WOMEN'S PERCEPTION OF HEALTH PROMOTION BEHAVIORS IN RURAL ANDHRA PRADESH INDIA

by

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BS, BPHIL, University of Pittsburgh, 2011

Submitted to the Graduate Faculty of

Graduate School of Public Health in partial fulfillment

of the requirements for the degree of

Master of Public Health

University of Pittsburgh

2013

UNIVERSITY OF PITTSBURGH

Graduate School of Public Health

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It was defended on

March 27, 2013

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Problem Statement: Throughout the world, the infant mortality rate (IMR) is considered a measure of a country's overall health status and public health achievements. In rural southern India, despite high rates of antenatal visits and delivery within healthcare institutions, infant mortality remains an issue of public health significance at 38 deaths per 1,000 live births.

Methods: In order to understand social, financial, and environmental factors contributing to infant mortality, SHARE INDIA staff facilitated focus groups with sixty-one mothers (ages 18-35) in seven villages of Medchal Mandal, in the state of Andhra Pradesh, India. Discussions explored mothers' home health and sanitation practices such as bathing, toileting, waste disposal, handwashing, breastfeeding, menstrual health, cosleeping, and laundering.

Research Questions: Researchers wanted to understand if infant mortality is attributed to lack of clean water access and other sanitation resources such as latrines, showers, sinks, and waste disposal services. In addition, SHARE INDIA wanted to understand if infant mortality is related to lack of awareness among the priority population concerning benefits, consequences, and proper completion of hygienic behaviors.

Results: Emerging themes included lack of accessibility of health promotion resources such as clean water and disinfectants, and varying levels of awareness of sanitary behaviors. Women demonstrated commitment to preserving infant health, but were not always connected to resources or aware of their proper use. Participant responses indicated

normalization of infrastructural barriers to promoting health, such as inadequate availability of water and trash disposal services, and the influence of sociocultural norms on health. Participants discussed the impact of geographic isolation and affordability on providing health resources. Social support was an asset cited by women, who received informational support and support completing household chores from family members and others.

Discussion: When possible, women took precautions to protect children's health. However, health-related decision-making and mothers' conception of appropriate situations to perform health promotion behaviors was influenced by environmental and cultural barriers prohibiting routine performance of evidence-based behaviors.

Conclusions and Implications for Global Health: Future research and interventions should target education regarding health promotion behaviors such as handwashing in the home to address appropriate completion of routine hygienic behaviors.

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PREFACE

This thesis is dedicated to everyone who has supported me in my education and personal endeavors. To my mother, I apologize for all the grey hairs I have given you in my international travels and work. You have never let me set limits on myself and have been my biggest cheerleader throughout my life. You are the strongest and most selfless woman I know and you inspire me every single day. To Matt, thank you for not letting me take myself too seriously and keeping me sane during these past four years of growth and change. Your patience is awe-inspiring. To my brother Danny, for our philosophical ramblings and challenging me to always ask questions. To my father, for teaching me at a young age the importance of standing up for what I believe in, even if it often completely contradicted your perspective. To the women in my family, both living and gone, for your strength, tenacity, stubbornness, and unwillingness to settle for less than you deserve.

I am overwhelmingly thankful for the exceptional members of my thesis committee. Dr. Burke, thank you for your guidance and for always listening to my thoughts, whether they be related to thesis cramming or getting stuck for forty minutes in a monsoon. Dr. Bunker, you have always been so open to my ideas and perspective. Thank you for answering countless emails and insightful conversations that have inspired me to continue my work abroad. Dr. Terry, thank you for challenging me to think outside the box and for your ability to redefine what is "normal" and what is "family." Dr. Hayden, thank you for your continued commitment to my education. Thank you for not turning me away, when I came to you as a wide-eyed undergraduate student wanting to explore gender dynamics in Italy. Your criticisms have made me more aware of the importance of not making assumptions and appreciating the

Complexity of an issue, while accepting there may not be one single answer to a problem.

To the wonderful people who have shaped my education and lead me to my work in India. To Joanne Russell and the staff of the Center for Global Health for all of your support and patience in helping me to carry out my work. To the Department of Behavioral and Community Health Sciences faculty, you have each made yourself so open and willing to help me improve myself both personally and professionally, while creating an environment that is nurturing and exciting.

To Dr. P.S. Reddy, thank you for welcoming me with open arms into the SHARE INDIA family. Your openness and giving nature have been integral in helping me feel truly at home in India. Your constant commitment to never being satisfied with the status quo motivates me to always strive for improvement.

To the fearless Shobha Gosa, you embraced me like a sister when I came to India. Your passion and allegiance to your cause are unwavering even in times of personal strife. Your selflessness knows no bounds; I know you will succeed in all you do, akka, and I hope to be there every step of the way.

To the staff of SHARE INDIA, thank you for everything. Thank you for your patience and helping me to adjust to life in India. Thank you for answering all of my questions and for your willingness to help me complete my work. Nitin, thank you for taking care of me, for ensuring I always arrived at my final destination and that food was waiting for me when I arrived. You are the hardest working person I know; I cannot begin to express my profound appreciation and gratitude for your friendship and honesty. To Dr. Tushar Singh, for your insight and encouragement and for your support in helping me to overcome challenges. To Dr. Balasubramanian for helping in the planning and arrangements of all my research

activities, and for our endless discussions of Indian politics over tea. To Madhav for never saying that something could not be done and for your confidence in me. To the REACH staff of Thanuja, Jyothi, Cossuma, and Sanjay for always including me and entertaining me during our long visits into the field. To Thanuja and Prem for welcoming me into their home and family and treating me as a sister and a friend. To the women of the LIFE Study (Deepa, Srilaxmi, Venkalakshmi, Jyothi, Kiranmai, Sujana, and Divya) for letting me come along on their visits and for acclimating me to the food and dress of India. To Deepa, Padma, and Jayalakshmi, for working tirelessly, but always with smiles, to make my project possible. I am eternally grateful for all of your attention, diligence, and hard work day in and day out. I could not have done anything without your help.

