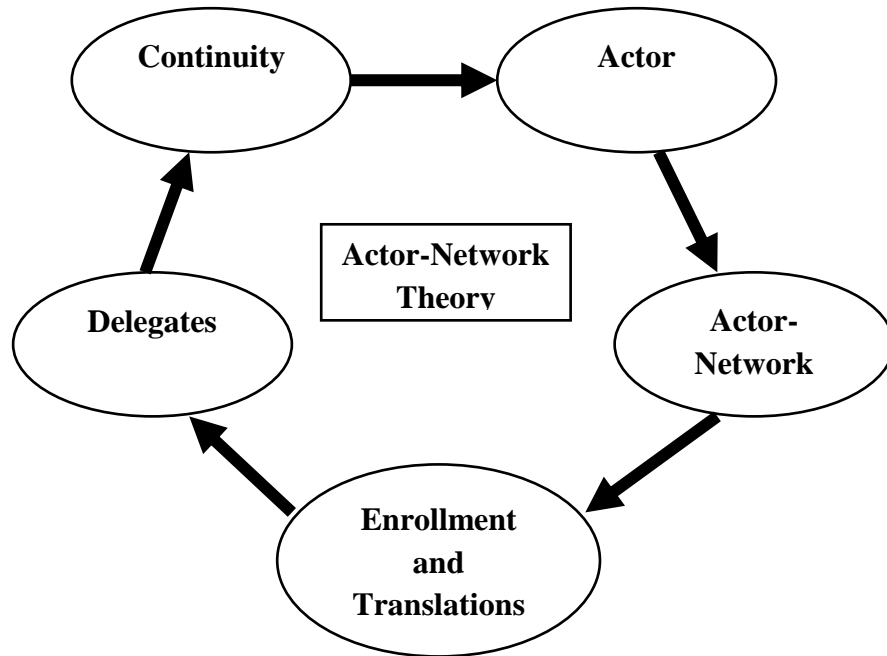
### **3.1 Introduction**

Service delivery through ICT has different aspects where decisions need to be made and a knowledge backed good leadership may make a difference. A number of theoretical frameworks have been proposed in these years to explain and cover all the aspects of e-Governance. Each of the frameworks is more comprehensive than the previous one. Public e-Services can be delivered at different levels. Each level has its own scopes of contribution in establishing effective mobile phone health services. In this chapter two parallel theories of e-Governance are also presented along with the motivation of how they relate to the mobile phone health service. Besides, the evolution of public services to e-Services is also described here. An analytical framework is also developed which will define the baseline features of an effective working mobile phone health service. This chapter also contains the operational definitions of different variables and indicators used in this study.

### **3.2 Actor-Network Theory**

Actor-Network Theory (ANT) is a famous theory of e-Governance as well MIS discipline. At the root of this theory, there are the actors who form relationships with each other. Actors may be human or non-human and constitute the set that defines the emerging technology through their interests, their ability to maintain networks of allied interests, their ability to convince others to join their network, and to embody any emerging technology with their interests and priorities. Technology in ANT is a network that includes within it components of, say, hardware and software, the people who designed these artifacts, the people who have built and assembled them and the large groups, organizations, and bodies that maintain these networks.

More specifically, ANT has the following concepts:



**Figure 1: Actor-Network Theory**

**Actor:** An actor is a human or a component or part of a technology.

**Actor-network:** This is a network, or a linking of people, technology components, organizations, technology bodies who have related interests.

**Enrollment and translation:** The processes of creating a network of actors that have related interests; this enrollment may happen by the use of persuasion or translating interests.

**Delegates** These are actors who represent, or speak for, a particular interest. These actors may be components such as software or embedded hardware that has certain priorities and processing logic built into.

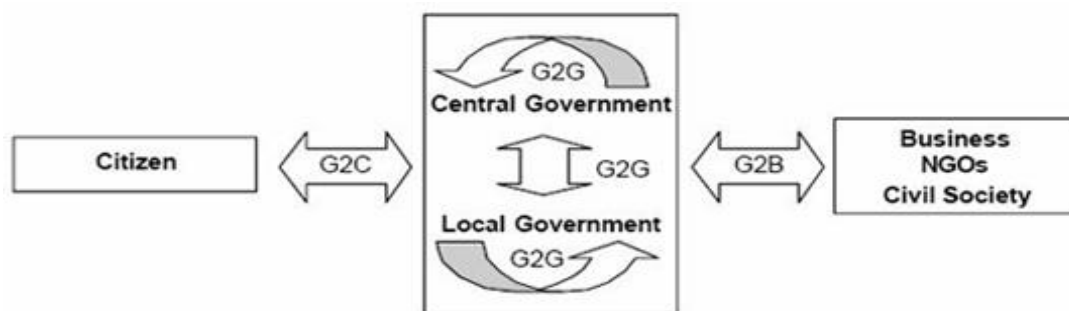
**Continuity:** This is the idea that certain interests that have been embodied in the actors (delegates) may be permanent or permanent to a degree. (De 2008)

The researcher has found Actor-Network theory more relevant to this study. In light of this theory, mobile phone is the Actor. And the mobile phone network links the service seekers of mobile phone aided health services with the service providers or delegates. And the activity of this program should continue or irreversible according to this theory.

### 3.3 Model of e-Governance

e-Governance can be defined as the relationships between governments, their customers (businesses, other governments, and citizens), and their suppliers (businesses, other governments, and citizens) by the use of electronic means. Similarly, e-Governance is simply using information technology to deliver government services directly to the customer 24/7. The customer can be a citizen, a business or even another government entity. Other definition of the e-Government is as the use of technology, especially Web-based applications to enhance access to and efficiently deliver government information and services (Eid 2009).

According to this model, the central government manages their customer relationship by providing needed services through coordination with other government organizations, departments, authorities, and local government as well as the commercial or non-commercial business sector.



**Figure 2: Model of e-Governance**

The term e-Government is of recent origin and there exists no standard definition. Since the conceptual understanding is still evolving. The generally accepted definition is: "e-Government" or electronic government refers to the use of Information and Communication Technologies (ICTs) by government agencies for any or all of the following reasons:

- Exchange of information with citizens, businesses or other government departments
- Speedier and more efficient delivery of public services
- Improving internal efficiency
- Reducing costs or increasing revenue
- Re-structuring of administrative processes.

ICT offers an opportunity for improvement in public service delivery and most administrative best practices build upon the process redesign and convergence that ICT facilitates. ICT leads to a transformation in work processes and service delivery, lowers transaction cost with improvement in transparency and accountability.

e-Governance information systems should not mean electronic reproduction of existing institutional patterns and relations, and the same patterns of inter-department co-operation. ICT enabled e-Governance models and best practices enable integration of Government processes and communication with access enabled across space and time on an on-line real time basis, with status tracking and status information. Integrated user group interface through ICT platforms help provide minimal public interface for time bound delivery of services with reduction in delay and corruption, improved transparency and help bridge the performance gap. The integration of back-end services and transformation of process design for basic service delivery linked to organizational level restructuring is at the heart of the transformation (Anon *E-Governance and Best Practices* n.d.).

### **3.4 Stages of e-Governance**

Researchers and institutions have developed different models to describe various stages of e-Government at different point of time.

According to the United Nations' E-Government Survey (2008), there are five stages of e-Government evolution. These stages are as follows:

**Stage I - Emerging:** A government's online presence is mainly comprised of a web page and/or an official website; links to ministries or departments of education, health, social welfare, labor and finance may/may not exist. Much of the information is static and there is little interaction with citizens.

**Stage II - Enhanced:** Governments provide more information on public policy and governance. They have created links to archived information that is easily accessible to citizens, as for instance, documents, forms, reports, laws and regulations, and newsletters.

**Stage III - Interactive:** Governments deliver online services such as download-able forms for tax payments and applications for license renewals.

**Stage IV - Transactional:** Governments begin to transform themselves by introducing two-way interactions between 'citizen and government'. All transactions are conducted online.

**Stage V - Connected:** Governments transform themselves into a connected entity that responds to the needs of its citizens by developing an integrated back office infrastructure (Monem & Hasan 2012).

### **3.5 Forms of E-Governance Interactions**

Researchers have a consensus of some sort about the scope of e-Governance in a sense that most of them, if not all, have defined the boundary of e-Governance beyond the government or e-Government. Backus (2001) argues that by achieving the concrete objective of supporting and simplifying governance for all parties - government, citizens and businesses through online services and other electronic means, e-Governance uses electronic means to support and stimulate good governance. Hoque (2009) quotes Dobrica (2006) to state that e-Governance aims to enable the interaction between government and citizens (G2C) (Government-to-Citizen), improve inter-agency relationships between G2G (Government-to-Government), and establish efficient relationship between the government and business enterprises (G2B) (Government-to-Business).



Application of ICTs in the processes of carrying out government functions facilitates interactions between different stakeholders, levels of government as well as strata of persons/organizations in governance. These interactions may be described as follows:

### **Government to Government (G2G)**

In this form, information and communications technology is used not only to restructure the governmental processes involved in the functioning of government entities but also to increase the flow of information and services within and between different entities.

### **Government to Citizens (G2C)**

Here, an interface is created between the government and citizens that enables the citizens to benefit from efficient delivery of a large range of public services. This expands the availability and accessibility of public services on the one hand and improves the quality of services on the other. It gives citizens the choice of when to interact with the government, from where to interact with the government and how to interact with the government.

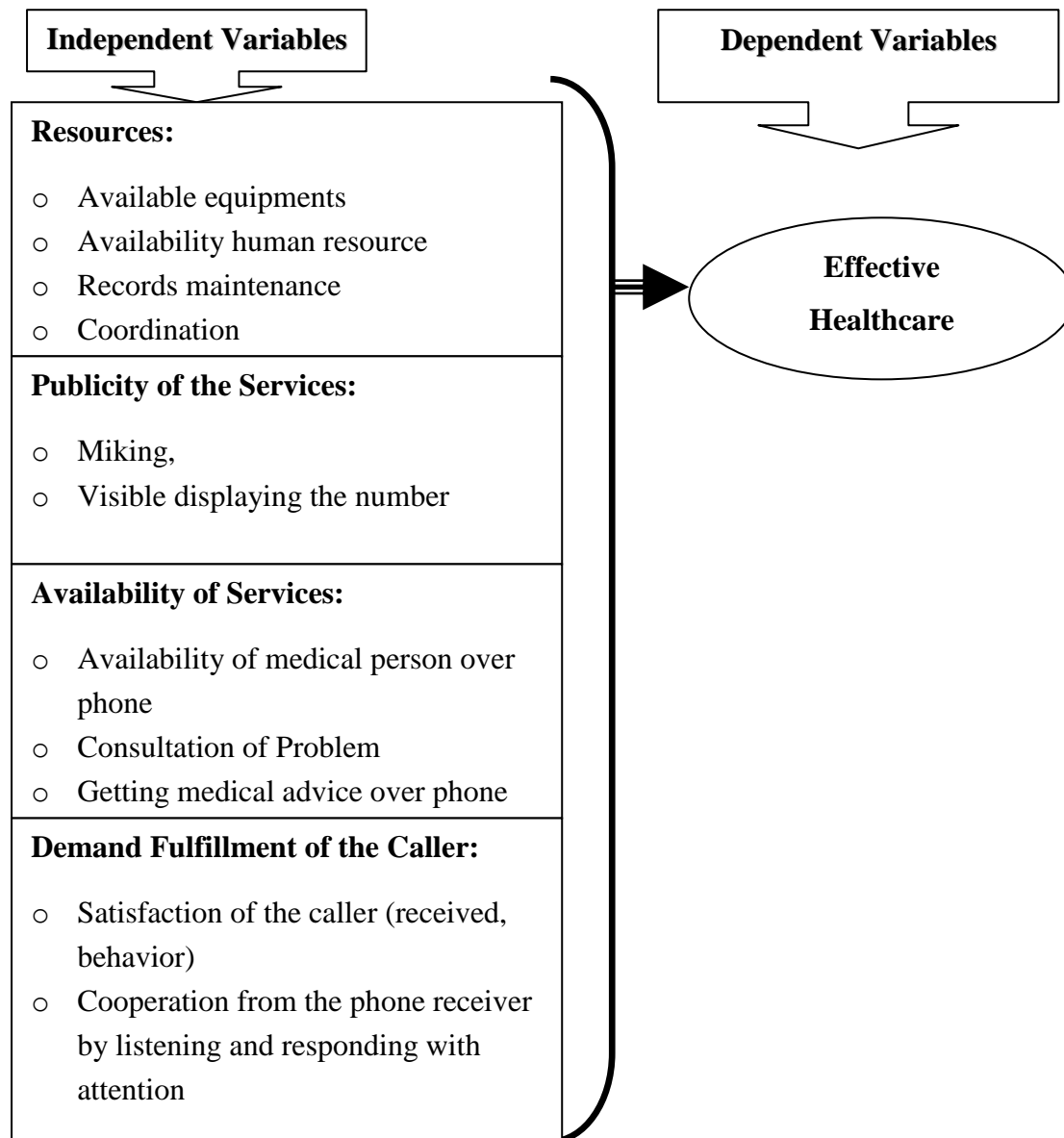
### **Government to Business (G2B)**

e-Governance tools are used to aid the business community – providers of goods and services – to seamlessly interact with the government. The objective is to cut red-tape, save time, reduce operational costs and to create a more transparent business environment when dealing with the government. The G2B initiatives can be transactional, such as in licensing, permits, procurement processes and revenue collection. They can also be promotional and facilitative, such as in trade, tourism and investment.

### **Government to Employees (G2E)**

Government is by far the biggest employer of Bangladesh and as such engages in a two-way interaction with its employees on a regular basis. Use of ICT tools helps in making these interactions fast and efficient on the one hand and increasing satisfaction levels of employees on the other (Monem & Hasan 2012).

### 3.6 Analytical Framework



**Figure 3: Analytical Framework**

The mobile phone aided health service of DGHS aims to reach the health services towards the rural people. The main focus of this program is to ensure availability of cheap health services to the recipients through mobile phone. Meeting the requirements of the end user is also important. To implement this program, DGHS collaborates with the district level and Upazila level government organizations. Grameen Phone Ltd. is providing the mobile phone

facilities for the Upazila health points and UNDP is sharing hands to train the human resources needed to run this program successfully. The people can be aware of the program through effective campaign. When the people are aware of the services, they will call to the phone numbers to consult with medical officers regarding their health issues. If the service seekers can reach the phone and the phone receiver addresses the service seekers with respect and care, they will feel free to share the issue frankly. And it is expected to the service providers that they will listen to their clients cordially and give medical advices with utmost care. If this practice continues smoothly, the service seekers will be able to avail of basic health services through mobile phone without going to the hospital. This way health services can reach the people who live far away from the hospital or who need emergency medical advices. Then DGHS will be able to attain its goal through mobile phone health services program. This study aims to explore the effectiveness of this program.

### **3.7 Operational Definitions of the Variables and Indicators**

There are some variables and technical terms used in this study. The operational definitions of those terms are given below.

- ❑ The term '**Mobile Phone Aided Health Service**' is used in this study to mean the healthcare service provided by DGHS through mobile phone at Upazila level. The Emergency Medical Officers of Upazila health complexes deliver medical advices 24/7 to the local citizens who make calls to the mobile phone. The numbers of the mobile phones are circulated in the communities by using local channels. A doctor on duty in the hospital remains available to answer to the phone calls. The service is free of charge.
- ❑ **Effective Healthcare Services** is used in this study as a better service system, where the health facilities are available to all citizens in Upazila level at 24/7 very quickly through mobile phones. It means the service providers will coordinate and manage resources accordingly to make the service available round the clock. And the service seekers will get the service by making mobile phone calls. The service providers are supposed to give quality service with full of attention and care for less time and cost.
- ❑ **End Consumer** refers to the direct recipients of mobile phone aided health services of DGHS at Upazila level.
- ❑ **Service Recipients** means the service seekers who already have taken the mobile phone aided services provided by DGHS at Upazila level.

- ❑ **Resources:** In this study, resources means the mobile phone in active form, available battery charge for mobile phone, available medical personnel to receive the calls and provide services, maintaining records of the program activities. To utilize the resources properly and provide service effectively, the Upazila health complex should have coordination with the district level and head office.
- ❑ **Publicity of the service:** In this study, publicity means campaigning of the mobile phone service to make the mass people be aware so that they can take the service. Miking, visible displaying the phone number, and postering about the service in various public places.
- ❑ **Availability of the Service:** In this study, availability of the services means that there must have medical personnel over phone who will receive the call of the service seekers. The service seekers should have the opportunity to explain the health issue to the medical personnel and get prescription or suggestion over phone.
- ❑ **Service Recipient's Satisfaction:** In this study, satisfaction of the service recipients means the level of satisfaction towards receiving calls, behavior of call receiver, and cooperation of the phone receiver to listen and respond with attention.

### 3.8 Conclusion

In this study, the researcher used Actor-Network Theory and e-Governance model. The Actor-Network theory helped to conceptualize the mobile phone health services in the aspect of e-Health services as well as e-Governance. The researcher has also used the e-Governance model to explain the benefits and effects of the mobile phone aided health service program as a part of e-Health services. In light with these theories and models, the researcher has designed an analytical framework to explain the effectiveness of the m-Health services.

## Chapter Four: Research Method

### 4.1 Introduction

This chapter explains the methodology that had been followed in this study. The data source is categorized based on the level of access. Data collection methodology is also mentioned with details. The motivation for choosing the study areas are also presented with due importance. The justification of sample size and analysis methodology is also mentioned for the readers' reference.

### 4.2 Source of Data

Primary and secondary- both types of data was collected for this study. Data collection methods of this study are given here in a chart along with indicators, type of data, and source.

**Table 1: Method of Data Collection**

<b>Independent variable</b>	<b>Indicators</b>	<b>Type of Data</b>	<b>Source of data</b>
Resources	Available equipments	Primary data, & secondary data	Interview, observation, website of DGHS
	Availability of human resources	Primary data, & secondary data	Interview, observation, Website of DGHS
	Records maintenance	Primary data	Interview, observation
	Coordination among Upazila level and head office	Primary data	Interview
Publicity of the service	Miking	Primary data	Interview
	Visible object displaying the phone number	Primary data	Interview, observation
Availability of the Service	Availability of medical officer over phone	Primary data	Interview, case study

	Consultation of Problem	Primary data	Interview, case study
	Getting medical advices over phone	Primary data	Interview, case study
Service Recipient's Satisfaction	Satisfaction of the caller (receiving calls, behavior of call receiver)	Primary data	Interview, case study
	b. Cooperation from the phone receiver listening and responding with attention	Primary data	Interview

### 4.3 Study Area

The study has covered two Upazila health complexes. Area profiles of these two Upazilas are given as follows:

<b>Naria</b>	<b>Savar</b>
Naria is an Upazila of Shariatpur district, Bangladesh.	Savar is an Upazila of Dhaka District in the Division of Dhaka, Bangladesh.
It is located at a distance of about 100 km southwest from Dhaka city (Roads and Highway, Distance Matrix)	It is located at a distance of about 24 km to the northwest of Dhaka city.
Total population is 2,25,560; among them 1,11,260 are male, and 1,14,300 are female (Census report 2001).	It has a population of 378,034. Among them males constituted 54.67% of the population, and females 45.33%.
The literacy rate is 41.15%.	Male literacy of Savar was 44.8% and female was 29.1% (BBS 2005)
It has 14 unions, and 190 villages.	It consists of 13 Unions/Wards, and 321 villages.

