UNDERSTANDING THE SOCIAL CONSTRUCTION OF DIARRHOEAL DISEASE RISK IN A SLUM COMMUNITY OF DELHI, INDIA USING THE ECOSYSTEM APPROACH TO HUMAN HEALTH

by

Ranu Sharma
B.Sc., University of Ottawa, 1998

A Thesis Submitted in Partial Fulfillment of the
requirements for the Degree of

MASTER OF ARTS

in the Department of Geography

We accept this thesis as conforming
to the required standard

[redacted]

Dr. S. C. Lonergan, Supervisor (Department of Geography)

[redacted]

Dr. S. M. Taylor, Departmental Member (Department of Geography)

[redacted]

Dr. M. Wilson, Outside Member (Department of Anthropology)

[redacted]

Dr. L. M. Mitchell, External Examiner (Department of Anthropology)

Supervisor: Dr. Stephen C. Lonergan

ABSTRACT

The purpose of the study was to explore the attitudes and behaviours of mothers that live in slum communities in Delhi, India. In order to examine the social construction of diarrhoeal disease risk among children under five in a slum community in Delhi, a qualitative case study approach was employed, in the slum Janta Jeevan Camp Tigri located in south New Delhi. The ecosystem approach to human health and social construction of risk were used as the conceptual basis. The presence, meaning and relationships of various themes were discussed and interpreted within the objectives of the study. The urban slum ecosystem of Tigri provides the optimal conditions for infectious diseases, such as diarrhoeal disease, to become a threat. It was found that the mother's understanding of diarrhoeal disease further enhanced the vulnerability to exposure of diarrhoeal disease risk. The residents in Tigri are marginalized from the rest of Delhi, and this results in the lack of ability to mobilize resources to cope with ill health. As a consequence the probability of diarrhoeal disease in Tigri and the severe consequences associated are high. Although diarrhoeal disease is a problem in Tigri, according to the mothers, there are even greater problems essential to survival in their community. Risk depends on what is perceived to be valuable and what is considered serious.

Examiners:

[redacted]

Dr. S. C. Lonergan, Supervisor (Department of Geography)

[redacted]

Dr. S. M. Taylor, Departmental Member (Department of Geography)

[redacted]

Dr. M. Wilson, Outside Member (Department of Anthropology)

[redacted]

Dr. L. M. Mitchell, External Examiner (Department of Anthropology)

TABLE OF CONTENTS

ABSTRACT ii
TABLE OF CONTENTS iii
LIST OF TABLES vii
LIST OF FIGURES viii
ACKNOWLEDGEMENTS ix
CHAPTER 1 INTRODUCTION 1
1.1 Context of Study 1
1.2 Research Questions 4
1.3 Research Objectives 4
1.4 Rationale for Undertaking the Research and Objective of the Study 5
1.5 Organization of the Thesis 6
CHAPTER 2 BACKGROUND LITERATURE AND CONCEPTUAL FRAMEWORK 8
2.1 Introduction 8
2.2 Ecosystem Approaches to Human Health 9
2.3 The Social Construction of Diarrhoeal Disease Risk 14
2.4 Determinants of Diarrhoeal Disease 20
2.4.1 Physical environmental factors 20
Urbanization 20
Sanitation and water 23
Biological environment 25
2.4.2 Socio-behavioural factors 27
Hygiene practices 28
Maternal factors 30
Cultural Factors 33
2.5 Conclusion 34
CHAPTER 3 REGIONAL SETTING 36
3.1 Introduction 36
3.2 The Setting of Delhi 36
3.3 The Setting of Janta Jeevan Camp Tigri 42
3.3.1 Physical environmental factors 43
Housing 43
Sanitation 45
Water 49
3.3.2 Social behavioural factors 52
Social aspects 52
Medical availability and access 58
3.4 Conclusion 59

CHAPTER 4 METHODOLOGY AND METHODS 60
4.1 Methodology 60
4.1.1 Case study approach 60
4.2 Methods 61
4.2.1 Community identification 61
4.2.2 Data collection 66
Collection of documents 67
Focus groups 68
Interviews 72
Direct observations 73
Participant observations 74
4.2.3 Data analysis 76
4.3 Conclusion 78

CHAPTER 5 RESULTS AND ANALYSIS 79
5.1 Introduction 79
5.2 The State of and Pressures On the Tigri Ecosystem 79
5.2.1 Water scarcity 81
Problems 82
Solutions and responses 85
5.2.2 Latrine and sanitation degradation 86
Problems 86
Solutions and responses 89
5.2.3 Slum Living Standards 90
Problems 90
Solutions and responses 93
5.2.4 Economics 94
Problems 94
Solutions and responses 95
5.3 The Social Construction of Risk 97
5.3.1 Diarrhoeal disease in Tigri as constructed by the mothers 97
Perceived symptoms of diarrhoea 98
Causes of diarrhoea 99
Prevention of diarrhoea 102
Treatment of diarrhoea 105
Problems encountered during episodes of diarrhoea 108
5.3.2 Diarrhoeal disease in Tigri as constructed by Mamta and the healthcare providers 115
5.3.3 Diarrhoeal disease in Tigri as constructed by researcher 124
Ecosystem stressors 126
Limitations of Mamta 127
Limitations of the healthcare providers 128
Diarrhoeal disease burden 130
5.4 Conclusion 130

CHAPTER 6 CONCLUSION 133
6.1 Introduction 133
6.2 Discussion of Results 134
6.2.1 Ecosystem factors related to diarrhoeal disease risk 134
6.2.2 Attitudinal and behavioural factors related to diarrhoeal disease risk 135
6.3 Theoretical and Methodological Issues 141
6.3.1 The ecosystem approach and social construction of diarrhoeal disease risk 141
6.3.2 Methodological issues 145
6.4 Recommendations 146

LITERATURE CITED 149
APPENDIX 1: MAP OF DELHI AND LOCATION OF TIGRI 155
APPENDIX 2: LETTER OF INITIAL CONTACT 156
APPENDIX 3: CONSENT FORM 157
APPENDIX 4: QUESTION GUIDELINES FOR FOCUS GROUP DISCUSSIONS 160
APPENDIX 5: QUESTION GUIDELINE FOR INDIVIDUAL INTERVIEWS 162
APPENDIX 6: FOCUS GROUP AND INTERVIEW SCHEDULE 166

LIST OF TABLES

Table 3.1 Toilet and sanitation profile in Tigri 46

Table 3.2 Water supply profile in Tigri..... 50

Table 3.3 Health facility profile in Tigri 58

Table 5.1 The pressures on mothers in the Tigri ecosystem – constraints and responses 81

Table 5.2 Outline of diarrhoeal disease situation in Tigri 98

Table 5.3 The social constructs of diarrhoeal disease risk by Mamta and the healthcare providers in the Tigri community..... 116

Table 5.5 A summary of the diarrhoeal disease burden in Tigri as constructed by the researcher. 126

LIST OF FIGURES

Figure 1.1 Leading causes of death for all ages by infectious diseases 2

Figure 2.1 The ecosystem framework 12

Figure 3.1 A Tigri home 45

Figure 3.2 The physical conditions of Tigri 47

Figure 3.3 Child defecating in open 48

Figure 3.4 The latrines in Tigri 49

Figure 3.5 The water situation in Tigri 52

Figure 5.1 Women collectively clearing their drains 90

ACKNOWLEDGEMENTS

I first would like to thank my supervisor Stephen Lonergan, who led me to the University of Victoria. I am grateful for his guidance, faith and support in my endeavours that have allowed me to pursue graduate research. I would also like to thank the members of my committee, Martin Taylor and Margot Wilson. Your inspiring thoughts, input and expertise is greatly appreciated, as well as your effort and patience.

This study could not have been completed without the financial support of the International Development Research Centre. I would like to express my gratitude to the members of the Program Initiative, Ecosystem Approaches to Human Health in Ottawa for making me a part of their team. A special thank you to Andres Sanchez for the discussions and comments on my research. I wish to thank the South Asia Regional Office in Delhi for their warm welcome. Their support in providing me space in their office, assistance with housing and advice eased the transition to Delhi. Thank you to Katherine Hay and Elizabeth Fajber for all their words of wisdom on doing research in India.

There are no words that can express my feelings for my family. To my father and mother, Ramesh and Sita, thank you for all that you have done for me, especially all of your hard work and sacrifices that enabled me to reach this point. To my brothers, Mohit and Ronit – you will continue to be my pillars. Thank you to my family in India for greeting me with open arms, helping me with homesickness and establishing myself.

Victoria will always be kept in my heart as 'home'. I have had the opportunity to meet numerous people, who have provided me with unending support throughout this whole process. I begin with my confidants, Anne Hammill and Bindu Bual, without whom I could barely get through a day. Thank you for listening to me through this process, the motivation, and especially the laughs. I would not have been able to complete this without you. My wishes to my kindred spirits – Pardip and Ruby Bandechha, Jenniffer Randhawa, and Punam Atlas. Thank you for the utmost support you have provided, and for the words of encouragement and strength to pick me up when I am down. The memories will bring smiles for years to come. I would also like to thank Ann Zurbrigg, Wanda Ollis, Denise Pritchard, Regina Wright and Andrea Blower for the coffees, words of wisdom and the spirit to continue. I would like to thank Mundeep Grewal, Ramzi Ghurani and Adnan Duale, who have all come through for me at various times of need -- I will never forget your support.

There are other individuals in both Canada and India who have played key roles in the completion of this thesis. My sincere thoughts of gratitude are with the Mamta family, especially Dr. Mehra, Dr. Goswami, Dr. Bhardwaj, Savithri, the staff at the Mamta field

office in Tigri and Seema. I would like to express my appreciation for the time and effort put towards this endeavour to: Sanjiv and Neeraj Joshi, Sagar and Anjali Bedi, Shalini Bhardwaj, Mrs. Agrawal, Mrs. Pradhan, Mrs. Sharma, Mr. Jain (DDA), Dr. Subrahmanyam (HUDCO) and Madhab Nayak (FODRA). My breakfast and dinner talks with my roommates in Delhi, Lillian D'Souza-Muise, Melanie Sommerville, Carolyn Switzer and Sarah Paynter and friends Dharmendra Kumar and Sandeep Sirohi provided me with additional context for this study and made my experiences in Delhi worthwhile.

Finally, thank you to all the people who participated in this study. I am eternally indebted to the community of Janta Jeevan Camp Tigri without whom I could not have completed this study. As I wrote this thesis I was able to reflect upon my own cultural heritage. I am privileged to have met so many caring individuals, who have shared not only their homes, precious time and stories with me, but opened their hearts to me as well.

Dhanya vad

CHAPTER 1
INTRODUCTION

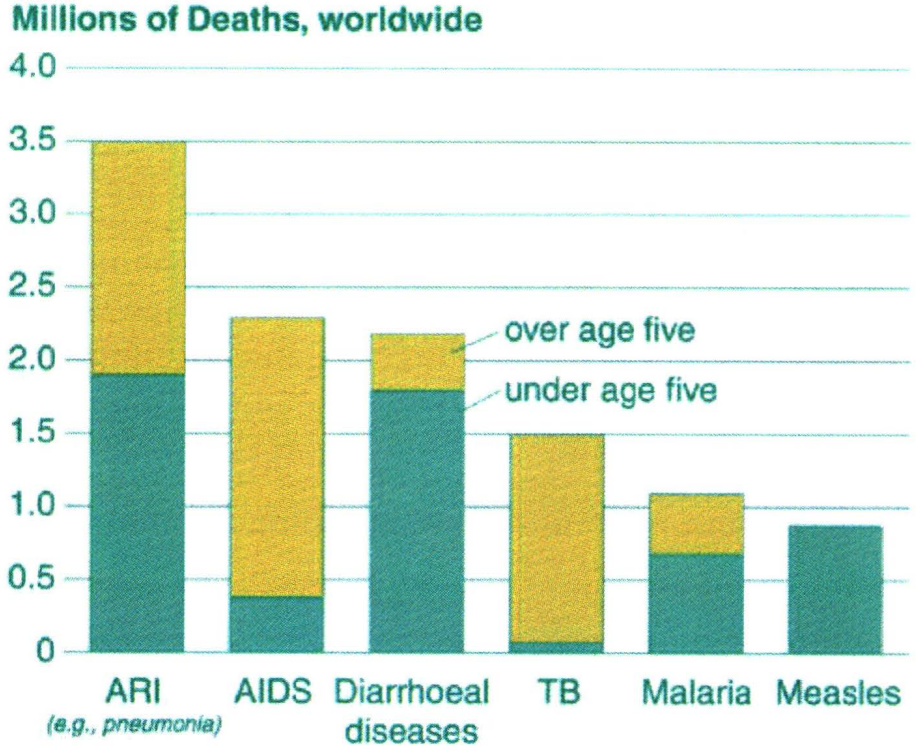
1.1 CONTEXT OF STUDY

The purpose of the thesis is to explore the attitudes and behaviours of mothers who live in urban poor communities in Delhi, India. In this research I seek to explore and understand this phenomenon within the context of the broader linkages of development, environment (bio-physical and social), and health issues occurring in an urban, poor community of Delhi, India.

At least 3.5 million children under the age of five die each year due to diarrhoea[1] worldwide (Mathan 1998:407). Diarrhoeal disease is regarded as the leading cause of infant and child mortality and morbidity in many developing countries (Brüssow et al. 1993; Lonergan and Vansickle 1991). Diarrhoeal disease is one of six diseases that WHO has identified as causing about 90% of all infectious disease deaths (see Figure 1.1) (Eyles and Sharma 2001). The presence of diarrhoeal disease can be attributed to bacteria, viruses, and parasites spread from the faecal-oral route, and are enhanced in many urban, developing country settings, such as Delhi, India, where water supplies and sanitary conditions are inadequate.

[1] Diarrhoea is defined according to the WHO standard as the passing of three or more liquid or semi-liquid stools within a 24 hour period (Brüssow, Rahim, Barclay, Freire and Dirren 1993).

Figure 1.1 Leading causes of death for all ages by infectious diseases



Source: WHO (1999), as cited in Eyles and Sharma 2001

With India's population now at 1.02 billion and Delhi's at 13.7 million individuals, it is not surprising that many problems with availability and access to resources exist (Registrar General and Census Commissioner India 2001). In Delhi, 57% of the households are connected to water supplies and only 40% are connected to proper sewerage (World Resources 1998). Conditions for ill health and disease can be further exacerbated in vulnerable[2] communities, such as those found in the squatter settlements/slums[3] of Delhi. In India it is estimated that 30% of the population resides in

[2] Vulnerability to disease may be defined as a state of increased probability of adverse outcomes, for a given environmental exposure. It includes two components: sensitivity to displacement and adaptation, the ability to return to an original resting state or achieve a new equilibrium. The most vulnerable populations are those already marginal in terms of location or resources. (Woodward, Hales and Weinstein 1998:31 and 36)

[3] Squatter settlements are typically characterised by uncontrolled and temporary housing, in many cases occupying land without permission of the owner. In contrast, slums are defined as legal, permanent

slums and 45% live in single room dwellings, with 34% of the urban poor population not receiving piped water (Mutatkar 1995). These settlements usually accommodate populations who have emigrated from various regions of India to the capital. In Delhi, more than 1 million residents live in these dwellings (World Resources 1996).

The most vulnerable populations found in today's society are women and children in developing countries. Conditions for disease are worse in squatter/slum communities where the most vulnerable populations are children below five years and their mothers (Bhatnagar and Dosajh 1986). In the developing world, mortality rates are significantly higher for children in squatter/slum areas of cities than for children living in non-squatter/slum areas. In Delhi, the infant mortality rate is 100 per 1000 live births in its urban poor communities, compared with 40 per 1000 live births for the city as a whole (World Resources 1996).

Mothers and other primary caregivers play an important role in impacting the household and individual risk level of diarrhoeal disease. They are not only responsible for management of the household, but the general well being and health of their children. Thus, in order to understand diarrhoeal disease risk among children under five in an urban poor community of Delhi, it is necessary to understand the social constructs created by the attitudes, behaviours, and beliefs of the caregivers.

---

dwellings, which have become substandard through age, neglect and/or subdivision into micro-occupational units (Agnihotri 1994; Drakakis-Smith 1981).

1.2 Research Questions

My research question is two-fold. First, in this study I will specifically ask, how do the conditions in slum ecosystems affect the social construction of risk associated with diarrhoeal disease among mothers? Second, in what ways do the attitudes and behaviours of mothers influence the social construction of diarrhoeal disease causation, prevention and control among children under five years of age, in an urban poor community of Delhi? These two questions can be broken down into a more specific question that guides the interpretation of the data: how do the attitudes, behaviours, and beliefs of mothers contribute to diarrhoeal disease risk at the household and individual level?

1.3 Research Objectives

The primary objective of this project is, as follows:

a) To develop a detailed case study to:

- Illustrate how social construction of diarrhoeal disease causation, prevention and control is linked to the broader determinants of diarrhoeal disease – i.e. factors such as development, urbanisation, environment (bio-physical and socio-economic) behaviour, and culture.

In addition, there are two secondary objectives:

b) To expand the theoretical discussion on the relationship amongst development, environment, and human health; and,

c) To provide information in a form relevant to the local community healthcare agenda.

1.4 Rationale for Undertaking the Research and Objective of the Study

The need to understand societal interactions with the physical environment has emerged in contemporary health geography. The importance of using a qualitative approach in this research is to draw on insights from social theory and examine the process of not only how and what knowledge is constructed and the relationship between constructed knowledge and behaviour, but also allow reflection about what methods are appropriate for incorporating knowledge in the analysis. Qualitative research is defined as that which stresses "the socially constructed nature of reality, the intimate relationship between the researcher and what is studied, and the situational constraints that shape inquiry" (Denzin and Lincoln 1998:8). The complexities of the biological, physical, and socio-economic environments, and cultural/behavioural factors in health and disease research over time and space must be understood in a holistic perspective. Any policy-driven solution can benefit from a better understanding of disease presence and biological/physical causation, as well as incorporate the social and cultural factors in order to target a specific community. In this study, I examined the experience of health and disease, with specific reference to diarrhoeal disease and its meaning to individuals in a particular slum community in Delhi. The strength of the study relied on the focus on views, perceptions, meanings and experiences of the study participants. Disease risk at the individual and household level is related to attitudinal and behavioural factors, which are closely linked to social constructions of diarrhoeal disease risk (i.e. cause, prevention, and control).

I concentrated on an urban poor community for the following reasons: a) they provide an identifiable sample population in the greater Delhi area and, b) these communities represent the extreme conditions brought about by developmental and environmental degradation. Furthermore, conditions for disease are concentrated in these urban poor communities where their maximum impact falls on the vulnerable population of children below five (Bhatnagar and Dosajh 1986). I chose to focus my study on mothers because they spend the most time with children and thus it is the mothers who impact the health of children. As well, mothers are responsible for the management of the household (i.e. the decisions of water resource collection, usage, and storage) and these decisions also play an important role in health.

1.5 Organization of the Thesis

The preceding sections outline the primary issues of this study. In Chapter Two an examination of the literature supporting the conceptual framework is discussed. I will begin with a general presentation of the ecosystem approach to human health as a tool to examine processes and relationships between development, environment and health. This will lead into the discussion of the main theoretical basis of the thesis, the social construction of risk. Both the ecosystem approach to human health and social construction of risk allow for a more thorough understanding of diarrhoeal disease – causation, prevention and control, especially in complex urban settings such as a slum. Chapter Three contains an extensive description of the setting of the study, the ecosystem and its fragile nature with respect to the pressures upon it. Chapter Four explains the methods used. The chapter focuses on the methodology and methods employed and the

choices I made in Janta Jeevan Camp Tigri. In Chapter Five the relationships between environment, development and health are examined in the slum – Janta Jeevan Camp Tigri, in Delhi, through both an ecosystem approach and the theoretical lens of social construction of risk. In this chapter, I present the themes and categories, which emerged, from focus group discussions, interviews and observations during my five-month field season. As well, I look not only at the social construction of risk by the mothers, but also at the broader constructs created by the community, the NGO, Mamta, and healthcare providers. My own social constructs of the diarrhoeal disease burden in the community are also explored through my experiences, and personal observations in the slum and in Delhi in general. These relationships answer the questions posited in the preceding sections and showcase the beliefs, concerns and values of this community for a better understanding of diarrhoeal disease risk. Finally, Chapter Six summarizes the findings and provides possible recommendations for this community to achieve a healthier lifestyle.

CHAPTER 2
BACKGROUND LITERATURE AND CONCEPTUAL FRAMEWORK

2.1 INTRODUCTION

The harm of diarrhoeal disease and complexity of transmission factors within urban poor communities can only be understood by exploring the relationships between development, environment and health. Different elements within these broader spheres combine to impact the social construction of disease risk in mothers and consequently the disease burden at the household and individual levels. These relationships are exemplified in Delhi, India, where the physical, biological and socio-economic environments, as well as personal behaviour, impact the well-being of individuals and populations. Most notably, biophysical resources are being degraded and there is a lack of socio-economic infrastructure to support the health and well-being of individuals and communities.

Human health is influenced not only by specific determinants of disease, but also by the results of the interactions between these determinants. The relationships between these various determinants create an unfavourable environment that can threaten individual and community health and security. A harmful environment is created which poses risks to human health. As a result, the urban environment has become a prime setting for diarrhoeal disease risks.

In this chapter I will begin with an examination of the ecosystem approach to human health as a tool that integrates many concepts, so that a better understanding of human

health may be obtained. This will explain how individuals and communities in urban ecosystems are impacted by pressures in their surroundings, and illustrate that not only is their environment unhealthy and unsustainable, but also their own risk and vulnerability to disease is increased. This chapter will discuss the social construction of risk and how decisions pertaining to health and disease ultimately lie with the individual and are conditioned by the surrounding forces of society. The degree of vulnerability to the pressures on the ecosystem is socially constructed, and in turn mediates behaviour, by influencing decision-making patterns within the individual. As a result, we are able to better understand how behaviours in response to these social constructs affect the risk to diseases, including diarrhoeal disease. The last part of this chapter will give a brief overview of the possible determinants of diarrhoeal disease, specifically in reference to those found in urban poor communities in developing countries.

2.2 Ecosystem Approaches to Human Health

Environmental degradation is one of the most serious consequences of global environmental change. Urbanization[4] is one such phenomenon of global environmental change and, as a consequence, the impact of human activity on the physical environment has increased. For example, as movements of individuals migrate from rural areas to the urban centres, the stress load on available resources, such as water increases as the population increases, especially in small-defined areas. The potential risks posed to humans as a result of a changing environment have also increased, especially those relating to human health. The urban environment and the processes of urbanization have

[4] Urbanization can be defined as the relative increase in the urban population as a proportion of the total population (Harpham 1994:11).

profound effects on the health of human populations, specifically those living in cities. The combinations of socio-economic and biophysical stresses influence the overall health of individuals in society and their residing environment. The ecosystem[5] approach is unique in that it incorporates human behaviour and action into its analysis of complex and dynamic ecosystems, including the urban ecosystem, and allows for the analysis of human health to occur from a holistic perspective.

The value of the ecosystem approach to human health encompasses the physical, socio-economic, cultural and political environments. An ecosystem approach to combating human health problems is essential since it balances the management of the ecosystem for improved human health while also maintaining or improving the overall health of the ecosystem. The ecosystem approach to human health takes into account the societal needs of the individuals at risk, assesses the causal linkages among human health and the physical and social environments and encourages a community driven, participatory approach to creating and developing viable sustainable solutions. It addresses…. "the needs of different social groups and their aspirations, including the differences between men and women" (Forget and Lebel 2001:S4). The approach encompasses many concepts such as ecological integrity and environment management, with the underlying

---

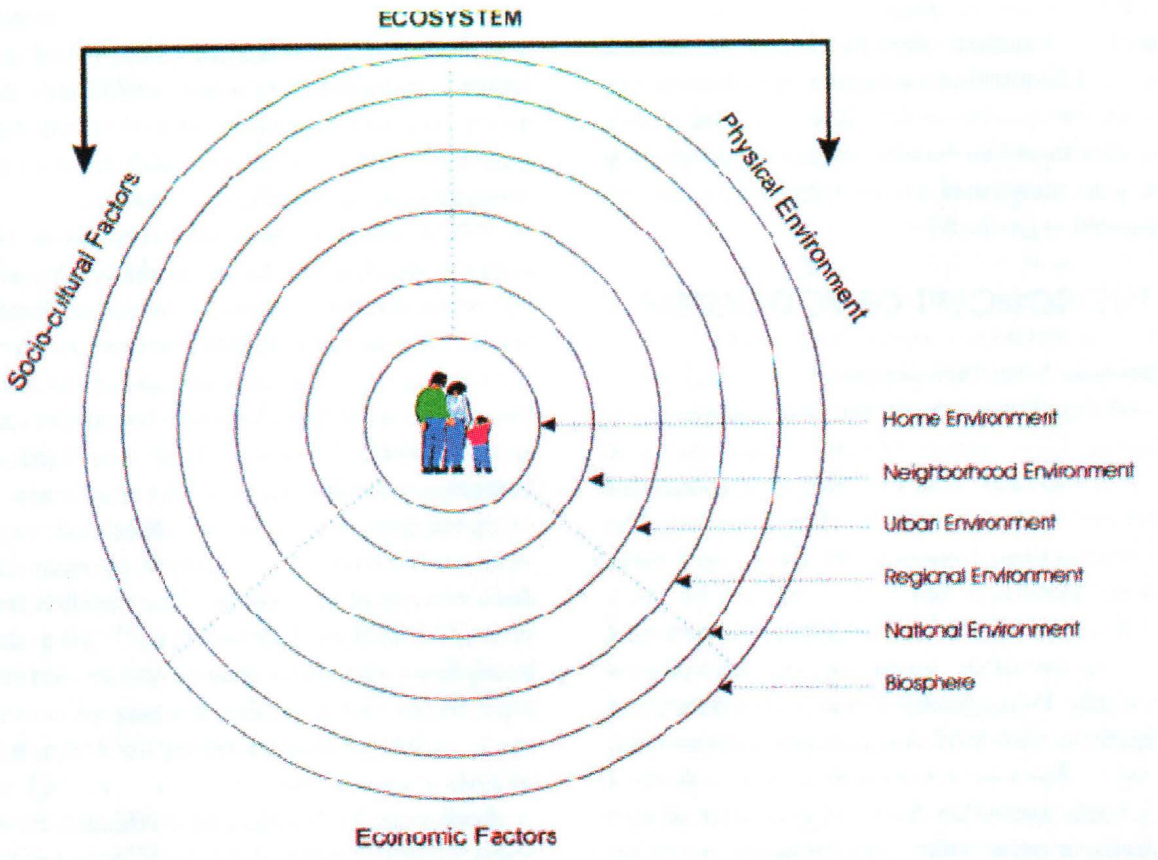
[5] With respect to the concept of ecosystem and its relation to this study, Reid and Miller (1989) give the following definition:

> [An ecosystem is composed of] the organisms of a particular habitat, such as a pond or forest, together with the physical environment in which they live; a dynamic complex of plant, […] animal [and human] communities and their associated non-living environments. Ecosystems have no fixed boundaries; instead, their parameters are set according to the scientific, management, or policy question being examined. Depending upon the purpose of analysis, a single lake, a watershed,[…] an entire region (Reid and Miller's study (as cited in Forget and Sanchez-Bain 1999:39).

reasoning that if an ecosystem is unhealthy and degraded, it cannot support human health and well-being.

The ecosystem approach allows a better understanding of the overall complex phenomena of health in an urban slum in India. Whether individuals have Western biomedical knowledge or not about the cause, prevention and control of diarrhoeal disease, there are larger overarching factors that contribute to the continued existence of diarrhoeal disease in slum communities in developing countries such as India. The ecosystem approach links human health to the physical, cultural, political, and economic environments that surround individuals and reveals the complexities of the environments at various levels between individuals. For example, the individual in a slum community is impacted by the processes of interaction occurring at the family, community, urban and national levels, and thus is part of a complex ecosystem. The ecosystem is a compilation of hierarchies (Figure 2.1):

Figure 2.1 The ecosystem framework



Source: Forget and Lebel 2001

What people in society face in their everyday lives, whether it is the breakdown of the healthcare system or their inability to have access to resources and institutions for better health, is the result of the pressures on their ecosystem. These pressures are caused by societal attitudes and practices, political and economic problems, religious and cultural beliefs, processes of urbanization, and lack of employment, safe access to drinking water and sanitation and hygiene. By taking into account the resources that are available and focusing on their management, whether it is water or waste, an ecosystem and human health itself can be improved. Ecosystems comprise living things in interaction with other living things and the "physical" world – humans are a significant part of this,

especially in cities. Human health is yet another component of this complex ecosystem. Individuals are considered a part of the ecosystem because they not only suffer the negative effects of the pressures on the ecosystems, but also they contribute to the problems by their daily interaction with the available resources and surroundings.

The ecosystem approach exposes and incorporates multiple interacting determinants of diarrhoeal disease. In other words, different components pertaining to: the biophysical and socio-economic environments, human behaviour, and biology of disease contribute to the positive influence on health of the individual and community. From the traditional biomedical model of health and disease, and later the introduction of social theory to health, the understanding of disease causation, prevention and control has advanced. An ecosystem approach to human health is another example of a more comprehensive paradigm. It integrates the holistic concept of health and the principles of natural resource management in changing environments.