To the women of Medchal Mandal, your devotion to your families and personal sacrifices have been uplifting. Thank you for accepting me into your community and helping me realize how much I have to give.

1.0 INTRODUCTION

This master's thesis discusses the risk factors for infant mortality in India among women in rural and limited resource settings. The terms infant mortality (death within the first year of life), and neonatal mortality (death within the first month or 28 days of life), are discussed throughout the upcoming chapters. Nationally, progress to lower the infant mortality rate (IMR) in India has been disproportionate. Disparities in healthcare access have resulted in families with low socioeconomic status (SES) becoming increasingly disenfranchised and suffering from higher rates of morbidity and mortality than wealthier social classes (Singh, Parthak, Chauhan, & Pan, 2011). While improvements have been significant in particular regions, these advancements have not been widespread or uniform throughout the country. The influence of sociocultural norms such as caste system on health status cannot be underestimated. The caste status of an individual has an important impact on quality of life and sometimes exacerbates the effects of other social determinants of health.

Despite the majority of births occurring in healthcare institutions, with 98% of mothers in the target population area for this thesis receiving three or more antenatal visits, the infant mortality rate stands at 38/1,000 live births (REACH, 2011). The SHARE INDIA organization has completed several effective projects that have also increased rates of child immunization coverage to 96% and decreased the total fertility rate, but the high infant mortality rate is a confirmation of an inconsistency in expected health outcomes (Balasubramanian, 2012; REACH, 2011). Researchers sought to identify home health practices that could impact an infant's health status during its most vulnerable period, the first 28 days of life.

In order to understand the underlying social, cultural, and environmental determinants of infant mortality in the project area, focus groups were conducted with women of childbearing age in Medchal Mandal. These focus groups add context to the complicated global issue of infant mortality. The discussions were chosen to explore the accessibility of health promotion resources for supporting health promotion behaviors and the awareness of performing these evidence-based practices routinely and accurately. In the context of this thesis, the term health promotion resources refers to any materials whether educational such as step-by-step handwashing brochures, sanitation supplies, or equipment necessary for encouraging proper hygiene such as clean water, antiseptics, or proper latrines. The availability of these health promotion resources is partially dependent on infrastructural policies, organizations, and stakeholder involvement, but also on the local environment and geography of the target population. The term health promotion behavior is also discussed, and is defined within this thesis as practices that have been shown through scientific research evidence to have a positive effect on optimizing health outcomes, such as handwashing with soap.

Chapter two addresses the current infant mortality literature and discusses risk factors for infant mortality at each level of McLeroy, Bibeau, Steckler, and Glanz's Social Ecological Model (1988). In addition, the concluding sections of this chapter highlight current infant and neonatal mortality data for India and its individual states. The third chapter details background information of the organization SHARE INDIA and population level data of the residents of Medchal Mandal. The fourth chapter explains the methodology of the LIFE Study, the project under which the focus group discussions (FGDs) were conducted, as well as the methods for the FGDs. This chapter is followed by the results, which reports on emerging themes from participants' responses and the demographic background of participants.

In the discussion, the results are further explained and related to the current literature in the context of the Social Ecological Model. The final chapter outlines the conclusions of FGDs including the public health implications of the results, limitations of the FGDs, and future directions as well as evidence-based interventions that may be relevant in the future for this particular population.

2.0 RISK FACTORS AND TRENDS IN INFANT MORTALITY IN INDIA: A SOCIAL ECOLOGICAL APPROACH

Infant mortality cannot be attributed to only one determinant or level of society. The health status of an individual is the result of exposures to the immediate physical and social environment. However, the status of the individual also reflects the status of health care in that environment, as well as how it affects the different individuals living in that environment. The Social Ecological Model, is utilized to reflect the relationship between different levels of society for the issue of infant mortality (McLeroy, Bibeau, Steckler, and Glanz, 1988). By using the Social Ecological approach, it can be acknowledged that infant mortality is a complex public health issue that requires the communication and collaboration of all levels of society. The actions of one level of this model can have significant impacts on other levels of the model. Their interaction and influence on other levels is unavoidable, as a result it is difficult to assign one risk factor to one level of the Social Ecological Model. In the following paragraphs, the risk factors for infant mortality are discussed within an assigned level of the Social Ecological Model; however, several factors can be linked to multiple levels of the model.

Factors at the individual level include a person's own qualities and attributes such as gender, race, socioeconomic status, religion, and culture, among other determinants. Interpersonal factors relate to the person's relationships with friends and family. At this level, health determinants may relate to a woman's autonomy within the household, which is impacted by the relationship with her husband, in-laws, and parents, especially in Indian

society. The dynamics within these relationships affect health status and are not always controlled by the individual; instead they are dependent on these relationships.