Agriculture and commerce are the two major economic sector of Naria Upazila <sup>5</sup> (Wikipedia 2012).	The main occupations of this Upazila are- agriculture 24.34%, agricultural laborer 12.84%, wage laborer 4.44%, cattle breeding, forestry and fishing 1.90%, industry 1.37%, commerce 17.35%, service 20.68%, construction 1.66%, transport 3.96% and others 11.46% <sup>6</sup> (Wikipedia 2012).
There are 83 km highway, 240 km mud road, and 165 bridges for transportation.	There are 562 km of mud road; and 50 km of highway.

#### 4.4 Sample Size

The populations of this study are the service recipients, and the service providers of mobile phone health service program at Upazila health complex. The sample size was 70. Purposive sampling method has been used in this study for sample selection.

**Table 2: Respondents Distribution for Primary Data Collection**

Types of Respondents	Data Collection Method	No. of Respondents
Service seekers from Upazila level (Naria and Savar Upazila)	Survey questionnaire (semi structured)	20*2= 40
Service providers from Upazila level (Naria and Savar Upazila)	Survey questionnaire (semi structured)	5*2= 10
Key informants (Naria and Savar Upazila)	Checklist	5*2= 10
Interview of the influential people or higher authority (Naria and Savar Upazila)	Checklist	05
Case study (Naria and Savar Upazila)		05
Total=		70

<sup>5</sup> The information of Naria has been taken from Upazila profile kept in Naria Upazila Parishad office as well as from the website of wikipedia.

<sup>6</sup> The information of Savar has been taken from Upazila profile kept in Savar UHC office as well as from the website of wikipedia.

#### **4.5 Data Validation**

The collected data have been validated through conducting the survey among different types of respondents, like- the service recipients as well as service providers; interviewing the key informants, higher officials who are involved with this program, and doing some case studies. Besides, the researcher also made phone calls to another ten UHCs disguising of patient in different times of a day for crosschecking the collected data.

#### **4.6 Data Analysis Tools**

The collected data was processed and analyzed by using statistical techniques, for example- Statistical Package for the Social Sciences (SPSS) software, & MS-Excel.

#### **4.7 Conclusion**

Research methodology is an indispensable part of a research. In this chapter, the researcher has provided a concrete description about the data source, sample size and analytical toolkits. These references will be drawn frequently to explain the results.



## Chapter Five: Structure and Operation of DGHS: Perspective e-Health

### 5.1 Introduction

To understand the m-Health services and evaluate it from different aspects, it is necessary to know the agency which is providing this service as the stakeholders and partners plays a vital role when it introduces a new service using new technologies like ICT. It requires a paradigm shift in dynamics of the agency itself. Hence this chapter aptly describes how DGHS, the agency which renders m-Health services, has created its position over the years and how it is centered in the nationwide healthcare service fabric of Bangladesh. It also informs the audience how DGHS has been working with other partners to bring in innovative e-Health services over the years (DGHS 2012).

### 5.2 Programs and Activities of DGHS

Emergency Obstetric Care (EOC)<sup>7</sup> is an important maternal healthcare service provided by the Ministry of Health and Family Welfare for achieving the Millennium Development Goal-5<sup>8</sup>. All medical college hospitals, 2 district hospitals and 269 Upazila health complexes provide comprehensive and 59 district hospitals and 132 Upazila health complexes provide basic emergency obstetric care services. NGO and private providers from a number of districts also provide similar services. The MIS-Health manages the service data on EOC. In 2009, data from 475 health facilities were received of which 13 were medical college hospitals, 61 were district and general hospitals, and 401 were Upazila hospitals. Besides, NGO providers from 30 districts and private providers from 62 districts also sent EOC data. The data contained events of 448,564 child deliveries. Of the total deliveries, live births were 434,502. There were 2,385 reported newborn deaths and 1,307 maternal deaths.

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<sup>7</sup> Emergency Obstetric Care is a specialized branch of healthcare provided by physicians, midwives, nurses, dietitians, and others to emphasize on health promotion and prevention of disease and complications during the process of pregnancy, labor, delivery, and prenatal care of mother and the newborn. An important aim of obstetric care is recognition of and effective management, including timely interventions, for high-risk pregnancies (Source: Answers.com).

<sup>8</sup> Millennium development goal 5: Improve maternal health (Source: *Goals, Targets and Indicators*, Millennium Projects, UN Development Group, 2002-2006. Cited from: <http://www.unmillenniumproject.org/goals/gti.htm> )

“Integrated Management of Childhood Illness (IMCI)<sup>9</sup>” is a worldwide program supported by UNICEF, WHO and other development partners. The morbidities which are included for the integrated management under this program are responsible for almost 75% of under-5 deaths. In Bangladesh, IMCI is provided through facility-based service as well as through home care. Facility-based IMCI is provided in 325 Upazilas of 41 districts. Community IMCI is a new intervention and is introduced in 15 Upazilas. The MIS-Health collects data on IMCI services. In 2009, data from all the 41 districts on 2,210,985 patients were collected and analyzed. Recently, new online database software has been hosted in MIS-Health server system to automate the data collection and report generation on IMCI.

### **5.3 Coordination**

The human resource information functions done by the MIS-Health are not at all unsatisfactory. One of the limitations of the existing personnel management information system is its inability to produce updated personnel status on real time. There are number of reasons. The personnel deployment system is done through paper-based manual system and in well over 600 places (MOHFW, DGHS, Divisional Directors’ offices; Civil Surgeons’ offices, Upazila Health Offices and each institutional level). There are many aspects of staff movements, viz. recruitment, leave, transfer, joining, promotion, suspension, termination, retirement, death, etc. If data related to all these information are not fed into personnel information system from the source in real time, a complete real time status of national health personnel is not possible to produce. As per their previous experience that in the given context of accountability system, without full process automation only reliance on human compliance for updating data from the multiple points will not guarantee complete real time staff profiles. MIS-Health is currently discussing possibility of introducing a web based database medical advices accessible to all health authorities real time and for full process automation.

One of the great challenges of the government health system of Bangladesh is the poor maintenance of logistic inventory at the health facility level. On the national level, efforts were made to periodically collect equipment status reports, viz. of numbers of major equipment by type in each institution, their functional status, if non-functional whether

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<sup>9</sup>According to WHO, Integrated Management of Childhood Illness (IMCI), is a broad strategy that includes a number of complementary interventions at health facilities and in communities (WHO 2006).

repairable or not, etc. However, it remains a difficult task to get periodic data to keep the database updated.

Inventory management for all logistics institution-wise was not attempted before. The ICT backbone as well as information culture of the Bangladesh health facilities in public sector are not yet good enough that may create interest for locally hosted computer-based inventory management system. MIS-Health dreams of a web based centralized inventory management system to start with major equipment in each of the larger facilities with automated report generation. This database would be accessible both at policy level at the head quarter as well as at local level for local management decision. The inventory management system will gradually be expanded to include more items and to more facilities.

The cabinet division of the government of Bangladesh requires routine reporting from each ministry each month and an annual report in July each year on many management issues related to the respective ministry. The issues to be reported by the DGHS contain an exhaustive list and MIS-Health has to carry out this function each month and annually on behalf of DGHS. MIS-Health could add better quality to this job than ever.

#### **5.4 Other Programs of MIS-Health**

Along with mobile phone health service, there were some other programs of MIS-Health that are given herewith:

##### **5.4.1 Population Information**

There is no routine data source in the country to estimate the status of health related Millennium Development Goals specially the MDG4<sup>10</sup> and MDG5 to know child and maternal mortality rates. In our country, most births and deaths occur in the households. There is a strong presence of private and informal sector in healthcare. Therefore, the households are the best source of data to estimate the age, sex and cause specific death rates, disease burden and other population based health information. Important population indicators, such as, child and maternal mortality rates are estimated through sample surveys in intervals. For example, the last child mortality was estimated by Bangladesh Demographic

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<sup>10</sup> Millennium development goal 4: Reduce child mortality (Source: *Goals, Targets and Indicators*, Millennium Projects, UN Development Group, 2002-2006. Cited from: <http://www.unmillenniumproject.org/goals/gti.htm> )

and Health Survey (BDHS) in 2007. The latest maternal mortality survey was done in 2009 the report of which is yet to be prepared and published. The prior maternal mortality survey was done in 2001. Fortunately, DGHS had a historical system of collecting population data annually since 1961. Popularly known as GR (Geographical Reconnaissance) once was a good source of population data for local level planning. GR, was literally a kind of annual health census, being carried out to collect population data by visiting every household each year in the month of January and February. Experts in several stakeholders' workshops have worked out that use of ICT in the GR process may minimize repetitive works and help to develop a computer based permanent population health database. Accordingly a machine readable data form has been designed, printed and distributed in all divisions for use in GR data collection in rural Bangladesh. The GR form has the provision of providing unique identification number to each member of the family as well as using the National Identification Number (NID), if there is any.

#### **5.4.2 Data from other Health Programs and Organizations**

MIS-Health also continued collection of data from other programs and organizations for report preparation and distribution. Information from programs like Essential Service Delivery (ESD), Communicable Disease Control (CDC), Non-communicable Diseases and other Public Health Interventions (NCD&OPHI), Micronutrient Supplementation (MS), National Nutrition Program (NNP), Mycobacterium Disease Control Program (MBDC) and organizations like Institute of Epidemiology, Disease Control and Research (IEDCR), Institute of Public Health (IPH), National Institute of Preventive and Social Medicine (NIPSOM), Institute of Child and Mother Health (ICMH), from Directorate General of Family Planning (DGFP), Directorate General of Drug Administration (DGDA), Directorate of Nursing (DNS) and from number of non-government organizations have been gathered.

#### **5.4.3 Geographical Information System (GIS) for Health**

Each divisional and district health office has been provided with a GIS device called Global Positioning System (GPS). The divisional and district information staffs are planned to collect geospatial data and present them on maps for easy visualization. As in July 2010, training of two batches of staffs out of four planned has been completed. The next two batches will be given training soon. The staffs will then be engaged for gradually building the GIS data resource. One of the objectives of our GIS program, amongst others, is to build GIS

resources for the health facility locations of Bangladesh to make publicly available on the Internet.

#### **5.4.4 Digital Training Facility**

MIS-Health created a digital training facility with the state of the art gadgets, such as, digital podium and sound, interactive board, wireless presentation, wifi<sup>11</sup> network, video conferencing to showcase opportunity for modern training. This facility is a learning opportunity for the heads of the training and teaching institutions to understand what types of teaching tools and environment they require for their students and trainees.

#### **5.4.5 Health Management Information System**

It is well known that MIS-Health is the only organization among the entire public sectors of Bangladesh which has created Internet connectivity across all health points down to Upazila level (~800 places). When the community clinics will be put in the network, it will be the largest network in the country even in the region. With the addition of web cameras up to community clinics, MIS-Health will also have the largest video conferencing and telemedicine network. MIS-Health provided connectivity in the DGHS and in the MoHFW through wifi network.

#### **5.4.6 Capacity Building and Maintenance Support**

MIS-Health continued capacity building through training, supply of ICT equipment, computer stationeries, payment of Internet bills and also repair and maintenance support.

#### **5.4.7 Training**

In 2009-10, thirteen types of training/workshop of different duration were held both at MIS-Health office in Dhaka as well as at local hospital/health offices. A total of 13,507 officers and staffs took part in the training/workshops held under Health, Nutrition and Population Sector Programme (HNPS). Under United Nations Children's Fund (UNICEF) supported training program, another 1,406 participants participated.

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<sup>11</sup> 'WiFi' or 'Wi-Fi' is a popular technology that allows an electronic device to exchange data wirelessly (using radio waves) over a computer network, including high-speed Internet connections (Wikipedia 2012).

#### **5.4.8 One Stop Service**

Currently, a one-stop service facility is being developed in order to provide better patient management and treatment follow up for the Out-patient Department (OPD). The OPD automation aims to address management of a large volume of patients with the following services:

- Efficient queue management (includes assigning unique identifiers for new patients through appropriate registration)
- Evaluation of patients for social welfare (includes automation of discount decision and determining appropriate differential fee)
- Nursing service (includes gathering and storing vital health statistics of patients and referral decisions to appropriate physician)
- Laboratory integration (investigation results sent directly to appropriate physician)
- Pharmacy integration (includes proper dispensation of drugs and inventory management)
- Cost-centre analysis (includes overall assessment of finances through integration of all related components)

#### **5.4.9 Supply of ICT Equipment and Computer Stationeries**

In 2009-10, 420 computers, 550 laser printers, 1,100 printer toners, 550 printer cables, 70 global positioning systems, 428 web cameras, 614 copies of antivirus software, 434 tables and 630 chairs have been procured and distributed to different health facilities and health offices. MIS-Health collected 1,500 web cameras from the National Election Commission for distribution among the hospitals under DGHS to introduce telemedicine service. Besides, some laptops computers were bought for MIS-Health training room. Different health offices were also provided financial assistance for buying computer stationeries.

#### **5.4.10 Repair and Maintenance of Computers, Printers and Other Accessories**

MIS-Health experiences that even in divisional or district towns there is a lack of appropriate private firms for fixing computers and related accessories. So MIS-Health has made an innovative medical advice. Under this approach, the respective health facilities or health offices having trouble with computers or related accessories are told to first try locally to fix

the problem or seek advices over phone from the MIS-Health offices during the first 24 hours. If within this period it is not possible to fix the problem locally, they are asked to send the troubled machine to MIS-Health office. MIS-Health head office with help of a repair vendor in Dhaka tries to fix the problem in next two days. On the fourth or fifth day, the computer should go back to the place from where it is brought. If it is not possible to fix within this period, an effort is undertaken in most cases to replace a workable computer to the respective place. This has been done to ensure that computer does not sit ideal for longer period. In 2009-10, MIS-Health fixed 118 computers, 20 monitors, 32 printers and 15 UPS (uninterruptible power supply) (DGHS n.d.).

#### **5.4.11 Dissemination of Information and Publications**

Several seminars and discussions are going on to disseminate information and progress of MIS-Health. Media features and news are frequently published in national newspapers. Radio and television including British Broadcasting Corporation (BBC) are airing special reports on activities of MIS-Health. MIS-Health website is a vibrant platform for information dissemination as a focal point for DGHS. The email and SMS broadcasts are other stronger tools of information dissemination within organization. The routine publications, like Health Bulletin, Year Book, IMCI newsletter, EOC newsletter have been continued. Other special publications, such as, Report on Service Availability Mapping, GIS Guidebook, e-Health Brochure, etc. need special mention. Distribution of Digital Health Guidebook remains as one of the popular publications. MIS-Health also actively assists to publication of snapshot book on development activities of Ministry of Health and Family Welfare by Bureau of Health Education on the occasion of Development Forum 2010 (of the development partners) held in Dhaka.

#### **5.5 Conclusion**

Since its inception, DGHS has been always playing the key role in building the healthcare network in Bangladesh. Irrespective of being public or private, a service provider is always responsible to the agency. Over the years, with the health sector, DGHS grows and now operates a fully fledged MIS department which introduced e-Health and m-Health in Bangladesh.

## **Chapter Six: Mobile Phone Health Service Delivery System**

### **6.1 Introduction**

Mobile Health Delivery System is a gift of twenty first century to humankind. It has brought an amazing number of people under the healthcare net in a short span of time. Different nations have implemented the services in different ways. Regarding the mode of end user, access may not be same in all countries. But the core idea is to allow people access at least basic healthcare services via cellular networks. This facility saves time and money of the poor people living in distant rural regions. This chapter gives the details of the Mobile Phone Health Service implemented by DGHS in Bangladesh. It covers different components of the service like 24 / 7 call centers, SMS services like pregnancy alerts etc.

### **6.2 m-Health Services**

m-Health or mobile health is a term used for the practice of medicine and public health, supported by mobile devices. The term is most commonly used in reference to using mobile communication devices, such as mobile phones or tablet computers for health services and information. The m-Health field has emerged as a sub-segment of e-Health, the use of information and communication technology (ICT), such as computers, mobile phones, communications satellite, etc., for health services and information. m-Health applications include the use of mobile phone devices in collecting community and clinical health data, delivery of healthcare information to practitioners, researchers, and patients (Wikipedia 2012).

### **6.3 Mobile Phone Aided Health Services of DGHS**

The mobile phone aided health service program has been launched in May 2009 in each government Upazila health complexes and district hospitals (total 482) of the country has been provided a mobile phone to act as a local call center for delivering round-the-clock (non-stop) medical advices to the citizens who make calls to the mobile phone. The contact numbers of the mobile phones have been circulated in the communities, using local channels. The mobile phone numbers are also available on the website of the DGHS ([www.dghs.gov.bd](http://www.dghs.gov.bd)). A doctor on duty in the hospital remains available to answer the phone calls.



The service is free of charge and has a number of benefits, viz. wider coverage that reaches everybody everywhere and simplicity of use even by the technologically-lagging people. As a medical doctor is available within distance of a phone call round-the-clock for free, people have a better option to avoid unqualified healers. Mobile phone health service also helps patients to avoid unnecessary visits to health centers, which indirectly benefits the health centers to provide better attention and supplies to the patients who physically visit the health centers. Being local, the service is also culturally responsive and easy to customize to local situations. Owing to the comfort of people in getting medical advices easily and quickly, it has been planned to roll out mobile phone health service up to community clinics. In 2010, a monitoring cell has been established in MIS-Health to randomly call several hospitals and check the quality of mobile phone health service (viz., whether the calls are answered; if answered whether it is done warmly; whether a doctor remains available to provide the advices, etc.). The “Union Information and Service Centers” project of the Access to Information (A2I) program at Prime Minister’s Office has also been engaged in promoting the mobile phone health service to the rural communities. Mobile phone health service received recognition through ICT for Development Award in 2010 and special mention in Manthan India Award in 2011 (DGHS 2011).

The lack in system integration has isolated DGHS’s initiative into a mere over-the phone advices, which does not have a feasible impact on the service rendered. Also, these services only allow over-the-phone solicitation on primitive cases and a follow-up through SMS are not incorporated. Hence, the patients need to make call to doctor for every advices sought. Due to this constraint, while giving advices even to a repeat patient, the advising doctor is bound to rely on the phone conversation in that instant. Due to the absence of any provision of reviewing past history, the advices from the qualified doctors often may not lead to convalescence for the patient.