The ecosystem approach to human health is also a valuable framework to understand the urban environment; allowing an examination of the relationship between humans and their cities. The urban and peri-urban ecosystems are increasingly housing more and more of the world's population, and as a result, put increased stress on the capacities of institutional, infrastructure, and natural resources that are available. This ecosystem framework addresses the multifactorial urbanization processes, taking into account development, institutional barriers, and the social, cultural, biophysical, and economic stresses. It recognises that the urban environment is a built environment, but nonetheless

is inhabited by many forms of life – in addition to humans. An "unhealthy" urban ecosystem is likely the result of excessive resource and land exploitation, making it unsustainable, and therefore, unlikely to contribute positively to the health and well-being of its inhabitants, but instead increase the risk of disease. (Ecosystem Approaches to Human Health PI 2000; Guidotti 1995; Hancock 2000).

2.3 The Social Construction of Diarrhoeal Disease Risk

The concepts of health[6] and disease[7] must be understood as dynamic qualities, always changing according to environmental conditions caused by social and biophysical factors. These concepts are important to the understanding of the philosophical and theoretical influences in diarrhoeal disease research in health geography. Traditionally, the biomedical model of health and disease research concerned itself with the principles of germ theory. This was a traditional scientific (biological and physical) approach to health and disease. The discovery that microbes cause alterations in the human body, led to advancement in sterilisation, vaccination, pharmaceuticals and antibodies. This coincided with rapid urbanization in North America and Europe in the 19th and early 20th centuries. The rising number of urban poor saw increased incidents of disease due to unsanitary living conditions. The connection between the environment and public health was first made when a cholera outbreak in London was linked to a single drinking source. The biomedical model was based on the germ theory principle that each disease had a

---

[6] According to the World Health Organization definition of 1946, "health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (Meade, Florin and Gesler 1988:8).

[7] May (1961) defines disease as "the alteration of living cells or tissues that jeopardises survival in their environment" (Meade et al. 1988:9).

single identifiable cause, which was produced only by germs in the "healthy body." This theory eventually led to the development of allopathic medicine. As a result of new products such as antibiotics and insulin, coupled with improved hygiene and sanitation in North America and Europe, major diseases were controlled. But with time, the limitations of this theory were recognized, as diseases with complex causes became the major causes of mortality and morbidity, such as cancer, heart disease and alcoholism that were based on culture, diet, nutrition, genetics, crowding, or mental attitudes as well. Thus there became an evident research gap in medicine that could not be met by the scientific approaches of biochemistry, biology or chemistry present at that time. (Jones and Moon 1987; Meade et al. 1988)

Within social theory in health geography, the social construction[8] of risk and perception of health, disease, and illness has been gaining importance in order to understand the

---

[8]There is a recurring division that emerges in geography of the physical, mental and social that may be used to explain the reasoning behind the philosophy of social constructionism. With respect to the physical, human beings are considered as natural constructs, where the body is the centre of experience and action. In other words, the body receives information through its connection to the outside world of neurons, and being a space, it expresses time by allowing neurons within to communicate messages to internal parts of the body and brain. The brain is unique in that it is able to organize information through a process of selection. These processes of selection are further divided into development (taking place primarily before birth and referring to the genetic instructions for neural development present in every organism) and experiential (occurring after birth, where there is selective attention and preferences in its new environment from the start). For the mental division, consciousness is considered the central phenomenon to the mind. Primary consciousness is considered a state of being mentally aware of things without any sense of self-a self with a past and a future. In contrast, higher-order consciousness involves the ability to construct a socially based selfhood, to model the world in terms of the past and future. Thus the mind is considered a social construct where, mental activity occurs in the presence of human activity, governed by informal rules. These rules are what shape individuals and where they are situated, for example the culture, politics, socio-economic situation, or history. According to Gerber (1997),

> ...to understand the mind of a person at a particular point in time one must know not only his or her situation but also what the situation means to that particular individual with his or her particular history, upbringing, etc. The mind is a social construct in that concepts that arise from discourse shape the way we think (Gerber 1997:7).

decision-making processes which occur with the individual, as well as the individual lack of agency (i.e., structural constraints). The social construction of health emerged as a critique to the biomedical approach, where it is believed that social, cultural, economic, and environmental factors were neglected. It was thus concluded that health and disease were socially determined (Curtis and Taket 1996; Jones and Moon 1987). Social construction posits that reality is constructed or created through human actions and does not exist independently of them. The world, as a meaningful reality, is constructed through human interpretative activity, belief systems and perspectives (Fulton, Madden and Minichiello 1996:1349). Furthermore, this theory implies that health, illness, and medical care are viewed as social phenomena, in that these categories are constructed by society, or institutions within society, to define and give meaning to certain classes of events, experiences and/or behaviours (Fulton et al. 1996:1350). The social constructionist perspective argues that problems and issues reflect the nature of society in which they are created and sustained. Alternatively, diarrhoeal disease is only a health problem if we define it as such (Dingelstad, Gosden, Martin and Vakas 1996; Lantz and Booth 1998). Social constructionist theory attempts to understand the question of who in society and how society decides what is normal, or in other words what is considered normal variation in society. It examines the perception of health and disease by taking into account society's norms, expectations and culturally shared rules. Social values within a cultural group of individuals will, in part, determine what is considered normal, acceptable or desirable, and reflect the fact that disease is dynamic. It is crucial to realise that disease is not only a biological state, but also one that is related to social status and

---

Thus concepts, categories and classification of information within the mind play a crucial role in how we perceive, think about and respond to the world. It is through interactions that individuals are socially constructed, and thus the final division of social understood. (Gerber 1997)

exists in social context. Judgments of health and disease are conditioned by age, sex, family status, occupation, and location; the activity of the individual; and, individual and societal attitudes, beliefs and perceptions all play a part in this conditioning process. Social construction theory also states that reactions to particular events are in response to peoples' ideas or concepts about those events and interpretations placed on them; meanings are attached to events on the basis of ideas, beliefs, knowledge and experience associated with similar events, or ideas previously constructed (Fulton et al. 1996). Thus, in understanding how disease and illness are socially constructed we are in essence exploring how social forces shape our understanding of, and actions towards, the general concepts of health, disease, illness and healing (Lantz and Booth 1998). One has to recognize that individuals (within the constraints of their socially constructed worldview) make decisions regarding health and their perception of health and disease can vary over time and in space. (Curtis and Taket 1996; Fulton et al. 1996; Jones and Moon 1987)

Risk is considered a social and cultural construction, whose extent or magnitude is influenced by the disease, the local socio-political context and prevailing local beliefs (Baxter and Eyles 1999). However, the level of risk felt by an individual and/or community depends on the vulnerability. As mentioned, vulnerability to disease relates to the state of increased probability of adverse outcomes for a given environmental exposure (Woodward et al. 1998). Delor and Hubert (2000) discuss the definition of vulnerability proposed by Chambers, according to whom vulnerability is "the exposure to contingencies and stress, and difficulty coping with them. Vulnerability has thus two sides: an external side of risk, shocks and stress to which an individual or household is

subject; and an internal side which is defenceless, meaning a lack of means to cope without damaging loss" (Chambers 1983:1, as cited in Delor and Hubert 2000). Furthermore, the three co-ordinates of vulnerability are discussed: the risk of being exposed to crisis situations (exposures), the risk of not having the necessary resources to cope with these situations (capacity), and the risk of being subjected to serious consequences as a result of the crises (potentiality). Vulnerability to risk is revealed through attitudes and behaviours as individuals respond to a crisis. It is also important to note that, while risk is socially and culturally constructed, that risks that are perceived as serious by one group may not be regarded as such by another. Risk to an individual or community can be selectively chosen as well[9] (Covello and Johnson 1987).

Disease risk at the individual and household level is related to attitudinal and behavioural factors, which are closely linked to social constructions of disease causation, prevention and control. Social construction of risk develops from the community group, i.e., the broader social surroundings – passed on through shared morals, stories, teachings, practices, and rituals to the caregiver(s), in most cases the mother. Decision-making in response to risk at this level is influenced by factors such as education, economics, politics/power dimensions, culture and religion. Responses would be based on when the caregiver first recognises that the child is ill, the diagnosis given and how the caregiver thinks it should be managed. As well, it is important to note that the extended family and/or the community, and the availability of and access to solutions influence the construction of disease risk by mothers (Shawyer, Gani, Punufimana and Seuseu 1996).

---

[9] For further reading on how individuals selectively assign risk and choose among risk refer to Risk and Culture: An Essay on the Selection of Technological and Environmental Dangers (1982), by Mary Douglas and Aaron Wildavsky.

So if solutions were unavailable and/or inaccessible, subsequent behaviour may impact risk in a negative manner. Bentley, Elder, Fukumoto, Stallings, Jacoby and Brown (1995), found that maternal ability to alter behaviour and practices in response to risk of child illness is constrained by time demands from other necessary activities. A possible explanation of why mothers may not be changing or would have changed their actions in response to diarrhoeal disease illness may be because diarrhoea is not initially seen as a threat that requires additional attention until it is perceived to be severe or of long duration (Bentley et al. 1995). Differences in education levels among mothers will also play an integral role in assessing level of risk, where the less educated will tend to rely on more traditional methods of how disease is caused and cured (Patel, Eisemon and Arocha 1988; Pitts, McMaster, Hartmann and Mausezahl 1996). In addition, factors such as poverty, lack of and resources and constraints in relation to access to resources, and sex of the child are important. Thus, by understanding the social construction for diarrhoeal disease, valid contributions can be made to health policy by illustrating how the effects of the social environment (class, race, gender, language, technology, culture, politics, economics, institutional structures, and societal and professional norms) often constrain or influence the possibilities for successful interventions (Lantz and Booth 1998).

2.4 Determinants of Diarrhoeal Disease

2.4.1 Physical environmental factors

Urbanization

Accelerating appropriate forms of development[10] in low-income countries is fundamental to alleviating many of the conditions that cause poverty. The United Nations Commission on Environment and Development (UNCED) in 1992 advanced the ideas that both underdevelopment (linked to poverty) and inappropriate development, leading to over consumption of resources and degradation of ecosystems, impact the overall health of individuals (Forget and Lebel 2001). Movements of populations from rural areas to industrialized cities have been the result of an increase in population pressure on rural resources. Lands that have been traditionally able to support the needs of the family have now exceeded their capacity to produce because of such factors as degradation from unsustainable practices, population growth, land appropriation (agglomeration of the land by the few), and the consequent pushing of the rural poor into more degraded lands or those less suitable for traditional agricultural practices. Thus prime motivations for many rural dwellers moving to the city have been poverty and the prospects of employment and resources. India experienced an increase in the urban population from 21% in 1971 to 38% in 1991 (Mutatkar 1995).

Ideally, urbanization provides individuals with access to health services and wage labour, and consequently provides financial resources with which they can purchase foods, shelter, clothing and education. As a result, the health status of the high-income urban

[10] Development is regarded as the overall improvement of all aspects of the quality of life; it is related to the distribution of resources, access to opportunities and political/human rights that improve the lifestyle of the individual or populations (Phillips and Verhasselt 1994).

population resembles their counterparts in developed countries. Although many aspects of urban life are conducive to good health, including material and educational resources, social support, physical security and access to organised medical and hospital care, there are many factors that promote the increased occurrence and transmission of infectious organisms and diseases, and the vulnerability to risk. Some of the major hazards associated with cities are listed below:

- sub-standard human settlements which are extremely crowded in land prone to landslides, floods, and other natural hazards;
- increased pervasiveness of extreme poverty;
- increased pollution (biological, chemical, and physical) of air, water, and land due to industrialization, transportation, energy production and improper management of commercial and domestic wastes; and,
- lack of physical, social and health infrastructure (e.g. housing, sanitation, roads, and hospital).

These observable facts are true for both middle and upper classes, as well as for the urban poor. (Canadian Global Change Program 1995; McMichael 1993)

However, in many developing countries, cities can barely support their inhabitants. Because urbanization in developing countries has occurred independently of any economic growth that is normally associated with industrialisation and urbanization in developed countries, governments have failed to accommodate growing urban pressures. This is particularly true for the urban poor who are in most cases, migrants from rural areas and lack education and skills to get good wage labour jobs. This population resides in slum/squatter communities where the basic needs as well as the environmental services that impact public health, such as, adequate water supplies, sewage systems, and waste disposal are absent or insufficient. Thus, in reality, many residents of cities in developing

countries are worse off than they would be in rural areas because they do not have the required skills for life in urban communities.

Poverty in urban centres of developing countries is one of the factors that promote risk to ill health, as it is largely uncontrolled and has led to an intense public health problem. Population growth arising from rural-urban migration causes pressures on the urban environment by degrading the quality of land, water and air with which individuals have day-to-day contact. In many cases, this migrant population settles in urban poor communities, where this degradation is enhanced through excessive pressures on resource and land exploitation and local infrastructures and services, such as drinking water supplies. Urban poor communities often live on land that is unsuitable for proper buildings to be constructed, thus making them vulnerable to increased environmental risk. The urban poor who may also live in dangerous environments (i.e., near major roads, river basins, factories and dumpsites) are further susceptible to threats from their physical environment (e.g. floods, landslides, and chemical pollution). Although disease outbreak is dependent on exposure to environmental risks, poverty can be considered the prime indicator of urban morbidity or mortality. The level of poverty impacts health because it determines the level of risk, as well as access to resources to deal with health risks. (Harpham 1994; Phillips and Verasselt 1994; Wang'ombe 1995; Yeager, Lanata, Lazo, Verastegui and Black 1991)

The spread of infectious diseases is enhanced in slum conditions due to lack of space, where individuals have less than one square-meter of space each. Transmission is

augmented because of proximity of contact between infected individuals and animals with healthy individuals; the relationship between the pathogen and the host is enhanced in slums because of the constant exposure to infectious microorganisms. (Canadian Global Change Program 1995; McMichael 1993)

Many processes can amplify conditions for increased ill health. In the recent paper in Forget and Lebel (2001) there is a discussion based on work done by Smith, on the concepts of "traditional risks" and "modern risks." Those living in poverty, where their health and well-being are commonly threatened by such factors as consumption of contaminated foods and water, the absence or inadequacy of sanitary facilities and crowded housing, express traditional risks. Risks that are classified as "modern risks" are related to development, industrialisation, and increased economic activity. In the developing world, people are caught between these two types of risk. As economies in the South attempt to develop, pollution from such sources as chemical spills increase and humans are being exposed to these new modern risks (i.e., Bhopal). At the same time, traditional risks have not disappeared and when coupled together with modern risks add to the threat on individual health, especially in urban poor communities.

Sanitation and water

Environmental impacts causing ill health are often exacerbated where conditions, such as overcrowding, unsuitable dwellings, insufficient and contaminated water supplies, and lack of sanitation allow for the presence and transmission of pathogens to populations

(Asthana 1995). For many years, water supply and sanitation[11] have been regarded as the prime indicator of health and well-being of individuals, including diarrhoeal disease (Cutting and Hawkins 1982; Esrey and Habicht 1986). However, in the developing world, the lack of physical infrastructure influencing water quantity, quality and usage play a crucial role in determining the cause and transmission of disease. Contamination of the surrounding physical environment, especially water sources, is a problem in developing countries. Most often, poorer individuals use the same source of water contaminated with raw sewage, pathogens and garbage for drinking, bathing, washing clothes, and rearing domestic animals. Favourable conditions for diarrhoeal disease outbreaks are created by improper water, sanitation, sewerage and waste control facilities (Asthana 1995). As a result, in controlling diarrhoeal disease outbreaks, various health programs have turned their attention to water supply and sanitation.

Many studies have found a positive correlation between reduction of diarrhoea and improvement of water supplies and sanitation (Gorter, Sandiford, Smith and Pauw 1991; Muttamara and Krishnaswamy 1982). As well, it was found that increased water availability contributed to a lower proportion of the population experiencing diarrhoea diseases; possession of a latrine did not relate to morbidity; and, the greater number of children under the age of five living in the houses related to higher incidences of diarrhoea (Asthana 1995, Gorter et al. 1991, Schorling, Wanke, Schorling, McAuliffe, DeSouza and Guerrant 1990).

---

[11] An estimated 2.9 billion people lack access to adequate sanitation and roughly 1.4 billion do not have access to safe drinking water (World Resources 1998).

Biological environment

Diarrhoea is a symptom of many diseases and is the passing of loose and watery stools as a defence mechanism to cleanse the intestine of pathogens (Edmundson and Edmundson 1989:991). Diarrhoeal disease can be caused by amoebic, bacterial, and viral infections of the intestine and are associated with some of the following strains of micro-organisms:

- *Amoeba E. histolytica* (protozoal);
- *Flagellate G. lamblia* (protozoal);
- *Shigella S. dysenteriae* (bacterial);
- *Escherichia coli* (coliform); and,
- *Reoviruses, paroviruses* (viral)

The natural environment that surrounds human beings affects the transmission of these organisms. Warm climates, overcrowding, improper water supply, poor sanitation and hygiene in many developing countries enhance the occurrence and transmission of microorganisms. Diarrhoeal disease caused by these microorganisms are transmitted through the faecal-oral route. Organisms are ingested via contaminated food or drink and unsanitized water. (Edmundson and Edmundson 1992)

The presence and prevalence of microorganisms causing diarrhoeal disease is dependent on exposure of humans to risk in the environment, the overall health of the individual and the vitality of the pathogens. From an epidemiological perspective, there is an intrinsic relationship between pathogens, host, and environment (physical, biological, social, cultural and economical). A weak immune system is vulnerable and allows an opportunity for these pathogens to thrive. Once the pathogen has infected the host, it can cause acute diarrhoea, tissue damage and in extreme cases, death. Children under

five in urban poor communities of developing countries experience the highest burden of disease (Bhatnagar and Dosajh 1986). Mortality rates are significantly higher for children in urban poor communities since they are the most malnourished and thus, susceptible to diarrhoeal disease outbreaks (Edmundson and Edmundson 1992; Emch 1999; World Resources 1996)

Malnutrition is frequently both a cause and result of diarrhoea. Vulnerable, malnourished populations will be prone to diarrhoeal outbreaks because their defence mechanisms are weakened. Malnourishment can be the result of trying to control diarrhoea; when diarrhoea develops, the child's stomach is considered weak and, as a result, either milk is diluted further with water or food intake is decreased, this was seen in a study of acute diarrhoeal disease in India and Indonesia (Edmundson and Edmundson 1989). Even if the water is boiled, the child is exposed to further risk because the diet of the diluted milk and water, and lack of food, does not contain the necessary nutrients for a healthy recovery. Thus, the nutritional problems are not caused by lack of food, but rather, by starvation during a diarrhoeal disease outbreak. The presence of a relationship between malnutrition and susceptibility to disease outbreaks allows the level of nutrition in communities to be a prime indicator of the combined effects of both the socio-economic and environmental determinants of diarrhoeal disease. (Asthana 1995; Edmundson and Edmundson 1989; Edmundson, Edmundson and Sukhatme 1992)

The lack of immune system development within children can also be attributed to early cessation of breast-feeding. Breast-feeding is regarded as a crucial preventive measure against diarrhoeal disease in young infants, in that diarrhoea is two to five times less common in breast-fed infants. Breast-feeding protects the child from occurrence of infections by first, reducing exposure to food and waterborne pathogens and second, by providing compounds such as secretory IgA[12], which fight infection (VanDerslice, Popkin and Briscoe 1994).

2.4.2 Socio-behavioural factors

Whereas poverty is the main underlying cause of diarrhoeal disease, behaviour, also governed by attitudes, culture, beliefs, customs and tradition impacts the definition, occurrence, transmission and treatment of disease by the individual at the household and community level. Behaviour is a reflection of not only the characteristics mentioned above, but of education about diarrhoeal disease and socio-economic standing with a population. This social and/or cultural environment will influence individual and community perception of risk, pain, disease, health and decisions to seek help and what measures are needed to achieve a healthy state. The choice of measures to combat ill health or diseases can be dependent on access to available resources and services, such as money, education, and healthcare. Also, the choice between the different types of healthcare services can be dependent on an individual's social and/or cultural conditioning. For example, traditional medical knowledge is also chosen as a viable option based on trust in heritage, culture, and beliefs, and can be valuable in that, it is

[12] Antibodies such as IgA (Immunoglobin A) in mother's milk provide partial immunity to diarrhoea (Edmundson and Edmundson 1989). IgA is secreted in the breast-milk and offers protection to the lining of the infant's gastro-intestinal tract against pathogenic microorganisms.

relatively inexpensive because most ingredients for the remedies can be found in the home. For some caregivers, there can be an additional peace of mind with the use of a traditional healer or practices, and thus may contribute to a healthier recovery.

Hygiene practices

Overall behaviour associated with waterborne diseases can be viewed in terms of how individuals and families interact with their physical, social and economic environments. Due to the lack of facilities for proper defecation in the household, there is often human (and animal) defecation around sources of drinking water such as wells and streams in developing countries such as India (Edmundson et al. 1992). Household and community sanitation is further inhibited due to the nature of residence facilities (i.e., sub standard housing). Individuals in slums and squatter settlements will often have to stand in line for hours to fill their buckets if water is provided through one communal neighbourhood source such as government tap or hand pump, or travel great distances to retrieve water from wells, streams or lakes. Accordingly, the pollution through the environmental conditions will impact the quality of the water resources, and in many cases cause contamination. Hence, hygiene practices such as boiling water do not occur unless the individual realizes that the water is contaminated and may pose a threat to health and/or has money and fuel to boil the water.

Although, studies have shown that by enhancement of physical infrastructure (i.e., healthcare services) the disease burden within a particular community decreased, it is important to note that the overall health of the individuals is not isolated from the social

and behavioural factors that surround them. The potential benefits of improvements in the physical infrastructure, such as hospitals and clinics and improved water supplies, are related to individual behaviour patterns, which in turn control the risk of exposure to pathogens. Even though water supply and treatment are significantly related to diarrhoeal disease outcome, factors associated with behaviour, hygiene, and sanitation are much more strongly associated and could minimize the impacts of improved water quality (Dikassa, Mock, Magnani, Rice, Abdoh, Mercer and Bertrand 1993; Jinadu, Olusi, Agun and Fabiyi 1991; Lonergan and Vansickle 1991). It is apparent from the discussion of the biological determinants of diarrhoeal disease outbreaks, as discussed above, that water availability, quantity and quality plays a crucial role in impacting the health of the individual. However, there will only be a significant decrease in disease outbreaks if the increased water availability, quantity, and quality are used in appropriate methods for washing at the household level. These methods are dependent on the individual's beliefs, attitudes and knowledge of disease, disease causation and water usage and are controlled overall by hygiene behaviour. Hygiene behaviour, for example washing of hands, food and utensils, and the disposal of children's stools, has been noted increasingly to be critical factors affecting risk of transmission in disease outbreaks due to water and sanitation (Dikassa et al. 1993; Kolsky, 1993; Oyemade, Omokhodion, Olawuyi, Sridhar and Olaseha 1998). Hygiene behaviour can be associated with the following five categories:

- disposal of human faeces;
- use and protection of water sources;
- water and personal hygiene;
- food preparation and storage; and,

- domestic and environment hygiene (Boot and Cairncross's study (as cited in Kaltenthatler and Draser 1996)).

All in all, proper hygiene behaviour, in combination with improved clean water supply, and personal and domestic hygiene can result in reduction of transmission of enteropathogens by the faecal-oral route by 40% (Baltazar, Tiglao and Tempongko 1993).

Consequently, by decreasing environmental contamination surrounding a particular community, the risk of diarrhoea is reduced among individuals. For example, by encouraging proper defecation practices among children and adults the faecal-oral transmission route can be interrupted (Yeager, Huttly, Bartolini, Rojas and Lanata 1999). Viable sanitation practices restrict enteric pathogens arising from the environment to impact populations; proper disposal facilities isolate human wastes from direct human contact and contamination of water supplies; and preventive measures such as hand-washing and personal hygiene reduce the presence and transmission of disease outbreaks at the household level (Van Derslice 1994).

Maternal factors

Various aspects of the caregivers' lives, such as education, available time for infant/child care, and knowledge of child health, influence the health of the child. It has been stated that maternal education has a powerful impact on child health (El Bushra and Ash 1991). Explanation for the relationship between mothers' education and childhood risk of death is complex. It relates to education's strong link to household economics and to the cognitive, attitudinal and social consequences of education that may influence a mother's

treatment of her children and understanding of the health environment (Barret and Browne 1996:1579).

Caretaking practices of children when they are ill are also important. Caretakers, whether they are mothers, extended families, or younger female siblings, must be able to first recognise and accurately interpret the characteristics of ill health in young children. This can be largely dependent on the caretaker's perception, attitudes and beliefs towards illness and, as well, or may be a reflection of their education, culture or religion. Secondly, the response of if and when healthcare is sought and the type of service chosen is dependent on the mother and the family and can impact the health of the child, i.e., care may be sought too late or from an untrained healthcare provider. The behaviour of the healthcare provider is also a determining factor in the alleviation of the illness or disease; improved results require a healthcare provider to disseminate necessary and proper advice and treatment, including referral to the hospital if needed. In many developing countries such as India, the rapport between the healthcare provider and patient may be poor and thus will impact the treatment given. Finally, behaviour plays a role in the caretaker's understanding and potential for acceptance of the advice and treatment provided, and practicing it within the household. With respect to caretaking of ill children, behaviour has an integral role in the treatment of diarrhoeal disease and is more crucial among young infants. (De Zoysa, Bhandari, Akhtari and Bhan 1998; Shawyer et al. 1996)

In India, certain behaviours are stimulated by religion, culture and deeply rooted traditional values. In a particular study for example, there was a preference for traditional medical treatment (i.e. traditional healers, religious ceremonies) in the home before seeking outside conventional allopathic or ayurvedic treatment – even when pharmaceutical/allopathic intervention is needed (De Zoysa et al. 1998). This behaviour would thus give possible insight into why some infants die at home without any care from a trained health professional and why there is a delay in reporting illness; the child is only brought to the attention of the healthcare provider, in some cases, when all else has failed.

In discussing the determinants of diarrhoeal disease, the mother's behaviour associated with breast-feeding is also vital in determining the child's health outcome. Although, as discussed above, adequate water supplies, proper sanitation and hygiene can result in decreasing diarrhoeal disease outbreaks, the encouragement of breast-feeding in young children (0-6 months) can further this decrease. Substituting other nutrients and weaning foods for breast milk may pose a risk to the health of the child because of possible contamination through food handling and polluted water used in their preparation. Furthermore, there are advantages to continuing with breast-feeding. Vulnerable communities, such as the urban poor, have limited resources that prevent them from preparing fresh food daily; adequately reheating previously prepared foods, or storing foods under refrigeration. Thus breast-feeding can be regarded as viable, in that breast milk is pathogen free, available on demand – provided that the mother has proper nutrition, and is free – unlike animal and powdered milk and infant formula, which makes

it economically sound. Also with respect to economics, sterilising bottles and preparing and storing formula adequately requires time, money and fuel (Edmundson and Edmundson 1992). VanDerslice (1994) has supported the findings that full breast-feeding allowed significant protection against diarrhoeal disease for infants during their first 6 months, especially in poor sanitary conditions.

Despite the value of breast-feeding, there has been an increase in early cessation of breast-feeding among urban poor women. These women are dependent on working and making an income for their families. Thus, this results in time away from children and tending to their healthcare needs because they are not able to take their children with them. With no childcare facilities, and heavy reliance on breast milk substitutes, bottled milk and weaning foods provided by surrogate mothers or older siblings, the child is faced with early malnutrition, usually within the first six months. (Harpham 1994)

Cultural Factors

Understanding the cultural dynamics of urbanization in India can be very difficult, in that communities in most urban areas consist of an array of religions, castes and ethnicities (Rao, 1990). The determinants of risk associated with children being susceptible to diarrhoeal disease can be attributed to many factors within a family. However, in many traditional families in developing countries, culture places more importance on the health of the male than the female (Henry, Briend, Fauveau, Huttly, Yunus and Chakraborty 1993). This can be seen in adults, where the father will eat first because he is the breadwinner of the family and thus needs all strength possible, leaving the mother and

younger children less nourished (Santow 1995). With respect to male children, it is often common that they will be breast-fed longer, and when faced with a threat of illness or disease, be treated immediately. In comparison, female children often are neglected. They are more likely to be given diluted milk and, to be neglected in healthcare during illness or disease (Santow 1995). The reasons for this are many, but lie in the context of traditional cultural values. Males are not only considered breadwinners of the family, but carry the family name, inheritance and higher value or respect in these societies. Females on the other hand, are considered burdens form the first day of birth; the pressure to marry off daughters and provide a dowry can be of immense strain on the parents (Henry et al. 1993; Santow 1995). However, it also must be noted that the females of the household, including mothers, control the food distribution within the family. This exemplifies the large cultural bias towards males in developing countries such as India and Bangladesh.

2.5 Conclusion

Many pressures impact ecosystems and subsequently will create unfavourable conditions that may pose a risk to their inhabitants. This is also evident in urban slum ecosystems. The pressures arising from such factors as economics, social, cultural, and bio-physical influences will impact the urban poor greatly and, in turn, will influence their risk to disease exposure. The vulnerability of individuals to increased transmission of infectious organisms and disease, can be the result of an unhealthy ecosystem. However, the intensity of the problem also depends upon the responses by the mothers and community in general to this risk. Different elements in these broader spheres combine to impact the

social construction of disease risk in mothers and primary caregivers, and thus, this mediates behaviour. As a result, this impacts the disease burden at the household and individual level.