The organizational level involves institutions that may offer services, such as schools and hospitals. SHARE INDIA is included at the organizational level, because it delivers healthcare services to the residents of Medchal Mandal. At the community level, SHARE INDIA partners with the local residents as well as other institutions, such as the University of Pittsburgh, which supports health research and activities by providing SHARE INDIA with students who have been trained in public health practice. Lastly, the policy level, sometimes also known as the government level relates to the overarching laws, ruling bodies, and infrastructure that impact health status. Several sections of the Indian Constitution address the health-related responsibilities of the nation and the individual states. These levels of the framework are interdependent, and yet each country experiences difficulty facilitating collaboration and communication between each level. Power struggles related to policies, funding, and inequity in access to resources are problems that affect each level of the Social Ecological Model. In the upcoming sections, the risk factors for infant mortality and their level of impact within this model are discussed. Although factors are selectively discussed in the sections, many of these factors are not mutually exclusive to one level of the Social Ecological Model.

2.1 THE INDIVIDUAL LEVEL

The health status of the child and the family is overwhelmingly affected by social, cultural, political, financial, and environmental exposures throughout the lifespan (Subramanian, 2011). Children are particularly vulnerable during the neonatal period, or the first 28 days of life. Thirty-nine percent of neonatal deaths occur on the first day of life, and 57 percent occur during the first three days of life (Singh, Yadav, & Singh, 2012). Infant mortality is attributed to asphyxia, premature birth, pneumonia and other acute respiratory illnesses, diarrheal disease, respiratory infection, and sepsis (Vaid, Mammen, Primrose, & Kang, 2007; REACH, 2011). However many of these adverse health outcomes can be counteracted by access to proper sanitation materials such as clean water and disinfectants.

Girls in India are at a particular disadvantage; not only do women suffer from intimate partner violence (IPV), but female infants exhibit a mortality rate five times higher than that of male infants from pneumonia and four times higher from diarrheal disease (Bassani, Kumar, Awasthi, Morris, Paul, Shet, Ram, Gaffey, Black, & Jha, 2010). Overall there is a much higher rate of infant mortality among girls (Khanna, Kumar, Vaghela, Sreenivas, & Puliyel, 2003). Girls tend to have lower rates of utilization for prevention and treatment services, which contributes to disparities in child mortality between genders (Bassani et al., 2010). There is significant inequity throughout the country in seeking healthcare services, as girls are less likely to receive vital immunizations at the recommended ages (Singh, 2012). Since the inception of the Universal Immunization Programme of India, measles immunizations in particular have been correlated not only to a decrease in the rate of child deaths from measles, but to a decrease in "all" causes of death of children, suggesting additional health

benefits from seeking early preventative services (Khanna et al., 2003). When these girls do not access preventative or treatment services to address preventable diseases related to hygienic practices, opportunistic diseases become life threatening.

The residents of poor rural regions of India experience exceedingly high rates of infant mortality (Mohanty, 2011). Children born into poor families are more likely to be born with low birth weight and to suffer from malnutrition, which puts them at greater risk for diarrheal diseases and mortality. When children are not properly nourished, infectious diseases can severely debilitate a child's health status and quality of life. In cases where children are malnourished, the mothers are also often malnourished, and therefore unable to produce sufficient breast milk to help children fight opportunistic diseases and infections. This issue becomes particularly prominent in women of low financial status. Mothers with more control over financial decision-making in the household and who participate more in the decision-making process are shown to postnatally adopt breastfeeding sooner and have infants who are less likely to be underweight or wasted than those with less control (Shroff, Griffiths, Suchindran, Nagalla, Vazir, & Bentley, 2011). Adopting these evidence-based behaviors such as breastfeeding, which provides passive immunity against infectious agents, will ensure that the child is more likely to overcome sickness and survive longer. Empowering women to become more involved in decision-making and ensuring proper nourishment could have a positive impact on further development of the child and health status of the mother (Shroff et al., 2011).

Cultural factors at the individual level may also create barriers to improving health outcomes. In the field of international research, a common obstacle to conducting sustainable and efficacious projects is the cultural environment that influences the perceptions

of target populations. Although it is commonly known among citizens in developed countries that handwashing and proper hygienic behaviors are invaluable in protecting health, these beliefs are more difficult to replicate and instill in a developing country. In the Indian culture, the perpetual isolation of the majority of citizens from pure water, disinfectants, and sustainable sanitation facilities has resulted in the citizens of India adapting their personal behaviors to combat diseases and germs. For example, there is an accepted practice of using each hand for different daily tasks when hygienic resources are absent. The left hand is to be used solely for handling the dirty business of the day, such as cleaning, using the latrine, or disposing of garbage, and the right hand is used for cooking, eating, grooming, and interacting with others. To shake the hand of another person with one's left hand is an insult of immeasurable proportions. Although this practice is logical and may at least partially prevent the sharing of germs and personal contaminants, cross contamination is unavoidable. Mothers require both hands to take care of children and complete household tasks.