#### **6.4 SMS Advices for Safe Pregnancy**

Launched in March 2010, the SMS-based pregnancy advice is expected to emerge as one of the pioneering programs of MIS-health. On registration via cell-phone SMS, pregnant mothers would receive appropriate periodic antenatal, safe delivery and postnatal care

advices through SMS. Currently, the mobile operator Tele Talk<sup>12</sup> has introduced the service. Grameen Phone is also working to replicate the service. Text in Bangla and also voice mail are also being considered to add to this pregnancy care advices. MIS-health plans to use the large number of health workers under the DGHS to undertake promotional activity for this service. The SMS<sup>13</sup> advice for safe pregnancy contributes to the MDGs 4 and 5 through improving neonatal and maternal health.

## **6.5 Bulk SMS**

The innovative bulk SMS system of MIS-Health introduced in 2009 remained as an effective medical advice even as of now to broadcast quick and urgent messages to health staffs. The use of bulk SMS was frequent and demand driven.

## **6.6 More m-Health**

A number of SMS based services are in plan to introduce gradually. These are Web/SMS box for receiving citizens' complaints/suggestions, Queue management in hospital OPD or doctor's chamber, Rapid health survey, Query-based delivery of health statistics, etc. MIS-Health has agreed to work in collaboration with University of Oslo to develop a system to collect public health data from the rural setting through using mobile phone by the health workers.

## **6.7 Telemedicine**

All necessary arrangements for introducing telemedicine services in eight hospitals (two tertiary hospitals, three district hospitals and three Upazila hospitals) with high quality video conferencing equipment have been completed. Vendors are now installing the system in the respective hospitals. It is expected that this will create a new avenue of remote healthcare in the public health service of Bangladesh. To expand the telemedicine services more in all hospitals, MIS-Health also provided web cameras to all Upazila hospitals. MIS-Health also

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<sup>12</sup> Tele Talk Bangladesh Limited brand name "Teletalk" is a GSM (Global System for Mobile Communications) based state-owned mobile phone company in Bangladesh. It is a Public Limited Company of Bangladesh Government (wikipedia.org).

<sup>13</sup> 'SMS' or Short Message Service is a text messaging service component of phone, web, or mobile communication systems (wikipedia 2012).

received 1,500 web cameras from the National Election Commission to distribute among all public hospitals of Bangladesh for expanding telemedicine service across the country.

Therefore, it is expected that people would get better healthcare facilities without traveling distant outlets. The telemedicine vision of the MIS-Health and Community Clinic project is to expand the service up to community clinics. For this purpose, it is planned to provide mini laptops to community clinics, where health workers will use those to help patients consult Upazila hospital doctors by video conferencing. The laptops in the community clinics will be used for multiple purposes, viz. telemedicine, updating community health data, health education of people, training of health staffs, communication, and Internet browsing.

## **6.8 Conclusion**

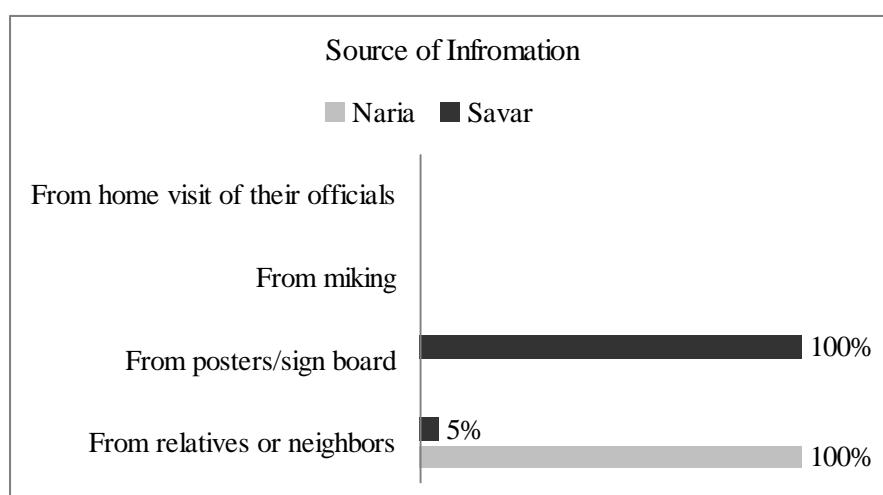
m-Health has created a new level of inclusiveness in the health sector of Bangladesh. 98% of the population is now connected to the publicly funded healthcare services through this network (DGHS 2011). This initiative has brought significant change in people's lives. Over the next few years, these changes will also be reflected in different health indices of Bangladesh.

## Chapter Seven: Data Presentation and Analysis

### 7.1 Introduction

The researcher collected primary data by using the previously modeled research methodology. Most of the analyses endorse the sincere effort by the healthcare professionals of DGHS and its sub-agencies. Rural Bangladesh has its very original geo-social dynamics. The researcher has described her experiences regarding the accessibility of government processes, bureaucratic challenges and in interacting people at the grass root levels in this section. These experiences are reusable resources for future researchers who will study on m-Health in developing nations. A highly categorical survey was conducted on the health professionals, people in the neighborhood and via standard service access channels. This chapter also contains a quantitative analysis of the collected data.

### 7.2 Source of Awareness of the Service Seekers



**Figure 4: Source of Information (n=40)**

During survey, the researcher asked the service recipients regarding how they came to know about the service. In replying the question, all the respondents of Savar informed that they got the phone number from the sign boards placed inside the hospital. In Savar Upazila health complex, there were some sign boards found in different important places where patients are used to gather, such as- in outdoor ticket counter, medicine's counter, indoor corridor. On the other hand, all the respondents of Naria replied that they got the phone number from their

relatives and neighbors. Besides, the service providers of Naria UHC<sup>14</sup> informed that they had initiated to publish the phone number in outdoor tickets and in indoor discharge receipts. As the academic qualification of Naria's respondents was low (see Table 5), they could not read the ticket, or were unaware of the services. While interviewing some outdoor patients and the key informants of Naria UHC, it was found out that they had tickets that mention the phone number, but they could not read or understand them.

During primary data collection, the researcher found that the Emergency Medical Officer<sup>15</sup> (EMO) was assigned for providing health services over phone by rotation. There was one mobile phone set in each UHC. The service seekers made phone calls to the given phone number and they were charged as per regular call rate. There was no written instruction found in any UHCs regarding the process of providing healthcare services over mobile phone or how to keep the records of the phone calls. While visiting the Naria UHC<sup>16</sup>, no evidence of call list maintenance was found. The researcher collected the mobile phone numbers of the service receivers from received call list of the mobile phone and contacted with them for interview. The Naria UHC disseminated the m-Health phone number through the outdoor tickets and indoor discharge receipts. On the other hand, while visiting the Savar UHC<sup>17</sup>, there were several sign boards placed in different locations where people gathered more. The locations were, for example, in front of outdoor ticket counter, in front of the pharmacy, on the way of outdoor chamber, in indoor corridors. Besides, there were health education sessions held in the outdoor section conducted by the doctors in every morning where the doctors discussed about different health issues and also informed about the mobile phone health services.

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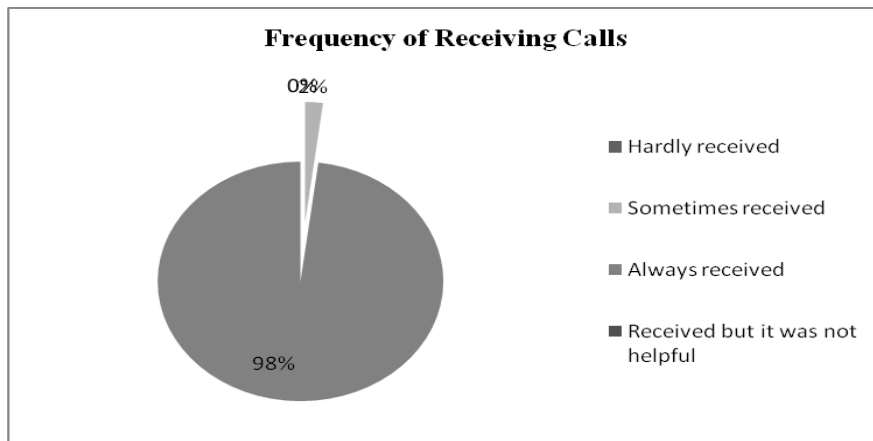
<sup>14</sup> 'UHC' or Upazila Health Complex means the government hospital located at Upazila level where essential healthcare services are provided.

<sup>15</sup> Emergency Medical Officer or EMO refers to the doctor who is assigned as in charge of emergency unit to attend emergency patients in hospitals by rotation. In this study, the researcher has found out that EMO is also assigned as in charge of Mobile Phone Health Services in Upazila Health Complexes. That means, in the hospital, the doctor who is taking the responsibility of emergency unit, will also take responsibility to attend the calls for mobile phone health service from the service seekers.

<sup>16</sup> Naria UHC is a government hospital located in Naria Upazila in Shariatpur district that is one of the study areas of this research.

<sup>17</sup> Savar UHC is a government hospital located in Savar Upazila in Dhaka district that is one of the study areas of this research.

### 7.3 Frequency of Service Access



**Figure 5: Frequency of Receiving Calls (n=40)**

Most of the respondents (98%) informed that when they made calls to the phone number, it was received by the attendants. The Emergency Medical Officer (EMO) of the Upazila Health Complex (UHC) was assigned to provide this service. When the researcher asked the service providers in this regard, they had also informed that they were available for 24 hours a day over mobile phone. Besides, while interviewing the Civil Surgeon and Health Education Officer of Shariatpur district, and Resident Medical Officer (RMO)<sup>18</sup> of Savar UHC, they informed that as the doctor's availability over phone was monitored frequently from the head office, so the frequency of receiving calls was high.

### 7.4 Adequacy of Human Resources

Maximum service providers (80%) of Naria informed that they did not have enough manpower to provide health services to the service seekers (see Figure 34). During their interviews they mentioned that the EMO had to handle with the emergency patients as well m-Health clients. At the same time they also had to deliver service to the outdoor patients. The researcher has found out that the doctor, who was assigned as EMO, was sitting with outdoor patients as well as carrying the mobile phone. And when there was any patient came to the emergency unit, the medical assistant called him on that mobile phone to come to the emergency unit. So, at a time they had to deal with three responsibilities. In an interview,

<sup>18</sup> Resident Medical Officer (RMO) is a doctor who is the in-charge of a hospital who resides in hospital.

Civil Surgeon<sup>19</sup> of Shariatpur district, informed that adequate doctors were appointed in this district, but some of them were on leave or some were not coming to the hospital regularly for different reasons. So, the doctors had to take extra work load. That was a very common scenario in rural areas as the CS had mentioned.

On the other hand, in Savar UHC, 80% respondents informed that they had adequate man power. In this regard, the RMO of Savar UHC informed that Savar was very close to the capital city and the doctors working in that UHC could avail maximum citizen facilities than the other Upazila. So, doctors' crisis was very less there.

### 7.5 Availability of Equipments

Maximum respondents (100% of Naria and 60% of Savar) informed that they did not have enough equipment to deliver this service smoothly (see Figure 35). About their required technical support or equipment, they mentioned the following-

**Table 3: Required Equipments**

Required Equipments	Naria	Savar
3G Mobile phone set	40%	0%
Extra mobile phone set with charger	100%	80%
24hrs electricity supply	0%	100%

The above table shows that 100% doctors of Naria and 80% of Savar felt the need of extra mobile phone set with relevant accessories, like battery, charger, etc. Because, the condition of their existing phone set was very critical. Sometimes the doctors needed to put the battery in their own phone set to make it charged. And 40% of them required a bit better quality or 3G mobile phone set so that they can handle the situation with extra care and provide right treatment. All the doctors mentioned that they tremendously suffered from power load-

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<sup>19</sup> Civil Surgeon (CS) is the designated senior physician or doctor who is responsible for providing the healthcare services in a district.

shedding. They had also added that it hampered their treatment also. So, they required backup electricity connection for uninterrupted electricity supply.

## 7.6 Record Maintenance

**Table 4: Status of Record Maintenance**

<b>Record Maintenance Status</b>	<b>Naria</b>	<b>Savar</b>
Have a register and maintain regularly	0%	60%
Have register but not maintain regular	0%	40%
There is no register	100%	0%

All the doctors of Naria informed that they did not have any register or record of the service receivers of mobile phone health service. On the other hand, all the doctors of Savar Upazila health complex informed that they had the record or register of the service recipients. And maximum doctors of Savar (60%) shared that they maintained the record regularly. But another 40% shared that they did not maintain it regularly. The in-charge of Naria UHC has also informed that they would start maintain a record of service recipients. But some service providers of Naria informed that maintaining record could hamper discharging the regular responsibilities.

## 7.7 Coordination & Monitoring

The service providers were asked about the way of the coordination with the head office to measure the attachment between the head office and Upazila health complexes. There were several options to reply, for example- via mobile phone, or physical visit, or monthly meeting, or official letter. In the same regard, they were also asked that how many times they were monitored by the head office.



### 7.7.1 Coordination

**Table 5: Coordination Method**

<b>Tool of Coordination</b>	<b>Naria</b>	<b>Savar</b>	<b>Average Percentage</b>
Via phone	80%	80%	80%
Via e-mail	20%	60%	40%
Via SMS	20%	0%	10%
Official letter	60%	100%	80%

Maximum respondents (80%) replied that most of the times they were coordinated with the higher authority over phone. They were ordered for any task or informed about emergency issues via mobile phone. Mobile phone was also used for tracking the activities of the health complex sometimes. Besides, most of the respondents (80%) also informed that official letter was one of the important tools for coordination. Some other respondents (40%) informed that recently they had started coordinating with the higher officials through e-mail. The frequency of e-mailing was higher in Savar Upazila (60%) than Naria. Besides, the head office also communicated with the Upazila health complexes via SMS (10%) also as they informed.

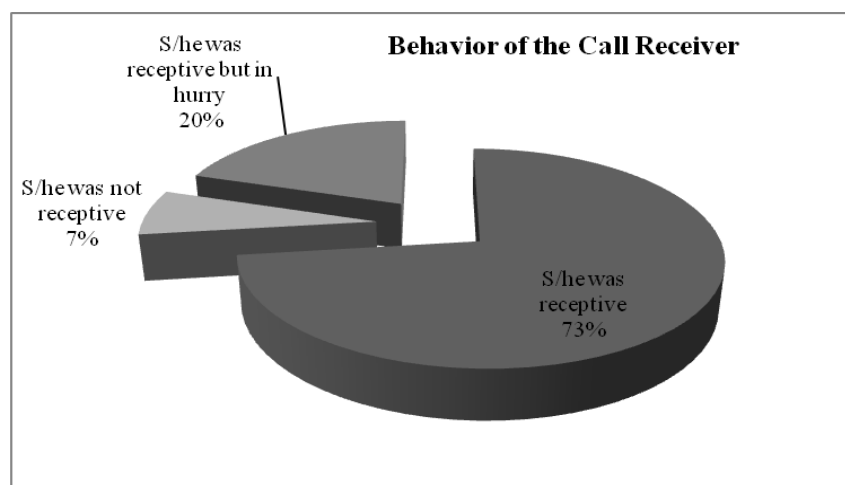
### 7.7.2 Monitoring

While interviewing the service providers, they were asked about the monitoring process of their activities. Replying the question, maximum doctors or service providers (60%) informed that the higher authority monitored their activity any time (see Figure 33). In an interview Civil Surgeon of Shariatpur, informed that most of the time mobile phone was used for monitoring. That was one of the reasons to ensure 24 hours doctor's availability over phone. While interviewed the Upazila Health and Family Planning Officer added that the officers from head office called to the phone and asked about who was in charge of the mobile phone that day, or looking for any other doctor. They did it to monitor whether the doctors were present in the hospital or not.

## 7.8 Availability of the Service over Phone

According to the analytical framework of this study, the availability of the service over phone was depended on the behavior of the call attendants. Generally, the receptive attitude of the call attendants led the service seekers to express their problem frankly. And the service providers need to listen and understand the problems very carefully to provide medical advices over phone. From that perspective, the researcher inquired about the availability of services over phone by asking the service recipients about these following issues:

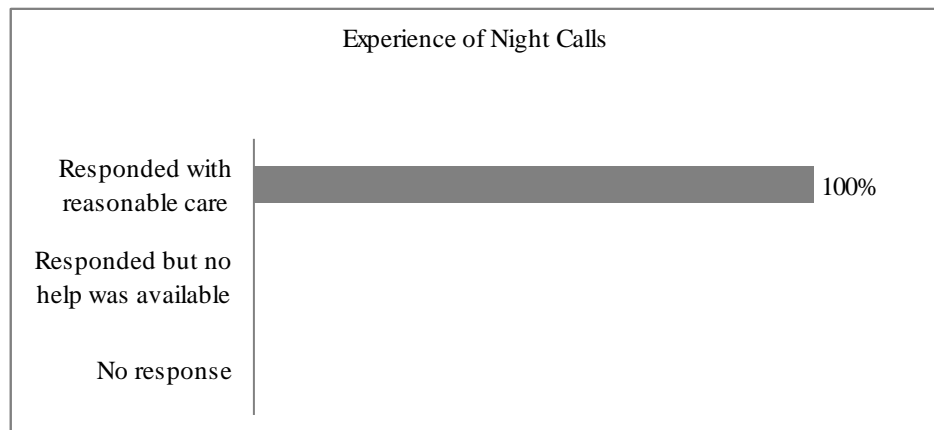
### 7.8.1 Behavior of the Call Receivers after Receiving Calls



**Figure 6: Behavior of the Call Receivers (n=40)**

Maximum service recipients (73%) informed that the call receivers were receptive to their clients. The Civil Surgeon of Shariatpur informed in his interview that it was happening because of frequent monitoring from higher authority over phone. But 20% informed that the call receivers were in hurry. In this regard, the service providers informed while conducting their interviews that sometimes the phone calls of the service seekers came when the doctors were busy with attending other emergency patients or affairs. In those occasions the doctors were in hurry answering the phone calls.

## 7.8.2 Experiences of the Callers while Calling at Night to the Given Phone Number



**Figure 7: Experiences of Calling at Night**

The researcher asked those service recipients<sup>20</sup> who had made calls at night for medical advices, to learn about their experiences of calling at night. And interestingly, all the respondents had informed that the doctors not only received their phone calls at night, but also provided medical advices with care. In a case study in Naria, it was found out that a service recipient made a call to the phone number at mid night for seeking medical advices. The doctor received phone and addressed very cordially. Then the doctor listened to his problem and gave medical advices. The service recipient was very happy with behavior as well as services of the doctor.