The subsequent chapters will build upon the foundation of the theoretical discussion of this chapter. The thoughts and ideas presented in this chapter not only defined the information I obtained, but also influenced how I went about collecting it. The results and analysis chapter, Chapter Five, will take this discussion to a more practical application in the setting of the slum, Janta Jeevan Camp Tigri. And finally, in Chapter Six I will present my conclusions and outline possible applications of these findings to both the community and the local healthcare agenda in Delhi.

CHAPTER 3
REGIONAL SETTING

3.1 INTRODUCTION

Disease and health are dynamic and constantly changing. The processes occurring in the environment surrounding individuals and communities all impact the level of risk associated with disease. The discussion in Chapter Two created the theoretical foundation for the following research questions and objectives. The ecosystem approach to human health is a valuable tool because it allows for a comprehensive understanding of disease and health to be obtained through examination of the processes and relationships within a particular ecosystem. The urban ecosystem, and most notably, the slum community, encounters many pressures and forces, which in turn pose a risk to disease. This chapter situates this study within a particular slum in South Delhi, focusing on a thorough description of the research setting. However, to better appreciate the complexities of the slum ecosystem, an account of the larger urban ecosystem, Delhi, is needed. This chapter will begin with an account of the history of Delhi and its transition over the years.

3.2 THE SETTING OF DELHI

Delhi, also known as the National Capital Territory or the Union Territory of Delhi, has a population of, 13.78 million (Registrar General and Census Commissioner, India 2001). This state covers an area of 1486 square metres and lies at an altitude of 239 metres above sea level. The river Yamuna, a major feature of the city, enters Delhi from the north at an altitude of 210.3 metres above sea level, and leaves after a course of about 48

km at an altitude of 198.12 metres. During floods, water depth can reach approximately 7.5 metres. (Jain 1996)

The history of Delhi has been characterized by many dynasties and rulers, witnessed now through the various Hindu and Moslem architectural influences on monuments and buildings. Occupation of the region can be traced as far back as 1000 BC during the time of the legends of the ancient Mahabharat. Hindu and Moslem rulers have been associated with Delhi from as early as 1638 to 1648, when Delhi was an important commercial centre positioned strategically between the Indus and Ganges basins, controlling the route into India from the northwest. Delhi was considered a fully equipped commercial centre by 1800. Foreign control of Delhi first occurred in 1803 when Delhi was defeated by General Lake of the East India Company. After the first war of Independence, the East India Company transferred control of Delhi to the British Crown in 1857 (Jain 1996).

King George V named the city of Delhi in 1912, and the subsequent development of New Delhi in the 1920-30s was to satisfy the needs of the British administration of that time. The overall urban design of New Delhi was the responsibility of Edwin Lutyens and Herbert Baker. The prime function of New Delhi was political and administrative (Jain 1996).

One of the most prevalent problems both Delhi and New Delhi face is housing. During the initial design of the city, there was a lack of provision for possible future expansion. As a result, housing became congested and of low standard, and by the 1950s half a

million people lived in slums and another quarter million were squatters spread over some 500 unauthorized colonies along the city fringe (Jain 1996). By 2015 the slum population will increase to 8 million (Alam 1999).

According to the 1991 census data, India's urban population was approximately 217 million and is expected to increase to 325 million by 2001 (Bhattacharya 1993). There are many reasons for this increase (Bhattacharya 1993) including:

- unemployment in rural areas;
- lack of year round employment and wage disparities between rural and urban agglomerations;
- lack of industrial development in rural areas;
- high inflation in the country; and,
- poor economic conditions of landless labourers and marginal farmers.

Causes of population increase in New Delhi can be attributed to many of the same reasons. History has shown an increase in refugees in New Delhi from neighbouring countries (e.g. Pakistan) and states due to the opportunities for possible employment in the commercial and industrial sectors; in addition, the access to relatively better amenities in this national capita makes it attractive to those in search of a better life. For the most part, population increases are related to the large number of rural to urban migrants (Jain 1996).

One of the many impacts of population increase within these cities has been the heavy concentration of urban poor living in slums and squatter settlements. Slums can be further defined as housing built by individuals or a group of individuals who are either

owners of the land or rent the dwellings. These individuals have legal status as tenants. Their rights and interests are protected by several laws and acts of Government; they cannot be evicted from the place of residence by an individual owner or any statutory body who owns the land and the slum, and they have a postal/municipal number. On the contrary, squatter settlements are under control of the city administration, and thus police authorities can evict residents forcefully at any given time. They have built their shelters on their own using any available material that they are able to collect and settle on property that is privately owned by an individual, organization, or government. Although they do not pay rent for their land, they often pay money to local leaders or employees of municipal authorities to ensure that they do not get evicted. (Bhattacharya 1993)

According to Bhattacharya (1993), there are many influences that impact the growth of urban poor communities in these urban centres:

- income disparity;
- high population growth;
- differential income distributions;
- existence of high degree of inequality in the standards of living;
- poor economic conditions of landless labourers and marginal farmers of rural areas encourages migration to the city centres in hopes of employment opportunities;
- economic/political issues;
- distribution of technology and development; and,
- natural disasters and accidents like famine, earthquakes and other natural calamities displace populations from their homes and force them to re-locate to city centres where opportunities and amenities may be present.

With respect to living standards and the way of life in these urban poor communities, in slums, structures may be made of temporary or permanent materials. Squatter shelters,

however, are usually made of rags, polythene sheets and other waste products. Residents in both these communities have a very diverse culture as they try to maintain their kinship ties to their native villages and maintain their bonds with members of their castes. In doing so, they attempt to re-create a rural social life in an urban environment (Bhattacharya 1993).

These individuals, in both slums and squatter settlements face conditions that are sub-standard in an environment that is generally unfit for living; there is a lack of proper structures for permanent dwellings, no access to safe drinking water and sanitation, and no provision for basic social infrastructure such as schools or healthcare facilities. Slum and squatter settlements are a symbol of the negative pressures and deficiencies in the socio-economic structures within society. They are the result of both the impacts of industrialization and the process of rapid urbanization. In general, one can characterize slum and squatter settlements as run-down, overcrowded, vulnerable to environmental hazards, surrounded by unsanitary conditions and lacking facilities or amenities that affect the slum/squatter residents' survival. Although the majority of individuals residing in these communities have been migrants from rural areas, some have also moved from better housing areas, a result of the increasing cost of living, mounting unemployment and shortage of housing within urban centres. For many individuals, a network of family, or persons of the same religion/caste, or people from the same village, exists that assists them and, facilitates migration to the cities.

In 1930, the Municipal and Corporation Acts were introduced in response to the need to improve slum dwellings, and required landlords themselves to initiate structure

improvements. Consequently this led to general repairs of the slum (e.g., improving street lighting and hand pumps), where landlords incurred the cost. In 1937, the Delhi Improvement Trust was set up to develop plans to improve living conditions within the city (Jain 1996).

Following the 1947 independence of India, there was a large influx of people into Delhi that consequently increased the pressure on resources and services. In 1955, the Delhi Development Authority was created as a response to the concern over slum clearance. The Slum Improvement and Clearance Act, the first legislation for slum dwellings, was passed in 1956, under the authority of Prime Minister Jawaharlal Nehru and the Indian government. Its main objective was to improve and clear slum areas and protect tenants in such areas from eviction and exploitation. In 1957, the Delhi Development Act replaced the Delhi Development Authority and Delhi Improvement Trust. As a result, responsibility for slum clearance and improvement was transferred to the Municipal Corporation. The Delhi Master Plan of 1962 assessed the deficiencies in housing, community facilities, and services. Upon reviewing these points, one can see that priority is given to the physical aspects (structural quality, availability of basic services, quality of environment) of a slum with no regards for the ownership of land or legality/illegality of structures (Jain 1996).

In April 1972, an initiative was introduced where financial assistance was granted to state governments for undertaking slum environment improvement programmes in cities with

population above eight lakhs[13]. The emphasis was placed on the physical environment and included provisions for such items as: sewers, storm water drains, latrines, water taps, road infrastructure, and community facilities such as parks and hospitals. This was extended to cities with a population of 300, 000 and above during the Fifth Five-Year Plan (1972-1979). In 1973, the Delhi Urban Art Commission Act was enacted, with the objective of preserving, maintaining and developing the aesthetic and environmental quality of urban Delhi. Although in subsequent Five-Year plans basic strategies for the improvement of urban poor dwellings were included, progress of the slum clearance and environmental improvement in Delhi has been slow. One of the possible reasons for this is the continuous shift in responsibility between the Municipal Corporation of Delhi and the Delhi Development Authority (Jain 1996).

3.3 THE SETTING OF JANTA JEEVAN CAMP TIGRI

The Janta Jeevan Camp Tigri is located in the southern part of New Delhi[14] and has an area of 3.5 to 4 square kilometres. It is an authorized slum that was established in the late 1970s. It is a very densely populated area with a population of approximately 45 000 individuals (approx. 5 000 families), most of whom are from the states of Rajasthan, Uttar Pradesh and Bihar. A main transit road divides the slum into two distinct parts. There are a total of 11 blocks (subdivisions), A-K, in the slum; the upper portion consists of 4 blocks and the lower portion has 7 blocks. Tigri, an authorized slum, is adjacent to

---

[13] One lakh is equivalent to 100 000.

[14] For the map of Delhi and the location of Tigri refer to Appendix One.

two communities, Sangam Vihar, an unauthorized colony[15], and Krishna Park, and touches upon the major transit road of Delhi, Mehrauli Badarpur (M.B.) Road.

3.3.1 Physical environmental factors

Housing

The structure of housing in Tigri varies, while a few established houses are scattered within the blocks, the majority are structures that are unstable (i.e. may fall down). Houses are usually covered with tin roofs, and the walls are either made of clay, bricks or cement that is falling apart. The houses are packed together in narrow streets, not following any regular symmetrical sequence. One house may be a one-room dwelling made of cement and falling bricks, and next to it might be a multi-room dwelling that is permanent and even two-stories. The slum is overcrowded, and paths in the community are like a maze, intertwining. There are some passages where the streets had been raised with cement blocks, and, as a result, the sewage drains either function properly or are covered. This was found mostly in the upper blocks - the situation in the lower blocks was quite different. The streets there are not raised and open drains are either clogged with sewage or are overflowing into the streets. In some areas there are streets where the road is raised, but the house is not – one must duck and climb down to the house as a result. My research assistant's house was like this, along with the rest of her neighbours' houses. It made me seriously wonder what would happen during floods or when the nearby sewage drains overflowed. In one particular house, a Muslim household, where I

[15] An unauthorized colony can either be a slum or squatter settlement, and is not recognized by the government – as a result, basic amenities such as water and electricity are not provided. Authorization is linked to how one can buy or sell property as well; in unauthorized colonies, one cannot get a registration of land.

conducted an interview, there were no steps to go down into their one-room dwelling. You had to jump through a small opening, which acted as the main door to the house. Outside, the children would play on the roof, which was approximately a metre above the street level, where the family dried their clothes. Approximately 62% of households lived in one-room tenements, 33% in two room rooms, 4% in three rooms and 1% in more than three rooms. Most houses were self-owned (88-89%), and around 7% were rented and 3% shared (Mamta 2000:7). Living space varied from 1 – 2.5 sq. m. and in the majority of homes there was no separate kitchen or bathroom. Many homes had several people sharing the same small living quarters, ranging anywhere from 5 to 10 individuals. In a one-room dwelling there would be one or two beds, a kitchen in one corner along with some buckets or containers of stored water intended for either bathing or washing. On the shelves or nearby in another corner there would be a television set or radio. In some cases there would be a section in the room, usually separated by a wall or half wall, for bathing. A small minority of dwellings did have a private toilet, but it was mainly in homes where the house was two-story, and often on the top floor the toilet would be located.

Figure 3.1 A Tigri home

Sanitation

There is no public toilet facility in any of the blocks, and, in the majority of cases, individuals have to use public facilities that are located approximately a kilometre from the slum. These public latrines are unhygienic and the physical structures are damaged. There are open sewage drains on the sides of the narrow streets within the blocks, and in many cases these are overflowing or clogged. In the higher blocks, the sanitation situation with respect to drainage was better, in that there were large blocks of cement placed on the street, which prevented drains from overflowing and created a stable path for walking between the blocks. Table One gives an indication of the sanitation situation in the community.

Table 3.1: Toilet and sanitation profile in Tigri

Blocks	Public Toilet Facilities (within 1 km)			Garbage Dumps (within 1 km)		
	Total	Functional	Non-functional	Total	Proper	Improper
A	204	164	40	4	3	1
B	204	164	40	4	3	1
C	204	164	40	2	1	1
D	204	164	40	1	1	-
E	140	80	60	10	3	7
F	175	172	3	4	3	1
G	175	170	5	4	3	1
H	175	175	-	4	-	4
I	140	80	40	3	2	1
J	140	80	40	10	3	7
K	175	172	3	4	3	1

(Mamta 2000:4)

The sanitation condition of the slum was by all accounts deplorable - with sewage and waste scattered in the streets in small piles, drains overflowing or clogged, parks being used for garbage dumps, and human and animal excreta exposed. Although it appeared that individuals kept their homes clean, they would throw household waste either onto the streets or into the drains, for the animals and scavengers to pick at, or into the open areas designated as *kacheras*. Though there was an official area selected for communal garbage collection, known as the *kachera*, people would usually just throw their garbage in the parks and open areas. In these parks all you could see were endless piles of plastic garbage bags. Amongst the rubbish children would play; and animals such as cows, dogs, pigs, and goats would wander. Women would also use the space to go to the bathroom at night. With respect to the cleaning of the slum, there were government officials assigned to clean the *kachera* area and some of the streets and drains. Otherwise, a community effort to hire lower caste Hindus, such as the scavengers and

sweepers, to clear the drains and sweep the streets was organized among a group of homes sharing a sewage drain.

Figure 3.2 The physical conditions of Tigri

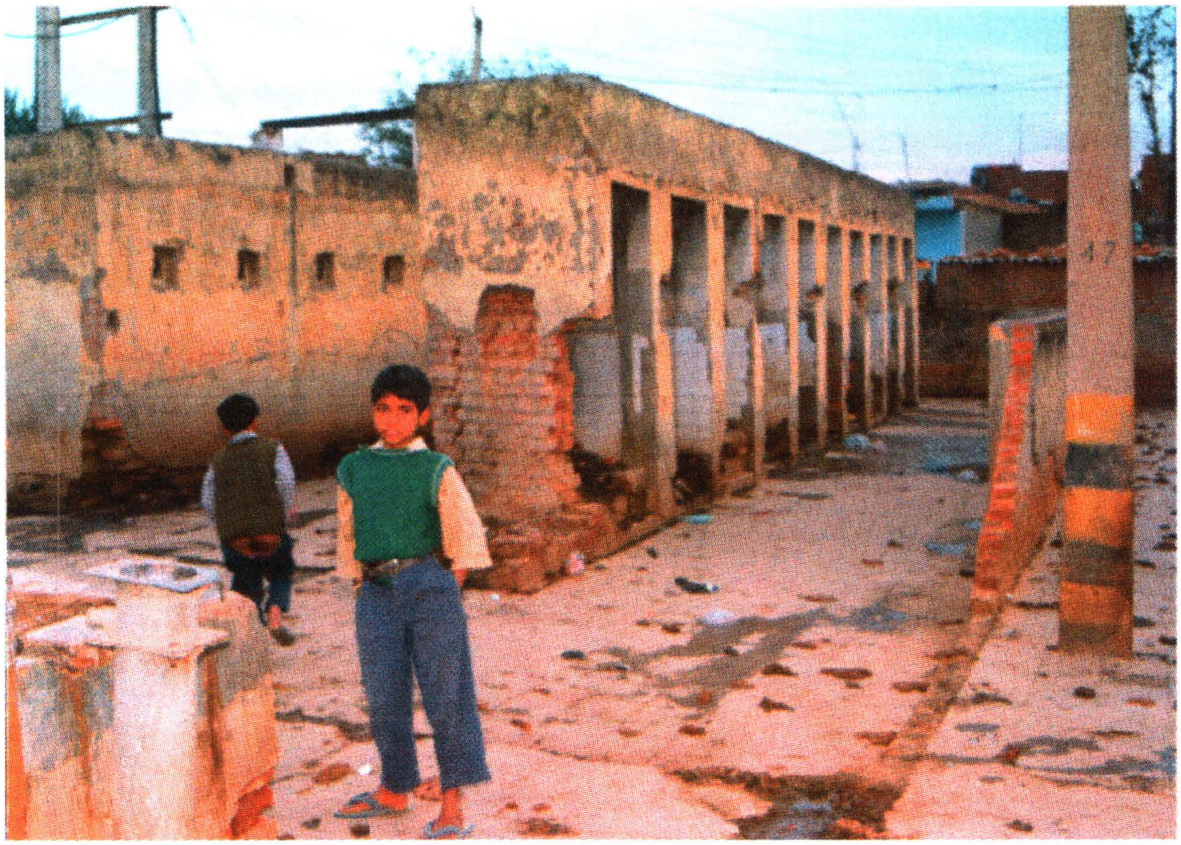
As for the toilet situation, it was evident that this was one of the largest problems in the community besides access to water. Most homes did not have a toilet and residents used the community latrines. The conditions within these community latrines were, in my mind, atrocious – there was a definite odour when one was near them, and they were broken, and apparently had not been repaired in years. People would defecate everywhere, and there was solid waste on the walls and in front of the premises around

the open area. There was also harassment of women around the latrines, especially in the evenings. As a result, many households constructed a facility to allow the girls and young women to go to the bathroom at home. However, if their housing structure did not allow for the construction of a toilet, many women would either travel in a group to the latrines or parks in the evenings. Children would most often openly defecate in the sewage drains or in the parks nearby to their homes.

Figure 3.3 Child defecating in open

Young infants would most often defecate in the home, and their waste would then subsequently be discarded in the drains or in the *kachera*.

Figure 3.4 The latrines in Tigri



Water

The water supplies are connected with the electricity. There is a common underground tank or tube wells for the blocks that supplies water to the houses, which is regulated by central power stations. When the electric motor is switched on at this central spot, water is drawn up from the tube wells to supply the houses. However, individual household access to electricity does not guarantee water. Although a majority of households have illegal electrical connections, very few have access to private and proper water supplies and toilets. Also, some houses may have smaller motors connected to their electricity supply, which is connected to the main source of water. The main source of water is

through communal hand pumps[16] and taps connected to municipal tube wells. Table Two gives an indication of the situation of the available water to the community.

Table 3.2: Water supply profile in Tigri

Blocks	Tube Wells (n)						Hand Pump (n)			Tap (n)		
	Within Block			Within 1 km.			Within Block			Within Block		
	Total	F	NF	Total	F	NF	Total	F	NF	Total	F	NF
A	1	1	-	22	20	2	2	2	-	450	400	50
B	1	1	-	22	20	2	3	2	1	500	475	25
C	1	1	-	2	2	-	7	3	4	115	115	-
D	2	2	-	2	2	-	4	2	2	135	135	-
E	-	-	-	12	12	-	8	7	1	22	22	-
F	2	2	-	22	20	2	4	1	3	65	63	2
G	-	-	-	22	20	2	6	2	4	80	70	10
H	1	1	-	15	13	2	3	1	2	50	40	10
I	1	1	-	12	12	-	2	-	2	130	130	-
J	1	1	-	12	12	-	3	1	2	45	45	-
K	-	-	-	22	20	2	3	3	-	6	3	3

(note: n – actual numbers; F – Functional; NF – Non-functional) (Mamta 2000:3)

A study conducted by CARE-India estimated that 63% of the houses in Tigri were connected to piped water supply, while 37% received water through hand pumps. Of the initial 63%, only 43% of the homes had their own house connections, and of the 37% of individuals who received water from hand pumps, only 5% had one on their premises (Alam 1999:47).

It appeared to me that the water problem in this particular community was similar to what was happening in Delhi and India in general; water is not available at all times, and one is fortunate to receive it in areas where there is no regular piping or electricity. Most

[16] Hand pumps are connected to the underground pipes or groundwater table, and are manually used to draw water. Tube wells are borings/drillings done in the ground and connected to a motor, which is used to pull up water on a large scale (i.e., to irrigate crops).

houses, in Tigri, did not have their own taps; usually there was one common tap shared for every 10 houses or so, or else a hand pump, which would often not work. This was a burden for many, since it required people to plan the use of their water, and spend many hours collecting it for their daily household chores. Women and children are responsible for this task, and they go to nearby taps and hand pumps with their buckets, plastic containers and/or large pots. There they wait for their turn, take the water home and return to gather more water. This task is an essential part of these individuals' lives; without water they cannot cook, bathe or clean. In many cases, electricity was not available either, and sometimes it would shut off for a couple of hours, or even for days. The longest time I experienced a lack of electricity in this slum was for 4 days, and since there was no electricity there was no access to water. Individuals, mostly women and children, would then have to go to the nearby water tanks, in adjacent neighbourhoods, travelling anywhere from a few metres to 1-2 km. The collection of water outside the community is very difficult for the women and children. They are responsible for collecting it despite how they may feel or whether they are physically able. If the women are extremely sick, then the children would go - and this would be difficult, as they would skip school, or have to make more trips because the containers when full, would be too heavy for them to carry. Water is a major concern for all individuals in this community. Their daily lives often would revolve around water, and their day would be planned according to when the water is available. If power came on at nine o'clock in the morning, all activities would stop and the process of organizing the collection of the water would begin. The same would be the case if the power came on in the afternoon.

Water retrieval was always the first priority of women and children. In very rare cases, the men would get involved, but generally, they would not be concerned with these tasks.

Figure 3.5 The water situation in Tigri

3.3.2 Social behavioural factors

Social aspects

Most families within Tigri are nuclear and patriarchal in nature, with two adult parents and children, comprising anywhere between 3 – 10 members, and not having many members of the extended family present. There were some households, which represented the more traditional Indian family consisting of a mixed/extended family,

with either grandparents or uncles and aunts present. Most families retained very close ties with their families back home in the villages as well as those in the slum who shared common cultural and traditional backgrounds originating from a particular village or region. Many families would find themselves missing their village home and often continued visiting during school holidays or during harvest times. The families in Tigri would also be very supportive of providing financial assistance to those members of their family who resided in the village. The predominant religion in the slum is Hindu, and the majority of these families are from either scheduled castes (i.e. lower caste Hindus) or tribes, with some upper castes represented. There are also a small percentage of Muslims, Sikhs and Christians.

The age for marriage is very early among members of the community. Men generally marry between 17-21 years of age and women between 15-19; most women experienced their first pregnancy by the time they reached 20 (Mamta 2000). In most Indian cultures, especially those deeply rooted in rural traditions, socio-cultural norms usually pressure women to have a child immediately after marriage. Through the help of media and the work of local NGOs, the use of contraceptives has increased, but cultural barriers often exist for getting the men to agree and participate in using contraceptive methods such as condoms. Many men feel it is not their responsibility to consider preventive measures and, as a result, most women are faced with the decision-making. I remember an instance when I was accompanying one of the Mamta program officers (POs) around the blocks and we were chatting with a group of women who were cleaning their homes in preparation for the Hindu holiday, *Diwali*. Very discreetly, a woman approached the PO

and asked her if she could get some condoms because she did not want to have anymore children. Many times young women would come to the Mamta field office, asking questions about contraception, or asking about methods of sterilization after they had their children. The NGO was very supportive in these matters. They provided contraception (mostly condoms) and imparted knowledge of other measures through interactive community focus groups or meetings, in the weekly women's health clinic and in general when they talked to the women of the community. In some cases during the counselling sessions, many women would come in who had gotten pregnant, but did not want the pregnancy and had to deal with the pressures of their husbands, in-laws, and society.

With respect to employment in the slum, the majority of men work as general labourers, vendors, or skilled workers (carpenters, painters, etc.). Their wages range from 25-75 Rs[17]. per day, although in most cases this is not stable employment. A few men have class IV government jobs where their wages would range from 500 – 4000 Rs. per month. The average income per household was about 3000 Rs. per month. It was considered better to get a government job because then one would be guaranteed a fixed income without the threat of losing one's job. Other men work on contract, for example as painters or carpenters; their income is dependent on when there was a job and how big that job was. Many men were also found hanging around the neighbourhood gambling, drinking and smoking/dealing drugs. Once the drinking and gambling would begin there was tension in the neighbourhood and, in many cases there would be fights and harassment of young women. As for the earnings, while some men gave their wages or

[17] One Canadian Dollar is equivalent to approximately 30 Indian Rupees (as of September 2001).

part of their wages to their wives to run the household, others did not and this would lead to subsequent problems for the family, which will be discussed in the following chapters.

There were many initiatives in the slum that encouraged saving through participation in savings and credit groups. According to (Mamta 2000) the majority of people would obtain credit for activities such as house repairing, health reasons, marriage of their daughters or sons, starting a small business, the celebration of a birth of a child, and festivals or religious holidays. The credit was provided by the government agencies, and at times gender variables applicable to other areas of decision-making were present here as well. Yet, it did provide women a modicum of autonomy.

Women play an important role in the community in terms of day-to-day activities. Women undertake a variety of tasks such as taking care of their husbands and children, and ensuring that their houses function with adequate food, water and supplies. In particular, women bore the burden of guaranteeing there would be enough water for the day's domestic chores, drinking and cooking. In many cases they were the first to rise in the morning and began their activities with collecting water, despite how they felt, or the circumstances under which they had to collect water. This would have to be delicately balanced with the maintenance of the house, taking care of infant children and preparing food. As mentioned, some husbands would support their wives by giving them either their whole or part salary to help run the house, and as problems would arise women would either wait for their husbands to return home or take the initiative and make decisions, such as those relating to ill health. However, a majority of women felt, out of

respect for their husbands, that any major decision relating to the upbringing of their children, questions pertaining to birth control, or the future of the family was better made with their husband's consent, out of respect and convention.

The importance and value of education varied within the slum. In cases where the parents were educated it was the male who was more educated than the woman. There were some households where neither father nor mother had gone to school. As a result, the level and quality of education available to the children varied. There are *anganwadi*[18] centres, non-formal education centres and tuition centres in the blocks that are available to the families as options for education. Outside of the slum, there are both primary and secondary schools that are run by the government or by private organizations.

Tigri faced several social problems, which were not always discussed in the open. Alcoholism and drugs are a threat to young and older males. These problems would often be the result of or enhanced by children dropping out of school and turning to small crimes. Alcohol and drugs among the adult males would often lead to household problems as well. As a result, such men would give their wives less money to run the house, impacting the overall security of the home. These men would be found loitering and gambling around certain areas near the latrines, especially during the evening. This activity posed a serious threat to the safety of young girls and women. Many households felt threatened by these dark areas near the latrines because they promoted instances of harassment, attacks and even rapes. In response to this risk, individual households began

[18] Anganwadi centres under the Integrated Child Development Scheme (ICDS) fall under the Department of Women and Child and are meant to do nutritional and educational interventions for mothers and children, as well as some programmes for adolescent girls.

looking at options to construct private latrines in their homes. The dark corners around the latrines also created atmospheres for sexual activity for teenagers. Many teenagers would use this venue to meet their boyfriends and girlfriends.

As a result of the social or cultural divisions in the community, a sense of uneasiness was created among members, on the whole. The lower caste Hindus, who were working as the scavengers and sweepers, were located within one area, whereas Muslims would be in another pocket. There were tensions associated with religious backgrounds, for example the Muslims living in the community were frowned upon by the Hindus because they would eat meat and in some cases beef. On the other hand, the lower caste Hindus also faced these problems because they would raise pigs and either sell them or eat them. Neither the Muslims nor higher caste Hindus accepted this, because to them this was considered "dirty". There were problems and arguments between mothers regarding their children. As children would have quarrels playing in the slum, the mothers would also get involved and this would cause problems with families within the same block. Mothers would also argue with their neighbours over their children. Mothers would feel that certain children in their neighbourhood were not appropriate influences on their children, especially if they did not go to school and just loitered around the streets. The mothers felt this would cause their own children to head down a similar path.

Medical availability and access

The community in Tigri has access to a variety of medical attention, however the range of quality is quite diverse and spread apart. In most cases, the community attends to unqualified medical practitioners, registered medical practitioner (RMP), *Dai*'s (midwives), and Non-governmental organizations providing medical treatment and clinics as opposed to university trained medical doctors. There are medical dispensaries located outside the slum with registered doctors where the range of fees and quality of care vary. The two hospitals that the majority of patients attend are, Safdarjung Hospital, a government hospital providing free care to patients located, about 18 km away, and Batra Hospital, a private hospital, which is closer (only 1-2 km). Health facilities that are available to the community in Tigri itself and those within a kilometre are as follows:

Table 3.3: Health facility profile in Tigri

Health Facilities (within block)	Blocks										
	A	B	C	D	E	F	G	H	I	J	K
General Practitioners											
Qualified Allopathic	-	-	-	-	-	-	-	-	-	-	-
Qualified Indian System of Medicine	2	-	1	-	-	-	-	-	-	-	-
Unqualified	2	3	1	2	1	3	3	1	-	1	-
Traditional Birth Attendants											
Trained											
Untrained											
Health Facilities (within 1 km)	Blocks										
	A	B	C	D	E	F	G	H	I	J	K
Nursing Homes	9	9	1	1	5	9	9	9	5	5	9
Health Centres/Dispensary	6	6	6	-	7	6	6	6	7	7	6
General Practitioners											
Qualified Allopathic	6	6	6	-	6	6	6	6	6	8	6
Qualified Indian System of Medicine	6	6	6	-	4	6	6	-	4	4	6
Unqualified	26	26	26	-	28	26	18	32	28	28	26
Traditional Birth Attendants											
Trained	15	15	15	-	19	15	15	15	14	14	15
Untrained	5	5	5	-	1	5	5	5	1	1	5

(Mamta 2000:5)

As can be seen, in Table Three, the number of qualified practitioners is very low in comparison to the size of the community. There is about 1 general practitioner (GP) and 1 Dai for every two thousand population (Mamta 2000).