2.2 THE INTERPERSONAL LEVEL

While the health of the child may not always imitate the health of other family members, adverse health outcomes for the mother and infant have been historically related to the mother's education, literacy, age of marriage, age of first childbirth, total fertility rate, adequate birth spacing, level of autonomy within the household, and healthcare access (Singh-Manoux, Dugravot, Smith, Subramanyam, & Subramanian, 2008; Mistry, Galal, & Lu, 2009; Vora, Mavalankar, Ramani, Upadhyaya, Sharma, Iyengar, Gupta, & Iyengar, 2009; Muldoon, Galway, Nakajima, Kanters, Hogg, Bendavid, & Mills, 2011; Singh, Pathak, Chauhan, & Pan, 2011). Mothers who are married under the legal age of 18 are more likely to give birth to

children who are stunted and underweight (Raj, Saggurti, Winter, Labonte, Decker, Balaiah, & Silverman, 2010). When these women become first-time mothers, they are at a greater risk of having an anemic child (Finlay, Ozaltin, & Canning, 2011). In addition, the age of the mother at childbirth has been associated with the ultimate health outcome of the child. It has been estimated that the risk of neonatal mortality and low birth weight increases by almost 50% if the maternal age at the time of birth is less than 20 years (Kulkarni, Chauhan, Shah, & Menon, 2010). The risk for adverse health outcomes related inadequate access to sanitation resources increases for mothers and children when they cannot obtain proper nutrition. While these factors are discussed at the interpersonal level for the purpose of this thesis, they may also be attributed to the community or policy/society level. Sociocultural norms within India that have been normalized over time, such as the caste system affect all levels of the Social Ecological Model and provide context for prominent risk factors.

These determinants are related to the mother as an individual; however, many of these factors are beyond the control of the mother and are related to interpersonal beliefs and values within the family or a social circle. The mother may not have had the opportunity to attend school, due to financial constraints or sociocultural values. A woman's age of marriage is often her parents' decision. A woman's fertility status is dependent on her relationship and level of autonomy within her relationship with her husband. If the woman is not employed, her opinion in financial matters is not necessarily considered; therefore, her beliefs concerning access to healthcare resources may not be recognized even in emergency situations. It has been suggested that women who have more power over decisions regarding money (i.e. seeking healthcare) are more likely to seek care and seek these resources sooner, therefore having a greater chance of preventing infant mortality (Mistry, et al., 2009). While women may

learn from family members and friends, if women do not have exposure to education or employment outside of the home, their knowledge and awareness of healthy behaviors may be restricted.

Personal experiences throughout the course of life may also result in adverse health outcomes. The presence of IPV in a relationship signifies that power and control are not equally distributed in a relationship, and the victim's health outcomes cannot always be handled at the individual level. Women who have experienced two or more instances of intimate partner violence (IPV) before the birth of their child are at higher risk for perinatal and neonatal mortality (Koenig, Stephenson, Acharya, Barrick, Ahmed, & Hindin, 2010). In a study of women from four Indian states, mothers who had experienced IPV shortly before the delivery of their child were 68 percent more likely to have instances of infant mortality than mothers who had not experienced instances of IPV (Koenig et al., 2010).

2.3 THE ORGANIZATIONAL LEVEL

In the state of Andhra Pradesh, just over 50 percent of Primary Health Centers (PHCs) are open to serve the public 24 hours a day, and only 56 percent of the these PHCs are equipped to deliver care to newborn infants (Kusneniwar, Mishra, Balasubramanian, & Reddy, 2011). Two-thirds of PHCs can refer mothers for delivery, and one-third of PHCs are recognized as referral centers that can perform C-sections when necessary. Of these referral centers, only 62 percent offer newborn care services at all hours of the day, and less than 30 percent of these centers have blood storages when situations require transfusions (Kusneniwar et al., 2011). These centers are not always supported with the supplies, equipment, staff, or training to address emergency health situations. When these needs are not met, the mother and child are

each at greater risk for mortality related proper sterilization of equipment, staff, and the medical environment. In order to understand why the infants who do survive and go home with the families subsequently suffer from adverse health outcomes, more effective surveillance strategies need to be implemented to monitor the health, nutritional status, basic resource access, and availability of sanitary health facilities (Kusneniwar et al., 2011).

The 2011 report for SHARE INDIA shows that delivery within a healthcare institution is not significantly associated with a newborn's survival (Kusneniwar et al., 2011). However, the exact definition of delivery in an institution is unclear, because these institutions vary in their number of medical employees, resources, size, training qualifications, and services offered to the public. During the time period of 2001-2009, the infant mortality plateaued at 42-44 per 1000 births, although the number of births in healthcare institutions increased by 17 percent during the time period of 2000-2009 (Kusneniwar et al., 2011). When identified risk factors such as the mother's literacy rate and the financial status of the household were controlled for in studies, there were higher rates of infant mortality for babies delivered in the healthcare institutions than in the homes (Kusneniwar et al., 2011). Although delivering an infant in an institution is recommended only when the facility has workers with the training, equipment, and capacity to handle adverse childbearing situations and outcomes, infant mortality is still prevalent even when these institutions have the expertise and resources to optimize health outcomes.

2.4 THE COMMUNITY LEVEL

Historically, there has been a significant issue with disparities between the northern and southern regions of the country, but oftentimes there is also variation within a state and region.

Geospatial analyses have revealed that there is a regional correlation between the rate of malnutrition of children, financial status, and literacy of women in regions where there were higher rates of adverse health outcomes for children and infants (Singh et al., 2011). Preterm birth and low birth weight were highly correlated with infant mortality in the tribal population and mortality was associated with maternal morbidity and breastfeeding at a later age (Niswade, Zodpey, Ughade, & Bangdiwala, 2011).