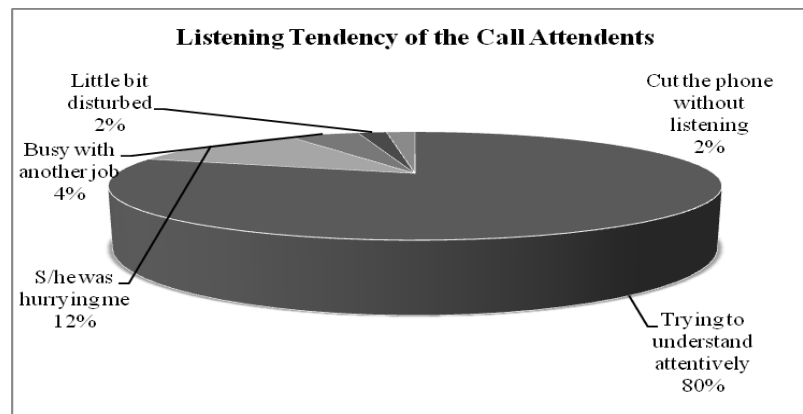
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<sup>20</sup> The researcher found out seven service recipients among sampled respondents who had made phone calls at night for medical advices.

### Case Study 1

Mr. Habib (40 years) lived in Naria upazila who was a private service holder. He made a phone call to the emergency mobile phone for medical advice for the first time. He made a call at 11.00pm as he was suffering from severe stomach pain. His home is around 6 km far away from the hospital. One of his neighbors had given the number to him. Then he called to that phone number without any expectation. But his call was received and he got held of the doctor over there. The doctor started talking with him very cordially and listened to his problem very patiently. After listening to the problem the doctor gave medical advice to Mr. Habib. He had the medicine and got cured. He was very satisfied with this service. It was beyond his expectation as he informed. And he told us that he would also disseminate this number among his relatives and neighbors. According to Habib, people would get emergency medical advice over phone at any odd time also. And Habib thought “It saved money as well as many lives”.

## 7.9 Experience of Service Recipients during Consultation of the Problem



**Figure 8: Listening Tendency of the Service Providers (n=40)**

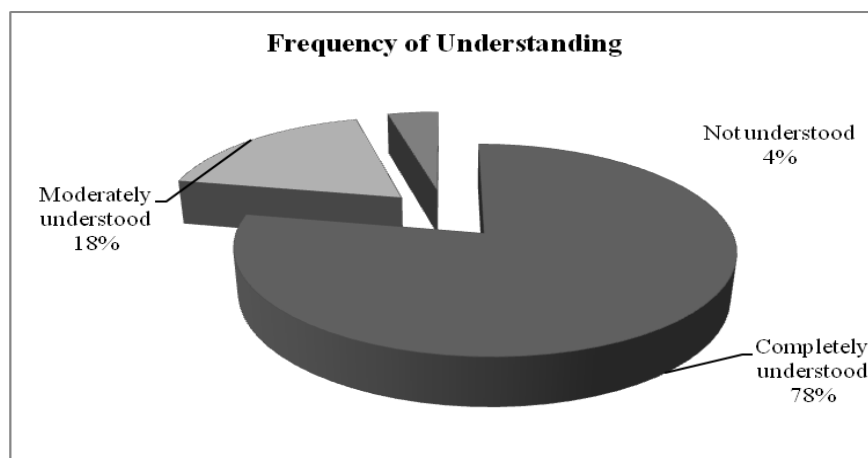
Regarding the experiences of consulting the problem with the service providers, most of the respondents (80%) informed that the doctor was trying to understand the problem very attentively over phone. Among the service recipients, 12% informed that the Emergency Medical Officers were hurrying them. As the EMOs had informed, it was because of emergency patients in the hospital. But one case study exhibits that may be there were a few service providers who were not enough kind to their clients. The case study found that a poor

mother made a call as her child was suffering from high fever. Her phone call was received by a doctor. But after receiving the call, the doctor told that she was in her quarter and cut the phone call without letting the patient to response.

### Case Study 2

Ranu Begum (22 years) lived in Naria upazila, Shariatpur. There was no earning member in her family. Ranu's only daughter was 7 months old who got high fever. One of her relative informed her about the mobile phone health services and asked her to call to the emergency phone number. That time she had only 5 taka balance in her mobile. As the hospital was 7 km far way from her home, she made a phone call to the hospital so that she could have any suggestion or any prescription instantly over phone. After making a call with the limited credit balance in her mobile phone, a doctor received the phone call and Ranu was trying to inform her about her daughter's fever. When the doctor understood that the call is from a service seeker, she told Ranu that she is staying in her quarter now and cut the phone call without letting the patient to response.

Obviously, this had offended the caller for the impolite demeanor. When the doctors attend the patients and listen to their problem, they are able to communicate better and explain their problem successfully. From the respondents' information, the rate of understanding the problem is:

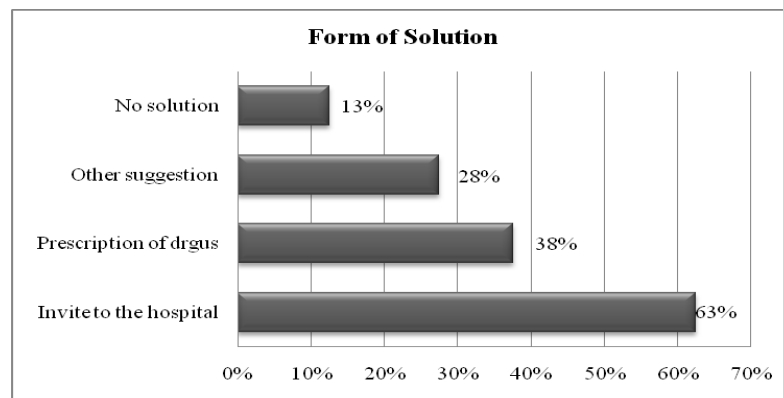


**Figure 9: Frequency of Understanding the Problem (n=40)**

The figure reveals that maximum (78%) respondents had informed that they were able to make the doctors understanding their problem over phone. Only 4% service recipients informed that they were not able to make the service providers understand their problem. It was exhibited from the interviews with EMOs that when there were emergency patients in hospital, they could not spend adequate time to listen the patient over phone.

### 7.10 Types of Received Medical Service over Mobile Phone

From the obtained data it is demonstrated that the service seekers made calls to the phone number for different health issues, like- fever, coughing, abdomen pain, waist pain, stomach pain, baby's fever and coughing, chest pain, hormonal problem, throne pain, child's injury, different suggestions, pregnancy cases, post delivery cases, queries about specific doctor's availability in the hospital. The form of medical advices they received is given below.

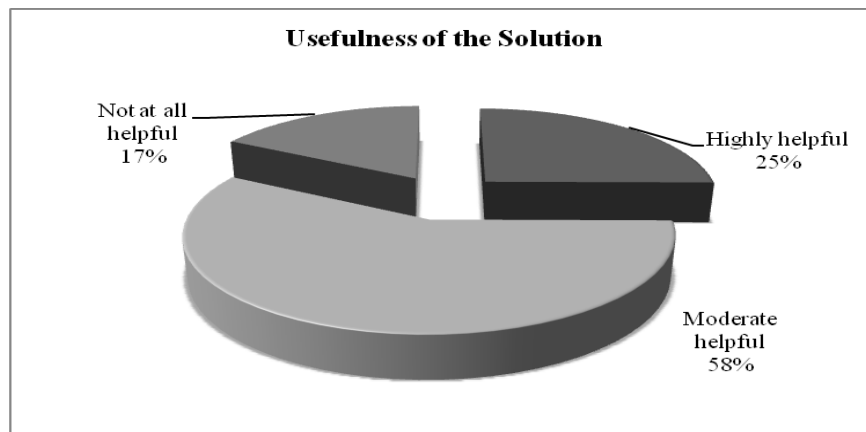


**Figure 10: Form of Medical Advices (n=40)**

The above graph shows that maximum respondents (63%) were invited to the hospital, 38% were prescribed for medicine over phone, and 28% received suggestions from the doctors as per their requirements. While interviewing with the RMO of Savar UHC, the researcher was informed that generally doctors provided drugs prescription in primary or minor cases. But there were some critical health issues, where the doctors could not provide medicine not examining the patients for life safety. But there were some service recipients who did not agree with this information. From some case studies and interviews, it is explored that some

of the service recipients of Savar were asked to come to hospital for fever or coughing. They expected that they would get drugs prescription over phone for those general problems. But they did not get that type of medical advices over phone. They thought because of insincerity of the doctors, they were asked to go to the hospital. A case study in Savar UHC appeared that the respondent made calls for several times for different health issue. And every time he was asked to go to hospital. Even when he was suffering from fever, he was asked to go to hospital for treatment. The respondent was not happy with that medical advice.

### 7.11 Usefulness of and Satisfaction about the Received Medical Advice: Service Receiver's Perspective



**Figure 11: Usefulness of the Medical Advice (n=40)**

Maximum respondents (58%) informed that the received medical advices were moderately helpful for them. And 25% respondents informed that the medical advices were very helpful for them. May be the reason was that maximum respondents were asked to come to the hospital to meet the doctor for getting medical advices. While asking about the satisfaction of the respondents towards the medical advices they had received, it was found out that maximum respondents (73%) were satisfied with the advices that as it helped them in the event of emergency (see Figure 22). About the reason of being satisfied, they had mentioned that after calling to this mobile phone, those respondents got prescription or suggestions on

health issues or at least advised to come to hospital. That was the reason of being happy with the medical advices.

### Case Study 3

Mr. Shohag (26 years) was a student who lived in Savar. He made calls to the emergency mobile phone number for several times. Last time he made a call as he was suffering from fever. He did not seem to be happy with the service as he was asked to go to the hospital for treatment by the attendant. After putting the phone down Mr. Shohag went to the hospital and got medical advice where he was given a very normal treatment which he could have got over phone as he pointed out. A few days later he made a call to the number for medical advice for his ill mother suffering from waist pain. Even at that point of time he was told by the doctor to take his mother to the hospital. Mr. Shohag agreed that may be his mother's case was complex and the doctor wanted to avoid the possibility of wrong treatment over phone. But in case of his fever, he could get the medical advice. He expressed that the service was not that much effective. According to Shohag, if the patients were asked over phone to go the hospital for every case, then there was no point for the patients to call to this number. He also assumed that may be the call receiver was not a doctor. That could be a reason of not getting any medical advice over phone- as he expressed. May be he could share the phone number to any of his relatives in emergency case and they could have medical advice over phone. Mr. Shohag strongly suggested for a doctor's availability over the phone.

## **7.12 Demand Fulfillment and Satisfaction of the Service Recipients**

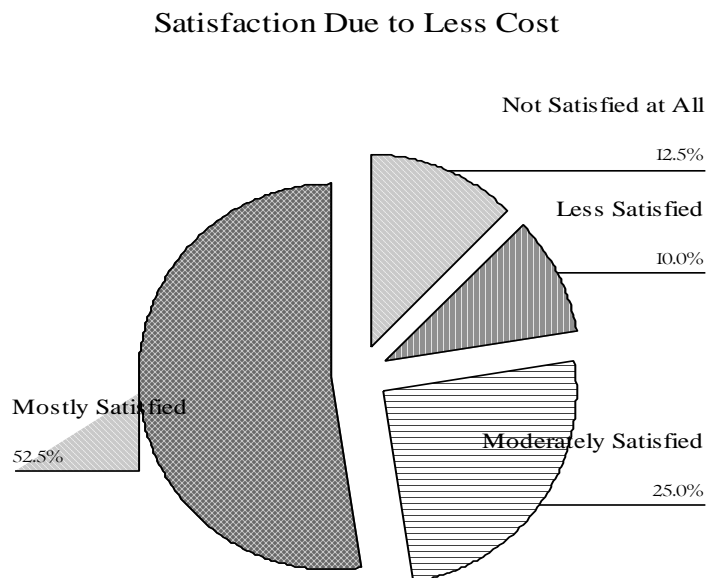
Though there were some organizational mission and goals of DGHS for planning and implementing the mobile phone health services, the service seekers also had some desire or expectation to this service. It was very important to identify that to extent the mobile phone health services were able to fulfill the demand of the service recipients. In this regard, the researcher asked the service recipients to measure their satisfaction in terms of saving cost, saving time, behavior of the service providers, types of medical advices they had received,



quality of the services, and feeling security for getting health services in emergency. The result of that scaling is given below-

### 7.12.1 Satisfaction of the Service Recipients Due to Less Cost

Mobile phone health services were provided to the service seekers for free of cost. The service recipients did not need to pay any fee except the mobile call charge.



**Figure 12: Satisfaction of the Service Recipients Due to Less Cost for Getting the Services (n=40)**

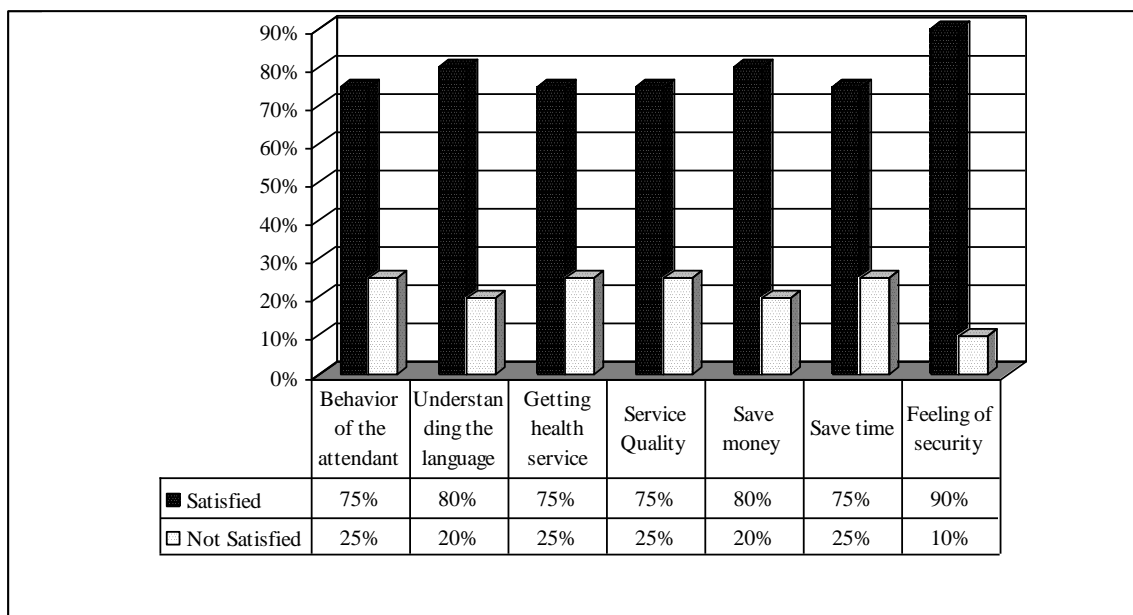
The above chart exhibits that the 77.5% respondents were satisfied as the services were less costly to avail. And 22.5% respondents were not satisfied. The reason they advanced for dissatisfaction were as follows-

- Describing a complex problem over mobile phone was expensive as it took longer time than usual.

- In some cases, the doctors can not prescribe drugs without examining the patient physically. While talking with the doctors of Naria UHC, some of the doctors suggested introducing video conferencing with this service.

### 7.12.2 Level of Satisfaction of the Service Recipients of Naria UHC

The service recipients of Naria UHC scaled their satisfaction of the mobile phone health services that is shown as below-



**Figure 13: Satisfaction Scale of Naria UHC’s Service Recipients (n=20)**

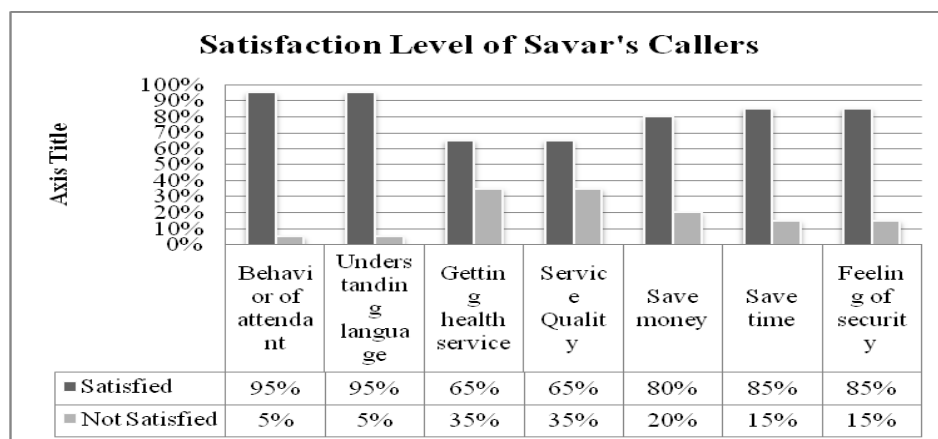
In Naria, maximum service recipients (90%) were feeling secured than previous time in terms of health issues that they would be able to avail medical advices in case of any emergency. It was because they received better health services with less expectation. And 80% respondents informed that this service has reduced cost and saved their time to avail health services. They did not need to go through a long way for health services. And 80% respondents informed that they could understand the language of call receivers very well. And 75% respondents were satisfied with the medical advices that they had received over phone. It was also found out that 25% respondents informed that they were not satisfied. The reason they advanced for

dissatisfaction were- not receiving medical advices directly over phone and asked to go to hospital even with a trivial medical problem. That was the reason of being not satisfied with the services.

The above graph also exhibits that in case of service quality, 75% respondents were satisfied with the medical advice they had received over phone. About the reason, they had informed that they were using this service for the first time and they were benefited by following the medical advices. And 80% respondents were satisfied as the services helped them saving cost of transportation and other treatment fees. The respondents mentioned that most of them lived far away from the hospitals and this service made them feel secured. And in the time of emergency they could consult the doctors at their will.

### 7.12.3 Level of Satisfaction of the Service Recipients of Savar UHC

The satisfaction scale of the service recipients of Savar UHC on the mobile phone health services is shown as below-



**Figure 14: Satisfaction Scale of Savar UHC's Service Recipients (n=20)**

It is shown in the figure that in Savar, maximum respondents (95%) were satisfied with the behavior of phone attendants. And 95% respondents were satisfied with understanding the conversation. Better educational background was the underpinning factor in this regard. And 85% respondents were satisfied as the service helped them saving time to get medical service.

Besides they also informed that they did not need to go through a long way for medical advices. Some respondents were satisfied as they could avail a doctor in their emergency situation over phone. And 80% respondents informed that they were satisfied with this service as they could avail health services for mobile phone call charge only. It reduced the cost of transportation. Besides, if there were any possibility to be referred to other hospitals or doctors, they were referred to over phone rather than going to the hospital physically. It reduced their physical hassles and cost also. Some of the respondents told that sometimes they needed to meet with specific doctors in hospital. If the doctors were not available, then they had to come back without treatment. But the mobile phone service had solved that problem. And about feeling secured, 85% respondents replied that they felt secured now than ever before as they would be able to access the health services in any emergency situation from anywhere if they have mobile phone access.