3.4 Conclusion

The ecosystem approach is a framework, which allows for the comprehensive understanding of the overall phenomena of disease and health in an urban slum of India, such as Tigri. In this chapter, it is evident from a description of the characteristics of the slum Tigri that this is a fragile ecosystem. This chapter allowed for a thorough understanding of the urban ecosystem with particular attention to that of slums and described the setting of the research. The subsequent chapter will provide the methodology and methods chosen for this study, and the appropriateness of the setting. In answering the research questions, one can understand the pressures upon the individual and family in Tigri and thus, why they make the decisions they do when it comes to diarrhoeal disease and its treatment.

CHAPTER 4
METHODOLOGY AND METHODS

4.1 METHODOLOGY

The concept of place, region and space are central in geographical discourse. Many medical geographers have studied relationships between occurrence of human disease and healthcare, location, cultures, and environments. Medical geography has evolved to a broader examination of the geography of health and healthcare and in so doing has drawn extensively on social theories that have been incorporated into human geography more generally. Places within medical and health geography have a degree of richness and meaning where one can understand the significance of place to people and the experiences they encounter. A person's place is influenced by socio-economic status in society and opportunities and access to resources. Health is placed in the context of socio-structural pressures, which can be identified in a small geographical area (Jones and Moon 1993). Geography of health considers the dynamic relationship between health and place and the impacts of both health services and the health of population groups on the vitality of places (Kearns 1993:145). With respect to this study the nature of the place - the locality, Delhi and more specifically, the slum Janta Jeevan Camp Tigri, was explored in relation to its role in structuring health status and health-related behaviour.

4.1.1 Case study approach

In order to examine the social construction of diarrhoeal disease risk in an urban poor community within Delhi, I used a qualitative case study approach. Qualitative methodology is appropriate in that this study aimed to examine the attitudes and

behaviours of caregivers in relation to the social construction of diarrhoeal disease risks. The case study is an exploration of a bounded system involving many sources of detailed information rich in context that aims to reveal meaning. It is important to understand that a bounded system is bounded by time and place and is valued for its uniqueness. In this thesis I bounded the study by the physical limits of the Janta Jeevan Camp Tigri in South Delhi, as well as being limited by the length of the field season (September 2000 to January 2001). The choice of this particular community was because of the capability of portraying the different perspectives of the problems and processes involved. As with other modes of inquiry in qualitative research, data were obtained through observations, interviews, audio-visual material, and documents/reports (Creswell 1998; Stake 1998). Therefore, the case emerged and became rich in context or holism through detailed data collection, analysis of themes or issues and assertions by myself. The richness allowed a contextual account to view space as a place with a meaning for everyday life, where space is implicated in human activity and vice versa (Jones and Moon 1993).

4.2 METHODS

4.2.1 Community identification

In order to conduct this research, fieldwork took place in Delhi, India, between September 2000 and January 2001[19], in the slum community Janta Jeevan Camp Tigri. My first step involved identifying an urban poor community of Delhi that was vulnerable to the processes of rapid urbanization and its impacts on the bio-physical and socio-economic environments, as well one which had prevalent diarrhoeal disease problems.

[19] The timing of the fieldwork took place at the end of the summer and the onset of winter. With respect to diarrhoeal disease, outbreaks were most common during the summer months due to the increased heat and summer rains.

Due to the short field season and time constraints prior to leaving for India I had, with the assistance of IDRC's[20] Ecosystem Approach to Human Health Program Initiative in Ottawa and their South Asia Regional Office in Delhi, selected three local grassroots NGOs to employ. These NGOs were selected based on their activities with urban poor communities in Delhi, and in particular those working with children and health issues.

My first month involved consultations with these NGOs, where valuable advice was given and various visits to slums were conducted. I also met with individuals working with the government at Delhi Development Authority (DDA) and the Housing and Urban Development Corporation (HUDCO) for discussions regarding the state of affairs with the urban poor in Delhi. I was subsequently referred to a NGO by the name of Mamta. Mamta is a NGO focused on maternal and child health in under-privileged urban communities in Delhi, such as slums and squatters. After meeting their Director, Executive Director and Research Associate, I was directed to one of their field sites, a particular slum community located in South Delhi, Janta Jeevan Camp Tigri. I met with the field staff and was given a tour of the community as a result of which I decided that this community and NGO would be the most appropriate for my study. The community faced serious problems with housing, sanitation, water and health. In addition, the NGO was not only focused on health problems in this community, but the larger social and economic issues facing the community. With the level of interest and support for my research at the main and field offices of Mamta, I felt that my research would benefit this organization as well. My research would assist the Mamta staff in areas such as:

---

[20] IDRC – International Development Research Centre

developing their maternal and child health programs and creating greater NGO awareness among the community through my interactions with the mothers.

Creating rapport with the community is an essential part of fieldwork. A nineteen year-old gatekeeper/field companion, Seema, was found through the help of Mamta. Seema was a single mother with a grade 10 education. She lived in Tigri and was knowledgeable of the customs, the way of life and the issues of concern facing the community. Another advantage to having a field companion was the benefit of an additional set of eyes and ears for observations, focus group discussions, and interviews. Also it is worth mentioning, that it is not safe for an outsider, especially a woman, to wander in slums in India. With the assistance of the field workers for Mamta and Seema, I was able to walk through the community, work in the weekly Mamta clinic, and participate in Mamta field activities. This allowed me to introduce myself and allow the community members to become comfortable with me. With respect to the community's willingness to work with me, a level of rapport was achieved between the community and myself. This rapport building process was enhanced by actions, such as the interactions with Mamta's community workers (CWs) – a level of trust and legitimacy was achieved. The importance and nature of the study was understood and of concern to the members of the community as well. Spending time just listening to the community and getting to know the issues that they endured helped enhance this process.

The value of this study depended on my sensitivity as a researcher to the surroundings I faced and the local norms and codes of behaviour. India is made up of many religions

and cultures, which at times have caused tension and struggles. The relationship between the study participants and myself may have affected the type of information I was able to obtain, as I am a Hindu female and of the higher caste, Brahmin[21], and most of the slum dwellers were either lower caste Hindus or originated from tribal groups. Although I am of Indian descent and can speak the native languages of Hindi, Punjabi, and Urdu, there were instances when I could not carry out my research very effectively. Sometimes, difficulties were present during interviews, where I was unable to understand the native dialect of the participants or was unable to get my points or questions across. With the help of my research assistant, a reasonable system of communication was established, where she translated for me when either the participants or myself did not understand.

Consideration of the community's day-to-day lives was taken into account with respect to when data was collected. Daily lives revolve around survival activities, such as collecting water, where the day would be planned according to when the water would be available. If the power came on at 9 in the morning, all activities would stop and the process of organizing the collection of the water would begin. Similarly if it came on in the afternoon the same would occur. This would cause problems with the research process in that at times it was difficult to collect data by doing interviews or focus groups when the individual would be concerned with getting water. As soon as the water would be available locally, the mood of the community would change. People would be concerned with retrieving water as their first priority. Also, traditional customs and

[21] The participants may have known this information by becoming aware of my last name. Hindu last names, in most cases, identify a person's caste/background and/or place of origin. The Hindu religion is divided into castes – priests, warriors, farmers, labourers, and untouchables, which results in a complex hierarchy. My own caste, Brahmin (priests) is considered at the top of this hierarchy.

practices were also respected; during the time around the Hindu holiday *Diwali*, and the Muslim holiday *Eid*, individuals and family were more preoccupied with preparing their homes, visiting family, having feasts and celebrating. As a result, I would have to re-arrange my schedule and respect their time. Moreover, as a result of becoming a part of the Mamta community and developing relationships with the community workers, who resided in Tigri, expectations were present that I participate in their day-to-day lives as well. For example, one day I attended a Muslim funeral for one of the community workers from Mamta, which allowed me to develop a personal relationship with the Community Worker as well as, allowed for an insight into the practices that were carried on in this religious group in Tigri. These are some examples events over the course of the fieldwork season that at times caused limitations to the collection of data, (i.e., the water schedule) and, at the same time, opportunities to view special parts of the culture (i.e., Muslim funeral) which aided the development of the holistic picture of the community.

As a recruitment incentive, in order to encourage participation, emphasis was placed upon the importance of the study and the sharing of end results. Results will be given back to the community through the assistance of Mamta, local hospitals, government officials and IDRC's South Asia Regional Office. Additionally, to thank and appreciate the assistance, effort and time put in by the community for this study, options for the improvement of the community were explored with Mamta, and I gave a donation to Mamta, through funding provided by the International Development Research Centre.

4.2.2 Data collection

There are six important data collection methods a case study researcher can use: documentation, archival records, interviews, direct observations, participant observation and physical artefacts (Yin 1994). In order to ensure validity and reliability it is important to incorporate data triangulation. Triangulation allows for the use of multiple sources of evidence, which essentially provide multiple measures of the same phenomenon; it allows information from various sources to converge on the same set of facts. My methods for data collection during my fieldwork season in Delhi included collection of documents, from libraries and health facilities, focus group discussions, interviews, and participation in community and Mamta activities and direct observations. However, limitations associated with using multiple sources of information exist; collection of data from multiple sources is more labour intensive, requiring in-depth knowledge of the various methodological frameworks (see below). Consultations with the multi-disciplinary team at IDRC (both in Ottawa and Delhi) and Mamta occurred on a regular basis, where they assisted in providing advice on strategies for collecting data. For example, an anthropologist on the IDRC team in Ottawa was able to give valuable suggestions as to how to conduct a more qualitative study through focus groups and interviews, while the team at Mamta offered assistance in guiding me to sources of literature and records in Delhi.

Collection of documents

Prior to the field season, collection of documents included a comprehensive examination of the available literature on diarrhoeal disease risks and the social construction of risk in urban poor communities. During my field season, I began with an extensive literature search to collect academic, institutional and popular texts of the study site and the urban poverty situation in Delhi and India. This involved visits to the various libraries in Delhi, such as Delhi University's Central Reference Library and the School of Planning and Architecture Library, Indian Social Sciences Institute, and libraries associated with various NGOs (Mamta, Participatory Research in Asia (PRIA), Centre for Science and Environment (CSE), etc.). Various articles and materials were also obtained from meetings with individuals from HUDCO and DDA. I also obtained maps of Delhi.

Documentation is a valuable source of information in that it is stable – it can be reviewed repeatedly and, unobtrusively (without affecting anyone involved in the study i.e., the community or mothers in the community); it provides context to the study – containing exact names, references, and details of an event, and allows for a broad coverage (Yin 1994). Despite these strengths, many weaknesses are also present. They involve issues of retrievability and accuracy – data can be limited, biased, selective, and inaccessible. This includes such examples as community and government health records, and data on water sources regarding quantity and quality. The conceptual framework for the study was created while gathering these documents. Furthermore, archival records such as maps and census records were also analysed for corresponding information (i.e. records on diarrhoeal disease in Tigri). This data will corroborate and augment information

gathered through the other methods to create a holistic picture of the situation. A critical analysis of this information recognizes that this information was produced for a purpose and audience other than this case study.

Focus groups

In order to obtain a large amount of information regarding the mothers' perceptions, experiences and feelings central to the phenomena in question, several focus groups were conducted. Originally I proposed that 2-3 focus groups would be conducted with 4-8 individuals. However, in consultation with Mamta, I decided that it would be beneficial to both myself and the NGO that as many focus groups be conducted in the community as possible. This would benefit the NGO in that they could strengthen their community outreach with respect to their weekly health focus group discussions. Out of the 11 blocks in Tigri, 7 focus groups were conducted[22]. This was both with and without Mamta's presence. The discussions that were carried on with Mamta's presence may have been biased in some ways, for example responses being altered because of the power structure between the community workers and the residents. The numbers of people varied between 5-15 women. By allowing small focus group discussions, each participant was able to have ample opportunity and time to explain reactions and thoughts to the issues with the help of the mediator's control. However this was not always possible, and thus those groups which had larger numbers were much more difficult to manage. With respect to the nature of discussions, I followed Morgan's (1997) description of a "funnel-based" focus group discussion. Each group most often began with a less structured approach that encouraged open discussion about perspectives and

[22] For complete schedule of focus group discussions, refer to Appendix Six.

then moved to a structured discussion relating to my specific interests and questions. These focus group discussions also incorporated insight into specific wordings and phrases local to Tigri, originating from people's original native rural villages. The discussions were conducted in the manner most comfortable with the participants, i.e. in their local dialect, which I was able to partially understand because of its relation to Hindi; and, in a suitable and comfortable place where we all could meet - in either a Mamta block office (there was one located in each block) or more informally on the street in front of an individual's house. The research assistant and myself facilitated focus group discussions, and when Mamta was present, their Community Worker also helped. Focus group discussions were tape-recorded and supplemented with my own notes, with the permission of participants. The anonymity and confidentiality of respondents were also assured. At the end, the tapes were transcribed and translated for data analysis by my research assistant, Seema.

An opportunity is provided in focus group discussions to observe "the formation of a temporary social structure that is a microcosm of the larger context" (Goss 1996:118). According to Morgan (1997), during focus group discussions, which encourage more open discussions of the research topic, greater emphasis is placed upon the moderator's ability to control the discussion and not influence discussions by his/her own bias. Allowing each participant to speak freely and not guiding their answers ensures this. This method allows for direct evidence about the similarities and differences in participants' opinions and experiences through group interactions, as well as key comprehension of decision-making and thought processes of groups. With my own

experiences, I found at times there were difficulties trying to control the flow of information during large focus group gatherings, since people would start randomly talking, out of turn, and thus getting off topic. Even with the help of the research assistant and other community workers it did become difficult. As well, when going through the tapes after the group discussions, there were many problems present in listening for information. It was very difficult at times to distinguish which voice belonged to whom and to separate the background noises of either small children crying, animals making noise, or music playing in a far off place. In addition, as I was spending time in one of Mamta's vocational field offices I had the opportunity to meet young adults who were students there. Thus, a chance presented itself to converse about the various issues in their community from their perspective. I did not plan to conduct a focus group, but did end up conducting two with adolescent teenagers. Nevertheless, because of the vast amount of data obtained in the end and the problems transcribing the tapes, I decided I would use the focus group discussions as more of a reflection of the general issues that were of concern to the community. Thus I did not use them for data analysis. Besides for the focus group discussions with the mothers and adolescents, I conducted focus groups in Tigri which were useful and used in data analysis. These were with Mamta program officers and community workers.

Sampling occurred through a purposive or theoretical sampling technique, where individuals were selected from one source. In other words, I selected members of the community who I thought would provide me with the best information – those dealing with diarrhoeal disease in children. However, while doing this I also learned so much

more about the way of life in the community. It was not possible to conduct focus group discussions with the fathers/men in the community due to lack of time and the inability to gather them in one setting due to their various work schedules. Also, Mamta suggested that it was unsafe to conduct these focus groups alone, and the accompaniment of another male (field program officer) was necessary. This was difficult because of the burden of work on the two male field program officers, and as a result I was unable to co-ordinate a suitable schedule. In doing so, perhaps the results are not gender sensitive or a true reflection of the processes that are occurring, as they only gave one view of reality with respect to diarrhoeal disease risk in the household. The mothers were either identified with the assistance of Mamta community field workers or my research assistant, Seema. This practise may have created possible biases by the community workers because of the power dynamics between the NGO and community. Also, they may have chosen those participants that they had relationships with, and thus participants may not have been a random selection. The benefit of this process however was that the community workers and Seema were individuals that are trusted and valued in the community because they are a part of the community. A possible limitation is that having the participants living in the same community and facing the same circumstances each day may lead to many assumptions, such as the way people deal with water scarcity. As a result, it was not always possible to explore the assumptions underlying such problems within the community and their responses in-depth unless one continued to probe. Although I did not have knowledge about these issues, to the residents of the community it may have been trivial and routine.

Interviews

Along with these focus group meetings, individual interviews with mothers and healthcare providers were conducted. Mothers were either identified at the end of a focus group discussion or through the assistance of Mamta and Seema. Again, this practice may have created possible biases by Mamta because of the power dynamics between the NGO and community, and pre-existing relationships. Healthcare providers were selected based on their level of involvement in the community (i.e., how often they were mentioned in the interviews with the mothers). The selection of caregivers included both mothers from the higher and lower blocks experiencing occurrences of diarrhoeal disease with their young children. In turn, this allowed for a detailed understanding of risk in households. Discussions revolved around attitudinal and behavioural factors linked to social construction of risk in households and in the community. The formal, in-depth, open-ended interviews – 25 in all – allowed me to gather information targeted directly on the case study topic – i.e. about the specific characteristics of the social constructions of diarrhoeal disease and its treatment by caregivers.

Prior to leaving for India, a potential questionnaire was compiled with the input from IDRC researchers in Ottawa and Delhi. Upon arriving in Delhi, these questions were further developed and refined to reflect the important issues in the community with the program officers at Mamta and during focus group discussions. This process of refining my questions ensured that I had as complete a picture of the participants' thinking as possible rather than relying on assumptions of what was relevant (Morgan 1997). The process of interviewing allows more control than in a focus group for the interviewer and

the interviewee is able to share greater information in private without being inhibited by other individuals in a group (Morgan 1997). This interview process enabled an in-depth understanding of each person's opinions and experiences.[23]

Direct observations

Throughout the whole fieldwork season in India I recorded my direct observations. Because there is a limit to understanding behaviour in verbal focus group discussions and in individual interviews, as people will often say one thing, but do another, observations are key to any case study. The settings for focus group discussions and interviews are created and thus unnatural – information is only provided for that particular interaction. For example, many people will say one thing, but do another; interactions and behaviours cannot be re-created in focus group settings or interviews. Although, behaviours take time to observe and understand and locating and accessing settings for such observations can be difficult, this method provided important data that cannot be obtained through other methods. Observations are a reflection of reality and are situated in the actual context of the phenomenon under study, as well as being influenced by the observer. My direct observations of Tigri were recorded through personal entries in my journal and photographs taken in the community. Personal journal entries also included observations made during the focus group sessions and individual interview settings. A more focused form of observation evolved with continual contact with the research participants. Examples of various observations related to the following were recorded by hand in journals as my reference during the focus groups, interviews and in general:

- general cleanliness of the home, mother and children;

[23] For complete interview guideline, refer to Appendix Five.

- practices related to defecation/urination of young children;
- water-handling behaviours;
- the feeling or mood within the community;
- food and drink preparation practices; and
- structure of housing.

Participant observations

Participant observation is another valuable method of data collection in fieldwork. While direct observations are more of a passive method of collecting data, participant observations place the researchers in a more active role in the phenomena being studied. Throughout my field season in Delhi, I was a participant observer in two main ways. The first was as a member of the NGO, Mamta where I participated in activities and programs, as well as spending a lot of time interacting with the program officers and community workers. In order to become more comfortable with the community and my surroundings, for the first part of my work in the field I observed the activities in the field office - helping out where I could. This was primarily by sitting in on the weekly health clinics, helping out when there were guests (i.e. donor agencies), conducting field visits, visiting the field with the program officers and lending a hand with the daily routine activities. As a result of interacting with the NGO, not only was I able to create rapport with the community and gain acceptance in the community as a legitimate researcher, I was able to observe and gain crucial insight into the daily functioning of the NGO and the community in general. I was able to understand some of the challenges the NGO faced (i.e., lack of funding, communicating information and encouraging the community to use their services) in working in slum conditions; the limitations and constraints that prevented them from achieving their goals at times. However, my results may have been

influenced in part by the affiliation with a particular NGO, as I may have been regarded as one advocating their agendas as well as creating a power dynamic where I was seen as an authority figure, which may have caused intimidation.

Secondly, I was able to conduct a participatory form of observation as a resident of Delhi – the larger context of my study. Although, I did not live in the slum itself, as a resident of Delhi in general, I was able to experience everyday life in Delhi. This was similar to other residents due to the nature of urbanization and development processes, as well as problems related to the physical environment. Through conversations with other Delhi residents, from various backgrounds, I was able to understand some of the common problems shared by all the inhabitants, gain greater awareness as to why people moved to Delhi, and the feelings towards and perceptions of the urban poor. This permitted me to place my study in the broader context - Tigri within Delhi.

According to Yin (1994), there are apparent benefits from participant observations. One is able to collect data through this method that may be otherwise difficult to gain access to. For example, if I was not a part of the NGO, I would not have been able to understand the dynamics of the relationship between the NGO and the community, the challenges NGOs like Mamta face in slum communities, and gain valuable insight into relationships and history among some of the community members. Since Mamta employed field workers from the community, I was given the chance to talk to these women on a one-to-one basis as a colleague and friend and develop my own relationships with them. Participant observation allows the researcher to have a more direct and

personal role in the phenomena under study and obtain a more holistic picture of everyday activities and their meanings.

There are also some disadvantages associated with participant observation. In some cases, the investigator has less ability to work as an observer who is uninvolved or unaffected in situations; one tends to come into a situation with personal biases and/or pre-existing conceptual views. In my study, possible biases may have been created in that I was part of a neighbourhood that was of a higher economic class. Also, as a member of Mamta, I may have carried their own thoughts and biases into my research. One possible way of overcoming this was through gaining the perspectives of many individuals in the NGO, and attempting to understand the problems in the community through the eyes of the doctors, program officers and community workers. In addition, there were instances when I was unable to record all the information I received, because I was in situations that were not appropriate, such as a funeral, or I was not prepared (i.e., I did not always have my journal and pen with me). For example, some of my best conversations about life in Delhi were with my auto-rickshaw drivers and through talking with merchants selling fruits and vegetables, or interacting with our house servant while she cleaned our home. As a result, these entries would be added to my journal later based on memory, which may not have been as reliable.

4.2.3 Data analysis

The information gathered in this study was analysed using content/thematic analysis to describe and explain the attitudes and behaviours of mothers and primary caregivers that

live in an urban poor community, Tigri, of New Delhi. The analysis took place with the study's research objectives and questions as a guiding framework. The data obtained through documents, focus groups, interviews, and observations were *textual* in nature. As suggested by Huberman and Miles, (1998), the data collected through the study - documents, records, focus group and interview transcripts, field notes and observations were organized and processed (i.e. transcribed, translated, corrected, edited, etc.) in order to analyse them for content/themes. Major ideas were categorized through a process of reading, analysing and coding the data, which led to the emergence of themes in the case study. The themes became the unit of analysis. The analysis and determination of themes was a manual process. As the study is concentrating on the social construction of risk associated with diarrhoeal disease, information was organized in themes related to the slum ecosystem and diarrhoeal disease. Coding occurred by recognizing how many times the topic was mentioned (i.e., the regularities and recurrent ideas). This was guided by the initial research questions and conceptual framework. The initial codes were subsequently broken down into sub codes to categorize the information by drawing on the relationships present. Data analysis has three main components – data reduction, data display, and conclusion drawing (Huberman and Miles 1998). This is an interactive process – the data were coded and constantly refined and reduced as I was determining how to display the data and particular themes. As a result of these steps the information was organized in a concise manner to report conclusions.

4.3 Conclusion

In this chapter, I accounted for the methodology, methods and techniques for analysis that I employed. These decisions were dependent on the nature of the study itself and guided by the research questions. I chose my methodology in order to get a broader understanding of the interactions that occur in a slum community, during my five-month visit. The case study approach allows for various methods to be employed. My decisions regarding the methods were dependent on the setting itself. For example, it was unsafe to reside in the slum, so I would travel to the community each day. I was involved with the NGO Mamta in order to not only get familiar with my surroundings, but also to make direct and participant observations. Moreover, I find that the methods mentioned in this chapter and my choice of analysis permitted me to understand the slum Tigri in the urban ecosystem, and furthermore examine the relationships through the theoretical lenses of social construction of risk.

The previous chapters have laid the foundation of this thesis – Chapter Two explored the theoretical basis of this study and Chapter Three gave a thorough description of the setting, whereby the parameters of the ecosystem and the state of the ecosystem are established. In Chapter Five I will present the results and key findings of my field season, bringing together the concepts and issues raised in previous chapters to a more specific community – that of Tigri. The theoretical implications of the results and key findings will further be discussed in the broader frameworks of ecosystem approaches to human health and social construction of risk.

CHAPTER 5
RESULTS AND ANALYSIS

5.1 Introduction

The previous chapters have developed the foundation for the research questions and objectives outlined in this thesis. In this chapter, I present the results of my five-month field research in the slum Janta Jeevan Camp Tigri located in the south of New Delhi. With a comprehensive understanding of the community and the surrounding area, and using an ecosystem approach, one can begin to unveil the complexities surrounding mothers and the care they provide to their children. In this chapter I not only discuss the social construction of diarrhoeal disease risk by the mothers, but also articulate the voices of community members, Mamta and healthcare providers. Even though external pressures on the Tigri ecosystem shape decision-making by residents, it is important to understand the influences of health education, the level and diversity of healthcare, and the attitudes and behaviours of healthcare providers. I also present my impressions formed during my time in New Delhi, through working with Mamta, and being a part of the community in Tigri.

5.2 The State of and Pressures On the Tigri Ecosystem

Tigri is an ecosystem under stress due to a lack of essential resources and physical infrastructure to support its inhabitants. In addition, socio-economic, cultural and political barriers prevent residents from achieving a sustainable and healthy lifestyle in the community. These problems and constraints affect the attitudes and behaviours of mothers, and how they make decisions pertaining to the health and well-being of their children and other family members. The pressures on the community were clearly

identified through my interviews, focus group discussions and observations. These exchanges also highlighted some of the responses the residents employ to adapt to risk in their environment, and set the basis for determining how diarrhoeal disease risk is socially constructed.

Spending time in the community and talking to people allowed me to get a sense of what was important to the residents of Tigri. I came to know what their daily lives were like and how they coped with their living conditions and the associated risks to their health and well-being. In this section, I present the state of and pressures on the urban slum ecosystem, Tigri, as constructed by residents of the community. I asked them about the most common problems in the community, the sources of most stress and tension, and what they wished would improve.[24]

Discussions in previous chapters suggest that community problems are associated with water, latrines and the general sanitation and cleanliness in the slum. These problems have a potential direct impact on diarrhoeal disease, its prevention, transmission and control. The following table outlines the themes, problems and some of the solutions/responses mothers have identified with living in Tigri.

[24] A complete list of questions can be found in Appendix Four and Five.

Table 5.1 The pressures on mothers in the Tigri ecosystem - constraints and responses.

THEME	PROBLEM	SOLUTIONS/RESPONSES
Water Scarcity	• Distance to acquire water • Climate conditions • Childcare • Length of time • Social problems • Quality of water • Quantity of water	• Prioritise • Continue searching • Storage tanks • Strain or boiling • Complaining
Latrine and Sanitation Degradation	• Lack of maintenance • Social problems • Overflow because of rains	• Find alternative facility • Take husband, or family member along • Build within house • Hire someone to clean drains
Slum Living Standards	• Lack of space • Desire to go home • Raising children • Threat of being evicted • Social/religious problems	• No choice • Save money • Educate children
Economics	• Inflation • Unemployment • One wage earner	• Save money • Women desiring employment

5.2.1 Water scarcity

Water plays a crucial role in the presence and transmission of pathogens causing diarrhoea. The quantity and quality of water are therefore important factors in determining hygiene behaviour, which, in turn, is an important determinant of diarrhoeal disease outbreaks in a household.

Problems

Life in the slum, for women, literally revolves around water. From the moment women rise to the moment they sleep at night their primary concern is to collect enough water for the day. For the mothers in the community, water poses a serious situation when the quality is poor and/or the quantity is inadequate. Water problems further influence not only the functioning of the household, but the individuals who reside in it. Every mother complained about the water problems. As water is not readily available, mothers are usually responsible for collecting it from elsewhere within the slum or from neighbouring communities. The collection distance, ranging from a half kilometre to sometimes one or two kilometres, becomes a health burden on women. At times, the mothers felt physically exhausted or fell down while carrying water; yet regardless of weather conditions (e.g., in extreme heat such as 45 °C or during monsoon rains) or ill health, water collection has to occur. In most cases, husbands did not accompany the mothers and children were too young to carry the heavy containers of water. It was only socially acceptable that men go and collect water with the mothers in cases of emergency.