In the state of Andhra Pradesh, under five-child mortality is 74.7/1,000 live births in rural areas and 44.8/1,000 live births in urban areas (NIMS, 2012). Rural areas also exhibit higher infant mortality rates than their urban counterparts, at 64.7/1,000 live births and 38.3/1,000 live births, respectively (NIMS, 2012). Poverty rates have stabilized at 15-30 percent of the population, and the number of underweight children is estimated to be at 20-40 percent in this region (Singh, 2011). Unfortunately, the range of geospatial data on multiple locations is still in development, and while data analysis from a nine-state study has shown correlations between under five mortality rate and urbanization, financial status, antenatal care visits, and female literacy, data are still considered "inconclusive" (Kumar, Singh, & Rai, 2012).

In underdeveloped communities, environmental risk factors must also be addressed to optimize family health outcomes. More than 1,600 children die every day from medical conditions such as diarrhea, in India (Walker, 2008). Simply adopting the behavior of hand washing is estimated to reduce instances of diarrhea by 50 percent when performed correctly with soap and water (Walker, 2008). According to public health professional associations, only 53 percent of citizens in India are believed to wash their hands after defecation, 38 percent before eating, and 30 percent before preparing food for a meal (Walker,

2008). There is a perception that hands that look visibly clean cannot cause sickness. Also there is a lack of awareness that water alone cannot successfully remove germs and dirt from hands. Raising awareness of the importance of performing routine health promotion behaviors, such as handwashing is crucial for improving health outcomes for all age groups.

While awareness of these behaviors is crucial, proper sanitation facilities are not always available. Flush toilet access has been measured at 61 percent in the project area of SHARE INDIA, while pit toilets represent eight percent, and 31 percent of households do not have their own toilet (Kusneniwar et al., 2011). It has also been shown in past efforts to supply toileting facilities to Indian residents that providing a toilet does not guarantee that household members will use the toilet ("Sustaining the Sanitation Revolution," 2008). The construction of advanced technological toileting facilities as opposed to more simple, sustainable options has resulted in the spending of much governmental and donor funding on expensive facilities, but has not resulted in the utilization of these facilities. In households where there is no access to a toileting facility of any type, the risk for infant mortality is estimated to be six times as high as those who have a proper latrine in their home. (Kusneniwar et al., 2011).

Unfortunately even when a toilet is accessible and utilized in the home environment, other factors such as the absence of consistent handwashing and the use of inappropriate materials for fuel, such as animal waste, affect the health of the infant and the rest of the household members. When infants are not living in an environment that promotes healthy behaviors and cleanliness, tetanus, sepsis, and diarrheal diseases become more pronounced and more harmful to the health status of the infant (Kusneniwar et al., 2011). Many of the homes have inadequate access to toilets, little availability of purified drinking water, and inappropriate space, fuel, and lighting for all of the inhabitants of the household

(Kusneniwar et al., 2011). Although bottled water is provided to the residents of the Medchal Mandal district at a low cost, only 38 percent of individuals are estimated to use this water, which has been found to be much safer than piped water (Kusneniwar et al., 2011). Ensuring access to clean water is crucial for ensuring a child's healthy growth and development. When the child does not have access to potable water, the risk for diarrheal disease and infection increase dramatically.

2.5 THE POLICY LEVEL

Although discrimination based on caste status is outlawed by the government, caste and tribal status are shown to impact household financial status, and those with low caste and financial status have exhibited a higher risk for mortality (Po & Subramanian, 2011). While the government did not impose the system, it is discussed at the policy level because governmental policy formally prohibits caste discrimination. Health Belief Model constructs of perceived susceptibility to adverse birth outcomes and perceived sociocultural and financial barriers to accessing affordable services can be considered when addressing social inequity. The impact of caste and tribal status on birth outcomes, as well as professional, educational, and economic opportunities, and subsequent health status has not been thoroughly addressed or rectified, but will continue to influence societal norms until further governmental action is taken to prevent and punish acts of social discrimination with severe consequences (Po & Subramanian, 2011). Discrimination based on caste status may result in less education, therefore fewer opportunities for professional development and job security. Inability to provide for the needs of the family because of financial constraints will negatively impact health outcomes during the child's vulnerable first year of life.

Caste and tribal status are two of the many demographic factors that are associated with poverty in marginalized populations of the country. The IMR in the most impoverished 20 percent of the country's population was measured as 2.5 times higher than the rate for the wealthiest 20 percent of the country (Singh et al., 2011). Poverty has been analyzed on a multifactorial level to consider the range of social, ecological, financial, and educational influences that contribute to the health status of the child (Mohanty, 2011; Nair, Webster, & Ariana, 2011). This multifactorial measure of poverty seeks to target individuals who are more likely to be living in a perpetual state of poverty, as opposed to those who exhibit fluctuating patterns of financial status or those who are considered financially stable (Mohanty, 2011).

Government health expenditures on health are currently 1.3 percent, although a recent study has recognized that raising public health expenditures by 10 percent would lower the risk of mortality by two percent for children, aging populations, and mothers (*Health Expenditure per Capita*, 2010; Farahani, Subramanian, & Canning, 2010). In addition, studies have shown that increasing transparency of governmental activities and expenditures and spending more on health per capita were positively associated with a decrease in both infant and maternal mortality (Muldoon et al., 2011). Under Article 38 of the Constitution of India, the state is given the responsibility for promoting social, political, and financial equality and decreasing inequalities in access (*The Constitution of India*, 2011). Under Article 39, the state is responsible for ensuring men and women alike have the right to a quality life, that men and women are paid equally for working equally, and that men, women, and children are not taken advantage of or forced to extreme measures to provide for themselves financially (*The Constitution of India*, 2011). Article 47 of the Indian Constitution prioritizes public health and nutrition services to the individual states of India (*The Constitution of India*, 2011). The

state is assigned these responsibilities individually, but the large differences across states in infant and neonatal mortality rates signify that some states have excelled more at providing adequate health opportunities for their citizens.