### **7.13 Factors behind Satisfaction or Dissatisfaction**

After getting the responses on the satisfaction scale, the researcher asked the service recipients about the factors behind their rating. Replying to that question, they informed the researcher that they were amazed when they got a doctor and medical advices over phone almost 24 hours. Most of the respondents of Naria were comparatively (see Figure 13) more satisfied with the form of medical services as they received medicine prescription over phone. According to that information, the researcher has pointed out some factors behind high satisfaction of the service recipients towards the mobile phone health services provided by DGHS that are given below:

#### **7.13.1 Frequency of Receiving Calls by the Phone Attendants**

All the respondents informed that their phone calls were received by the phone attendants always whenever they had made calls to the given number (see Figure 3). And the high frequency of receiving calls had created positive impression towards the mobile phone health services.

### **7.13.2 Doctors' Availability over Phone**

Doctor's availability over phone was an important factor of being satisfied as the respondents had informed during their interviews. The service recipients felt good when they got a doctor over phone, with the person they could discuss their health issues.

### **7.13.3 Receiving Calls at Night on Average in a Week**

The Emergency Medical Officers received approximately 5-6 calls at night on average in a week as the service providers had informed (see Figure 21). And all the service recipients who had made calls to the m-Health phone were happy that their calls were received even if at midnight. That experience made them to feel secured and being satisfied of the service.

### **7.13.4 Form of Medical Advices**

The service recipients who received drugs prescription or necessary medical advices over phone were more satisfied than the service recipients who were asked to go to the hospital for normal health problem which they could avail over mobile phone (see Figure 20). Besides, some service recipients were satisfied that they received the suggestions and information as per their requirement.

### **7.13.5 Behavior of the Phone Attendants**

It is exhibited in figure 9 that maximum service recipients informed that their phone calls were received very cordially by the phone attendants. And the attendants talked to service recipients very cordially that they feel free to explain their problems. Those experiences of the service recipients made them to be satisfied (see Figure 11).

A case study of Savar Upazila explored that the respondent was highly satisfied with the service. She called to this number for several times for different health issues. Every time her call was received very cordially and she got treatment over phone. She mentioned during her interview that she would be able to avail health services through mobile phone from anywhere at any time.

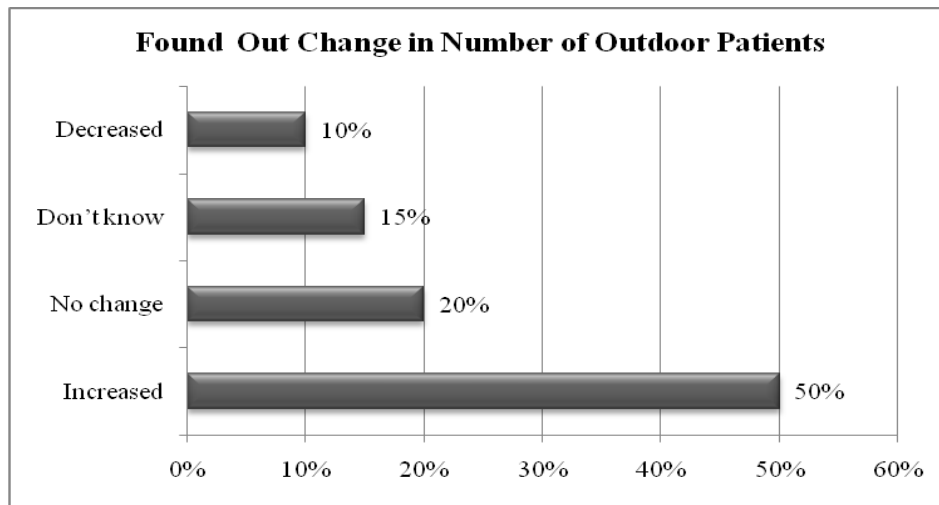
#### Case Study 4

Mina Bugum was a housewife (25 years) of Savar upazila. She was very satisfied and happy with this mobile phone health service provided by DGHS. She called to the given number at mid night as her baby was suffering from severe coughing. Her home was 10 km far away from the health complex and it was around 2.30 am. Her call was received and there was a doctor on the phone. He listened to her very cordially and gave prescription. Mina's husband was a CNG driver. He brought the medicine. And after taking the medicine her baby was recovered soon. She also disseminated this number among her relatives and neighbors as she found the number useful. One of her sister's baby was suffering with similar medical problem days ago. They went to a private clinic. They were prescribed same medicine as Mina's baby. But their treatment cost was around five thousand taka. On the other hand, Mina has got the same treatment for five taka only. According to Mina, the service was very much helpful for the poor patient. People could have better treatment for less cost. It also saved many lives with timely service or medical advice. She was happy that she could avail this service from anywhere of this country through mobile phone. It was a very good initiative of the government as she argued.

#### **7.14 Assessment of Mobile Phone Health Service Program from Service Providers' Perspective**

The research was designed to collect information from both of the service recipients' perspective as well as service providers' perspective to identify the effectiveness of the mobile phone health services. From that context, the researcher asked the service providers to evaluate the program from their own experiences whether the service was effective to deliver health services or not, or whether they had found out any change in number of outdoor patients after implementing mobile phone health service program. The findings of those questions are given herewith.

### 7.14.1 Change in Number of Outdoor Patients



**Figure 15: Change in Number of Outdoor Patients (n=10)**

As mentioned earlier, in this study the researcher aimed to find out if there was any impact of the mobile phone health services on reducing the number of outdoor patients in UHCs. During the field visit it was found out that most of the service providers (50%) thought that this service did not contribute much to reduce the number of outdoor patients. However, there were no statistical data or record found as evidence regarding this issue. Interestingly, 20% respondents opined that the number of outdoor patients had increased because of the rapid growth population. Only 10% of the service providers indicated that the number of outdoor patients coming to the hospital has decreased because of the treatment they received over phone. But the respondents who maintained this opinion, was fail to provide with any concrete numerical figure.

### 7.14.2 Evaluation of the Service: Service Providers' Perspective

**Table 6: Effectiveness from Service Provider's Perspective**

<b>Effectiveness from Service Provider's Perspective</b>	<b>Naria</b>	<b>Savar</b>	<b>Average Percentage</b>
Very effective	20%	40%	30%
Moderate effective	20%	60%	40%
Not effective at all	60%	0%	30%

Maximum respondents (40%) informed that the m-Health service was moderately effective because of some technical difficulties, like- load-shedding, or problem with the phone set. And 30% respondents informed that the health services were not effective at all. While interviewing the doctors of Naria, they argued that because of shortage of manpower and extra work load, it was not possible to deliver quality services to the mobile phone service seekers. To assure the quality services and to make the service effective for the service seekers, they needed adequate manpower. And 30% respondents informed that the service was very much effective to reach health services to the people living in remote area. Their argument was that those who could avail health services over phone did not need to come to outdoor unless there was any medical emergency. People could get right advices or decisions at right time without any delay. From that point of view they argued that the m-Health service was very effective to provide emergency healthcare services.

### 7.15 Comparative Analysis between Two Upazila Health Complexes

Comparatively the Savar UHC was in better condition in terms of infrastructure readiness as the researcher has observed. In this regard, the RMO of Savar UHC, who was working there for more than 5 years, informed that the mobile phone health service had initiated in that UHC first. Savar UHC maintained the record of service recipients regularly that was absent in Naria UHC. For this reason the researcher had to collect the phone numbers of the service recipients from the received call list of mobile phone set to interview them.



Along with the technical readiness, the service recipients of Savar UHC were more educated and aware about mobile phone health services than Naria. So, in many cases it was found out that the service recipients of Savar made calls to get information about the availability of any particular doctor. While interviewing the service providers, some of them were agree that it was a bit risky to get drugs prescription over the phone without checking the patient physically. But as the service recipients of Naria UHC were less educated and less conscious about health, they did not found any problem of receiving the drugs prescription over phone. Moreover, they were happy to get prescription over mobile phone. In this regard, the service providers of Naria informed that they provided drugs prescription only for normal health problems. While interviewing the service recipients of Naria, they informed that another reason of being happy with the advices was the poor communication system which caused physical hassles to the patients. To avoid physical hassles, they preferred m-Health services for getting medical advices for very normal health issues. And the service recipients of both the UHCs informed that the positive issue was their phone calls were received and they got a doctor over phone that was ready to give medical advices. And most of the cases the doctors were responsive to their clients. The important factor behind this positive situation was regular and sudden calls came to the given number from head office. Sometimes the officers of head office disguised as a patient and talked to the service providers to monitor their activities.

In the context of publicity of the m-Health phone number, the in-charge of Naria UHC attempted to disseminate the emergency phone number through entry tickets. But as most of the service seekers were less educated or illiterate, a large number of populations were out of the facilities of this service. There were no other initiatives for publicity found out in Naria during the observation. While interviewing the service providers of Naria UHC, they informed that because of extra work load they were reluctant for more publicity. One of the service providers of Naria said, “We will not be able to manage the patients over phone if we do more publicity because of extreme work load. Mobile phone health service is a very good initiative of the government and we really appreciate this new invention. But we have to have enough manpower to provide quality services to the clients.”

But in Savar, the scenario was different. There were several signboards found in side the hospital. And the doctors of this UHC initiated for a health education session for the outdoor patients regularly. And while conducting interviews with the service recipients of Savar, all

of them informed that they got the phone number from the sign boards that were hung inside the hospital.

As the socio-economic background of Naria and Savar Upazila were different, that reflected on the type of their queries and satisfaction of the service. While comparing the satisfaction scale of the respondents of Naria and Savar, the researcher found out some variations. For example- in case of understanding the conversation, the number of satisfied service recipients was higher in Savar UHC (90%), (see Figure 30) than Naria UHC (65%). Better educational background was the contributing factor in this regard. There were some variations found in receiving medical advices over phone (see Appendix II; figure 31) where it was exhibited that most of the respondents of Savar UHC were invited to the hospital for getting medical advices and most of the respondents of Naria UHC received drugs prescription over phone. But interestingly, after getting the medical advices over phone, most of the respondents of these two UHCs found the service useful (see Figure 32). The reason was the service recipients of Savar were much aware regarding health issues and the communication system was better that they could come to hospital for medical advices easily.

About the m-Health service, one of the service recipients of Savar UHC said,

*“I am very happy that the government has started this type of e-Health service. So, there is a possibility for the people living in remote areas to avail healthcare service in emergency. I hope the government will continue this service in the long run”.*

While asking about the problems faced by the service providers during delivering the services, both of the UHCs informed about the offended incoming calls. People were not aware about the use of m-Health phone number. So, sometimes calling to the given number, people tried to gossip with the doctors. They had also mentioned that some offended calls came to the phone number who was specifically looking for the lady doctors of that hospital. This situation had negative impact on delivering the m-Health services as the service providers informed.

Besides, they had also informed about tremendous crisis of power supply which sometimes hampered the service delivery. While asking about the cooperation of local government or local influential people, the respondents of Savar informed that they would appreciate the support and cooperation of the local leaders for further enhancement of the program. The

Upazila Education Officer of Savar informed during his interview that he was interested to communicate with the in-charge of UHC regularly and learn about the problems if they had any. On the other hand, in Naria UHC they were not interested for taking support from the local leaders as they were under close contact and supervision with the higher authority. They also had added that if the local leaders were interested to help the m-Health program of the hospital, they will not avoid. But with all these happenings, the service providers found the mobile phone services useful that the service seekers can avail medical advices or suggestions in emergency.

### **7.16 Is the General Scenario That Much Rosy in other UHCs?**

The researcher had made phone calls in disguise of patients or relatives to ten randomly chosen Upazila health complexes to verify their availability and responsiveness. The overall situation was better than expected. The health professionals were available at five out of ten health complexes at first attempt. All of them were doctors. Out of five received calls, four were handled with very good care and attention. Among them in two UHCs doctors talked with care for ten minutes and provided medical advices. The average airtime with the professionals was five minutes and 11.48 seconds. In most of the cases they had prescribed initial medicines. In two cases they advised follow up calls. In all cases the recipients were very patient. The comprehensiveness of the language and responsiveness were very high for all cases. But it was also noticeable that in one UHC, the call attendant informed that it was not possible to provide medical advices over phone. Without listening about the health problem, he gave address of a private hospital to visit (see Table 11).

### **7.17 Conclusion**

The collected information represents how the dynamics between the grass root level population and public health services have been changed by m-Health services. A broader survey regarding its socio-economic impact is also due to appreciate the full situation. Primary data strongly recommends that the m-Health should be one of the main stream health services providing mechanism in the context of densely populated rural Bangladesh.

## **Chapter Eight: Conclusion**

### **8.1 Introduction**

This chapter contains the findings of this study sourced from multiple levels of survey interactions. The obtained data also contains the service impacts from both the consumer and provider perspective. So, a holistic evaluation of the service can be possible analyzing the findings. After analyzing the findings, this chapter also contains some policy implications drawn based on the researcher's experiences and the collected data. It also indicates scopes of further research to analyze the impact of the m-Health service in a broader perspective.

### **8.2 General Findings**

The study has examined the extent to which the mobile phone aided health services were effective. Generally the service recipients could access the mobile phone aided health services in any emergency. It was also revealed that the service recipients were satisfied with the services. Major factors behind the satisfaction were that the service providers were cordial and caring to deliver services to their clients over phone. Besides, the service seekers could access the services in any emergency for less cost and time that made the service recipients feel more secured than the previous times. From the user perspective, mobile phone aided health service was very much effective.

### **8.3 Specific Findings**

In the very beginning of primary data collection process, the researcher made a call to an Upazila's phone number at mid night in disguise of a patient's relative. The researcher found out that the phone call was received by an attendant very cordially. The attendant asked about the health problem in details and provided necessary medical advices. The researcher also asked the service recipients about the availability of the phone connection as well as doctor's availability. The respondents of this study from service recipients cluster also informed that the phone number was reachable and their phone calls were attended cordially. So, the first impression of the service recipients on the service was good. They also informed that they could recognize that the phone attendants were doctors of the hospital rather than any other employees. The collected data from interviews revealed that the people living in rural areas had less expectation to get medical advices over phone. And when they received the services, they were happy. The service recipients also appreciated the change in delivering health

services. The unfriendly communication system of rural areas made problems to access healthcare services from the hospitals. But the m-Health services had promoted the medical advices to access from home without any physical hassles. It was also a very positive finding that the service recipients, who made calls at night time, had a doctor available at the other end to provide health services. The availability of doctors over phone at night or mid night made the service recipients to feel secured that they will be able to avail medical care at any time for less cost and time.

The variation in socio-economic background some times caused variation in type of the queries and received advices. Usually the service seekers asked medical advices for very normal health issues. And the service providers also preferred to provide drugs prescription over phone only for emergency issues or if they could diagnose the problem. So, the service seekers can access drugs prescription, medical advices or suggestions, or necessary health information through m-Health services in emergency. And as the service providers were responsive and well behaved, the service recipients felt better while getting the services over phone.

In this government intervention, private sectors involvement was found in logistic support, like- mobile phone set and SIM as well. It was also observed that through this healthcare program, the government was able to provide health services to all citizens till to the people living in hard-to-reach areas by less investment (like- mobile phone set and SIM). And the service recipients found the service useful for their emergency and were satisfied with the current service delivery. Therefore, from the user's perspective, the service is effective.

From the service providers' perspective, mobile phone aided health service was a very good initiative to reach health service to the rural areas in emergency. But there were no official letters found about how to deliver the services to the end users. And as the EMOs had to play dual responsibilities at a time, the service providers required for assigned doctors to attend the phone calls so that the mobile phone health services would not be hampered anyway.

The researcher found out few publicity initiatives of the m-Health service in Upazilas. There was no miking about the mobile phone service. There were signboards or leaflets mentioning the m-Health phone number placed in the outdoor ticket or on the discharge receipt of indoor patients. While interviewing some key informants of these two Upazilas, it was found out that people were less aware about the m-Health service because of less publicity. So, many of the

potential end users were remaining out of the coverage of this program. While interviewing some key informants of the study areas, the researcher found out that there held monthly Upazila Parishad Meeting<sup>21</sup> in every Upazila. A common agenda of the meeting was disseminating the information about mobile phone health services to the mass people. But the participants of that meeting did not emphasize on that issue. The service providers also informed that as there no lack of assigned doctor to deliver m-Health service, they were less interested for more publicity which would caused their extra work load.

In light with the given theoretical framework, it is exhibited that according to actor-network theory, mobile phone aided health service program of DGHS is a m-Health program under MIS discipline that delivers medical advices among the service seekers under mobile phone network by using mobile phone technology. Here the delegates are public and private entities who have contribution in the process of delivering healthcare services to the end users, like-Grameen Phone company ltd., UNDP, DGHS, Upazila Health Complexes. And according to e-Governance model, this government service is delivering to the service seekers 24/7 through coordination between the head office and the UHCs. In light with this model, as an ICT tool, mobile phone integrates the service delivery process, reduces delay and corruption in delivering the service, and provides medical services very efficiently for cheaper cost that make the service recipients more satisfied than ever before that is also exhibited from the collected data. By using the mobile phone network, this program also covered the people of hard-to-areas under health service network.

#### **8.4 Further Research Area**

Because of limited time and resources the researcher could not cover most of the UHCs under this study. In future, research can be conducted in other geographical parts of Bangladesh to come up with the holistic findings. Besides, further studies can be held to evaluate the service from the national health policy perspective.

#### **8.5 Conclusion**

This research project has rediscovered the established fact that if an agency is committed to provide a better service, financial limitations or technological barriers cannot come into its

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<sup>21</sup> All the Upazila Parishad Chairman, Members, local government officials, and in-charge of all government institutions attend the meeting.

way even in a developing nation. Being a developing nation with very low per capita income and ICT preparedness, Bangladesh Government is able to bring 98% of the population under the health network (DGHS 2011). This population can have the first emergency contact with a qualified registered health professional 24/7 in the cheapest possible way. This single project has changed the dynamics of healthcare system of the nation for ever. This silent revolution can only move forward. The findings confirm that the professionals are sincere, well trained and caring. They have been available in most of the cases. This fact is also endorsed by the client survey where most of the respondents emphasized to continue this service. The researcher expects that the analysis presented here will strengthen the evaluation process of DGHS regarding the m-Health services. Increasing dissemination of quality health services require indigenous innovation of ICT. The m-Health service will always be a classic example of this fact.

## **8.6 Policy Implications**

The researcher has identified some policy implications in the light with the recommendations came from the respondents as well as experiences gathered during the study. These implications can help the decision or policy makers of this m-Health service program for improvement.

### **8.6.1 Logistics Support**

As the mobile phone set is a core actor of this e-Health service, the government should emphasize on the quality of this component for the continuity of the service delivery.