> *No, he doesn't feel good about it...people will think men are getting water...people think there is the wife and the girl, even then the man is doing the work. We have to go sick or else.* (Sapna)

The water problem became a dilemma as well when it came to caring for children. Those who were too young to collect water had to stay home, raising the issue of childcare (i.e., the issue of who takes care of them while the mother is away). If mothers brought children with them, there would be difficulties in taking care of them and collecting the

water at the same time. Time was also an issue, since it takes anywhere from a few hours to an entire day to collect a few buckets of water, depending on the distance to the source.

Added frustration is experienced if containers broke or leaked during the walk home, or if there was no water accessible in the vicinity. The anxiety is evident in this mother's statement:

> *My feet start hurting, walking we have to carry it over our heads, some people allow you to fill water, others do not. Sometimes we come back empty handed. See yesterday we did not even have water to drink. My girl got it from the "Devli" well thrice, the girl's hands started aching, and she carried huge cans of water on her head. So sometimes when the water leaks or it breaks, she gets wet in her sari. When we get water from great distances, it is a big problem.* (Sapna)

Since water is a precious commodity, women would fight at the water source over simple situations such as who arrived first. Many times mothers complained of being turned away by the owners of the taps and having to find water elsewhere. Although the government provides tube-wells, families in one block would feel a sense of ownership towards their common tap. In some cases, individual households have installed electric motors in their homes that draw the water from the government lines. When I asked why the women were denied access to water, most women answered that they did not know exactly, but those who had control over water used this power over them.

> *They don't let us fill it because we go far to get water and they know we don't know anyone there. If someone from Tigri comes and we don't know him or her and our tap was okay, we would say it is broken and send him or her onward. That is why we are sent too. There is a government tube-well set up in their block, and there are some who have put motors on, and as a result the water*

> *does not get further down. And so they have control, and we have to go there but they always will say no. They don't let us fill; they look at the face first and then let people fill.* (Shabana)

> *Well they don't, they say you will wreck the tank or the "washers" are going to wear out. They don't let us get it even if it is just flowing away as wastage or uselessly.* (Priya)

> *They say we have put in the money...the pump belongs to them, which costs money...they say that since it is our own property it belongs to us. Well when we don't understand so we move on to the next one. When somebody takes pity on us they might let us fill the water. Just that they don't let us fetch the water at times; we have to come back empty handed and frustrated.* (Neelam)

One of the mothers explained that one of the reasons for this was the fear that their water source would break due to over use, and they themselves would be left without water. The community is made up of individuals from various backgrounds, cultures, states, and religions, and consequently conflicts frequently arose over water. Another mother said that she would turn away lower cast Hindus because of fear of contaminating her tap.

> *We are also a little uncomfortable with Harijans; we would prefer it if they did not come here to get water. We don't drink their water, and we don't let them use our dishes either. We want to live in a clean manner separate from this. Mostly this is the concern with all in this area. There are some households that are Muslims, and they stick to their own kind and will not let anyone fill water too. Therefore there are some problems, and thus you have to look for a house where there are your brothers and sisters that will let you fill water. Or we look for a place where the people are clean and the tap is clean and so we get water from there, just because everyone is getting water does not mean we have to go there too.* (Shabana)

Further, problems arose when the electricity failed and there was no access to water at all, or when it was not possible to collect enough water in one day. For example, when a mother had to travel 2 km, she may only have had time to make one trip, and thus the water she collected on that trip would have to suffice for that day.

Water quality is also a critical issue. In most cases, water was described as *dirty* and *smelly,* with garbage and debris leaking in from the sewer drains. Often, there were stones, sand, worms and insects present in the water. Typically, women judged the water unfit to drink only when they could see evidence of matter in the water.

Solutions and responses

Women have few options to deal with the water situation. They cannot afford bottled water, nor can they travel greater distances to collect clean water. Their solution to water problems was to prioritise. If they only had a small quantity of water they would first use it for drinking and cooking, and would forgo bathing, washing clothes, or mopping the floors. Rather than face frustration, stress, and disappointment when they were unable to find water fit to drink, mothers would continuously look for water near their homes. They also tried to store as much of the water they collected as possible so that they would not have to get as much the next day or worry when there was a lack of water throughout the whole community. Water that was stored would be used the next day for chores that did not require fresh water, such as washing clothes or mopping the floor. In only extreme situations would stored water be used for drinking and cooking. Water would be stored in containers such as pots, buckets, or large tanks and would only be covered in some of the houses. When the water was visibly polluted the mothers usually used a cloth to strain the debris or would allow it to settle rather than boil it.

The government was generally seen to be responsible for solving problems of water quantity and quality and as such was the target of residents' complaints. But it was often left to the residents themselves to devise a solution.

> *We try to get our line fixed, for example if it is a government tube-well, we will make a complaint and say that our lines are leaking, or will amongst ourselves try and contribute by giving 50 or 100 Rs., and we get it checked and fixed ourselves. Sometimes the water from the sewer drains will also mix with the clean water.* (Shabana)

> *Nobody's responsibility, when we don't get water all the women tell the village chief. She does something – all the women get together and go...and we clean the streets ourselves. No body comes to sweep here, the sweepers only clean the drains.* (Anu)

However, some mothers implied that the problem was due to deficiencies in the government and thus felt they were not responsible for any proactive action.

> *It is better. Sometimes the pipes or wells leak and the dirty water of the drains will mix in. Sometimes there is garbage and insects. It is the responsibility of the government to fix this, and then the public will get clean water. When it is breaking, the well, then we are drinking dirty water. They should fix them, check them. These are government pipes. When it is time for votes then they come with their hands joined together and go from door to door. But now they don't listen, perhaps because we are little people.* (Laxmi)

5.2.2 Latrine and sanitation degradation

Problems

The mothers in this community felt very strongly about latrine and general sanitation issues. Their complaints about the neighbourhood focussed on disgust and distress over the condition of the latrines. As mentioned in Chapter Three, a majority of the homes did not have private latrine facilities and residents had to use the facilities provided by the

municipal government. These facilities are located within walking distance, just outside the slum. As can be seen in Table 5.1 above, mothers had problems with the physical conditions of latrines – most notably the lack of maintenance and cleanliness.

When I asked whom they thought was responsible for the facilities, many mothers did not regard themselves responsible for the facilities. Instead, they felt that either the local government was responsible or the lower caste Hindus, such as the sweepers and janitors. It was a responsibility that was not their concern, and should not be a burden to them. In many instances the facilities were unclean, damaged and unhygienic.

> *There are so many problems there; sometimes for 15 days they don't get cleaned. We have had to go to other complexes, such as Dakshin Puri. It is their job, the sweepers whose duty they have. But sometimes they don't even come. If they feel like they want to, they will if they don't they won't.* (Shabana)

> *They do come to clean, sometimes they clean otherwise they do a half-hearted job. When there is a bigger inspecting officer coming then they do a proper job, otherwise just the bare minimum.* (Neelam)

> *They do what pleases them...half the work. Apparently there is no supervisor or any authority figure, if there was some authority or someone to take initiative it would be better. For example, when they clean this drain, if we are around we say please clean it properly otherwise he just does one sweep and says it is done. And even the latrines, they just pour water even if it lies all around they don't clean it.* (Sita)

The problems of hygiene were obvious from the insects and flies around the latrines.

Despite the larger structural factors surrounding the latrines and sanitation in the community, mothers did not realize that they, too, were a contributing factor to overall

cleanliness of the community. One mother was able to make the link that the problem is due to the individuals' poor treatment of the facilities.

> *They are dirty. Women make them dirty, there is cleaning, but the women make them dirty. I don't know why even the walls are dirty. Women are the problem. Women don't have common sense. If the latrine is made, then sit and use it properly.* (Saira)

Additional problems with the latrine focussed around the social aspects and privacy. Many unemployed men would loiter near the latrines, and women would feel very uncomfortable about going there, as they would have to pass these men. These men, including younger adolescent men, would harass women, especially in the evening or night. For many parents, this was a serious threat to their families if they had young women or teenage daughters in their family. Many families feared that their daughters would become victims of sexual harassment by these men lurking around in the dark.

> *At first we used to go to the government place, but now we have it built in our house. Boys used to eye the girls while performing nature calls, we used to feel very bad, and we have grown up children. It was uncomfortable going outside. So we had it dug up at home.* (Sapna)

> *There may be robbers or ghosts. There was one woman who died in the latrines. I feel scared from that.* (Saira)

While for some the fear surrounding the latrines centred on alcoholics, potential robbers or ghosts, it was also pointed out that many young couples used the latrines as a meeting point for their boyfriends or girlfriends.

Many women regarded the latrine and sanitation issues as something they had to endure. Some would try and go to alternative facilities located outside the slum, or would ask the males, in most cases their husbands, to accompany them if they needed to go at night. They were fearful and in some instances they would also go to the nearby parks as an option. Others built latrines in their homes, especially households with younger daughters.

Solutions and responses

The exposed drains running alongside the lanes of homes pose a serious risk to the health of the community. Again, it was the absence of the government's actions to improve their community that was to blame. As long as their homes were clean, where they threw their garbage was not that important and in many cases this resulted in arguments between neighbouring women. Drainage problems were exacerbated during the monsoon season, as the drains overflow and clog, causing effluent to pour onto streets and into homes. It was residents of the lower blocks who were most vulnerable to this problem. Some women recognized this as a problem that needed attention from the residents. They would collectively hire a sweeper or janitor to come and clean their drains and collect the garbage from their area, or would do this at least in front of their own homes.

Figure 5.1 Women collectively clearing their drains

5.2.3 Slum Living Standards

Problems

Like other slum neighbourhoods in Delhi, Tigri is very congested, polluted, and disease-prone. The women in this community experience discomfort due to the inadequate living space. Most mothers interviewed expressed feelings of not being happy with living in Tigri, and they longed for their life back home in the rural areas, where there were open spaces, green fields and vegetation. Given the opportunity, they would return to their native villages.

> *We like the village. There are trees and plants and peace there. Here we have the smell of the latrines present all the time, day and*

> *night. In the village there is open space, trees, plants, water...there are tube-wells in all the houses. In the village there are no latrines, people go in the jungles.* (Shabana)

Not all problems in Tigri are as evident as those discussed thus far. In many instances there is uneasiness linked to factors that are not discussed openly, including the constant fear of the government coming in to the community to force the individuals out of their homes, as well as social and religious based differences. The following quotation describes a mother's view of living in Tigri.

> *In the village there were problems as well. With schools and all, our children could not learn. We don't have that many earnings, it is a farmer's living and we cannot provide a decent education. With less money we can't give, for example if there are girls and we want to teach them sewing there are less centres and facilities around. Because of these problems we are here in the city. We want our children to learn and become something. When we get old we want to move back to the village, and they will be okay. Eating is better in the village. The problem in this community is that everyone has only little spaces. We have many problems, but even with limited space we try and stay happy and peaceful. There are not many problems in this community. Sometimes there are some problems with the drains when they clog up and then we go collectively to the sweepers and get them to do something about it. We try and keep the drains in front of our house clean. Sometimes when the people don't come we try and keep the drains clean ourselves. We drop the garbage in the* katchera *ourselves, so that around us we do not have dirty conditions. The drains are the most important, and secondly, that water be made available in our street. So that the others and we do not have to go elsewhere, that there be clean water. It would be nice to not have to stand up in a long line and wait for water, and we can collect it comfortably. The drains should be clean. Another thing would be the latrine. We go in the dirty conditions, and we create these conditions, and if we controlled this would be clean. My husband is a* kabari *(delivery man). We want to move from here, we don't know when the mood of the government will change. If we put money into this house, and then the bulldozers come, then it will all go to waste. We have these problems. We would leave here, if we have money we would move and buy another place. Yes. We would move to an established colony. If not, then a colony like this is fine. We have*

> *so little space, and our children are getting older and are able to understand. We wonder where we will sleep, and where the children will sleep. When children get older, there is a big difference between children and parents. We have so many problems now, when a child gets older then parents can't even joke around with each other. We wish we had a dwelling with our own room and a separate room for children. We think this, but we have so many expenses that we can't think further.* (Shabana)

The challenges of raising children in such conditions pose a significant problem to the mothers of this community. Living in such close proximity to one another, residents feel that it is difficult to control their children and discipline them accordingly when they are exposed to a variety of negative influences, such as alcohol and gambling.

> *One of our problems is that we want to leave here. We don't like our neighbourhood; look at the children and how they are playing. This is how they are going to grow up and become delinquents. Slowly they play like this and later will play bigger games like gambling and their lives are ruined.* (Saira)

> *Some of them are pretty civil, others are uncivilized. They cause a lot of noise with abusive language after getting drunk and get into drunken brawls. There are no options to move from here, some how we have to manage to get along. Sometimes there are broken locks, sometimes there are thefts – that is what is scary. We don't have enough living space, we can't go anywhere or build more, and there are the problems.* (Priya)

> *They start fighting about everything, the drain, if a little garbage goes in one direction they will start fighting. If somebody hits this little one there will be a fight. Anything, if a piece of paper flies away in this direction or a little piece of garbage or somebody's child does or hits another, they will start fighting. Nobody excuses anything or takes anybody as friendly; they each are trying to be bigger and better than everyone. I don't know why, there is no one who thinks in a friendly way and think there is no point fighting. If the children are one and happy together, garbage will be taken care of regardless...it is not such a big problem, but nobody thinks like that.* (Sita)

These examples of social problems in the community coupled with religious based differences create a very stressful living environment. In addition to the problems arising

between Hindus and Muslims, problems could also arise among Hindus of different castes, as the following quotation from an upper caste Hindu, against lower caste Hindus residing in a different section of Tigri, illustrates:

> *Whatever it happens might be because of ethnic Hindu/Muslim rights. Many women do that. I get tired with Muslims, if a Muslim talks to a Hindu they create tension and start getting anxious.* (Sapna)

> *There is one thing important here. This place has a butchery where they butcher pigs, they all eat them. They are from the... class of families. No, No, we don't even want to live here. We just want someone who can sell off our hut. We are stuck at the wrong place.* (Kantha)

In most cases, Hindus are considered to be vegetarians, however some lower caste Hindus will eat and sell meat openly. Pigs are considered dirty animals that are not clean and transmit disease; they are not acceptable by either higher caste Hindus or Muslims. Hindu and Islamic residents were disgusted by the actions of this group living in a particular section of Tigri, and this caused prejudice and ill feelings towards them. These feelings can also lead to fights and arguments over resources in the community.

Solutions and responses

Despite the obvious stresses associated with these problems, the overall sentiment was that moving was not an option. Families had to live where their jobs were. Many had come to Delhi in hopes of finding a better life and improving their living standards and did not wish to return to the poorer conditions of their villages. Although they missed their native lands, and complained of Tigri and its problems, they felt that they had no choice but to continue to live there until another option presented itself. For many mothers, it was a case of being where their husband was because they had married into

Tigri and had not been a part of the community since birth. Some mothers and families did feel, in order to prepare for an emergency such as eviction by the government, that it was necessary to save funds to ensure their children's education.

> *We are Muslims, and we are teaching them Hindi, Urdu as well as Arabic. We are trying to teach them, and teach them English too. People need to know about our problems, poor people have so many problems, but what can we do we are enduring them. We would like to send our children to private schools, like the bigger people, but what can we do. But we have limited money, and where are we going to do this. If they learn well, and get good marks, then our children will do well and get good jobs. If we can't give them a good education then who is going to ask about our children. We want to try and make our children go further in life. We have two boys and two girls, and we want to educate them equally, there is no difference among them.....well like if he brings home a 100 Rs. We will try and save 50 Rs and spend the other 50. So that if there is no work, then the children can eat. When there is limited money, we will try and make the clothes at home, and we will spend less on ourselves. We will not sacrifice our children's education. If we start sacrificing in education, then they will not go on further. We will cut down our expenses, me and my husband will, but we will not sacrifice our children's education.* (Shabana)

5.2.4 Economics

Problems

The level of poverty in these communities plays an important role in determining the response to any situation. The residents of Tigri face a bitter reality, in that they experience more destitution in the city than in their village. Most residents complained about increasing inflation, unemployment, and the problems of not being able to meet their needs with only one wage earner in the family. The result was that some longed for the ideal simplicity of the village even though it was the potential for jobs in the city that had brought their husbands to the city in the first place.

> *It was good there, there were no problems like kerosene oil or wood etc., and it's a big problem here. We would just cut a tree from the jungle and cook on the spit [in our village]. Well, there is not much of an income and prices are rising everyday. Example, when I came to Delhi flour was 2 ½ Rs./kg now it is 8 Rs./kg. Kerosene oil was 2 ½ Rs./bottle now it is 15 Rs./bottle – it's too much.* (Rama)

> *Yes. There is only one breadwinner in this family and four children to feed, who work as cobblers. If he finds work you eat and if he does not you go to bed hungry. So where would you get money for education.* (Sita)

> *My husband is sick all the time. He can't work and there are 5-6 members to feed, so how can we manage. If the man is strong and healthy then he can work. If he works there will be money, and whatever he brings home we have to make do with. If we get enough money, then we will be happy. If there is not enough then we can't make ends meet. Life will be good if there is good work. If there is a regular income then everything at home will run smoothly. And if you can't find work, and there is no money then you suffer. It all depends on money, and if you feel like buying something you can. It depends on money.* (Laxmi)

Solutions and responses

The economic pressures are felt not only by individual families, but also by the community as a whole, and this impacts its vitality and sustainability. Many mothers felt stress in their own families, not only with their husband's lack of earnings, but with being situated in a cosmopolitan urban centre such as Delhi, where the effects of inflation are felt by all. In response to these circumstances, women of the household would try and save money for their families. Many women desired to work, and often did small jobs from their home to help ease the financial burden on their family. In the focus groups, many expressed the desire for an employment facility that would be able to provide them with a stable income, but be located close to home.

> *Well, I have problems here and I had problems there too. Somehow we manage, somehow but with much labour. It was much more pleasant in the village. Fresh vegetable, water, toilet facilities, it's a big problem here, but there is no labour work there, we don't have land for farming. Food and shelter is what we have here and talking about food, it's never enough. The more you earn the hungrier you get. There were no problems there, its been more problematic since my brother in law fell ill. We can go back given a chance, but there is not much to do, we do not have farmland to farm and the whole family here, the old house has collapsed too!* (Priya)

> *Well as much as we would wish to leave, I don't think it is our fate/destiny. If you have money in your pocket then you think about going, if you go to a new place...take new place, pay rent. Now this is ours.* (Neelam)

The problems described in my interaction with Mamta and discussions with their program officers (POs) and community workers (CWs) strengthened the views presented by the mothers. However, from their perspective, social problems had decreased over time. Alcoholism and unemployment were the main concerns, but the issue of early marriage was also mentioned along with the problems to which it led (i.e., young mothers with many children). Also, as members of the community, the CWs experienced the water and sanitation problems first hand and expressed the same frustrations as the mothers. Some felt that increased use of the water from the tube-wells instead of the hand pumps had led to water shortages. A lower water table resulted in dependency on electricity (for pumping). In contrast, others felt that the use of tube-wells improved water availability by supplying more homes.

The profound environmental, economic and social disadvantage and deprivation of the Tigri community described in this section provides a backdrop and context for examining the social construction of risk associated with diarrhoeal disease in Tigri.

5.3 The Social Construction of Risk

The ecosystem approach to human health combines the social, cultural, economic and bio-physical determinants of health. A social construction of risk associated with diarrhoeal disease adds to our understanding of the socio-cultural, economic and political relations and behaviours in a slum such as Tigri in New Delhi. The determinants of diarrhoea in Tigri reveal that this is not a one-dimensional problem -- the factors affecting disease causation, transmission, prevention and control are multi-dimensional and dynamic. Moreover, examining the social construction of diarrhoeal disease risk in Tigri requires an understanding of people's perceptions and behaviours as they relate to child health. The findings for this study are based on a combination of interviews, focus group discussions and observations.

In this section, I use social construction theory to explain the underlying processes that affect mothers and the community with respect to diarrhoeal disease causation, prevention and control.

5.3.1 Diarrhoeal disease in Tigri as constructed by the mothers

The understanding of the risk level for diarrhoeal disease in Tigri among children under five is only possible by identifying the social constructs created by the attitudes, behaviours, and beliefs of the mother. In this section, I discuss the structural and material

constraints that shape mothers' experiences of diarrhoeal disease and healthcare services. In other words, I examine how individual perceptions and larger socio-structural relations influence experiences.

Diarrhoeal disease is one of the most prevalent problems facing children each day in Tigri. Diarrhoea is the result of many determinants, all of which exist in Tigri. The following table presents a summary of findings from 25 interviews conducted with mothers relating to diarrhoeal disease in this slum community.

Table 5.2: Outline of diarrhoeal disease situation in Tigri

PERCEIVED SYMPTOMS OF DIARRHOEA	CAUSES OF DIARRHOEA	PREVENTION OF DIARRHOEA	CONTROL AND TREATMENT OF DIARRHOEA	PROBLEMS DURING CHILDREN'S EPISODES OF DIARRHOEA
• Passes two or more liquid stools • Change in colour or smell of stools • Child becomes weak • Change of behaviour in child (i.e. stop playing, laughing and talking)	• Lack of hygiene • Change of seasons • Eating improper foods • Teething • Lack of knowledge • God's intentions • Evil eye (Nazar)	• Proper hygiene • Water storage management • Monitoring food • Proper care in response to changing seasons • Educating the children	• Giving home remedy to child • Getting pill from local store • Seeking outside treatment 1. doctor 2. hospital 3. visit priest, traditional healer • Changing feeding patterns	• Lack of money • Unable to do other work • No support from husbands • Barriers to seeking good healthcare

Perceived symptoms of diarrhoea

From a constructionist perspective, disease and health are socially defined. Mothers account for abnormalities in their children's health when something out of the ordinary occurs, and thus the sickness or disease will exist depending on the mothers' reactions to

the abnormality. The severity of diarrhoeal disease in children under five can only be understood if the mothers themselves consider it as a problem first. During the interviews when participants were asked, "what illnesses do your children face the most?", diarrhoea was one of the top answers along with ailments such as colds, fevers and coughing. Among the many names for diarrhoea, the most common word in this community, in Hindi, is *dast*. The interviews revealed that there was a general consensus on the symptoms of diarrhoea, which enabled mothers to recognize and describe the disease. A variety of names and descriptions were given to the occurrence of episodes by mothers:

> *The stomach has cold and develops a symptom 'ao'. 'Ao' develops and it can form into 'khooni pechish' as well. There will be much pain in the stomach, the child will go several times and there will be blood.* (Shabana)

> *Everyone calls it diarrhoea, sometimes there is cholera, which is vomiting and also has pearly white recurrent diarrhoea.* (Anu)

> *Some call it 'pechish' (mucous diarrhoea) or 'khooni pechish' (mucous diarrhoea with blood)...some say the child has to go again and again. So there are so many ways that you could find out...so if you know what to look for it is easy, but sometimes if you don't know it is impossible to tell. (*Kantha)

Causes of diarrhoea

The level of Western biomedical understanding of diarrhoeal disease varied among the mothers. Their perception of when the child had diarrhoea was based on the recognized symptoms mentioned above. Similarly, with respect to the causes of diarrhoea, the level of mothers' understanding varied widely. While some mothers knew exactly what to say when asked questions pertaining to cause, prevention and control, others were not sure and quite vague in their responses. One possible explanation for this could be that with

the number of NGOs present in Tigri and the increase of awareness campaigns, some households may be more aware of the issues pertaining to health and hygiene than others. Also, with the number of NGOs visiting households, with or without researchers from abroad, there may have been an influence on the mothers regarding not only how to respond to researchers but what information to give. In other words, they were accustomed to the research process. For example, at the end of one focus group discussion with mothers, one mother asked when they were going to get the biscuits and little toffee (candy). Another mother gave elaborate and appropriate answers suggesting that she was aware of the issues pertaining to ill health or that she knew what types of answers to give (or both).

The reported causes of diarrhoea show a variety of possible reasons for its presence in this community. Based on the literature presented in previous sections, a lack of hygiene is expected in situations where water and sanitation facilities are degraded. However, mothers did not make the connection between poor water quality or a lack of water and diarrhoeal disease. They recognized lack of hygiene as a problem, but only in relation to feeding of the child (i.e., not washing hands, eating food that is contaminated, or not washing bottles).

> *A lot of mothers may feed their child milk from the bottle, those who cannot produce it themselves. Probably the bottle will not be clean and that is how one gets diarrhoea.* (Shabana)

> *Because they bottle feed them from the beginning then they will always have diarrhoea. They sometimes mix things, sometimes bottle milk and then other times their own.* (Laxmi)

Many mothers attributed diarrhoea to the changing seasons (i.e. exposure to the wind, heat, or sun). While the mothers do not fully understand the environmental causes of diarrhoea (i.e. the Western biomedical perspective of disease transmission), they at least recognize that physical surroundings play a role in the health of the child, and that diarrhoea may be a symptom of another disease, such as, flu in the winter. The mothers identified other possible causes. Some mothers linked diarrhoea to their child eating something harmful to their body such as spicy food.

> *When it is hot the tea causes more heat in the child and tea causes diarrhoea or if they eat "junk" or if they eat vegetables or curry with extra chillies that causes it too.* (Sapna)

> *I think if they eat a lot or something hot (spicy) like chicken or potatoes.* (Saira)

Not all causes of diarrhoea in children are a result of the physical surroundings or hygiene, but may be a symptom of another ailment. Some mothers recognized that the problems could be the result of feeding the child something disagreeable, or could be caused by food poisoning, or, in simple episodes, even the result of teething. However, some mothers had no comprehension of the causes of diarrhoea. There are times when culture and religion manifest themselves as reasons why things happen, when something was unexplainable. With many members of this community trying to retain the specific cultures from their villages, at times mothers would relate diarrhoea with religion or the evil eye, *nazar*.

> *Yes, if the medicine is not working then we think it is nazar.* (Saira's mother-in-law) *When the child is irritated, and is crying, and is not going quiet, then we know it is nazar.* (Saira)

One respondent explained that the cause of diarrhoea was something one cannot control - it is God's intentions.

> *We clean that regularly, but if the Almighty God has to give you distress there is not much you can do. I mean, we can clean up as much as we want, but if there is some problem with the child's stomach, we cannot do anything about the food if they cannot tolerate anything. About food is that you are eating, you won't let your child go without food.* (Kantha)

When a child was not getting relief from any of the medical treatments, mothers sometimes would attribute the origin of the illness to *nazar*, where the evil eye of someone, such as a jealous relative or neighbour had glanced upon them.

Diarrhoeal disease in urban slum communities may be attributed to many origins - both biophysical and socio - behavioural, as described in Chapter Two. The perceived causes of disease were rarely supported by reasoned explanation. Knowledge obtained from awareness campaigns through NGOs and media, was conditioned by cultural heritage - rural village backgrounds, families, and a lack of education.

Prevention of diarrhoea

Although the respondents' perceptions as to the exact causes of diarrhoea from a Western biomedical perspective were often unclear, they often made some association between hygiene and prevention of diarrhoeal disease episodes. Many women mentioned washing their children's hands and face, cleaning the dirt and garbage around the home, and controlling where the children played as ways to maintain good hygiene practices. Examples of the association with hygiene and feeding of children are given below:

> *If we are going to give milk through the bottle then we have to boil the bottle in hot water, we clean it, boil just enough milk for the child, and we use it all up. Then we boil the bottle again, clean it and store it.* (Shabana)

> *It should be properly covered. Whatever food you have at home should not get contaminated with dirt. You should feed the children on schedule, if they don't eat on time it gets harder to digest and the child gets diarrhoea.* (Sita)

It is worth mentioning again that Shabana's answers seemed to be influenced by other sources. Her answers were always long and complete with information that she thought I would want to hear. For example, she mentioned it was important to have proper water storage management as a measure to prevent illness.

> *When there is heat there are more flies. We collect clean water and cover it. We put a container in the water that you can use to get the water. This way a child can come, get the water and drink it. This way a child can do this on their own and easily.*

Another step identified by mothers to prevent diarrhoea was better handling of food (i.e., using fresh food, cleaning vegetables).

> *Yes, we can prevent diarrhoea by keeping the children clean and giving them clean food, not giving them food, which is hot/spicy/irritating to the stomach, and give them more water to drink.* (Anu)

This statement coincided with the earlier observations that diarrhoea was caused by eating hot, spicy foods. It is also apparent that this person had made the link to proper hygiene and rehydration to keep a child healthy. In India, I noticed many individuals relate health to the concepts of hot (*garm*) and cold (*sard*) and its balance in the body. When the seasons change and there is a change in temperature, many mothers felt that diarrhoea was more prevalent. Since my time in Tigri was in the winter, many of the responses related the cause of diarrhoea to the colder weather conditions. In order to prevent diarrhoea they felt that the best method was to wear proper attire, or not to bathe,

as this could trigger pneumonia or exacerbate the condition of a sick child. Massaging a sick child with hot oil was presented as one option against the cold.

> *In the winter we protect them from the cold. We make them wear a sweater and make them sit inside. We don't let them roam around outside too much. We protect them from the cold.* (Shabana)

> *So if it is cold outside, we don't take a bath or if the child has diarrhoea or fever we don't bathe them for fear of pneumonia.* (Priya)

> *In the cold, we will not bathe them. We will give them a massage with hot oil, and this is how they will feel less cold.* (Laxmi)

Some parents prevent their children from playing with a child that is sick or with children who play in unsanitary conditions.