The lack of collaboration and communication within the healthcare system means that India will not meet the target of the 2015 MDG4, reducing under five mortality by two-thirds (Paul, Sachdev, Mavalankar, Ramachandran, Sankar, Bhandari, Sreenivas, Sundararaman, Govil, Oswin, & Kirkwood, 2011). Historically, women have not had adequate access to the necessary resources and information to successfully sustain family planning practices. Healthcare facilities have not been established and staff have not been trained at a rate to meet the needs of the rapidly growing population (Paul et al., 2011). Consistent surveillance of both infant and maternal care and mortality would help to provide a baseline foundation and argument for implementation of evidence-based health behavior interventions (Vora et al., 2009). Expanding availability of basic healthcare and sanitation resources to increase accessibility, and lowering the cost of healthcare to ensure affordability are necessary steps in increasing utilization of healthcare services and optimizing infant health outcomes (Pathak, Singh, & Subramanian, 2010).

2.5.1 CURRENT PROGRAMS

Although problems of meeting capacity to address the healthcare needs of children are common throughout India, the government of India has implemented programs to address health disparities. The government's Ministry of Health and Family Welfare has established the National Rural Health Mission, which is in operation in 18 Indian states. This program seeks to reduce both infant and maternal mortality and increase access to public health priorities, such as maternal and child health care, clean water, nutrition supplementation, and immunization

services through health workers, local government (panchayats), and existing health centers ("National Rural Health Mission: Mission Document," 2012).

Within this same program, Janani Suraksha Yojana (JSY) offers financial incentives for pregnant women who seek care during and after their pregnancy. Institutional delivery is encouraged as well as treatment within a health center immediately post-partum (*Janani Suraksha Yojana Guidelines for Implementation*, 2006). JSY prioritizes identifying high-risk cases before delivery and incorporates health workers at the community level to promote program involvement early during the gestational period (*Janani Suraksha Yojana Guidelines for Implementation*, 2006). The program supports at least three antenatal and postnatal care visits and strives to provide monetary incentives to mothers incrementally throughout the program's duration (*Janani Suraksha Yojana Guidelines for Implementation*, 2006). Unfortunately neither of these federal government programs are carried out in the state of Andhra Pradesh; they are focused within states that perform consistently low on health measures.

Another government initiative, the Total Sanitation Campaign, which increased access to proper latrines in rural settings and encouraged local leaders to address open defecation, has lowered the rate of rural infant mortality caused by fecal matter contaminants (Spears, 2012). Latrines had a greater effect on densely populated areas (Spears, 2012). Newborns who had access to improved measures of sanitation were more likely to live beyond the first year of life, and infant mortality decreased by 4/1,000 live births from this program (Spears, 2012). The campaign also found that offering incentives to the leaders of underdeveloped, limited resource organizations after implementation of the program resulted in a decrease in infant mortality after the program (Spears, 2012). The local government leaders' motivation and

involvement in program activities were identified as main reasons why the program was more effective in some states rather than others (Spears, 2012). If leaders were proactive with the program's implementation, they were rewarded and their efforts to continue the program's mission were sustained.

Special Newborn Care Units are another approach to addressing infant mortality in limited resource rural settings. These wards are reserved for newborns that have emergency complications in the immediate postnatal period. These units are supported by additional wards for mothers immediately postnatal for rest or breastfeeding. In addition, increasing the numbers of beds, staff, and access to updated equipment was recommended to hospitals incorporating these units into their infrastructure. Decreases in case fatality rates for six of the eight hospitals implementing the program were as high as 50 percent in the first year (Neogi, Maholtra, Zodpey, & Mohan, 2011). Mortality attributed to sepsis and low birth weight decreased and the use of sterilization practices in hospitals increased (Neogi et al., 2011).

Perhaps the most well known government sponsored program is the Anganwadi Programme. Created in 1975 under the Integrated Child Development Services Program, the program targets children under age six and originally focused on decreasing issues of food security and nutrition ("Anganwadi," 2011). Anganwadi workers are selected from their communities and run the program in their community after receiving four months of training. One worker may run a program responsible for up to 1,0000 residents ("Anganwadi," 2011). Anganwadi workers are overseen by supervisors called Mukhyasevika(s), who are supervised by Child Development Project Officers ("Anganwadi," 2011). There are over one million Anganwadi Centers in India, which are run by 1.8 million predominantly female workers ("Anganwadi," 2011). While the Anganwadi Programme's original purpose was to impact

nutritional status, it has over time taken on its Hindi meaning of being a “courtyard shelter” ("Anganwadi," 2011). These shelters provide food, but also serve as sites for immunizations, sanitation resources, and education for young children ("Anganwadi," 2011). Anganwadi workers also help pregnant mothers and new mothers, and are estimated to see over 58 million children and over 10 million new and expecting mothers ("Anganwadi," 2011). This program has been established in Andhra Pradesh and within the target project area of this thesis, Medchal Mandal.