Along with the quality of the mobile phone set, the government should take necessary initiatives to make sure that the phone set will not be switched off for any technical difficulties, like- problem with phone set charging instrument, or power crisis for longer time, or disconnection for due bill payment, etc.

### **8.6.2 Human Resource Management Policy**

To provide better quality services through mobile phone, the government should create a position who will deliver the m-Health services only. Two or three doctors can be assigned for this job by roster. It will stop hampering the job of emergency medical officer in hospitals. Besides, the government should initiate trainings for the m-Health officers

regarding customs and manners of providing medical advices to the service seekers over phone. There should have a specific code of conduct about how to deal with their clients. For the continuity of m-Health services, there should have a monitoring team in DGHS head office that will monitor the activity of m-Health service units in all the Upazilas.

### **8.6.3 Policy Regarding Service Delivery System**

The government can make this m-Health service more accessible by making the incoming phone calls of the given phone numbers free of call charge. It can be possible with the collaboration of telecom companies. This initiative will help the service seekers who have complex health problem that may take longer time to explain.

The authority should take initiatives for the publicity of the m-Health services so that mass people can be aware of the service and take emergency medical advices. In this regard, the government can involve the principals of all the schools and colleges to disseminate the m-Health phone numbers through the students. This way the information of m-Health can be circulated very fast and effectively.



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## Appendix I: Tables

**Table 7: Table of Dependent and Independent Indicators**

<b>Independent Variables</b>	<b>Indicators</b>	<b>Dependent Variable</b>
1. Resources	a. Available equipments b. Availability of human resources c. Records maintenance d. Coordination among Upazila level and head office	Effective Healthcare Service: a. Availability of health services b. Accessibility c. Timeliness d. Quality service e. Infrastructure readiness f. Public awareness of the services
2. Publicity of the service	a. Miking b. Visible object displaying the phone number	
3. Availability of the Service	a. Availability of medical officer over phone b. Consultation of Problem c. Getting medical advices over phone	
4. Service Recipient's Satisfaction	a. Satisfaction of the caller (receiving calls, behavior of call receiver) b. Cooperation from the phone receiver listening and responding with attention	

**Table 8: Level of Satisfaction of the Service Recipients due to Less Service Cost**

<b>Level of Satisfaction</b>	<b>Frequency</b>	<b>Percent</b>
Not satisfied at all	5	12.5%
Less satisfied	4	10%
Moderately satisfied	10	25%
Mostly satisfied	21	52.5%

**Table 9: Education Level of the Respondents of Naria and Savar**

<b>Level of Education</b>	<b>Naria</b>	<b>Savar</b>
Below Primary	10%	5%
Upto Primary school	30%	15%
Upto SSC	40%	10%
HSC & more than HSC	20%	70%

**Table 10: Educational Background of the Service Recipients and their Satisfaction on Language**

<b>Education Background</b>	<b>Language of service provider</b>				<b>Total</b>
	Not satisfied at all	Less satisfied	Moderately satisfied	Mostly satisfied	
HSC & more than HSC	1	1	8	13	23
SSC	1		3	5	9
Primary		1	3	4	8
<b>Total</b>	2	2	14	22	40

**Table 11: Satisfaction of the Service Recipients due to Service Cost and Distance**

<b>Distance between hospital and home</b>	<b>Save money</b>				<b>Total</b>
	Not satisfied at all	Less satisfied	Moderately satisfied	Mostly satisfied	
1-5 km	1	2	5	11	19
6-10 km	2	1	4	9	16
11-15 km	1	1			2
16-20 km	1				1
21-25 km				1	1



26-30 km			1		1
<b>Total</b>	5	4	10	21	40

**Table 12: Satisfaction of the Service Recipients due to Saving Time and Distance**

Distance between hospital and home	Satisfaction Due to Saving Time				Total
	Not satisfied at all	Less satisfied	Moderately satisfied	Mostly satisfied	
1-5 km	1	1	5	12	19
6-10 km	2	1	2	11	16
11-15 km	1	1			2
16-20 km	1				1
21-25 km				1	1
26-30 km				1	1
<b>Total</b>	5	3	7	25	40

**Table 13: Findings of the Study**

Independent Variables	Indicators	Dependent Variable
1. Resources	<p>a. each UHCs had one mobile phone set to provide service</p> <p>b. Emergency Medical Officers of the UHCs provided mobile phone services</p> <p>c. 1 UHC (50%) were maintaining the record of callers list accordingly</p> <p>d. The UHCs were coordinated (been instructed and monitored) with the head office through mobile phone mostly, e-mail and official letter also.</p>	<p>Effective Healthcare Service:</p> <p><b>I.</b> Availability of health services</p> <p><b>II.</b> Accessibility</p> <p><b>III.</b> Timeliness</p> <p><b>IV.</b> Quality service</p> <p><b>V.</b> Infrastructure readiness</p> <p><b>VI.</b> Public awareness of the services</p>
2. Publicity of the service	<p>a. There was no miking about this service.</p> <p>b. In Savar UHC, sign boards were placed in several locations. And in Naria UHC, the phone number was printed on the entry ticket of outdoor section.</p>	
3. Availability of the Service	<p>a. The doctors were available for 24 hours over phone to provide medical advices</p> <p>b. Maximum service recipients were able to consult about their problem</p> <p>c. Maximum service recipients received medical advices, or suggestions, or drugs prescription over phone.</p>	
4. Service	<p>a. The service recipients were mostly</p>	

Recipient's Satisfaction	satisfied in terms of behavior of the service providers, less cost and time for getting service, and quality of service.  b. Maximum service respondents informed that the service providers attended the calls and listened to them very cordially.	
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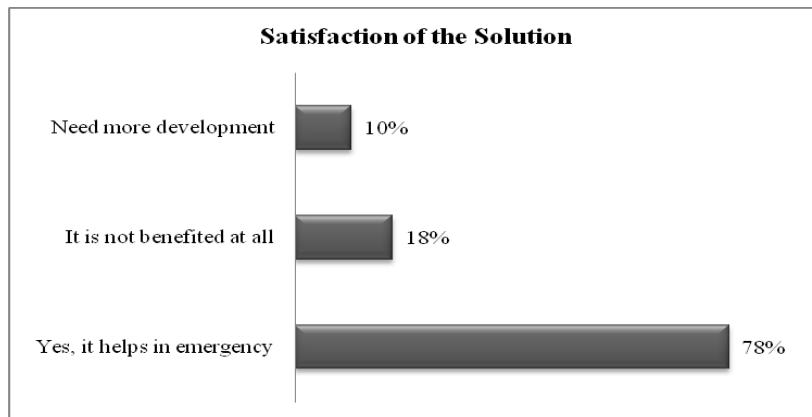
**Table 14: Deviation in Responses during Measuring Satisfaction Rates**

<b>Criteria for Satisfaction Rating</b>	<b>Mean</b>	<b>Std. Deviation</b>
Behavior of service provider	3.30	.82
Language of service provider	3.40	.81
Security for getting service	2.93	.94
Quality of service	2.93	.97
Save time	3.30	1.07
Save money	3.18	1.06
Feeling of security	3.40	.90

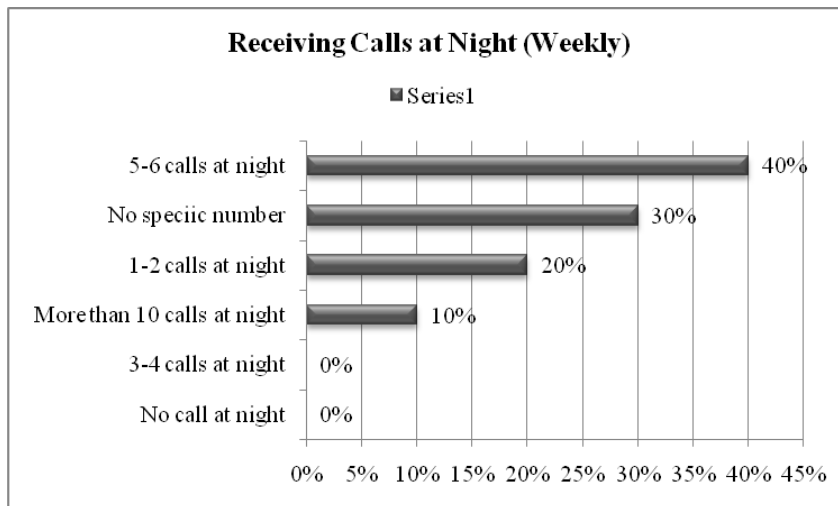
**Table 15: Calling Experience of the Researcher in Ten UHCs for Data Validation**

	A	B	C	D	E	F	G	H	I	J
1	Upazila Name	Phone Number	Calling Time	Call Duration	Connection	Doctors	Reception	Respons	Type of Advice	Remarks
2	Sandwip, Chittagong	1730324454	11:50:00	1.5 mins	yes	no	very bad	no	None	very bad.. told to visit Haramia Bridge Ghat Hospital
3	Bandarban District Sodor	1730324765	12:50:00		no	---	---	---	None	---
4	Kaligonj, Lalmonirhat	1730324666	13:50:00	3:05:00	yes	yes	very good	yes	medicine	very good
5	Tala, Satkhira	1730324619	14:50:00	3:17:00	yes	yes	very good	yes	medicine	very good
6	Bissonath, Sylhet	1730324751	16:50:00	9:32:00	yes	yes	very good	yes	medicine	Excellant service
7	Durgapur, Netrokona	1730324541	19:50:00	10:05:00	yes	yes	very good	is cordial	medicine	Excellant service
8	Sarsa, Jessor	1730324587	1:30:00	---	Unreachable	---	---	---	---	Tried to reach for 2 times, but failed
9	Dohar, Dhaka	1730324401	1:30:00	---	Didn't receive	---	---	---	---	Tried to reach for 2 times, but failed
10	Puthia Rajshahi	1730324707	1:50:00	---	1 call rejected, 1 call not received	---	---	---	---	Tried to reach for 2 times, but failed
11	Muladi, Borisal	1730324415	1:50:00	---	Unreachable	---	---	---	---	Tried to reach for 2 times, but failed

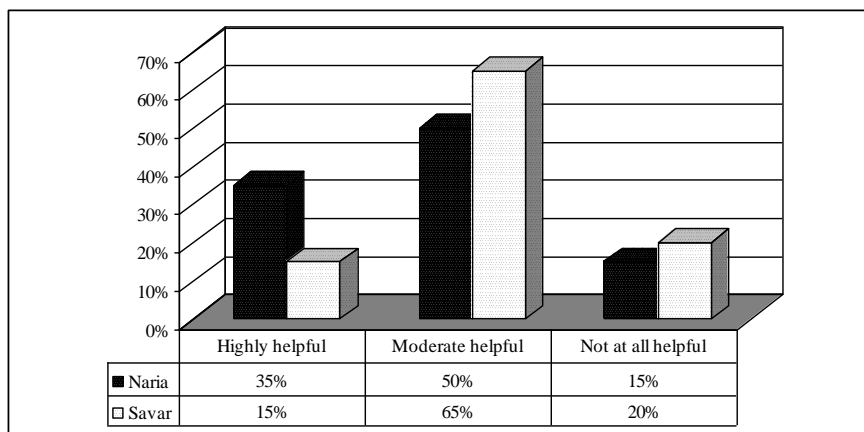
## Appendix II: Figures



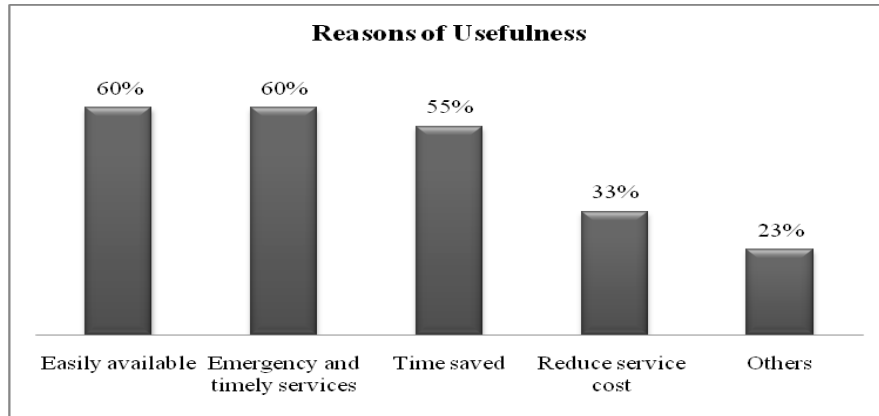
**Figure 16: Satisfaction of the Medical Advices**



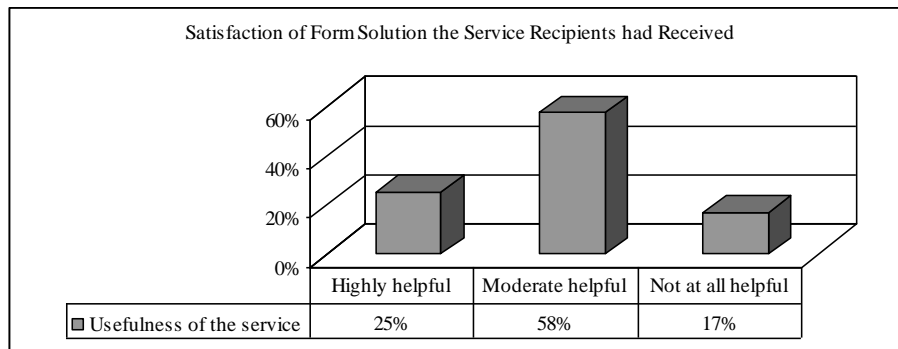
**Figure 17: Frequency of Receiving Calls at Night in a Week**



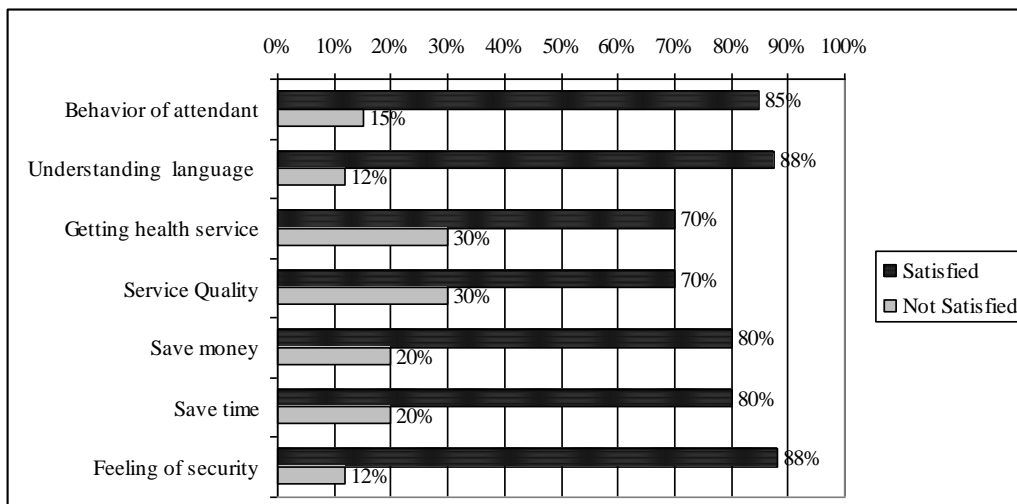
**Figure 18: Satisfaction of the Service Recipients on Received Medical Advices**



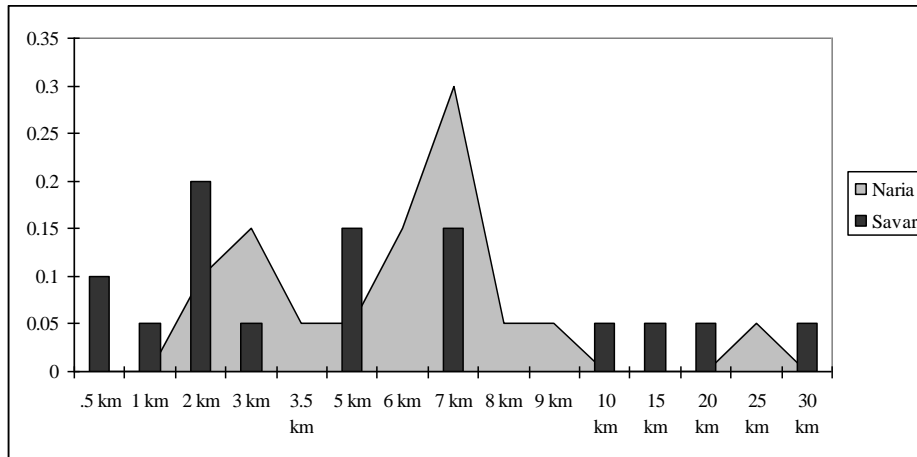
**Figure 19: Opinions of the Satisfied Service Seekers for Improvement of the Program**



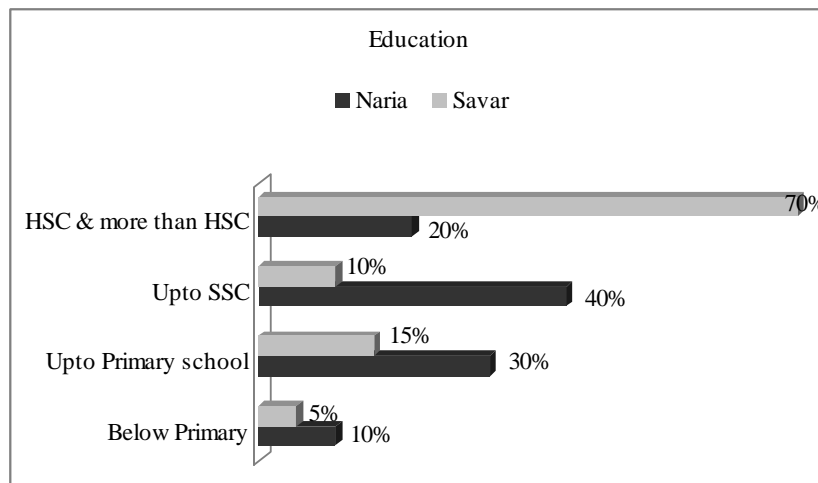
**Figure 20: Satisfaction Scale of Medical Advice the Service Recipients had Received**



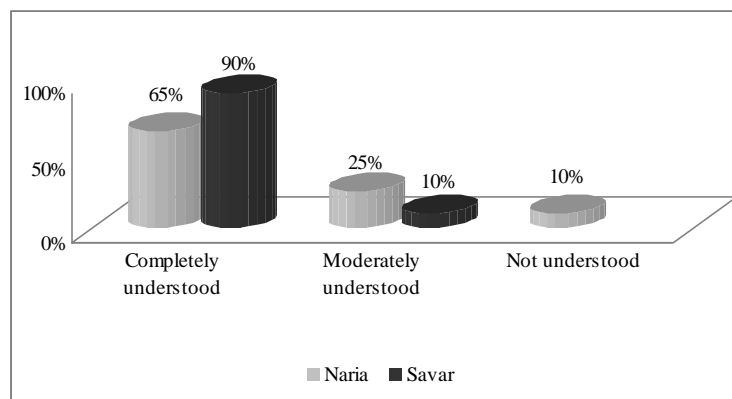
**Figure 21: Combined Satisfaction Scale of the Service Recipients in Two UHCs**