> *When some child is sick, or is in unsanitary conditions we do not let them go out...we teach them at home...don't go there children, they are dirty, they play dirty games like marbles.* (Priya)

Also, in many cases mothers had to attend to chores or daily activities to ensure the proper management of the household. During these times when the mother was not able to attend to the younger children, older children would take care of their younger siblings. This was often the case when mothers would go out to collect water, go to market or visit doctors. Young female children would most often be expected to take care of their younger siblings, more so than their brothers. Thus, to ensure their young infants stayed healthy, mothers would teach these older siblings how to take care of them – giving baths, washing the younger ones when they go to the bathroom and changing their clothes. But this was problematic in that the older children often neglected their younger siblings.

Treatment of diarrhoea

The incidence or burden of disease can be greater on the community if there is no attempt to control its occurrence. By implementing appropriate steps to control diarrhoeal episodes in the family, the community's incidence of diarrhoeal disease and vulnerability to risk would decrease, especially if the cause of diarrhoeal disease is transmittable/microbial. With diarrhoeal disease, the basic remedies are to ensure the child is rehydrated and malnutrition does not occur, both of which can be done effectively at home. Nevertheless, in Tigri, the response to diarrhoeal outbreaks mainly involved seeking some form of medical attention and treatment. Only a small proportion of mothers would make the oral rehydration salts (ORS), at home (using water, salt, and sugar) even when the ingredients were available to them. Many women would go to the local shop (i.e., cigarette and candy shop) and get a pill. This would cost no more than one to two Rs., and would be identified as the *yellow pill*[25] - the pill that stops diarrhoea, according to the mothers.

To obtain medical treatment, mothers utilize a wide range of healthcare providers[26]. Generally, going to the healthcare providers was considered the first step instead of treating the illness at home. The available MBBS doctors in the slum were associated with NGO dispensaries, such as Mamta. To seek a MBBS doctor, other than those available in the dispensaries/clinics, mothers had to walk at least a kilometre outside the slum. When there was no satisfactory result from one doctor, individual mothers would

---

[25] According to Mamta, this pill was most probably a pain killer for common ailments.

[26] The healthcare providers in this community ranged from doctors with a MBBS degree (Bachelor of Medicine and Bachelor of Surgery) with medical training from an accredited university; RMPs (Registered Medical Practitioner) with some basic training through another MBBS doctor (some states in India recognize RMPs as healthcare providers); and chemists (pharmacist).

change their doctors and go to the next one to find relief. Their first preference was to go to the RMP located in the slums, because they were less expensive than their colleagues who had earned a MBBS degree. Mothers would only wait a day or two to see if there was any relief for their child, and, if not, would move on to the next available doctor, and so on until the child was well. When I asked how mothers choose their doctors, or how they differentiated between doctors, the responses were generally that they wanted a doctor who could provide relief and cure their child; whichever doctor gave the medicine that worked would be their choice. Those who were not too concerned with money as a barrier to seeking proper healthcare chose a doctor who had a professional degree. Others would go where medicine was less expensive, taking into account the advice of their family or neighbours.

Usually when there was no improvement, after either waiting a few days or changing doctors, mothers would go to the hospital. The hospitals of choice were either Safdarjung Hospital, located 18km away, or Batra Hospital located 1-2 km from Tigri. Only one or two mothers reported that they would go to a private nursing home[27], but this was dependent on income. Safdarjung Hospital is a government hospital that provides free medical care and treatment to its patients, including the medicine. Batra Hospital is a privately run hospital that charges fees for its services. The cost varies according to the level of treatment required. Batra Hospital does have an OPD (Out Patient Department) clinic one or two times a week, where individuals with limited funds can attend for free.

[27] In India a nursing home is a private medical establishment, similar to a hospital but much smaller with doctors, nurses, and technological equipment for tests.

In Tigri, most of the mothers preferred to get treated at Safdarjung Hospital because it was free.

In some cases, when a child was seriously ill and there seemed little hope of recovery, a fatalistic attitude was adopted. As noted above, the illness was often attributed to some unexplainable reason, such as *nazar* (the evil eye). In these cases, after trying all the remedies from various doctors and hospitals, mothers and their families would most often either pray, visit their priest, or see a traditional healer who would combine a ritual ceremony with praying and prescription. This was usually the last step taken by the family in hopes that their child would get better. In some cases, families would involve traditional healers earlier in the process. The general interpretation of ill health often given by the healers, which is also applicable to the explanation of diarrhoeal disease, was that ailments were caused by unexplainable forces or by an imbalance within the child. Choosing a doctor and/or traditional healer depends on the background of the individual and the practices that are carried out in their religion, family or village.

> *After this, then we pray to God. The doctors try, but they are not God. The doctors try and save the child, but it is all up to God and His intentions. It will only work by either prayers or medicine. Sometimes this happens and we deal with it at home. We are Muslim, and we do prayers,* namaz, *at home. We read our God's book, and then pray for our child. Yes, I do think it is caused by the evil eye. The evil eye causes diarrhoea and fever, and when we pray our child gets better. We don't believe in this tantric medicine. I only believe in God and reading namaz. I make prayers for the house, our neighbours, our neighbour's children and everyone. We believe in the doctor and the Almighty.* (Shabana)

> *Even when the child is not getting better after going to the doctor. We take peppers and put it around them. You can also take them to the Masjid*[28]*, and they will do a prayer as well.* (Saira)

Another treatment method for children suffering from diarrhoea was to change the feeding patterns for children at home. Mothers would give their children less food, or would give foods which would be easier on the stomach such as lentils, dahl or kitchri. As well, doctors may prescribe a change in diet, for example more fruits and increased water. Mothers also paid close attention to the child's diet when they were ill, and tried to satisfy them by providing them what they needed.

Problems encountered during episodes of diarrhoea

Vulnerability to risk of diarrhoeal disease is related to how mothers perceive the disease in the context of the stresses created by their social and economic circumstances. In this regard, awareness campaigns aimed at increasing knowledge about diarrhoea have had limited effect. The many problems encountered when children are ill and the barriers to healthcare strongly influence the risk of diarrhoeal disease at the household level.

The root problem in this community is poverty. Tigri is a slum community with individuals originating from rural areas in various parts of India. The level of income, or the access to funds, impacts the well-being of children who suffer from diarrhoeal disease. When I asked mothers what problems they faced when their children were sick,

[28] Masjid is the Hindi word for mosque.

they always answered a lack of money. In most cases, mothers received money from their husbands' earnings.

> *Whatever my husband makes he gives it to me. It is my responsibility to decide who needs new clothes, or medicine, or how many groceries are needed. I have to manage, I mean if our child is sick, who am I going to beg to.* (Shabana)

However, husbands' spending on drinking, gambling and drugs was identified as a problem and a source of domestic tension especially when a child is sick.

> *My husband goes in the morning at 8 a.m. and comes back at 10 or 11 p.m. I don't even know if he would earn that day or not.... if he earns an extra 100 Rs. or so he might give some, he might earn more he loses in gambling or drinks it away. If he does not earn anything, you cannot fight with your husband forever. And with that he comes home and fights with us, how far can we tolerate this.* (Sita)

Where the father provides support, women are able to seek the healthcare they desire and can afford within their means. Money plays an important role in not only the type of healthcare mothers seek, but also in the treatment. The following quotations show the feelings, frustrations, and problems the mothers face when their children are ill and there is a lack of money.

> *If it is something trivial we get some pill from the pharmacy, or just bear it for a while. The doctors charge 20 to 25 Rs., it is better to get a pill and get better with that.* (Sita)

> *My husband faces lack of work, there is low availability of work, if the children are sick then you think of all kinds of bad things.* (Kantha)

> *If it is in our abilities then we will go to a private hospital, if we don't have money then we will go to a government hospital. In seeking treatment there are always problems. Sometimes you have money, sometimes you don't. And sometimes you need to borrow money, and you can't find anyone to lend, even if you are willing to pay interest on it. We have to face a lot of problems when our children are sick. Well we try and arrange money somehow. With*

> *interest it is sometimes 10 Rs or 16 Rs. Sometimes you don't get it at all, and you have to put something from home on collateral, or things like jewellery you have to sell and use the money on your child. With my son, I spent 55 thousand rupees on him, even sold all my dishes. When he was a newborn he had diarrhoea a lot, and even today his stomach is weak. I had so many problems. I had to beg many relatives and cry. Many relatives lent me money. They helped. I went to the private and Medical (Safdarjung) hospitals. A lot of money was spent; all the dishes in the house were even sold. The doctors are good, but they only treat those who have money. And that poor individual who does not have money, nobody sees them.* (Shabana)

> *First we go to the doctor, sometimes for little money we are benefited. When there is no relief from the doctor, and the doctor says that it is beyond them and recommends the hospital then we go there. We go directly to the hospital and then we need money. At first, we try and go to the small doctors to see if we can get treatments for less money. Whatever is within our capacity. What we desire is that how these "big" people spend money openly on health that we could do that too and our child gets better soon. However, instead we never have that much money that we are able to give. Our heart's desire is such that like the "big" people, we have money so that our children do not get sick readily. But whatever we can do within our capacity that is what we do.* (Shabana)

> *Well if it is in our capacity we will. And if we can't then we won't. If something is really expensive then where will we get the money? Well you have to treat it somehow, even if we have to borrow. Once we have money, we will do the treatment. And when all is fine, we will work and try and take care of the debt with interest. Slowly we will take care of it.* (Laxmi)

Many mothers try to borrow money from other family members or neighbours, as well as save on their own, with or without their husband's knowledge. For these mothers, borrowing money can be a stressful ordeal and the shame of begging and the fear of rejection always makes them hesitant to go through this.

> *The only people who have money are the only ones who get respect and those who don't, don't get anything. There nobody is ready to give anyone 1 Rs. People are so bad they will take from us, but when we need it, they never give. I don't know why? They look at the person and family, whether they would return the money or not. They know the husband drinks and creates racket in the locality. They would not give – whatever you have you have to survive with that.* (Sita)

As for saving money, if their husband is a gambler or alcoholic it becomes a problem when he comes to know of this extra money, and subsequently can cause troubles between the couple. However, mothers feel responsible for their children's health, and attempt to adapt to the situations they face.

> *I do it myself without waiting for him. I don't know if he will give money or not. I save discreetly for my children. If I earn a little bit I save for my children. Where will I go if I spend it all? If my children are okay – I think I am fine. He drinks and gambles. If he earns a little extra he drinks and gambles it away. Goes to work 5 days a week, occasionally he might or may not give for the people in the house. He doesn't even have his cobbler shop; he just goes from street to street.* (Sita)

> *Well we have a savings account; we try and put in a little bit at a time. For example in the future if there is a need for our children to get a job, we don't have the means of knowing the right people. We think that if we have some extra money, then our child will also get a good job. So if we have some extra money we will add to our bank account.* (Shabana)

The challenge of managing a child's illness was compounded by the other major demands on mothers, especially if there was lack of support from the husbands. It is the women who manage the households in Tigri, whether it involves collecting water, cleaning the home, getting food together for the day, or washing clothes. Accordingly, when there was an illness such as diarrhoea occurring among children, and especially young children under five years of age, their attention would be distracted. The illness would take time away from their other chores, and their main focus would be to get their

child better. While, some mothers said that their husbands did take an interest in their children's health, spared no expense, and would even take time off work to go to the hospital, other mothers complained of the opposite.

> *My husband does not listen to anything, nothing about doctors; he does not even care about me.* (Anita)

The lack of support from fathers was an important issue, because the women depended on their husbands, to get medicine or accompany them to the hospital. The women often do not know the bus routes, and are often unable to read the numbers, signs, or deal with the administration at the hospitals. Since the facility of choice for the majority of the mothers was Safdarjung Hospital, this dependency on the husbands is a major problem because Tigri was approximately 18 km away, thus requiring transportation by bus, scooter or taxi.

The problems with mode and cost of transportation, and the time it would take to get there, get treatment and return are all factors that influence whether going to Safdarjung Hospital was a feasible option for the family.

> *Well if you have to go in the scooter, it goes really fast. It takes money. The bus is really crowded with children. And sometimes you can't get on, and when you do get on the poor sick person will get worse, they will continue to vomit.* (Laxmi)

Time is of great importance to these individuals. When a mother had to choose a doctor, the time to get treated was also a major consideration. The preference to treat the illness at home or go to the RMPs in the slum may not only have depended on money, but on time as well. Generally speaking, the MBBS doctors, whether they are situated in

the community or on the periphery, had specific times that they were accessible and visits involved waiting in long line-ups.

> *I generally go to the quicker one, like half hour, 10 minutes etc. I don't go to the crowded ones, like Dr. Gill because it is crowded – your turn doesn't come for 1 and half hours...we only go if there is no relief.* (Rama)

> *People here are like always looking for money, dispensary is just for a name, and there too you have to pay and then too no relief. You do not get the cause of the disease as well...at the doctor at least you get answers. They do not have answers, if you get medicine once, you can't go again that day, and you can only go the next day, at the doctor you can go when you please. She means all the dispensaries, is only 1- 3 days and not in evenings.* (Kantha)

There were also many frustrations related to administrative requirements when using healthcare services.

> *I did not have the money, so they took her, gave her I.V. glucose medicine and said to change the bed. They made me and my belongings go upstairs along with the daughter with her glucose. I was alone, there was nobody with me. I did not know how to go, nobody gave me a bed, they told me to get the slip. When I got that they wanted money and they would give my belongings after money. With all this she died in my arms.* (Sita)

> *He has vomiting and diarrhoea. They admitted him immediately in Safdarjung. I went with my neighbour, I was quite naïve. She was the one who took us, she had all her kids at Safdarjung so she knows her way around there. She occasionally goes when other people are sick too. I had never gone before the time my son got sick.... we took a three-wheeler. He charged us 50 Rs. to take him to the emergency. They immediately admitted him there. The vomiting stopped soon, but the diarrhoea continued. They prescribed some medicines to take home as well – even then the diarrhoea would not go away completely. We went to other doctors, they said his liver is weak, so he cannot digest food properly. Once he starts eating other foodstuff like bread and fruit it will improve on its own, Now he is doing much better; now only he has asthma and gets colds and fevers occasionally.* (Rama)

The level of anxiety and distress felt by mothers over their children's well-being was always high and when they became ill it was the mothers utmost concern to get them better. They would feel relieved and better knowing that their child was playing and eating well. As with any mother in any community, the expectation of the level of healthcare provided to their children was high and its quality is considered important, especially if they are paying for it.

> *I am happy, I would be happy if my child gets well and comes home quickly. We only go to one doctor, we only go to one family doctor to get medicine from. And when that doctor cannot do anything for us, then we go straight to the hospital. We don't keep switching from hospital to hospital, all hospitals are the same. What is in the government one is the same as the private.* (Shabana)
>
> *Yes, when you pay then they do the treatment.* (Priya)
>
> *If we take them to the dispensary they charge the same – 15 Rs.. And the doctor takes the same, so we take them to the doctor. They do a good check-up and give medicine so we don't go to the dispensary.* (Sapna)
>
> *I don't know, some will call you 4 times while others can do the same at one time visit. Yes and sometimes when they charge less and give inefficient medicine what is the use? I always say charge as much as you want, but we don't want to come for a second time. This Bengali doctor charges 20 Rs. gives you one shot, two bottles of medicine and 4 or 5 other packets of medicine. Even if the child is not better the medical one would give you one big bottle and 3-4 packets and one injection and says if he is better don't bring him back.* (Sita)
>
> *Well we go to that one first where we have faith from before. Where we have gotten medicine from before. Like we get it today, no effect, we go back tomorrow, still no effect, and then the third day again and still no change. Even within three days there is no change, then a neighbour may suggest another doctor who is better. Then we will try that. If a child is not getting well by a doctor, we will try another. We are giving money, it is not like we are getting treatments for free. Well they are fine, as long as our*

child gets well. If they are not well and we are spending money, then we have to change. (Laxmi)

5.3.2 Diarrhoeal disease in Tigri as constructed by Mamta and the healthcare providers

The individuals with whom mothers interact when their children are ill influence the social construction of risk associated with diarrhoeal disease. Thus, it is important to discuss the role of Mamta and that of the local healthcare providers. One of the primary roles of Mamta is health promotion and awareness through the work of their field staff in Tigri and their community clinic. Thus, because of their presence in Tigri, NGOs such as Mamta play an important role in influencing health issues among mothers. I conducted two focus groups – one with the program officers (POs) and one with the community workers (CWs) – in order to further my understanding of their perspectives on the issues relating to my study[29].

Additionally, during my field season, I approached the healthcare providers that were mentioned most often during interviews with the mothers. A total of 7 healthcare providers were approached: a doctor[30] from Safdarjung Hospital; a doctor from Batra Hospital; two doctors in the vicinity of Tigri; one doctor associated with Mamta; a RMP in Tigri, and one chemist in the vicinity of Tigri. Throughout my visits with the healthcare providers, the wide range of care available to this community was evident.

---

[29] It is important to note that although the perspectives of both the POs and CWs are grouped together in my discussion of Mamta, they vary in their opinions of life in the community. The POs are educated individuals who reside outside of the community in middle class communities in Delhi, with the exception of one. CWs, generally, have basic education (such as tenth grade) and live in the slum. Thus, the perspectives of the POs are limited by the efforts they put into understanding the community, and the views of the CWs may be biased since they live in the community.

[30] All doctors who were approached were fully trained and qualified with a MBBS degree.

The availability, type and quality of care, rapport with patients, and knowledge and qualifications of healthcare providers influence the outcome of any disease outbreak. The following table summarizes some of the key concerns and views:

Table 5.3: The social constructs of diarrhoeal disease risk by Mamta and the healthcare providers in the Tigri community

	PROBLEMS WITH DIARRHOEAL DISEASE	SOLUTION TO DIARRHOEAL DISEASE
Mamta	• Lack of application of knowledge • Lack of hygiene • Problems with RMPs • Barriers to Healthcare 1. Economic 2. Knowledge 3. Literacy 4. Domestic duties	• Increase awareness through activities of NGOs in communities • Linking with RMPs • Comprehensive development of the community
Healthcare Providers	• Lack of knowledge • Do not come for follow-up visits • Young mothers • Too many children • Women depend on husbands • Money • The stage at which treatment was sought • Community not utilizing resources adequately • Cannot differentiate between different healthcare providers	• Administering oral rehydration salts (ORS) and increasing nutrition • Promoting breast-feeding • Education • Improving physical surroundings

With respect to diarrhoeal disease in the community, Mamta (POs, CWs and doctors) and the RMP felt that, although disease prevalence was still high, individuals were more aware than a few years ago due to the work of NGOs, media and education. The key explanation, according to Mamta, was that increased knowledge had not translated into better practices. The POs also felt mothers would not take the time to get medicine

because they had duties at home, had to work, or were lazy. Mothers were unable to see the advantages of accessing proper and early treatment for ill health.

On the contrary, other healthcare providers felt there was an apparent lack of understanding of diarrhoeal disease, where the mothers did not know of prevention, or the importance of re-hydration and follow-up visits. This may have been attributed to the early marriage of young girls, the care of too many children, and the dependency of the mothers on their husbands.

> *They understand the problems of the child, they know the child is suffering from some problem, they want to go to the doctor for treatment. The only thing they don't understand very well is the loss of fluids from the child's body, which they don't realize. By the time they realize it is too late. That is what they don't understand what the child may be losing. The liquid, which fills up the body, has to be compensated with ORS or it has to be compensated by giving the child any liquid in any form, the level that a child can take.* (MBBS Doctor in vicinity)

> *The young age in particularly Muslim communities. They are living in overcrowded areas, they are poor also, and they are less educated. And if they have studied they have only studied the Quran or religious books. Because their family is such that their education is not up to this level that they would understand. But when we educate them to their level, then they understand.* (Safdarjung Doctor)

> *They are generally not sure about when to treat the child and how important it is to treat the child at the early stages so that it does not become severe. They are not very conscious of the problems with gastro-enteritis.* (Batra Doctor)

According to the doctor associated with Mamta, the barriers to improvement of diarrhoeal disease control were as follows:

- stopping the feeding of food when the child was passing loose stools in hopes that they would get better;

- mother thinking the child is fine after the frequency of stools has decreased, and not realizing the problem is still present; and,
- cultural taboos created by families and the community, such as grandmother suggesting to the mother to stop breast-feeding.

The doctor representing Batra Hospital felt that culture also presented a barrier in providing proper health to both male and female children.

> *Very often and it is sad that if there is a girl child, the mother-in-law will not let her come. The child's paternal grandmother. If there is a need for blood transfusion, the grandmother will not allow her son to donate blood. And these are very common problems. Yes with anyone who is sick who needs intensive care. If it is her own son, she will allow him to donate blood and buy medicines. And if it is a female, she thinks she will have another baby and it does not matter. No there are definite differences between feeding as well.* (Batra Doctor)

In the table above, we can see that the various problems with diarrhoeal disease and barriers to healthcare coincide with those identified by mothers. In general, the community had limited options because of the condition of their physical surroundings, economic situation, lack of education, and carelessness.

> *It is because they are not getting potable water, they don't get hygienic living conditions. And the most important is that of literacy. It is literacy that is not allowing people to come up. It is also the throwing of garbage, throwing here and there outside of the house. And children are made to sit outside on the roadside for passing motions and all; this is the main cause of infection travelling from one place to another. There is not enough space to live, not enough space to breathe, not enough space to move. This is the main cause. It includes the factors of throwing the garbage, the dirt, and everything outside the house. See in India the place to throw the garbage is outside the house.* (MBBS Doctor in vicinity)

The RMP felt as a member of the community it was his duty to enhance the knowledge of mothers about health, by talking to the mothers as they came to visit. For example, although mothers knew storing water could lead to dengue and other transmission of

infections, through contamination and the presence of mosquitoes, there were limited choices because the scarcity of water in the community forced households to store water. The only solution was to promote methods of hygiene, in order to improve the health of the family, such as covering the stored water. The doctor from Mamta felt that the results of the various NGO activities and community workers were allowing for increased community awareness of health problems by communicating the importance of hygiene, clean water, and breastfeeding. The healthcare providers emphasized the significance of malnutrition and dehydration in relation to diarrhoea, as not only a diagnosing method, but also that of administering education to the mothers.

The degree of poverty felt by the families seems to be the underlying factor in determining what decisions are made. Again, monetary reasons affected the type of treatment sought which could lead to problems in seeking the adequate care needed.

> *Mostly these people go to RMPs. They give 10 Rs. fees and they give medicine with it. The MBBS doctors' fees are much higher, and they charge up to 30 Rs. and don't give medicine. That is why people prefer the RMPs because of money and getting medicine with their visit. Those RMP doctors only give medicine for one day and charge 10 Rs., in turn they will call you back everyday until the child is okay. It will be up to 40 Rs for 4 visits, but can easily cost 100 Rs. If they went to the MBBS doctor once, they would get a prescription for 5 days, and would not have the hassles everyday. They mentally think it is cheaper to go to RMP because they are only paying 10 Rs instead of 30 Rs. They don't care if the doctor is good or not, or what kind of medicine he prescribes, whether it is good, all they care about is that it is cheaper. They get these pills, which are different colours, green, red or yellow in a pouch, but they have no idea as to what kind of pills they are. They most of the time get local medicine, which is C grade. These pills are usually really cheap, 10 paise or so, and this what they keep in stock. They don't diagnose well, these RMP use this medicine that well accelerate the effect of medicine. And*

> *the patient will get well but the immunity will* decrease. (Chemist)

From the healthcare providers' perception, the issue of prevention is not clear enough to many of the Tigri residents.

> *Even though we tell them to boil the water, local hygiene etc., the basics to prevent infection, they don't follow that. Either they don't understand what we are talking about such as boiling water, or else they may not have the time to sit and boil the water. And third, they may be so busy trying to do other jobs financial reasons as* well. (Batra Doctor)

The timing of when mothers sought treatment is also a crucial factor in determining diarrhoeal disease, and this also may be due to economic reasons. Many mothers may feel that by waiting perhaps the child may get better, thus not truly understanding the importance in getting attention if the child becomes severely dehydrated or malnourished.

> *Eighty percent of the cases they do come in time. It is only 20, or 25% of the cases when it is too late. But in 80% of the cases when a child starts loose motions or diarrhoea, they do come. But it depends on the intensity of the diarrhoea. Sometimes it is a frail child, already Indian children are malnourished so 8 to 10 loose motions can put them into acute case of dehydration. So it depends, they do manage to go to the doctors in time.* (MBBS Doctor in vicinity)

> *At the stage of moderate to severe dehydration. Or even after chronic diarrhoea they are malnourished and then they come to us. Yes, they have probably taken one or two doses from here and there, from the local practitioner or tried some home remedies. When they feel it is becoming severe then they come. Very few come in the initial stages.* (Batra Doctor)

In most cases the mother would go to the trained professional medical facility only after attempting remedies at home and visiting the local RMP, and in many cases this would be at stages of severe illness. When a child would be severely dehydrated, it may be

difficult for the healthcare provider to administer treatment because it would require immediate hospitalisation for IV fluids.

However, Mamta and the healthcare providers felt in addition to the problems articulated above that mothers were not aware of how to utilize resources adequately. The community may not have had many healthcare providers, but there were a variety of services available outside the community in the vicinity of Tigri. This lack of knowledge by the mothers of what services were available and how to choose among the services contributed to the ill health of their children. In many cases, mothers were not aware that Batra Hospital provided free OPD clinics at certain times during the week, or that private nursing homes were sometimes more interested in making money and would try and keep the patients longer and administer unnecessary treatments that could have been done easily at home, such as rehydration. They also lacked an understanding of the role and activities of many of the NGOs that were present in Tigri, who in many cases ran their own medical clinics and provided services to the family in a cost-effective manner.

With respect to RMPs, as untrained medical practitioners, the MBBS doctors considered RMPs a problem, since mothers often chose to seek treatment with them before seeking qualified advice and/or assistance.

> *There are not that many qualified doctors in this area. Some do that RMP course, it is 2 years or there are those who have worked with a doctor and now try to prescribe accordingly. Mostly unqualified doctors such as RMPs are in this area. There are very few MBBS doctors, maybe one or two.* (Chemist)

> *MBBS have gone through a proper medical college. Who has done his undergraduate, has done his internship, who is done their graduation and is trained in all the subjects. RMP is someone who*

> *has worked as a compounder or a dispenser with a doctor, and with that kind of experience there are one or two states, not all over the country, who have issued these degrees of registered medical practitioner with experience with working with someone. They have no formal medical education at all. They are dangerous.* (Batra Doctor)

Mamta is able to provide the link between the community and proper healthcare facilities. Through their interactions with the community, they are able to address the problem of diarrhoeal disease in a much broader perspective. Thus, the solutions to these problems are more concentrated and complete. Mamta felt that the only way to improve community health was to continue their current work, creating awareness about health and providing services in a cost-effective manner. The lack of knowledge of the slum dwellers was not any different from any other Delhi resident with respect to not being aware of the types of services available for particular health problems. Mamta would try to provide direction and support to families in directing them to where to go when one required medical attention for an illness. They also recognized that mothers continued to visit RMPs and felt that in order to overcome this problem they would cooperate with the RMPs by giving them additional training, supplies and support. The community workers felt that their work in their blocks was successful, informing mothers about diarrhoeal disease, and providing enough knowledge so that parents could recognize when their child was sick and needed a doctor.

In sum, it was felt by the POs that a *comprehensive development of the community* was necessary, focussing on health, income, and education/awareness. With increased literacy, especially in young children, the overall health of the community would improve. As a result, individuals would make better judgements as to what to do in case

of sickness and know where to gain medical attention. As well, they would be able to earn, and spend money toward improving their homes, educating their children, purchasing medicine and having a proper diet. This strategy would be sustainable in that once mothers were more educated they would be able to educate their children.

In addition, healthcare providers stressed the importance of oral rehydration salts (ORS), better nutrition and breast-feeding to control diarrhoeal disease episodes and prevent dehydration and malnutrition. The key was to treat the symptoms as they occurred or at the onset of diarrhoea. Education of mothers was necessary to change behaviour. The healthcare providers also recognized the advantages of the activities of NGOs, in Tigri. The value of Mamta's work was linked to the community workers. Many mothers were in contact with the community workers, as they were members of their own blocks. As a result, the CWs not only had a comprehensive understanding of the local problems but could deliver education to the individual homes with direct contact with the mother and child.

> *As I told you, some of the solutions include education. I think this is the most important. If they have education right from the school level this is important. School level education, rather than teaching them of past history, other things that are not relevant like in Russia, Canada, which are not going to help them. They have to know what is happening in their own country, they should teach basic hygiene. Basic education is cutting your nails, taking your bath regularly, coming to school nicely. If this is told to the child at the primary level they would become good citizens of this country, otherwise Indians are very obedient and very God fearing. So I think if education is given to them properly, rather than wasting their time in other things, which are not relevant. Health should be a very important subject in this country... 70% of my patients are from Tigri. They are nice people, but like I said if they had some good garbage collecting system, some good method of disposing or controlling toilet facilities, and everything like the*

> *environment, then I don' t think you will have any problems in this part of the world.* (MBBS Doctor in vicinity)
>
> *Education, increasing the literacy rates. If the children themselves study, they follow that at home, they teach their mothers, they teach their younger brothers and sisters. I don't know if you will agree, but the economic conditions have improved. People are earning more, there are more job facilities, even if they have to go greater distances, but there are still jobs available. They have to learn to understand that they have to go to the right place for treatment. Adding up all these things together, one thing is not going to work, but due to the summation of all these together. Most of the diarrhoeal diseases are preventable and that is the big thing.* (Batra Doctor)

In general, it was felt while diarrhoea could not be eradicated, it could be controlled by a combined effort of the healthcare providers, the increased work of NGOs, and improving the physical infrastructure.