2.6 THE DETERMINANTS OF INFANT MORTALITY

In order to comprehensively address the issue of infant mortality, stakeholders at each level of the Social Ecological Model must be engaged to modify current policies and rectify limitations to create a healthcare system and social environment that supports optimal health outcomes. In the following figure, the risk factors for infant mortality are summarized and assigned factors to a particular level of the Social Ecological Model. Although factors in Figure 1 are color-coded for a singular level of the Social Ecological Model, they are not mutually exclusive to one level. Early marriage is an individual factor but it is strongly affected by relationships at the interpersonal level and sociocultural norms at the community level. Immunization status is an individual level factor, but it is impacted by access to organizations offering immunization services. The occurrence of preventable disease differs individually but it is influenced by people, resources, and interactions at the community level. Transportation access and ability to afford healthcare are both individual and interpersonal determinants of health, however they are affected by transportation systems and social policies created by organizations and governing bodies. The complex nature of infant mortality makes it impossible to assign blame to one determining factor of health or one level of society. There are deficits and inequities occurring at each level

of the Social Ecological Model that must be addressed through multi-level partnerships to create sustainable change.

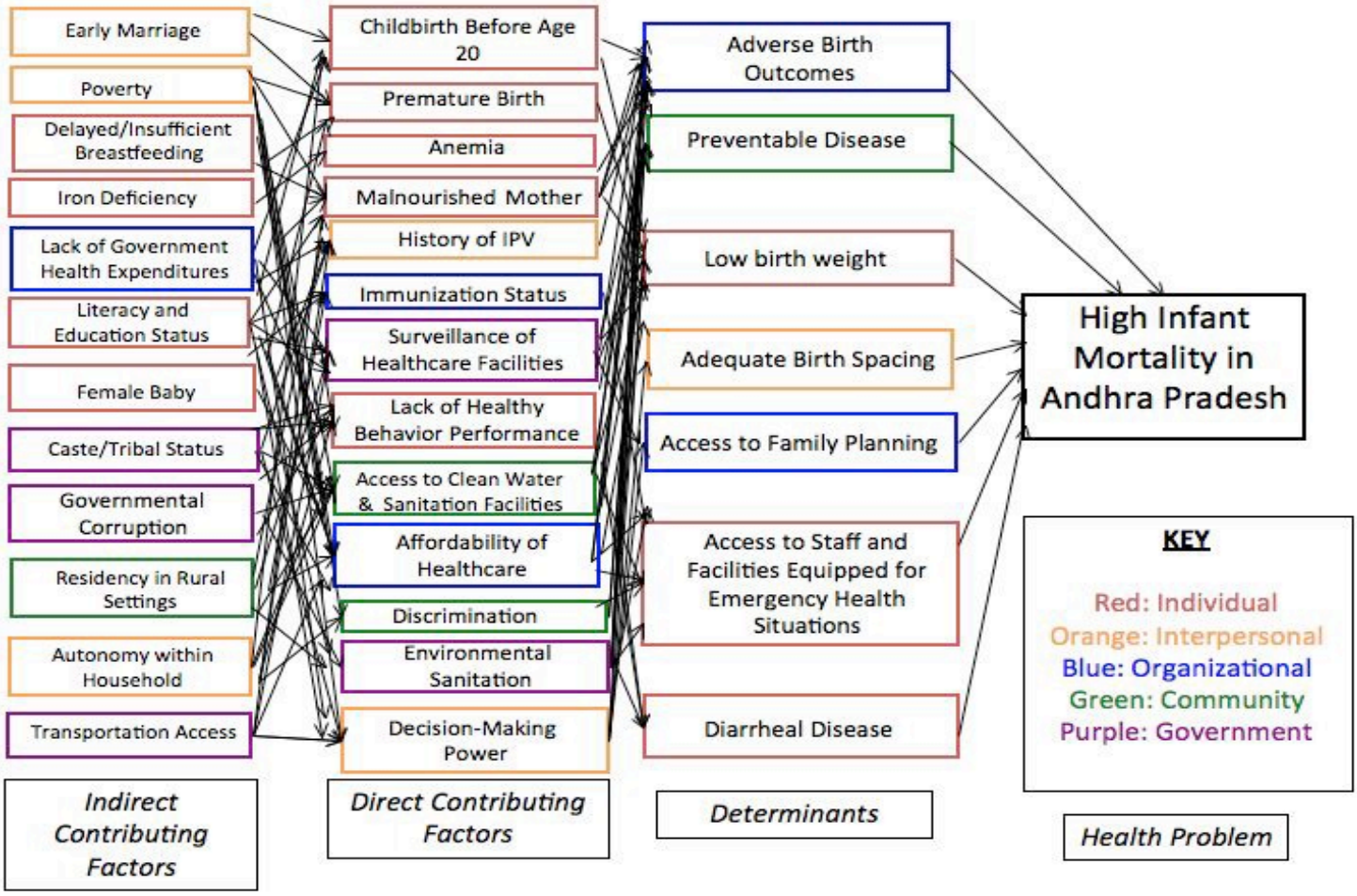

Figure 1. The Determinants of Infant Mortality in India and their Placement in the Social Ecological Model

2.7 INFANT AND NEONATAL MORTALITY BY INDIAN STATES

2.7.1 TOTAL, RURAL, AND URBAN INFANT MORTALITY

In order to understand how different social, financial, environmental, and cultural factors of the Social Ecological Model affect the different states of India, it is helpful to be aware of the current rates of infant and neonatal mortality both in India and more specifically in the state which is the focus of this thesis, Andhra Pradesh. As shown in Table 1, India's total infant mortality rate, which includes both urban and rural rates, is 47/1,000 live births; the rural rate (51/1,000 live births) is twenty points higher than the urban rate (31/1,000 live births). India ranks 49th in the world for highest infant mortality rates, compared to the United States, which ranks 173rd at 6/1,000 live births ("Country Comparison: Infant Mortality Rate," 2012).