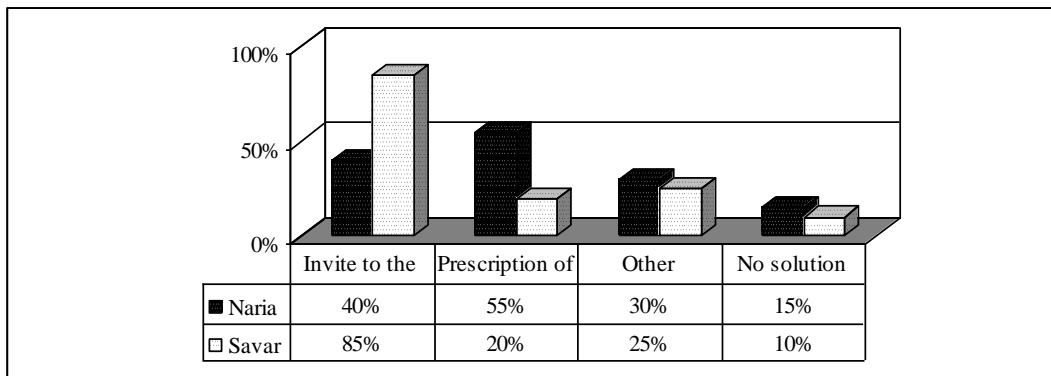
**Figure 22: Distances of the Dwelling Place of the Service Recipients as the Hospitals**



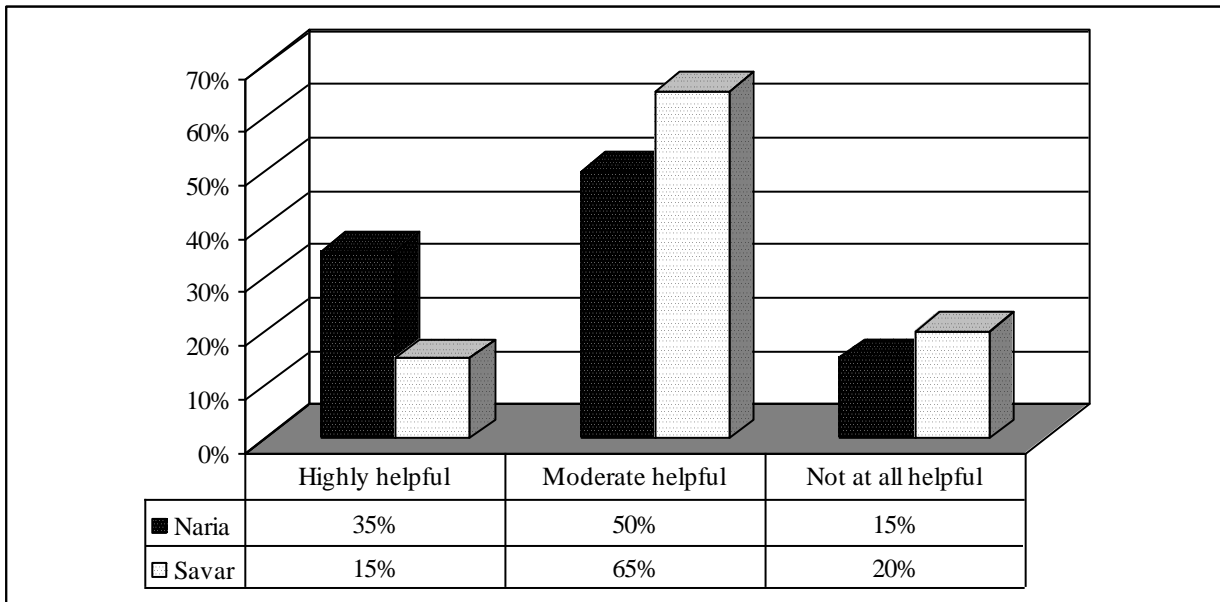
**Figure 23: Comparative Figure of Educational Background of the Service Recipients of Two Upazilas**



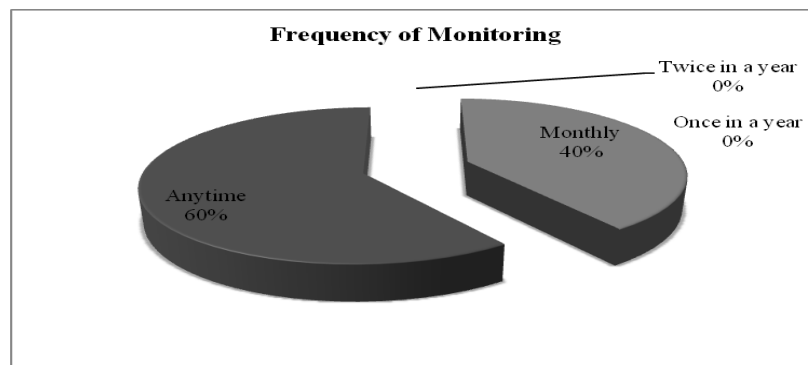
**Figure 24: Variation in Understanding the Conversation**



**Figure 25: Received Medical Advices over Phone**

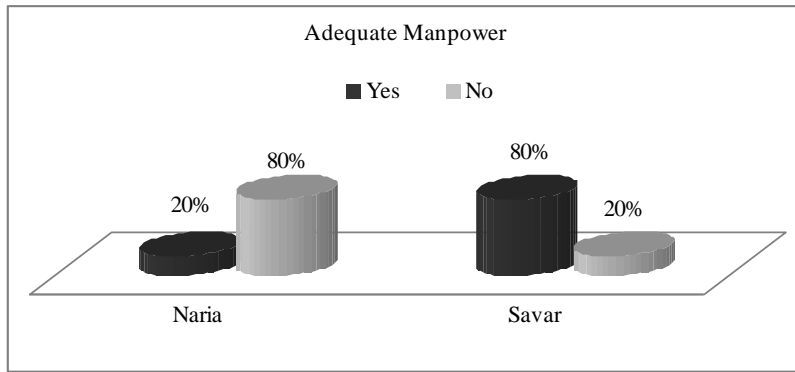


**Figure 26: Usefulness of the Received Medical Services from Service Receivers' Perspective**

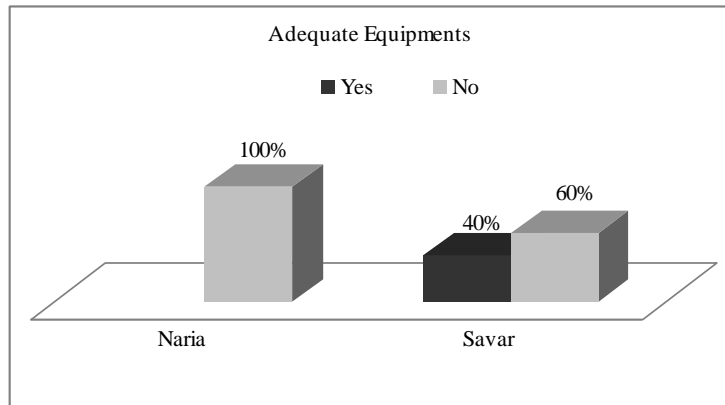


**Figure 27: Frequency of Monitoring by Head Office (n=10)**





**Figure 28: Adequacy of Human Resources (n=10)**



**Figure 29: Adequacy of Equipments (n=10)**

### **Appendix III: Case Studies**

#### Case Study- 5

Papia Aktar (28 years) was a teacher. She lived in Naria upazila. Naria upazila health complex was around 2 miles away from her home. She made a call to the emergency phone number due to abdominal pain. According to Papia, the doctor received the phone call and asked about her problem very cordially. So, she felt very good and discussed her problem with the doctor very frankly. Then the doctor prescribed medicine for her. He also asked Papia to come to the hospital if she needed. After taking medicine she got cured. Papia got the phone number from one of her relatives who were satisfied with the service. According to Papia, mobile phone health services program was very much helpful for the poor people particularly living in the remote areas. This service helped her to reduce her transport cost substantially to access the medical care. She also has mentioned that this service helped her to save her time of traveling and waiting in the que for medical attendants. However Papia emphasized the importance of reductions of call charges to these numbers. While talking to a doctor over phone generally it takes a lot of time to explain medical problem one is having. And that is why very poor people might not want to take advantage of this service. However, Papia in front as that she was fully satisfied with the service.

## Appendix IV: Questionnaires & Check-list

### A. Questionnaires & Check-list in English

#### Questionnaire Set: A

#### For the Service Recipients of Mobile Phone Aided Health Services at Upazila Level

Serial No: \_\_\_\_\_

Date: \_\_\_\_\_

Upazila: \_\_\_\_\_

1. Name: .....
2. Sex:  Male  Female
3. Age: ..... Years
4. Educational background:
  - More than HSC
  - Upto HSC
  - Upto SSC
  - Upto Primary school
  - Below Primary
  - Illiterate
5. Occupation: .....
6. Distance between dwelling place and the health complex (approximately):.....
7. How frequently have you used the mobile phone aided health service by DGHS?
  - Occasionally  Several times  Hardly use
8. Please mention the reason why you have used it?
  - I. ....
  - II. ....
9. What was your experience of using MPHS? You call is-
  - Hardly received
  - Sometimes received
  - Always received
  - Received but it was not helpful
10. What was your experience after getting an attendant over phone?

- S/he was receptive    S/he was not receptive    S/he was receptive but in hurry
- 11.** Did you follow his/her conversation?    Yes    No
- 12.** Did they give you adequate time to listen?    Yes    No
- 13.** Did they try to understand your every word?    Yes    No
- 14.** How did you get the phone number?
- From relatives or neighbors
  - From posters
  - From miking
  - From home visit of their officials
  - Others (please mention) ....
- 15.** Have you seen any poster or bill board or hear miking about this service in your area?
- Yes    No
- 16.** What type of medical advice did you get over phone?
- Prescription of drugs
  - Appointment of the doctor
  - Invite to the hospital
  - No medical advice
  - Others (please mention): .....
- 17.** How helpful was the conversation?
- Highly helpful
  - Moderate helpful
  - Not at all helpful
- 18.** Please mention in which way it was useful?
- Reduce service cost [Please mention how much money you have saved? .....]
  - Easily available
  - Timely services
  - Time saved
  - Others (Please mention).....
- I.** If 'No', please mention the reason:
- i. ....
  - ii. ....
- 19.** Have you ever found that the phone was switched off or unreachable?    Yes    No
- 20.** Have you ever called this number at night time for health assistance?
- Yes    No

If 'Yes', what was your experience?

- No response
- Responded but no help was available
- Responded with reasonable care

**21.** Do you know how to complain or give feedback about this mobile phone service through SMS?

- Yes  No

**22.** Have you ever made any complaint to the relevant authority?  Yes  No

If 'Yes',

**a.** What was the issue you complained about? \_\_\_\_\_

**b.** How did you make your complain?  SMS  Written  Orally

**c.** Did you notice any improvement after the complaint was made?

- Yes  No  Don't know

**23.** Did you ever have to pay for getting this service?  Yes  No

If 'Yes',

**I.** How much you have to pay? .....

**II.** To whom have you paid? .....

**24.** Will you suggest your relatives or neighbors to take this service?  Yes  No

Please mention the reason:

i. ....

ii. ....

iii. ....

**25.** Do you have any suggestion to improve the service?

i. ....

ii. ....

**26.** How much satisfied are you of this service? Please put tick mark.

	Most satisfied	Satisfied	Less satisfied	Not satisfied
Behavior of the attendant				
Understanding the language of the attendant				
Getting health service				
Service Quality				

Save money				
Save time				
Feeling of security				

*Thanks for your valuable time and information. Your information will be used for academic purpose. Thanks for your cooperation.*

**Questionnaire Set: B**

**For the Service Providers of Mobile Phone Aided Health Services at Upazila Level**

Serial No: \_\_\_\_\_

Date: \_\_\_\_\_

Upazila: \_\_\_\_\_

1. Name (optional).....
2. Designation: .....
3. How long are you been here? .....
4. Have you got any training from Head Office to manage the mobile phone health services?  
 Yes     No

If yes, please mention what type of training along with duration?

Name of Training	Duration
1.	
2.	
3.	

5. Do you have any assigned staff to deliver mobile phone health service?  
 Yes     No  
 If 'No', then who delivers the service? .....
6. Do you have any initiative to make publicity of the service?  Yes     No
  - a. If 'Yes', what type of technique do you follow?  
 Postering

- Miking
  - Home visit
  - Others (please mention): .....
- 7.** Is there any record of your clients you have attended?  Yes  No
- a.** If yes, for what purpose do you keep it?: .....
  - b.** If no, do you have any plan to keep it?  Yes  No
- 8.** Do you think the number of outdoor patients was increasing after running MPHS program?
- Yes  No
- If 'Yes', what was the percentage? .....
- 9.** How do you get coordinated with the head office?
- Via phone
  - Via e-mail
  - Via SMS
  - Via official letter
  - Others (please mention): .....
- 10.** Do you initiate any report on the prospects of MPHS program?
- Yes  No
- If 'Yes', how often?
- Fortnightly
  - Monthly
  - Annually
  - Others (please mention): .....
- 11.** How does the head office follow up/ keep track on your activities?
- Via phone
  - Via e-mail
  - Inspection
  - Monthly meeting
  - Others (please mention): .....
- 12.** How frequently are you monitored by higher authority? .....
- Once in a year
  - Twice in a year
  - Monthly
  - Others (please mention).....

**13.** Have you ever collected feedback from your clients about the existing service?

- Yes  No

If yes, how do you collect the feedback? .....

**14.** Do you have adequate manpower and equipments to do your activities effectively?

- Yes  No

**15.** Do you have enough equipment as per your requirement?  Yes  No

**a.** If not, what are the equipments you need? .....

**16.** How do you assess the effectiveness of MPHS?

- Very effective  
 Moderate effective  
 Not effective at all

Please mention the reason: .....

**17.** Do you have medical assistant available for 24 hours?  Yes  No

**a.** If 'No', what was the reason?

**18.** How many calls do you receive weekly on an average? ....

**19.** At night time how long the medical health officer is available over phone:

- Upto 10.00 pm  
 Upto 12.00 am  
 Upto 2.00 am  
 Whole night  
 Others (please mention) .....

**20.** Where do you keep the mobile phone?

- At office  
 To the medical officer  
 To the office in charge

**21.** Do you have any backup if there is any problem with the mobile phone set?

- Yes  No

**a.** If 'Yes', please mention the technique: .....

**b.** If 'No', please mention the reason: .....

**22.** How much the service seekers understand your language?

- Very poor  
 Moderate  
 Very well

**23.** Do you face any technical problem for load-shedding?  Yes  No



- a. If 'Yes', do you have any backup plan?  Yes  No

If 'Yes', please mention the plan: .....

24. Do you receive any support from the local leaders and administration?  Yes  No

- a. If 'Yes',

i. What sort of support do you get?

a) .....

b) .....

ii. How often do you get it? .....

- b. If 'No', do you think you need their cooperation?  Yes  No

Please mention the reason:

i. ....

ii. ....

25. What is your suggestion/opinion as to how the service could be more effective?

i. ....

ii. ....

*Thanks for your valuable time and information. Your information will be used only for academic purpose. Thanks for your cooperation.*

### **Interview Checklist for some Higher Officials**

Date: .....

Place: .....

1. Name: .....

2. Occupation: .....

3. Designation: .....

4. Do you think mobile phone aided health service of DGHS will be able to reach health facilities to the remote area people of Bangladesh? Please explain.

5. Do you think the service seekers are benefited by this service? Please explain.

6. What are the challenges of this service? Please explain.

7. Do you think local leaders and administration have an important role to make it effective? Please explain.

8. What is your suggestion to make the service successful and reach it effectively to the residing area?

*Thank you very much for your valuable time and information.*

**Checklist for Key Informants**

Date: \_\_\_\_\_

Name: \_\_\_\_\_

Sex:  Male  Female

Occupation: \_\_\_\_\_

Dwelling place/Upazila: \_\_\_\_\_

1. Do you know about mobile phone based health service of DGHS?  Yes  No
2. If 'Yes', how do you know about this service?
3. What do you know about this service? .....
4. Have you or your family member ever used this service?  Yes  No
5. Do you think this service is benefited for the people?  Yes  No

Please mention the reason:

- i. ....
  - ii. ....
  - iii. ....
6. What is your opinion/suggestion to make the service more effective or useful?
    - i. ....
    - ii. ....
    - iii. ....

*Thank you very much for your valuable time and information.*

## B. Questionnaire and Checklist in Bengali

### প্রশ্নমালা সেটঃ ক

#### মোবাইল ফোনে স্বাস্থ্য সেবা গ্রহণকারীদের জন্য

কোড নম্বরঃ \_\_\_\_\_

তারিখঃ \_\_\_\_\_

উপজেলাঃ \_\_\_\_\_

১. নামঃ .....

২. লিঙ্গঃ  পুরুষ  মহিলা

৩. বয়সঃ ..... বছর

৪. শিক্ষাগত যোগ্যতা:

এইচএসসি ও ততোর্ধ

এসএসসি

প্রাইমারি

অক্ষরজ্ঞান

নিরক্ষর

৫. পেশাঃ .....

৬. বসবাসের স্থান থেকে হাসপাতালের দূরত্ব (আনুমানিক):.....

৭. স্বাস্থ্যজনিত সমস্যার দরুন আপনি কতবার এই মোবাইল ফোন স্বাস্থ্যসেবা গ্রহণ করেছেন?

মাঝে মাঝে  দুই/একবার  কখনো করি নাই

৮. কি কি সমস্যার কারণে আপনি এই সেবা গ্রহণ করেছেন?

I. ....

II. ....

৯. এই সেবা গ্রহণের জন্য মোবাইল ফোনে কল করার পর আপনার অভিজ্ঞতা কি?

ফোনে কানেকশন পাওয়া যায় না

সহজে ফোন রিসিভ করে না

মাঝে মাঝে রিসিভ করে

সব সময় রিসিভ করে

ফোন রিসিভ করেছে, কিন্তু কোন সমাধান পাইনি

১০. যিনি আপনার ফোন কল রিসিভ করেছিল, তার ব্যবহার কেমন ছিল?

মোটামুটি আন্তরিক  আন্তরিক নয়  মোটামুটি আন্তরিক কিন্তু তাড়াহড়া করছিল

১১. তিনি কি আপনার কথা মনোযোগ দিয়ে শুনে বোঝার চেষ্টা করছিল?