5.3.3 Diarrhoeal disease in Tigri as constructed by researcher

I will also present my own constructs of the problem of diarrhoeal disease in the Tigri community based on my own education and cultural background, my time in New Delhi, working with Mamta and being a part of the community in Tigri. My own Indo-Canadian cultural background and education from a developed country creates a lens through which I perceive the diarrhoeal disease burden in this community. In addition, my own biases may have been influenced by my affiliation with my family during my time in India (i.e. a Brahmin family), and living outside of the community in a middle class neighbourhood. As well, as a researcher I cannot separate myself from the study, as many of the problems and pressures that were described by the mothers regarding their slum ecosystem can be felt throughout Delhi in many of the middle class communities.

For example, I, too, had to deal with arranging my schedule according to availability of water and be a part of a polluted and congested urban centre such as Delhi. I was also able to see how this fit into the bigger picture in Delhi, in that it allowed me to relate it to other slums in Delhi, and the general perceptions and views of middle and upper class Delhi residents towards slum dwellers.

However, the time spent in the field with Mamta, interacting with the program officers, community workers and doctors, provided me with insight into the background of the community. Listening to the community voices, developing relationships with the members of the community, and observing the daily activities of the mothers further shaped my understanding. My understanding of health issues, the accessibility of healthcare providers, and the attitudes of NGOs and healthcare providers towards these mothers allowed possible insight into the thoughts that controlled the mothers' attitudes and behaviours when their child is ill. A summary of my social constructs of the diarrhoeal disease problem in Tigri is presented below in the following table.

Table 5.5: A summary of the diarrhoeal disease burden in Tigri as constructed by the researcher.

THEMES	ISSUES
ECOSYSTEM STRESSORS	• Water • Latrines • Sanitation • Living standards
LIMITATIONS OF MAMTA	• Not working with other NGOs • Relationships in Mamta • Attitudes towards community
LIMITATIONS OF THE HEALTHCARE PROVIDERS	• Approachability • Safdarjung vs. Batra Hospitals
DIARRHOEAL DISEASE BURDEN	• Poverty • Lack of knowledge • Social issues

Ecosystem stressors

As previously discussed, my impressions of the stressors on the ecosystem coincided with the perspectives of the mothers. There was a serious lack of water, and my own schedule for interviews and focus group discussions was determined by the timing of when water was available to the community. The latrines were in a deplorable state, and I would see children using the side drains and parks openly. The lack of sanitation, particularly where it would lead to the drains overflowing, prevented individuals from walking in the community at times. This would mean one would have to be extremely careful and choose alternative paths. In most cases, the standing sewage water was in large puddles and individuals did not wear adequate foot protection. The housing structure and standard of living in these conditions was difficult to endure for a Westerner such as myself. I was surprised to see how many individuals could fit into a house. The presence of animals in the community was evident, as people raised pigs, chickens and goats domestically, and in some cases shared their sleeping premises with the animals at

night. There were also dogs, cats, mice, pigs, and cows roaming around without control throughout Tigri. In many houses, I saw television sets and radios, and in one house even a washing machine. Families would also spend their money on gadgets, alcohol, cinemas, holidays, and weddings.

Limitations of Mamta

My choice of Mamta was based on their interest in health issues, the rapport with the directors, doctors, researchers, program officers, and community workers, and their ability to accommodate me. It came to my knowledge that although a majority of mothers in the community did not know of activities of NGOs such as Mamta, there was a small percentage that did utilize their services or were in contact with either the program staff or community workers. Mamta's main focus was on increasing awareness of health issues and the provision of healthcare in a financially sound manner to the community. I realized that there were some limitations associated with the successful delivery of these objectives.

Tigri has many NGOs working in its community, with similar objectives as Mamta, but rarely did I see or interact with them. It is necessary to increase these interactions among the NGOs in the field to avoid duplication of services and perhaps overwhelming members of the community with information. The task of helping to alleviate poverty, improving health and general well-being of these individuals in Tigri can be enhanced by a concerted, joint effort by all NGOs, so that more community members become aware of health problems and have access to adequate care.

Through my interactions with Mamta I developed a sense of their relationship with the community and among the staff itself. I felt that the separation of the program officers and the community workers into two distinct groups and sometimes even separate rooms created a hierarchy that inhibited the organization's success. The program officers in many cases would sit together chatting and delegating work, while it was the community workers who did all the tasks. More field interaction of the program officers was needed; and more positive and personal relationships could be developed. The responsiveness of any mother to the healthcare knowledge will be shaped by the rapport with the healthcare provider. As a result, the attitudes towards the community by the NGO were important. I felt that the activities handled and efforts expressed by the community workers were exceptional; they seemed to be most hardworking, busy, and most sincere in their endeavours. The decision to employ members in the community to work in the NGO provided the successful link to the community itself. On the other hand, the distance and lack of development of relationships with the community by the program officers and doctors created a sense of inhibition to approaching them and receiving the care they required. The way the community was perceived at times created this hierarchy, and prevented mothers from feeling comfortable at the field office. For example, neither the program officers nor the doctors expressed interest in knowing about the patients' lives and seemed to talk down to them.

Limitations of the healthcare providers

I feel the success of any health intervention will depend on the level of approachability of the healthcare providers. In my discussions and experiences with the healthcare

providers, I generally felt I had the same feelings about doctors with an MBBS degree as I did with the program officers and doctors of Mamta. This was with the exception of the doctor whom I interviewed at Safdarjung Hospital. They all seemed to have a sense of arrogance, lack of willingness to get to know the person they were treating or talking with, and in most cases were concerned with their own prestige, making money, and running their clinics. Those who were not concerned with the advancement of their careers, such as the doctor from Safdarjung Hospital or those who were in the vicinity of the slum day-to-day, such as the chemist and RMP, seemed to be more sincere and considerate of the patients' health and general well-being. This could partially explain why mothers hesitate in going to the doctors or wait till their child is severely ill.

In my quest to meet with doctors from both Batra and Safdarjung Hospitals, I was also able to assess the care provided in these facilities. I was quite impressed with Batra Hospital; it catered to a wide range of economic classes, had nice gardens, and seemed visibly new. In contrast, Safdarjung Hospital was a much older facility treating patients of lower economic classes. The following quotation, from my interview with the doctor at Batra Hospital depicts the contrast between the Batra Hospitals and government hospitals, such as Safdarjung:

> *There are so many differences. We have one patient to a bed where I have worked in a government hospital, we used to have 4 patients to a bed. Here we have so many residents that keep seeing the patients every 2 hours, 3 hours or 4 hours. There we had about 120 patients between two doctors. We never had time to see the patient more than once in a day Living nearby around this hospital, I don't know that the care is available, where to come, how to get in, what is the time to come. It takes effort to come. It is only when we don't have a bed here, then we refer them to the government hospital. But for the people who don't know the*

> *hospital, the times and the ways, they could probably go to the government hospital.*

Even during my own visits to Safdarjung Hospital, I was shocked to see some of the conditions the patients had to suffer: two or three children sharing a bed in the paediatric wing, adults sleeping on the floor because of lack of beds, and patients holding their own IV bottles in their hands. The facility was in an overall deteriorated state.

Diarrhoeal disease burden

In conclusion, in my opinion the determining factor in diarrhoeal outbreaks occurring in this community is the level of poverty. Diarrhoea is controlled by the variety of determinants discussed throughout the previous chapters. Individuals would not be in communities, such as Tigri, if they did not have to leave their homes in the rural areas and come to the city to seek employment. The lack of housing in Delhi and accessibility to those economically less fortunate have forced this population to live on the fringes in physically and socially vulnerable environments. The social, cultural, and religious problems that are created in the community are the result of tensions over resources, living in close proximity and lack of money and savings in the family. There is also an apparent lack of knowledge regarding diarrhoeal disease causation, control and prevention.

5.4 CONCLUSION

This chapter articulated the voices of the mothers and the broader community in understanding the dynamic relationships that exist in Tigri between environment, development and health, and, more specifically, the social construction of risk with

diarrhoeal disease. The beginning of the chapter outlined the state and the pressures on the Tigri ecosystem as perceived by the mothers and the community. The main stressors on the community are related to water scarcity, latrine and sanitation degradation, slum living standards, and economics. Through the discussion about the stressors a variety of social, cultural and religious predicaments that the mothers endured emerged.

Household choices are influenced in part by the factors that surround an individual in their community and their response to these pressures. In turn, this leads to the attitudes and behaviours in coping with the risks associated with diarrhoeal disease. The individual socially constructs the degree of vulnerability to these risks. In this chapter I demonstrated how diarrhoeal disease risk is constructed by the mothers in a thorough discussion of the perceived/recognized symptoms, causes, prevention, and control/treatment of diarrhoea. I also recorded the problems in seeking treatment during episodes of diarrhoea. Mothers and their ability to make sound judgements about health are further influenced by the sources of information made available to them, such as that provided by NGOs and community healthcare providers. Thus, it is important to understand these individuals and their approach to Tigri. For example, I realized that while many mothers see money as a factor in reducing their child's risk of diarrhoeal disease, the healthcare providers overwhelmingly thought that simple prevention methods were more effective than purchasing expensive healthcare. Also, the degree of separation between the various groups discussed in this chapter is quite evident, where one can realize how far removed most healthcare providers are from the realities of the slum mothers, how mothers do not know which healthcare provider to trust and how NGOs fail

CHAPTER 6
CONCLUSION

6.1 INTRODUCTION

In this final chapter I summarize the findings of diarrhoeal disease risk in Tigri, a Delhi slum community, and place them in the larger theoretical framework posed by the initial research questions of this thesis. I conclude by commenting briefly on the social construction of diarrhoeal disease risk and the generalizability of this research, and offer suggestions and recommendations for future research in addressing health issues in the urban poor communities.

My time in Tigri made me realize the problems and constraints that urban poor communities face. My discussions with mothers revealed that diarrhoeal disease was a major health concern. Among the most pressing topics in the community were water supply, latrines, and sewage drains. In examining and explaining the health problems in Tigri, and how the mothers understood diarrhoeal disease risk, I concentrated on the views, perceptions and experiences of the mothers. By utilizing the ecosystem approach to human health as a framework and the theory of social construction of risk, I was able to answer the initial research questions of this study. These were:

- How do the conditions in slum ecosystems affect the social construction of risk associated with diarrhoeal disease among mothers?
- In what ways do the attitudes and behaviours of mothers influence the social constructions of diarrhoeal disease causation, prevention and control among children under five years, in an urban poor community of Delhi?
- How do the attitudes, behaviours, and beliefs of mothers contribute to diarrhoeal disease risk at the household and individual level?

In answering these questions, I also attempted to:

- Develop a detailed case study to illustrate how social construction of diarrhoeal disease causation, prevention and control are linked to the broader determinants of diarrhoeal disease – i.e. factors such as development, urbanisation, environment (bio-physical and socio-economic) behaviour, and culture.
- Expand the theoretical discussion on the relationship amongst development, environment, and human health; and,
- Provide information in a form relevant to the local community healthcare agenda.

6.2 Discussion of Results

6.2.1 Ecosystem factors related to diarrhoeal disease risk

Chapter Five discussed the ecosystem stressors on Tigri and the social constructs created by mothers, Mamta, the healthcare providers and the researcher in relation to diarrhoeal disease risk. In answering the first question of this thesis, (i.e., how do the conditions in slum ecosystems affect the social construction of risk associated with diarrhoeal disease among mothers?), it was important to understand the complexity of issues (bio-physical, socio-economic, political and cultural) that exist at various levels (household, Tigri community, Delhi and India), and, in turn, how these influenced and conditioned the individual's response to risk. The main findings with respect to the ecosystem stressors on the Tigri community were as follows:

- The availability of water is a major problem. The availability and access to water resources impacts the stress levels of the mothers on a daily basis. Mothers tend to focus their daily schedule around when water will be available and how far they will have to travel to get the water they require. In turn, this may involve arranging for childcare and coping with the variety of social tensions that revolve around water.
- Water quality is also an issue, in that it impacts how water is used and the overall health of individuals in the community.
- Community latrines and the general sanitation issues of the streets are a concern as well. The deteriorating condition of the latrines, the exposure of the open side

sewage drains in the community, the social issues arising from these problems, and the threat of occurrence and transmission of pathogens also impacts the stress levels of the mothers.

- Living conditions in Tigri cause tension among the mothers, with congestion, pollution, and social problems contributing to a lifestyle that is uncomfortable and unhealthy.
- Poverty is an underlying factor that contributes to the overall stress burden of the mothers.

Many factors contribute to the vulnerability of the individuals to risk of diarrhoeal disease. From an ecosystem perspective, these include the physical, socio-economic, cultural, political and behavioural environments. The urban slum ecosystem of Tigri provides the optimal conditions for infectious diseases, such as diarrhoeal disease, to become a threat. The stressors on the Tigri ecosystem directly relate to the determinants of diarrhoeal disease, as outlined in Chapter Two. They impact on the occurrence of diarrhoeal disease, their prevention, transmission and control.

The residents in Tigri are environmentally and economically disadvantaged and this results in an inability to mobilize resources to cope with ill health. Their level of poverty impacts profoundly on their response to any situation and specifically their ability to cope with diarrhoeal disease among their children.

6.2.2 Attitudinal and behavioural factors related to diarrhoeal disease risk

The fragile state of the Tigri ecosystem plays an influential role in the social construction of risk associated with diarrhoeal disease. How mothers respond to health problems is conditioned by these surrounding factors and thus increases the probability of diarrhoeal disease in their children. Furthermore, the mother's understanding of diarrhoeal disease

can increase or reduce the exposure of their household to diarrhoeal disease risk. Taking into account the pressures on the Tigri ecosystem, the theory of social construction of risk allows us to understand how mothers cope with diarrhoeal disease risk in their children. In this chapter, how mothers perceive their surroundings and explore their own lived experiences as they relate to child health in Tigri is described.

In answering the second question of this research, (i.e., in what ways do the attitudes and behaviours of mothers influence the social constructions of diarrhoeal disease causation, prevention and control among children under five years, in an urban poor community of Delhi?) the main findings were as follows:

- Mothers know what diarrhoea is – they can recognize and describe it.
- The level of understanding surrounding the causes of diarrhoea is vague and varied among the mothers in Tigri.
- There is limited knowledge of various preventive biomedical methods (i.e., hygiene, hydration, proper clothing, and feeding).
- With respect to control, there was a large dependency on healthcare providers.

Insights from the discussions with the mothers, Mamta, healthcare providers and the thoughts of the researcher help to answer the last research question of this thesis: How do the attitudes, behaviours, and beliefs of mothers contribute to diarrhoeal disease risk at the household and individual level? Mothers in this community contribute to the healthy, sustainable living of not only their household, but also the community itself. Concerning the social construction of risk associated with diarrhoeal disease, one must realize that social constructs are created by the attitudes, behaviours, and beliefs of the mother. These attitudes, behaviours and beliefs are influenced by the level of stress and tension

that mothers endure day-to-day, conditioned by surrounding voices (NGOs, media, families and healthcare providers) and further impacted by their own culture and religious heritage and level of education.

This thesis has identified the various levels of stress that mothers face arising from interactions at different levels – i.e. household, community, Delhi, and India. Stress is an important determinant of how mothers react and respond when their child suffers from diarrhoea. Stress may, for example, distract the mother from the child or impact the choice of treatment. The following main points were drawn from discussions with the mothers regarding stress levels and how they impact diarrhoeal disease risk at the household and individual level. Stress and tension among mothers arose from:

- The logistical problem of obtaining water for the daily functioning of the household. This resulted in problems such as children being left unattended or under the supervision of their siblings who were children themselves. This impacted diarrhoeal disease risk at the household and individual levels in that, once unattended or under minimum supervision, children were readily exposed to pathogens (i.e. playing on streets, not washing hands, eating improper foods).
- Fear of going to the latrines at night. As a result, mothers would either go to the bathroom in areas that are shared public places, where pathogens are not contained such as the home, street and/or park. This exposed individuals including children in the home and community to possible diarrhoeal disease risk with increased exposure to pathogens.
- Fear of government induced eviction. This influenced the level of risk, where money was saved and not invested in improving homes (i.e., building latrines, improve the hygienic conditions of the home).
- Lack of financial resources for the family to function. The level of poverty and financial constraints impact the choice of healthcare (i.e., yellow pill and RMPs over trained doctors) and treatment (i.e., obtaining proper medicine, following advice on diet for child when sick). The most popular choices when children were sick were also those that were most financially attractive, but were not necessarily suitable for treating the child in a healthy manner. Although, ORS is a relatively cheap and easily made treatment along with being effective in treating diarrhoea, most mothers prefer to seek healthcare providers when their child is sick. In some ways mothers were restrained from seeking proper healthcare

because they depended on their husbands' income or had to seek ways to borrow funds. The excessive time taken or wasted waiting also impacted the child's condition when they were ill, where symptoms were not treated as they occur on the onset.

- Lack of time. At times, mothers preferred going to local community practitioners simply for reasons of time as opposed to going to trained healthcare providers outside the community. Often the line-ups for MBBS doctors, and the administration processes at Safdarjung or Batra Hospital, were deterrents for the mothers. Once a child became sick, time would be taken away from maintaining the home and taking care of other children, thus furthering the impact of the level of diarrhoeal disease risk at the household and individual levels.

In addition to stress, various household practices also impact negatively on health. For example, the presence of animals such as pigs and goats in some households would impact the exposure to pathogens and vulnerability to disease. In many cases animals are housed within the same space as the family, which increases the potential risk of contamination of stored drinking water supplies and food, as well as the overall hygienic conditions of these dwellings (in most cases, single room structures).

The water problems in the community encouraged the women to adapt and find solutions to ensure they had adequate water for their families. However, solutions such as prioritising water usage would, in some cases, result in foregoing bathing and basic hygienic practices. Storing water in the home would also be problematic because many times water would be left uncovered and was prone to contamination and provided an environment for transmission of pathogens. The quality of water is an important determinant of health and disease. In Tigri, water was often contaminated and posed a disease risk when instead of boiling water mothers would strain it with a cloth or simply allow debris to settle. This indicated a lack of knowledge of microbiological

contamination as a cause of diarrhoea. Some women found water to be unfit to drink only when they could see physical evidence of pollution.

Furthermore, latrine degradation and the lack of cleanliness in the community also result in attitudes and behaviours that increased the presence and transmission of infectious microbiological agents, which cause diarrhoea. Many mothers were not attentive to where and how children played on the streets, in many cases very close to open sewage drains and piles of debris. There was also a problem with young children when the mothers felt it was acceptable for them to either go to the bathroom in the home, sewage drains or nearby parks, especially when the child was already suffering from diarrhoea. However, mothers often did not realize these areas were the same places where children played; they were not aware of the contagion process of diarrhoea or the nature of germs. On the whole, as long as their homes were clean mothers did not give much attention to the overall state of the community. This was evidenced by how mothers threw garbage onto the streets, taking no ownership of their contribution to the unhealthy state of Tigri's physical environment while thinking that other people were responsible in maintaining a sustainable community.

Education is a possible solution, and more specifically health education as the key to the future of Tigri, especially in preventing and controlling further outbreaks of diarrhoea among children. The lack of health awareness among mothers results in attitudes and behaviours that increase the risk of diarrhoeal disease in the home. There was a lack of uniformity and conformity to Western approach to health as to when and how to treat a

child with diarrhoea and which healthcare was best. For example, the dependency on healthcare instead of utilizing oral rehydration salts at home at the onset of an outbreak, not finishing the course of medicine that is prescribed by one doctor and not having clear understanding as to what causes diarrhoea are factors that also impact the burden of disease in the household.

During my time in Tigri, I felt that a holistic grasp of the experiences of mothers as they responded to diarrhoeal disease could be achieved by talking to Mamta, a typical NGO working in a slum, and the healthcare providers that mothers interacted with. Discussions with Mamta and healthcare providers would provide alternative perspectives on the phenomenon of diarrhoeal disease risk in Tigri. Mothers' knowledge, and behaviours are influenced by awareness campaigns by NGOs and by the availability, approachability and attitudes of healthcare providers. In many respects, the views of Mamta employees and healthcare providers corresponded with those views of the mothers, regarding the social problems, water and sanitation issues, the economic frustrations, and the barriers that exist in receiving proper healthcare.

On the other hand, the perspectives of the other groups provided insights into prevalent problems in the community not identified by the mothers. While many mothers regard improving economic stability in the home as a factor in reducing their child's risk of diarrhoeal disease, the following perspectives from other groups highlight the differing opinions as to how the diarrhoeal disease burden may be controlled and reduced.

- There was agreement by Mamta and the healthcare providers that: a) a lack of Western biomedical knowledge existed among the mothers regarding diarrhoeal

disease. This lack of knowledge is evident as it manifests in mothers' attitudes, behaviours, and beliefs, as discussed above, and plays a role in impacting the level of diarrhoeal disease risk; and, b) there was a problem with prioritising how money was spent in the home (i.e. spending on alcohol or electronic goods rather than improving the home, or investing in education or health).

- The healthcare providers agreed that: a) improving the physical surroundings was key to decreasing the level of diarrhoeal disease risk among children; and b) that cultural and religious backgrounds are also important in determining the health outcome of the children.
- Mamta and healthcare providers agreed that the practices of RMPs added to the problem.
- Healthcare providers agreed that simple prevention methods were most effective, such as hydration (ORS), breast-feeding, and proper nutrition.
- I felt that the NGOs failed to work in a concerted fashion in Tigri and that, in some cases, healthcare providers were far removed from the realities of the mothers. In addition, the rapport created between the healthcare provider and the patient is vital, and at times it was evident that the level of approachability to the healthcare provider created inhibitions and confusion as to what healthcare to seek.

Thus, the discussion of results has allowed a better understanding of the Tigri ecosystem, and burden of diarrhoeal disease in this community. This discussion further leads to the broader theoretical and methodological issues surrounding this thesis, and the possible implications of the research.

6.3 Theoretical and Methodological Issues

6.3.1 The ecosystem approach and social construction of diarrhoeal disease risk

The value of the ecosystem approach lies with its holistic nature; it allows one to examine the interplay between humans and their surroundings and among the environments (bio-physical, socio-economic, and cultural), and it incorporates the perceptions, attitudes, and behaviours of the local people with respect to health. The ecosystem approach to human health is one of many conceptual frameworks within which to conduct research.

However, with respect to this thesis it is an especially useful approach as it allows for the incorporation of the discussion of social construction of risk within the spheres of the built and natural environments. Social constructs are created as a result of the relationships that occur in the ecosystem.

The concepts of risk, insecurity, and vulnerability all relate to the probability and persistence of any health problem. The following definition of risk, as defined in Tierney's discussion of risk (1999), gives a broad conceptual basis; "the potential for realization of unwanted, negative consequences of an event" (Rowe, 1977:24). This thesis has explored factors of risk by demonstrating that risk is socially constructed, in that larger forces surrounding individuals influence decisions that affect the probability and impact of diarrhoeal disease risk. Furthermore, a social constructionist approach assumes that "the basic sociological task is to explain how social agents create and use boundaries to demarcate that which is dangerous" (Clarke and Short 1993:379, as cited in Tierney 1999). Although diarrhoeal disease is a problem in Tigri, according to the mothers, there are even greater problems – the physical and social agents that are essential to survival in their community. An underlying theme seems to be that diarrhoeal disease risk is not as important to mothers as concerns relating to financial stability and access to resources, such as water or other threats to health. It is the external society, that which is not experiencing daily life in Tigri, in this case the healthcare providers, Mamta and to some extent the researcher, who have deemed diarrhoeal disease as a huge problem in the community, and in some cases blame the mothers for the

magnitude of the problem. However, it may be beyond the mother's capacity to deal with the situations that arise when their children suffer from diarrhoeal disease.

Mamta, healthcare providers, and other Delhi residents often felt that slum dwellers, including those in Tigri, did not prioritise their finances. Rather than choose viable options to improve the living standards in the community (i.e., investing in their homes, health or education), families instead spent funds on buying electronic equipment, weddings, and festivals or men spent it on drinking and gambling. One reason for this may have been the fear and insecurity created by the threat of being evicted at any time. As well, the attractiveness of portable consumer items over fixed improvements to homes/neighbourhoods. To some it may have been an opportunity to feel more connected to the community by financially investing in gatherings during holidays, weddings and festivals.

Risk depends on what is perceived to be valuable and what is considered serious or dangerous. As mentioned in Chapter Two, risk to an individual or community can be selectively built. Risks to health encompass individuals everywhere. Applying an ecosystem approach, as well as incorporating the thoughts of various groups in the community, permitted a thorough examination of risks associated with diarrhoeal disease in the Tigri community. The challenge of finding a solution to the problem of diarrhoeal disease is that those risks that are perceived as serious by one group may not be regarded the same by another. At the same time, not all of the people who are influenced by the same array of factors suffer the same way. Living in the slum is a result of inadequate

finances, and families cannot move into a better neighbourhood, or even go back to their villages. They have not necessarily accepted the risks, but rather either they have no choice or they do not define diarrhoeal disease as a risk, at least not a serious one.

It is important to realize that risk is also dynamic and changes over time. With respect to this thesis, the attitudes, behaviours, and beliefs of the mothers as they relate to production of diarrhoeal disease risk are ever changing. Mothers are dependent on social changes that surround them, and, as a result, their vulnerability also changes. The changes in dynamics and processes of interactions at the individual, community and city levels will all impact variations in vulnerability and risk. Thus, the importance of the case study approach is obvious, since attitudes, behaviours and beliefs are bounded by time and space.

Risks are also imposed unequally in society, and, in most cases, those who are most exposed are least able to cope with risk (Tierney 1999). As noted previously, families living in slums are exposed to greater risk than their counterparts in more economically stable neighbourhoods. This poses a problem, in that the marginalized societies in slums also have the most obstacles experiencing and recovering from the consequences of ill health.

The social construction of diarrhoeal disease risk is closely related to vulnerability. The degree of vulnerability to the pressures on the ecosystem is socially constructed, and in turn mediates behaviour by influencing decision-making patterns within the individual.

The main findings of this study are discussed in terms of the three components of vulnerability presented in Chapter Two – exposure, capacity and potentiality. Vulnerability symbolizes fragility, as well as insecurity.

- Exposure to Diarrhoeal Disease:
    - The urban slum ecosystem of Tigri provides the optimal conditions for infectious diseases, such as diarrhoeal disease, to become a threat.
    - The mothers' understanding of diarrhoeal disease further enhances the vulnerability to the exposure of diarrhoeal disease risk.

- Capacity to cope with diarrhoeal disease:
    - The residents of Tigri are marginalized from the rest of Delhi, and this results in the inability to mobilize resources to cope with ill health.

- Potential for serious consequences:
    - As a result of high levels of exposure to diarrhoeal disease risk and low capacity to cope with diarrhoeal disease outbreaks, the probability of diarrhoeal disease in Tigri and severe consequences are high.

6.3.2 Methodological issues

The value of the research results is related to the concepts of triangulation and generalizability. Triangulation involved applying multiple methods to explore the same phenomena. The coupling together of thoughts from various groups who could articulate the state of the ecosystem and the diarrhoeal disease burden in Tigri provided validity to the research, and as well posed new and interesting research questions - i.e., why do the mothers and Mamta workers not view diarrhoeal disease in the same way? The multiple measures of the same phenomenon produced results that strengthened the evidence-base for the conclusions.

The Tigri case study can be generalized to other settings. The general characteristics of the Tigri community are similar to other slums Delhi, and, in general, India. Inadequate development, rapid urbanisation, vulnerability to risk, and poor economic conditions are similar in most urban slum communities. In most cases, the urban poor in Delhi and India represent a group of people who have migrated to an urban centre in hopes of bettering their lives, usually because of perceived economic opportunities in cities. My experiences in two other slums allowed me to view similar characteristics of slum life to that of Tigri. This was further enhanced through my observations and conversations with urban poor residents during my travels in India. Although community characteristics may be different, (e.g., the religious or cultural make-up of the community), the overall attitudes, behaviours and beliefs and poverty determinants are similar.

6.4 RECOMMENDATIONS

The findings of this study support the view that solutions to child health problems depend on managing the ecosystem and alleviating the stressors that act upon it. By managing the ecosystem, and creating a healthy, sustainable community (i.e., through poverty alleviation, and increasing access to resources), the security and overall health of the individual and household will improve. It is not only important to reduce the vulnerability of the individual and family to diarrhoeal disease, but to understand the values individuals place on risks in their environments and to answer the questions of *why* these values exist. An additional advantage of the ecosystem approach is that it is participatory, focussing on the needs of the individual and community. Based on the case study, the following recommendations are presented.