- আন্তরিকভাবে বোঝার চেষ্টা করছিল
- কিছুটা বিরক্ত হয়ে শুনছিল
- তাড়াতাড়ি বলার জন্য বলেছিল
- অন্য কাজে ব্যস্ত ছিল

১২. আপনি কি তাকে সব কথা বুঝাতে পেরেছিলেন?

- সম্পূর্ণ বুঝাতে পেরেছি  মোটামুটি পেরেছি  ভালভাবে পারি নাই

১৩. মোবাইল ফোন সার্ভিসের এই ফোন নম্বর আপনি কোথা থেকে পেয়েছেন?

- আত্মীয়/ প্রতিবেশীর কাছ থেকে
- পোস্টার দেখে
- মাইকিং শুনে
- স্বাস্থ্য কমপ্লেক্সের লোক বাসায় এসে জানিয়েছে
- অন্যান্য (অনুগ্রহ করে উল্লেখ করুন) ....

১৪. আপনি কি আপনার এলাকায় এই সেবা সংক্রান্ত কোন পোস্টার বা বিল বোর্ড বা সাইন বোর্ড দেখেছেন, বা মাইকিং শুনেছেন?

- মাইকিং শুনেছি
- সাইন বোর্ড দেখেছি
- বিল বোর্ড দেখেছি
- এরকম কিছু দেখি নাই, শুনি নাই

১৫. ফোনে আপনাকে কি ধরনের সমাধান দেয়া হয়েছিল?

- অশুধের প্রেসক্রিপশন
- ডাক্তারের সাথে দেখা করতে বলেছিল
- হাসপাতালে আসতে বলেছিল
- কোন সমাধান পাই নাই
- অন্যান্য (অনুগ্রহ করে উল্লেখ করুন): .....

১৬. এই ফোনলাপ আপনার সমস্যা সমাধানে জন্য কতখানি সহায়তা করেছে?

- খুব সহায়তা করেছে
- মোটামুটি সহায়তা করেছে
- কোন সহায়তা করেনি

১৭. আপনি কি মোবাইল ফোন স্বাস্থ্য সেবাকে উপকারি বলে মনে করেন?

- হ্যাঁ, প্রয়োজনের সময় কাজে লাগে

- তেমন লাভ হয় না
- আরো উন্নত করা দরকার
১৮. এই সেবা কার্যক্রমের কি কি ভাল দিক আছে বলে আপনি মনে করেন?
- এই সার্ভিস পেতে খরচ কম লাগে (আনুমানিক কত খরচ বেঁচে যায় বলে মনে করেন? .....
- হাসপাতালে না গিয়ে সহজে সেবা পাওয়া যায়
- জরুরি প্রয়োজনের সময় সেবা পাওয়া যায়
- সময় বাঁচে
- অন্যান্য (অনুগ্রহ করে উল্লেখ করুন).....
১৯. আপনি কি কখনো এই সেবা কার্যক্রম থেকে প্রদত্ত ফোন নম্বরে কল করে বন্ধ অবস্থায় পেয়েছেন?
- হ্যাঁ  না
২০. আপনি কি কখনো স্বাস্থ্যসেবা পেতে এই নম্বরে রাতে কল করেছেন?
- হ্যাঁ  না
২১. রাতে ফোন করে থাকলে আপনার কেমন অভিজ্ঞতা হয়েছে?
- কেউ ফোন ধরে নাই
- ফোন ধরেছে কিন্তু কোন সমাধান পাই নাই
- পরের দিন ফোন করতে বলেছে
- ফোন ধরেছে এবং ভালভাবে সেবা দিয়েছে
২২. আপনি কি জানেন যে এই সেবা সংক্রান্ত আপনার মতামত বা অভিযোগ মোবাইল ফোনে এসএমএস এর মাধ্যমে দেয়া যায়?
- হ্যাঁ  না
২৩. আপনি কি এই সেবার ক্ষেত্রে কোন অভিযোগ কখনো সংশ্লিষ্ট কর্তৃপক্ষকে জানিয়েছেন?  হ্যাঁ  না
- জানিয়ে থাকলে,
- I.** অভিযোগের বিষয় কি ছিল? \_\_\_\_\_
- II.** আপনি কি মাধ্যমে অভিযোগ জানিয়েছেন?  এসএমএস  লিখিত  মৌখিক
- III.** অভিযোগ জানানোর পর কোন পরিবর্তন হয়েছে কি?
- হ্যাঁ  না  জানি না
২৪. এই সেবা পেতে আপনাকে কি কখনো টাকা দিতে হয়েছে?  হ্যাঁ  না
- হ্যাঁ হলে,
- I.** কত টাকা? .....
- II.** কাকে দিতে হয়েছে? .....
২৫. আপনি কি আপনার প্রতিবেশি বা আত্মীয় কে এই সেবা গ্রহণের জন্য পরামর্শ দিবেন?  হ্যাঁ  না
- অনুগ্রহ করে কারন উল্লেখ করুনঃ

- i. ....
- ii. ....
- iii. ....

২৬. মোবাইল ফোনে স্বাস্থ্যসেবা কার্যক্রমের মান উন্নয়নের জন্য কি কি করা উচিত বলে আপনি মনে করেন?

- একজন ডাক্তার ফোন ধরলে ভাল হয়
- ২৪ ঘন্টা যেন ফোন রিসিভ করে
- ফোন নম্বরটি প্রচারের জন্য আরো উদ্যোগ নিলে ভাল হয়
- অন্যান্য (অনুগ্রহ করে উল্লেখ করুন).....

২৭. মোবাইল ফোনে স্বাস্থ্যসেবা গ্রহনে আপনি কতখানি সন্তুষ্ট? নিচের ঘরে টিক চিহ্ন দিনঃ

	খুব সন্তুষ্ট	মোটামুটি সন্তুষ্ট	অল্প সন্তুষ্ট	সন্তুষ্ট নই
সেবা দাতার ব্যবহার				
সেবা দাতার ব্যবহৃত ভাষা ও কথোপকথন				
সেবা প্রাপ্তি নিশ্চয়তা				
সেবার মান				
কম খরচে স্বাস্থ্য সেবা				
কম সময় স্বাস্থ্য সেবা				
স্বাস্থ্য নিরাপত্তা লাভে মানসিক স্বস্তি				

[আপনার মূল্যবান সময় ও তথ্য প্রদানের জন্য আন্তরিক ধন্যবাদ। আপনার প্রদত্ত তথ্যাবলী শুধুমাত্র শিক্ষাবিষয়ক গবেষণার উদ্দেশ্যে ব্যবহৃত হবে।]

**প্রশ্নমালা সেটঃ খ**

**ডিজিএইচএস প্রদত্ত মোবাইল ফোনে স্বাস্থ্য সেবা প্রদানকারীদের জন্য**

কোড নম্বর: \_\_\_\_\_

তারিখ: \_\_\_\_\_

উপজেলা: \_\_\_\_\_

১. নাম (ঐচ্ছিক).....
২. পদঃ .....
৩. আপনি কতদিন ধরে এই প্রতিষ্ঠানে সেবা দিয়ে আসছেন? .....
৪. আপনি কি চাকুরিজীবনে এমন কোন প্রাতিষ্ঠানিক প্রশিক্ষণ পেয়েছেন যা মোবাইল ফোনে স্বাস্থ্য সেবা প্রদানে সহায়ক?
  - হ্যাঁ  না
 হ্যাঁ হলে, কি প্রশিক্ষণ এবং তা কত দিনের ছিল, অনুগ্রহ করে উল্লেখ করুনঃ

প্রশিক্ষণের নাম	আয়োজক প্রতিষ্ঠানের নাম	সময় (দিন/মাস)
১.		
২.		
৩.		

৫. মোবাইল ফোনে স্বাস্থ্যসেবা প্রদানের জন্য বিশেষ কোন স্বাস্থ্য কর্মকর্তা নিয়োজিত আছেন কি ?

- হ্যাঁ, একজন আছেন
- পালানক্রমে আছেন
- নির্দিষ্ট কেউ নেই, সুবিধামতো যে কেউ এই সেবা দিয়ে থাকে
- ডাক্তার সংকট বলে এই মুহুর্তে কেউ এই সেবা দিতে পারছে না

৬. এই সেবা সম্পর্কে জনগণকে অবহিত করতে কোন পন্থা অবলম্বন করছেন কি?  হ্যাঁ  না

I. হ্যাঁ হলে, কি পন্থা?

- পোস্টার
- মাইকিং
- বাড়ি বাড়ি গিয়ে জানানো
- বহির্বিভাগের রোগীদের মাধ্যমে প্রচার
- অন্যান্য (অনুগ্রহ করে উল্লেখ করুন): .....

৭. মোবাইল ফোনে সেবা গ্রহীতাদের কোন রেকর্ড রেজিস্ট্রার রাখা হয় কি?

- হ্যাঁ
- আছে, কিন্তু নিয়মিত লেখা হয় না
- এরকম কোন রেজিস্ট্রার নেই

I. হ্যাঁ হলে, কি উদ্দেশ্যে রাখা হয়?

- উর্ধ্বতন কর্তৃপক্ষের নির্দেশ আছে
- কত জন রোগী সেবা নেন তার হিসাব রাখতে

II. না হলে, ভবিষ্যতে রাখার পরিকল্পনা আছে কি?

হ্যাঁ  না

৮. আপনি কি মনে করেন মোবাইল ফোনের স্বাস্থ্যসেবা কার্যক্রমের ফলে হাসপাতালে সেবা গ্রহীতার সংখ্যা বৃদ্ধি পাচ্ছে?

হ্যাঁ, বেড়েছে  না  জানি না

I. হ্যাঁ হলে, কত শতাংশ বৃদ্ধি পেয়েছে বলে মনে করেন? .....

৯. আপনারা হেড অফিসের সাথে কিভাবে সমন্বয়/ যোগাযোগ রাখেন?

- ফোন
- ইমেইল
- এসএমএস
- দাপ্তরিক চিঠি
- অন্যান্য (অনুগ্রহ করে উল্লেখ করুন): .....

১০. মোবাইল ফোন স্বাস্থ্য সেবা কার্যক্রমের উপর কোন প্রতিবেদন তৈরি করতে হয় কি??

হ্যাঁ  না

হ্যাঁ হলে, কত দিন অন্তর প্রতিবেদন তৈরি করতে হয়?

- পাক্ষিক প্রতিবেদন
- মাসিক প্রতিবেদন
- বাৎসরিক প্রতিবেদন
- অন্যান্য (অনুগ্রহ করে উল্লেখ করুন).....

১১. হেড অফিস থেকে আপনাদের কার্যক্রম কিভাবে মনিটর করা হয়?

- ফোনে
- ইমেইলে
- সরাসরি প্রত্যক্ষ করে
- মাসিক/ বাৎসরিক সভায়
- অন্যান্য (অনুগ্রহ করে উল্লেখ করুন): .....

১২. উর্ধ্বতন কর্তৃপক্ষ বছরে কতবার এই কার্যক্রম মনিটর করে থাকে? .....

- বছরে একবার
- ছয়মাসে একবার
- মাসে একবার
- অন্যান্য (অনুগ্রহ করে উল্লেখ করুন).....

১৩. মোবাইল ফোন সেবার মান বাড়াতে সেবা গ্রহীতাদের মতামত গ্রহন করা হয় কি??  হ্যাঁ  না

a. হ্যাঁ হলে, কিভাবে মতামত নেয়া হয়? .....

১৪. আপনি কি মনে করেন মোবাইল ফোনে এই সেবা প্রদান করতে এই প্রতিষ্ঠানে যথেষ্ট লোকবল রয়েছে?

হ্যাঁ  না



১৫. আপনি কি মনে করেন এই সেবা প্রদান করার জন্য যথেষ্ট কারগরি সুবিধা আছে?  হ্যাঁ  না

I. না হলে, আর কি কি কারগরি সুবিধা প্রয়োজন বলে মনে করেন? .....

১৬. মোবাইল ফোন স্বাস্থ্য সেবা কার্যক্রমকে আপনি কিভাবে মূল্যায়ন করেন? এই কার্যক্রম-

খুবই কার্যকর

মোটামুটি কার্যকর

মোটেই কার্যকর না

অনুগ্রহ করে কারন উল্লেখ করুনঃ .....

১৭. মোবাইল ফোনে স্বাস্থ্য কর্মকর্তাকে কি ২৪ ঘন্টা পাওয়া যায়?  হ্যাঁ  না

I. না হলে, অনুগ্রহ করে কারন উল্লেখ করুনঃ

১৮. সপ্তাহে গড়ে রাতের বেলা কতটি ফোন কল আসে? ....

১৯. স্বাস্থ্য কর্মকর্তা রাত কয়টা পর্যন্ত ফোন রিসিভ করে থাকেন?

রাত ১০ টা পর্যন্ত

রাত ১২ টা পর্যন্ত

রাত ২ টা পর্যন্ত

সারা রাত

অন্যান্য (অনুগ্রহ করে উল্লেখ করুন) .....

২০. স্বাস্থ্য সেবার জন্য প্রদত্ত মোবাইল ফোনটি সাধারণত কোথায় থাকে?

উপজেলা স্বাস্থ্য কেন্দ্র অফিসে

স্বাস্থ্য কর্মকর্তার কাছে

অন্যান্য (অনুগ্রহ করে উল্লেখ করুন) .....

২১. মোবাইল ফোনে স্বাস্থ্য সেবাদানের জন্য প্রদত্ত ফোন সেটে কোন সমস্যা হলে সেবাদান অব্যাহত রাখার জন্য কোন বিকল্প পন্থা আছে কি?

হ্যাঁ  না

I. হ্যাঁ হলে, কি পন্থা? উল্লেখ করুনঃ .....

II. না হলে, কারন উল্লেখ করুনঃ .....

২২. সেবা গ্রহীতা ফোনে আপনার কথা কতখানি বুঝতে পারে বলে আপনি মনে করেন?

খুবই কম

মোটামুটি বুঝতে পারে

ভালভাবে বুঝতে চেষ্টা করি

২৩. লোডশেডিং এর কারনে এই সেবা প্রদান ব্যাহত হয় কি?  হ্যাঁ  না

I. হ্যাঁ হলে, সেই সমস্যা মোকাবেলায় কোন পদক্ষেপ নিয়েছেন কি?

হ্যাঁ  না

i. হ্যাঁ হলে, কি পদক্ষেপ? ( অনুগ্রহ করে উল্লেখ করুন) .....

২৪. মোবাইল ফোনে স্বাস্থ্য সেবা প্রদান কার্যক্রম ত্বরান্বিত করতে স্থানীয় সরকার বা জনপ্রতিনিধি বা প্রভাবশালী কারো সহযোগিতা পেয়েছেন ?

হ্যাঁ, সহায়তা পেয়েছি  কেউ কেউ খোঁজ রাখেন  না, কোন সহায়তা পাই নাই

I. হ্যাঁ হলে,

i. কি ধরনের সহযোগিতা পেয়েছেন, অনুগ্রহ করে উল্লেখ করুনঃ

○ .....

○ .....

ii. কতবার এই ধরনের সহযোগিতা পেয়েছেন? .....

II. না হলে, এই ধরনের সহযোগিতার প্রয়োজন আছে বলে আপনি মনে করেন?  হ্যাঁ  না

অনুগ্রহ করে কারন উল্লেখ করুন:

i. ....

ii. ....

২৫. মোবাইল ফোনে স্বাস্থ্য সেবার এই কার্যক্রমকে আরো কার্যকর ও সফল করার জন্য কি কি করণীয় বলে আপনি মনে করেন?

i. ....

ii. ....

[আপনার মূল্যবান সময় ও তথ্য প্রদানের জন্য আন্তরিক ধন্যবাদ। আপনার প্রদত্ত তথ্যাবলী শুধুমাত্র শিক্ষাবিষয়ক গবেষণার উদ্দেশ্যে ব্যবহৃত হবে।]

**উচ্চপদস্থ কর্মকর্তা অথবা বিশিষ্ট ব্যক্তিবর্গের সাক্ষাৎকারের নির্দেশিকাবলী**

তারিখ: .....

স্থান: .....

১. নাম: .....

২. পেশা: .....

৩. পদ: .....

৪. মোবাইল ফোন স্বাস্থ্য সেবা কার্যক্রম সম্পর্কে আপনার কি অভিমত? অনুগ্রহ করে ব্যাখ্যা করুন।

৫. আপনি কি মনে করেন এই সেবা কার্যক্রম সেবা গ্রহীতাদের জন্য উপকারি ? অনুগ্রহ করে ব্যাখ্যা করুন।

৬. এই কার্যক্রমকে আরো সফল করতে কি কি প্রতিবন্ধকতা আছে বলে আপনি মনে করেন? অনুগ্রহ করে ব্যাখ্যা করুন।

৭. এই সেবা কার্যক্রমকে সফল করতে স্থানীয় সরকার ও জনপ্রতিনিধিদের গুরুত্বপূর্ণ ভূমিকা আছে বলে মনে করেন কি? অনুগ্রহ করে ব্যাখ্যা করুন।
৮. এই সেবা কার্যক্রমকে অধিক কার্যকর করতে ও এর মাধ্যমে স্বাস্থ্যসেবা প্রত্যন্ত অঞ্চলে পৌঁছে দেবার কাজকে সফল করতে আপনার মতামত বা পরামর্শ কি?

আপনার মূল্যবান সময় ও তথ্য প্রদানের জন্য আন্তরিক ধন্যবাদ

### এলাকাবাসীর সাক্ষাৎকারের নির্দেশিকাবলী

তারিখ: \_\_\_\_\_

নাম: \_\_\_\_\_

লিঙ্গ:  পুরুষ  মহিলা

পেশা: \_\_\_\_\_

বসবাসের এলাকা: \_\_\_\_\_

১. আপনি কি ডিজিএইচএস প্রদত্ত মোবাইল ফোন স্বাস্থ্য সেবা কার্যক্রম সম্পর্কে জানেন?  হ্যাঁ  না
২. হ্যাঁ হলে, এই সেবা সম্পর্কে কিভাবে জেনেছেন? .....
৩. আপনি এই সেবা সম্পর্কে কি কি জানেন? .....
৪. আপনি অথবা আপনার পরিবারের কোন সদস্য এই সেবা গ্রহণ করেছেন কি?  হ্যাঁ  না
৫. আপনি কি মনে করেন এই সেবার মাধ্যমে মানুষ উপকৃত হচ্ছে?  হ্যাঁ  না

অনুগ্রহ করে কারন ব্যাখ্যা করুনঃ

I. ....

II. ....

III. ....

৬. এই সেবা কার্যক্রমকে আরো কার্যকর ও ফলপ্রসূ করতে আপনার পরামর্শ কি?

I. ....

II. ....

III. ....

আপনার মূল্যবান সময় ও তথ্য প্রদানের জন্য আন্তরিক ধন্যবাদ।