- Increase the literacy levels of mothers through education and focus attention on improving educational services to children. Incorporate more health and information about hygiene.
- Improve physical surroundings by addressing the problems of water scarcity, latrine degradation, and lack of sanitation.
- Improve the linkages and dialogues between individuals, community and municipal governments by focusing on long-term solutions. Most of the coping mechanisms adopted by families are short-term, and viable options for management of the ecosystem need to be focussed on long-term solutions. Since women are users and managers of the ecosystem and are primarily responsible for the health of children, it is important to include them in all aspects of ecosystem management.
- Emphasize how community health is related to individual and household health. This involves encouraging community participation in developing collective or organized plans for cleaning streets or interacting with the municipal government. By having individuals take ownership of their actions, attention to health risks may occur through different perceptions, constructions and responses to risk.
- Increase options for alleviating financial burdens in households, for example through women's co-op initiatives, and exploring options for women's employment.
- Develop an urban health policy that addresses the roles of the different government ministries. This may occur through increased communication between government and community. Residents of the slums need a sense of acceptance in larger society, and the lack of priority given to these communities by the government furthers their feelings of insecurity and marginalization.

Two possible directions for future research which were beyond the scope of this thesis are:

- The importance of the local context and its many dynamics has become apparent through my research. A multidisciplinary approach is necessary by utilizing theories from many disciplines to explore and explain the processes occurring at the local level. This study provided a qualitative description of the social construction of diarrhoeal disease risk. The research could be strengthened by incorporating complementary quantitative data (e.g., medical records, analysis of water quality).
- Interviews with the mothers presented only one view of reality with respect to diarrhoeal disease risk in Tigri. Including perspectives from Mamta, healthcare providers and personal observations gave validity to the conclusions above. However, it would also be interesting and likely useful to take into account the

views of the fathers. This would enhance the research design and process by making it more gender sensitive.

LITERATURE CITED

Agnihotri, P. 1994. *Poverty Amidst Prosperity: Survey of Slums*, New Delhi: M.D. Publications.

Alam, B. 1999. *Environmental and Water Quality Management Survey in Delhi Slums – Final Report*, New Delhi: CARE – India.

Asthana, S. 1995. Variations in poverty and health between slum settlements: contradictory findings from Visakhapatnam, India. *Social Science and Medicine*, 40(2): 177-188.

Baltazar, J.C., Tiglao, T.V. and Tempongko, S.B. 1993. Hygiene behaviour and hospitalized severe childhood diarrhoea: a case-control study. *Bulletin of the World Health Organization*, 71(3/4): 323-328.

Barret, H. and Browne, A. 1996. Health, hygiene and maternal education: evidence from the Gambia. *Social Science and Medicine*, 43(11): 1579-1590.

Baxter, J. and Eyles, J. 1999. The utility of in-depth interviews for studying the meaning of environmental risk. *Professional Geographer*, 51(2): 307-320.

Bentley, M., Elder, J., Fukumoto, M., Stallings, R.H., Jacoby, E. and Brown, K. 1995. Acute childhood diarrhoea and maternal time allocation in Northern Central Sierra of Peru. *Health Policy and Planning*, 10(1): 60-70.

Bhatnagar, S. and Dosajh, U. 1986. Diarrhoeal disease morbidity in children below 5 years in urban slums in Delhi. *Indian Journal of Medical Research*, 84: 53-58.

Brüssow, H., Rahim, H., Barclay, D., Freire, W.B. and Dirren, H. 1993. Nutritional and environmental risk factors for diarrhoeal diseases in Ecuadorian children. *Journal of Diarrhoeal Disease Research*, 11(3): 137-142.

Canadian Global Change Program. 1995. *Implications of Global Change for Human Health*, Ottawa: The Royal Society of Canada.

Covello, V.T. and Johnson, B.B. 1987. The social and cultural construction of risk: issues, methods, and case studies. In B.B. Johnson and V.T. Covello (Eds.), *The Social and Cultural Construction of Risk: Essays on Risk Selection and Perception* (pp. vii-xiii). Boston: D. Reidel Publishing Company.

Creswell, J.W. 1998. *Qualitative Inquiry and Research Design: Choosing Among Five Traditions*, California: Sage Publications.

Curtis, S. and Taket, A. 1996. *Health and Societies*, London: Arnold Press.

Cutting, W.A.M. and Hawkins, P. 1982. The role of water in relation to diarrhoeal disease. *Journal of Tropical Medicine and Hygiene*, 85: 31-39.

Delor, F. and Hubert, M. 2000. Revisiting the concept of 'vulnerability', *Social Science and Medicine*, 50: 1557-1570.

Denzin, N.K. and Lincoln, Y.S. (Eds.). 1998. *Collecting and Interpreting Qualitative Materials*. Thousand Oaks, CA: Sage Publications.

De Zoysa, I., Bhandari, N., Akhtari, N. and Bhan, M.K. 1998. Careseeking for illness in young infants in an urban slum in India. *Social Science and Medicine*, 47(12): 2101-2111.

Dikassa, L., Mock, N., Magnani, R., Rice, J., Abdoh, A., Mercer, D. and Bertrand, W. 1993. Maternal behavioural risk factors for severe childhood diarrhoeal disease in Kinshasa, Zaire. *International Journal of Epidemiology*, 22(2): 327-333.

Dingelstad, D., Gosden, R., Martin, B. and Vakas, N. 1996. *The social construction of drug debates*. Social Science and Medicine, 40(12): 1829-1838.

Drakakis-Smith, D. 1981. *Urbanisation, Housing and the Development Process*, London: Croom Helm Ltd.

Ecosystem Approaches to Human Health PI. 2000. *Ecosystem Approaches to Human Health Program Initiative Program Prospectus*, Ottawa: IDRC.

Edmundson, S.A. and Edmundson, W.C. 1989. Acute diarrhoeal disease in India and Indonesia. *Social Science and Medicine*, 29(8): 991-997.

Edmundson, S.A. and Edmundson, W.C. 1992. Management of diarrhoeal disease in India and Indonesia. In W.C. Edmundson, P.V. Sukhatme and S.A. Edmundson (Eds.), *Diet, Disease and Development* (pp.137-153). Delhi: Macmillan India Limited.

Edmundson, S.A., Edmundson, W.C. and Sukhatme, P.V. 1992. Social and cultural influences on health. In W.C. Edmundson, P.V. Sukhatme and S.A. Edmundson (Eds.), *Diet, Disease and Development* (pp.264-284). Delhi: Macmillan India Limited.

El Bushra, H.E. and Ash, L.R. 1991. Health status of the mother: is it an overlooked risk factor for diarrhoeal disease in children. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 85: 822-823.

Emch, M. 1999. Diarrhoeal disease risk in Matlab, Bangladesh. *Social Science and Medicine*, 49: 519-530.

Esrey, S.A. and Habicht, J. 1986. Epidemiologic evidence for health benefits from improved water and sanitation in developing countries. *Epidemiologic Reviews*, 8:117-128.

Eyles, J. and Sharma, R. 2001. *Infectious Diseases and Global Change: Threats to Human Health and Security. Aviso No. 8.* Victoria, B.C.: Global Environmental Change and Human Security.

Forget, G. and Lebel, J. 2001. An ecosystem approach to human health. *International Journal of Occupational and Environmental Health*, Supplement to 7(2): S3-S38.

Forget, G. and Sanchez-Bain, A. 1999. Managing the ecosystem to improve human health: integrated approaches to safe drinking water. *International Journal of Occupational and Environmental Health*, 5(1): 38-50.

Fulton, G., Madden, C. and Minichiello, V. 1996. The social construction of anticipatory grief. *Social Science and Medicine*, 43(9): 1349-1358.

Gerber, J. 1997. Beyond dualism – the social construction of nature and the natural and social construction of human beings. *Progress in Human Geography*, 21(1): 1-17.

Gorter, A.C., Sandiford, P., Smith, G.D. and Pauw, J.P. 1991. Water supply, sanitation and diarrhoeal disease in Nicaragua: results from a case-control study. *International Journal of Epidemiology*, 20(2): 527-533.

Goss, J. D. 1996. Focus groups as alternative research practice: experience with transmigrants in Indonesia. *Area,* 28(2): 115-123.

Guidotti, T.L. 1995. Perspective on the health of urban ecosystems. *Ecosystem Health*, 1(3): 141-149.

Hancock, T. 2000. *Urban Ecosystems and Human Health*. Paper prepared for the seminar on CIID-IDRC and urban development in Latin America, Montevideo, Uruguay, April 6-7, 2000.

Harpham, T. 1994. Cities and health in the Third World. In D.R. Philips and Y. Verhasselt (Eds.), *Health and Development* (pp. 111-121). London: Routledge.

Henry, F.J., Briend, A., Fauveau, V., Huttly, S.A., Yunus, M. and Chakraborty, J. 1993. Gender and age differentials in risk factors for childhood malnutrition in Bangladesh. *AEP*, 3(4): 382-386.

Huberman, A.M. and Miles, M.B. 1998. Data management and analysis methods. In *Collecting and Interpreting Qualitative Materials*, edited by N.K. Denzin and

Y.S. Lincoln, (pp. 179-210). Thousand Oaks, CA: Sage.

Jain, A.K. 1996. *The Indian Megacity and Economic Reforms*, New Delhi: Management Publishing Co.

Jinadu, M.K., Olusi, S.O., Agun, J.I. and Fabiyi, A.K. 1991. Childhood diarrhoea in rural Nigeria. I. Studies on prevalence, mortality and socio-environmental factors. *Journal of Diarrhoeal Disease Research*, 9(4): 323-327.

Jones, K. and Moon, G. 1987. *Health, Disease and Society*, London: Routledge & Kegan Paul Ltd.

Jones, K. and Moon, G. 1993. Medical geography: taking space seriously. *Progress in Human Geography*, 17:515-524.

Kaltenthaler, E.C. and Drašar, B.S. 1996. The study of hygiene behaviour in Botswana: a combination of qualitative and quantitative methods. *Tropical Medicine and International Health*, 1(5): 690-698.

Kearns, R.A. 1993. Place and health: toward a reformed medical geography. *The Professional Geographer*, 45(2): 139-147.

Kolsky, P.J. 1993. Diarrhoeal disease: current concepts and future challenges (water, sanitation and diarrhoea: the limits of understanding). *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 87(Suppl.3): 43-46.

Lonergan, S. and Vansickle, T. 1991. Relationship between water quality and human health: a case study of the Linggi River basin in Malaysia. *Social Science and Medicine*, 33(8): 937-946.

Lantz, P.M. and Booth, K.M. 1998. The social construction of the breast cancer epidemic. *Social Science and Medicine*, 46(7): 907-918.

Mamta. 2000. *Profile of Janta Jeevan Camp, Tigri*, New Delhi: Mamta.

Mathan, V.I. 1998. Diarrhoeal diseases. *British Medical Journal*, 54(2): 407-419.

McMichael, A.J. 1993. *Planetary Overload*, Cambridge: Cambridge University Press.

Meade, M., Florin, J. and Gesler, W. 1988. *Medical Geography*, New York: Guildford Press.

Morgan, D.L. 1997. *Focus Groups as Qualitative Research,* Thousand Oaks, CA: Sage.

Mutatkar, R.K. 1995. Public health problems of urbanization. *Social Science and Medicine*, 41(7): 977-981.

Muttamara, S. and Krishnaswamy, M. 1982. Diarrhoeal diseases related to sanitation and water supply. *Southeast Asian Journal of Tropical Medicine and Public Health,* 13(3): 348-352.

Oyemade, A., Omokhodion, F.O., Olawuyi, J.F., Sridhar, M.K.C. and Olaseha, I.O. 1998. Environmental and personal hygiene practices: risk factor for diarrhoea among children of Nigerian market women. *Journal of Diarrhoeal Disease Research*, 16(4): 241-247.

Patel, V.L., Eisemon, T.O. and Arocha, J.F. 1988. Causal reasoning and treatment of diarrhoeal disease by mothers in Kenya. *Social Science and Medicine*, 27(11): 1277-1286.

Phillips, D.R. and Verhasselt, Y. 1994. Introduction: health and development. In D.R. Philips and Y. Verhasselt (Eds.), *Health and Development* (pp. 3-32). London: Routledge.

Pitts, M., McMaster, J., Hartmann, T. and Mausezahl, D. 1996. Lay beliefs about diarrhoeal diseases: their role in health education in a developing country. *Social Science and Medicine*, 43(8): 1223-1228.

Rao, R. 1990. *Social Organisation in an Indian Slum.* New Delhi: Mittal Publications.

Registrar General and Census Commissioner, India. 2001. *Census of India.* Available from http://www.censusindia.net/index.html. Accessed September 30, 2001.

Santow, G. 1995. Social roles and physical health: the case of female disadvantage in poor countries. *Social Science and Medicine*, 40(2): 147-161.

Schorling, J.B., Wanke, C.A., Schorling, S.K., McAuliffe, J.F., DeSouza, M.A. and Guerrant, R.L. 1990. A prospective study of persistent diarrhea among children in an urban Brazilian slum. *American Journal of Epidemiology*, 132(1): 144-156.

Shawyer, R.J., Gani, A.S.B., Punufimana, A.N. and Seuseu, N.K.F. 1996. The role of clinical vignettes in rapid ethnographic research: a folk taxonomy of diarrhoea in Thailand. *Social Science and Medicine*, 42(1): 111-123.

Stake, R.E. 1998. Case studies. In N.K. Denzin and Y.S. Lincoln (Eds.), *Strategies of Qualitative Inquiry*, California: Sage Publications.

Tierney, K.J. 1999. Toward a critical sociology of risk. *Sociological Forum,* 14(2): 215-242.

VanDerslice, J., Popkin, B. and Briscoe, J. 1994. Drinking-water quality, sanitation,

and breast-feeding: their interactive effects on infant health. *Bulletin of the World Health Organisation*, 72(4): 589-601.

Wang'ombe, J.K. 1995. Public health crises of cities in developing countries. *Social Science and Medicine,* 41(6): 857-862.

Woodward, A., Hales, S. and Weinstein, P. 1998. Climate change and human health in the Asia Pacific region: who will be most vulnerable? *Climate Research*, 11: 31-38.

World Resources, 1996. *The Urban Environment.* New York: Oxford University Press.

World Resources, 1998. *Environmental Change and Human Health.* New York: Oxford University Press.

Yeager, B.A.C., Lanata, C.F., Lazo, F., Verastegui, H. and Black, R.E. 1991. Transmission factors and socioeonomic status as determinants of diarrhoeal incidence in Lima, Peru. *Journal of Diarrhoeal Disease Research*, 9(3):186-193.

Yeager, B.A.C, Huttly, S.R.A., Bartolini, R., Rojas, M. and Lanata, C.F. 1999. Defecation practices of young children in a Peruvian shanty town. *Social Science and Medicine*, 49:531-541.

Yin, R.K. 1994. *Case Study Research Design and Method – Second Edition (Applied Social Research Method Series Volume 5).* Thousand Oaks, CA: Sage Publications.

APPENDIX 1: MAP OF DELHI AND LOCATION OF TIGRI

APPENDIX 2: LETTER OF INITIAL CONTACT

To Whom It May Concern:

I would like to take this opportunity to introduce myself. My name is Ranu Sharma, and I am currently a research intern at the International Development Research Centre in Ottawa, Canada. More specifically, I am working with the PI- Ecosystem Approaches to Human Health, within IDRC. As well, I am a MA student with Dr. Steve Lonergan in the Department of Geography at the University of Victoria in Victoria, BC, Canada.

I am writing you in the hopes of obtaining some information and assistance with respect to my MA thesis. My thesis topic is entitled: *Understanding the Social Construction of Diarrhoeal Disease Risk in a Slum Community of Delhi, India Using the Ecosystem Approach Human Health.* I have attached a one-page summary of my research objectives in order for you to have a better understanding of my intentions.

As part of my research, I will be coming to Delhi this fall (September to December 2000) for my fieldwork season. Currently, I am preparing and developing my work plan for my stay in Delhi. At this time I would like to request your assistance in this process. I am searching for local organizations involved with urban poor communities (slums or squatters) doing research or activities relevant to environment, development or health. I would like to identify these groups of individuals, and perhaps narrow my community selection to 3-4 urban poor communities for my study prior to my arrival in Delhi. Upon arriving in Delhi, I hope to select one community to focus my study on. I would welcome any information that you may be able to provide regarding these areas as well. If you or your colleagues could help me in this manner or direct me I would be grateful.

Please do not hesitate to contact me if you have further questions or would like clarification. I would like to thank you for all your time and effort, and I look forward to hearing from you soon.

Warm regards,

Ms. Ranu Sharma

APPENDIX 3: CONSENT FORM

You are being invited to participate in a study entitled: *Understanding the Social Construction of Diarrhoeal Disease Risk in a Slum Community of Delhi, India Using the Ecosystem Approach Human Health*, that is being conducted by Ranu Sharma. Ranu is a graduate student in the department of Geography at the University of Victoria and you may contact her if you have further questions at:

South Asia Regional Office
International Development Research Centre
208 Jor Bagh, New Delhi, 110 003
Tel: 91-11-461-9411
Fax: 91-11-461-7619 or 462-2707
Email: ranu_sharma@hotmail.com

As a graduate student, this research is part of the requirements for a degree in Masters of Arts in Geography and it is being conducted under the supervision of Dr. Steve Lonergan. You contact the supervisor at (250) 472-4849 or lonergan@uvic.ca.

The International Development Research Centre is funding this research.

The purpose of this research is to explore the attitudes and behaviours of mothers and primarily caregivers that live in an urban poor community of Delhi, India. This study will specifically ask, how do the conditions in slum ecosystems affect the social construction of risk associated with diarrhoeal disease among mothers? Second, in what ways do the attitudes and behaviours of mothers influence the social construction of diarrhoeal disease causation, prevention and control among children under five years of age, in an urban poor community of Delhi? These two questions can be broken down into a more specific question that guides the interpretation of the data: how do the attitudes, behaviours, and beliefs of mothers contribute to diarrhoeal disease risk at the household and individual level?

The primary objective of this project is to develop a detailed case study to illustrate how social construction of diarrhoeal disease causation, prevention and control is linked to the broader determinants of diarrhoeal disease – i.e. factors such as development, urbanisation, environment (bio-physical and socio-economic) behaviour, and culture. In addition, there are two secondary objectives: a) to expand the theoretical discussion on the relationship amongst development, environment, and human health; and, b) to provide information in a form relevant to the local community healthcare agenda.

Research of this type is important because any policy-driven solution to control diarrhoeal disease will not only have to understand disease presence and biological/physical causation, but incorporate the social and cultural aspects to target a specific community. From this research and links to similar research in India, and other developing countries, it is hoped that viable solutions, research need and gaps will be identified through expansion of the theoretical discussion on the relationship amongst

development, environment and human health. Along with the local community healthcare providers benefiting from this study, other possible end-users include, local, regional and national policy makers, urban planners, water authorities in Delhi and India. A copy of the final results will also be given to the participating community, in order for them to use it to their own advantage.

You are being asked to participate in this study because a) your willingness to participate, b) your knowledge of the local issues in relation to diarrhoeal disease, and c) recommendations from a third party (NGO, other participants).

If you agree to voluntarily participate in this research, your participation will include either one or both of the following a) approximately 2 hours for each focus group discussion or 2 hours for individual interviews. Observations will occur in your community. Meetings and interviews will be conducted wherever is most convenient and comfortable for you (i.e., your home, public space such as parks or community centre).

There are no known anticipated risks to you by participating in this research. The potential benefits of your participation in this research include a copy of the research and its results for you and the community.

As a way to compensate you for any inconvenience related to your participation, options for improvement of your community will be explored, for example, supplies for the local school or medicine for the community healthcare institution. It is important for you to know that it is unethical to provide undue compensation or inducements to research participants and, if you agree to be a participant in this study, this form of compensation to you must not be coercive. If you would not otherwise choose to participate if the compensation was not offered, then you should decline.

Your participation in this research must be completely voluntary. If you do decide to participate, you may withdraw at any time without any consequences or any explanation. If you do withdraw from the study your data will be deleted from the project research files.

To make sure that you continue to consent to participate in this research, Ranu will periodically remind you (both verbal and written) about the terms of participation.

In terms of protecting your anonymity the files will not identify you in any way. The focus group discussion or interview will be tape recorded, but only with your approval. To ensure anonymity, code names will be assigned to you ad subsequently used in all research files with your information. Your name will not appear in any published results.

Your confidentiality and the confidentiality of the data will be protected. All data will be kept in a locked cabinet in a locked office and will only be available to myself. Tapes will be erased and all information collected on paper will be shredded one year after the end of the study.

It is anticipated that the results of this study will be shared with others in the form of a completed thesis to my supervisor and other members of the University of Victoria as well as the participants and community.

In addition to being able to contact the researcher and the supervisor at the above phone numbers, you may verify the ethical approval of this study, raise any concerns you might have, by contacting the Associate Vice President Research at the University of Victoria (250-721-7968).

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researcher.

Participant Signature Date

APPENDIX 4:
QUESTION GUIDELINES FOR FOCUS GROUP DISCUSSIONS

Group A: Mothers and Community

1. A prevalent issue facing children in this community is diarrhoea. Could you tell me how you know your child has diarrhoea?
2. What are the other words you use for this?
3. What do you do when you first think the child has diarrhoea?
4. Do you treat diarrhoea? How?
5. Do you get advice from anyone to do this?
6. Suppose the child does not get any better, or even gets worse, then what do you do?
7. And if there is still no change?
8. What do you consider before you seek treatment? Are there any constraints, problems, or issues of access?
9. Is diarrhoea more common at some times of the year than others - why might this be so?
10. What causes diarrhoea? (List of causes and routes of transmission)
11. Is there anything you can do to avoid getting diarrhoea?
12. What are the most common problems facing your community?

Water (supply, collection, usage, and storage)

1. What type of drinking source is available to you?
2. How far is this from your house?
3. How is this distributed and allocated?
4. What methods are used to collect and store the water? (when and how often)
5. What is your perception of the quality of water?
6. How do you feel about the water facilities available to you?
7. How is water used in the household?

Waste Disposal

1. What types of toilets are used?
2. If you go to the open area, why do you go there?
3. Who cleans the toilets or drains?
4. Where do you dispose of household waste?

Group B: Mamta

1. What are some of the most prevalent problems in each of the blocks?
   -social, environmental, health

2. How do you feel about the water situation, toilets, drainage, and electricity problems?
   -where do most people go, difficulties, perceptions, whose responsibility

3. What health problems do young children face in Tigri?
   -do residents know of diarrhoea (i.e., the level of knowledge)
   -when is diarrhoea serious
   -what stage do they go to the doctor
   -who accompanies child
   -stages of treatment
   -barriers
   -how do they choose their doctor, comparison of hospitals

4. Can you tell me more about the community?
   -how has it changed over the years
   -comparison between blocks
   -feelings about the state
   -priorities for improvement
   -raising children
   -social problems

APPENDIX 5: QUESTION GUIDELINE FOR INDIVIDUAL INTERVIEWS

Group A: Mothers

Education

1. How many children in the age group of 5-12 years are going to school?
2. What type of school do they attend?
3. Where is the school located?
4. What do you think of the education system?

Diarrhoea

Illness

1, How do you know your child has diarrhoea?
2. What other words do you use for this?

Treatment

1. What do you do when you first think your child has diarrhoea?
2. Who takes care of the children with diarrhoea?
3. Who makes/contributes to the decisions about how episodes are managed?
4. Do you treat diarrhoea? How?
5. When, where and to whom do you go to for help and advice when your child has diarrhoea?
6. What do you do when the child does not get any better or even gets worse? How do you feel?
7. And if still no change?
8. Where is the nearest facility or individual where you may receive treatment for your child?
9. What types of barriers to seeking treatment do you encounter?
10. How do you feel about the treatment your child got at the health centre?

Causes

1. Is diarrhoea more common at certain times of the year than others - why might this be so?
2. What causes diarrhoea? (List causes and routes of transmission)

Prevention

1. Is there anything you can do to avoid getting diarrhoea?

Healthcare Facilities

1. What facilities are available to you?
2. How much money do you spend on medical treatments (per week, month or year)?
3. How do you feel about the healthcare facilities and services provided to you?

What are the most common problems facing your community?

Water (supply, collection, usage, and storage)

1. What type of drinking source is available to you?
2. How far is this from your house?
3. How is this distributed and allocated?
4. What methods are used to collect and store the water? (when and how often)
5. What is your perception of the quality of water?
6. How do you feel about the water facilities available to you?
7. How is water used in the household?

Waste Disposal

1. What types of toilets are used?
2. If you go to the open area, why do you go there?
3. Who cleans the toilets or drains?
4. Where do you dispose of household waste?

Maternal Behaviours

1. Where do you allow your child to defecate and why?
2. What do you do after your child has finished?
3. What is the child's diet consist of? How do you prepare this?
4. How do you change your care and feeding patterns when your child is sick?

Community

1. How do you feel here in this community in comparison to your original place?
2. If given a chance, would you go back to your original place?
3. How do you feel about the state of this community?
4. Do you feel anything should be done to improve it?
5. Who should be responsible for improving it?
6. What would your priorities be for improvement?

Demographic Background

1. To which religion, caste, or tribe do you belong to?
2. How many members are in the household?
3. What is the highest level of education for members over 12?
4. What is the average family income per month?
5. How long have you been living here?
6. Why did you come here?
7. Who is employed in the household?
8. What type of employment is carried out?

Group B: Healthcare Providers

1. A prevalent issue facing children in this community is diarrhoea. What are the other words used for "diarrhoea" in this community?

2. What is the level of understanding diarrhoeal disease?

3. What are the different types of diarrhoea occurring in this community?

4. Are there types of diarrhoea that are perceived as not needing treatment?

5. How do you become aware of the problem? What stage, who brings your attention to it?

6. How do you diagnose for diarrhoea?

7. Do you treat diarrhoea? How?

8. What are the different treatments that can be given?

9. Do you consult anyone with the treatment, what do you consider before administering the treatment?

10. Do you conduct any follow-up visits?

11. Suppose the child does not get any better, or even gets worse, then what do you do?

12. And if there is still no change?

13. What are some of the barriers seeking treatment?

14. How does the community receive the types of treatment given?

15. Is diarrhoea more common at some times of the year than others - why might this be so?

16. What causes diarrhoea? (List causes and routes of transmission)

17. What can be done to avoid getting diarrhoea?

APPENDIX 6: FOCUS GROUP AND INTERVIEW SCHEDULE

Focus Group Schedule:

Focus Groups with Community

1	October 31
2	November 1
3	November 2
4	November 3
5	November 5
6	November 16
7	November 22
Adolescent Group #1	January 3
Adolescent Group #2	January 8

Focus Groups with Mamta

Program Officers	January 10
Community Workers	January 11

Interview Schedule:

Interviews with Mothers

Shabana	November 2
Sharmila	November 3
Smita	November 4
Rekha	November 4
Priya	November 5
Neelam	November 6
Karishma	November 7
Anu	November 8

Rani	November 8
Anju	November 8
Kantha	November 14
Sapna	November 14
Rama	November 15
Sita	November 15
Laxmi	November 22
Sonia	November 23
Komal	November 23
Kiran	November 24
Alka	November 24
Kanchan	December 24
Krishna	December 24
Divya	December 28
Durga	December 28
Anita	January 2
Saira	January 2

Interviews with Healthcare Providers

Mamta Doctor	November 6
RMP	November 16
Chemist	November 17
MBBS Doctor in Vicinity #1	January 5
MBBS Doctor in Vicinity #2	November 17
Batra	January 10
Safdarjung	January 18

VITA

Surname: Sharma Given Names: Ranu

Place of Birth: Ottawa, Ontario, Canada

Educational Institutions Attended:

University of Ottawa	1992 to 1998
Ryerson Polytechnic University	1996 to 1997

Degrees Awarded:

B.Sc.	University of Ottawa	1998
Post-baccalaureate Certificate	Ryerson Polytechnic University	1997

Honours and Awards:

International Development Research Centre (IDRC) Centre Internship Award 2000

Publications:

Eyles, J. and Sharma, R. (2001). *Infectious Diseases and Global Change: Threats to Human Health and Security. Aviso No. 8.* Victoria, B.C.: Global Environmental Change and Human Security.

Warith, M.A. and Sharma, R. 1998. Technical review of methods to enhance biological degradation in sanitary landfills. *Water Quality Research Journal of Canada.* Vol. 33(3), pp.417-437.

Chauret, C., Armstrong, N., Fisher, J., Sharma, R., Springthorpe, S., and Sattar, S.A. November 1995. Correlating Cryptosporidium and Giardia with microbial indicators. *Journal of American Water Works Association.* Vol. 87, pp. 76-84.

Chauret, C., Sharma, R., Springthorpe, S., Sattar, S.A. November 1995. *Efficiency of the Anaerobic Digestion Process in Reducing the Pathogen Content of Treated Sludge or Biosolids.* Ottawa, Ontario: Regional Municipality of Ottawa-Carleton.

UNIVERSITY OF VICTORIA PARTIAL COPYRIGHT LICENSE

I hereby grant the right to lend my thesis to users of the University of Victoria Library, and to make single copies only for such users or in response to a request from the Library of any other university, or similar institution, on its behalf or for one of its users. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by me or a member of the University designated by me. It is understood that copying or publication of this thesis for financial gain by the University of Victoria shall not be allowed without my written permission.

Title of Thesis:

Understanding the Social Construction of Diarrhoeal Disease Risk in a Slum Community of Delhi, India Using the Ecosystem Approach to Human Health

Auth[redacted]

Ranu Sharma

December 21, 2001