On the World Bank's list of 223 countries, the highest infant mortality rate belongs to Afghanistan (121.6/1,000 live births) and the lowest rate to Monaco (1.8/1,000 live births) ("Country Comparison: Infant Mortality Rate," 2012). The rates in Andhra Pradesh are very similar to India's national averages; the total infant mortality rate is just below the national average, at 46/1,000 live births, and is identical to those for rural areas (51/1,000 live births) and slightly higher in urban areas (33/1,000 live births) (NIMS, 2012). When comparing Andhra Pradesh to other states, eight states have higher total infant mortality rates, the highest of which is 62/1,000 live births for Madhya Pradesh (NIMS, 2012). Eleven states have lower rates than Andhra Pradesh for this measure, the lowest of which is 13/1,000 live births for Kerala (NIMS, 2012).

Of the 20 Indian states detailed in UNICEF's 2012 report on child mortality, every state exhibits lower rates of infant mortality in urban areas than rural areas (NIMS, 2012). Six

states have a higher rural infant mortality rate than Andhra Pradesh, with the highest rate shown in Madhya Pradesh (67/1,000 live births) (NIMS, 2012). Gujarat's and Haryana's rural infant mortality rates are the same as Andhra Pradesh at 51/1,000 live births (NIMS, 2012). However, Gujarat's urban infant mortality rate is slightly lower at 30/1,000 live births, and Haryana's is slightly higher at 38/1,000 live births. Eleven states have a lower infant mortality rates for rural populations than Andhra Pradesh, with 14/1,000 live births the lowest in Kerala (NIMS, 2012). Kerala also has a lower urban infant mortality rate (10/1,000 live births) and a lower total infant mortality rate (13/1,000 live births).

Table 1. Total, Rural, and Urban Infant Mortality (NIMS, 2012)

REGION	URBAN*	RURAL*	TOTAL*
India	31	51	4
Andhra Pradesh	33	51	4
Gujarat	30	51	4
Haryana	38	51	4
Madhya Pradesh	42	67	6
Kerala	10	14	1

***Numbers are per 1,000 live births**

2.7.2 TOTAL, RURAL, AND URBAN NEONATAL MORTALITY

As shown in Table 2, the total neonatal mortality rate of India is 33/1,000 live births, and when comparing rates between rural (36/1,000 live births) and urban populations (19/1,000 live births), the same trends are apparent as infant mortality (NIMS, 2012). In comparison, the neonatal mortality rate for the United States is 4.19/1,000 live births ("Neonatal and Postneonatal Mortality," 2011). The neonatal mortality rate for Andhra Pradesh is slightly lower than India's at 30/1,000 live births total (NIMS, 2012). In this state, the rural neonatal mortality rate is the same as India's (36/1,000 live births), but the urban rate is lower (13/1,000 live births) (NIMS, 2012).

Eleven states have a higher total neonatal mortality rate than Andhra Pradesh, which range up to 44/1,000 live births (Madhya Pradesh) (NIMS, 2012). Eight states have a lower total neonatal mortality rate than Andhra Pradesh, which is as low as 7/1,000 live births (Kerala) (NIMS, 2012). Six states have higher rural neonatal mortality rates than Andhra Pradesh, with the highest being 47/1,000 live births (Madhya Pradesh) (NIMS, 2012). Three states tie Andhra Pradesh's rate of 36/1,000 live births (Assam, Gujarat, and Haryana) (NIMS, 2012). Ten states have a lower rural neonatal rate than Andhra Pradesh, the lowest being 8/1,000 live births (Kerala) (NIMS, 2012).

At 13/1,000 live births, Andhra Pradesh's urban neonatal mortality rate is lower than fifteen states (NIMS, 2012). Chhattisgarh and Odisha exhibit the highest rates for this measure (32/1,000 live births) (NIMS, 2012). The states of Assam, Bihar, and Tamil Nadu have numbers identical to Andhra Pradesh for this measure (13/1,000 live births), but Kerala has managed to decrease their neonatal mortality rate in urban areas to 5/1,000 live births (NIMS, 2012). Differences within states exist concerning policies, access to care and education, and environmental sanitation. Again, the differences in health status and rates of infant and neonatal mortality cannot be attributed to one determinant or one level of the Social Ecological Model.

Table 2. Total, Rural, and Urban Neonatal Mortality (NIMS, 2012)

REGION	URBAN*	RURAL*	TOTAL*
India	19	36	33
Andhra Pradesh	13	36	30
Madhya Pradesh	30	47	44
Kerala	5	8	7
Assam	13	36	33
Gujarat	19	36	31
Haryana	24	36	33
Chhattisgarh	32	38	37

***Numbers are per 1,000 live births**

3.0 BACKGROUND OF SHARE INDIA

Science Health Allied Research Education (SHARE) INDIA is a research organization of MediCiti Institute of Medical Sciences (MIMS) and MediCiti Hospital created by Indian expatriates in 1986, who wanted to optimize health outcomes in underserved populations. The organization first implemented the Rural Effective Affordable Comprehensive Healthcare (REACH) Study to prioritize the health of individuals living in rural areas (Kusneniwar et al., 2011). The REACH project identified community health volunteers (CHVs) in each of the 40 villages of Medchal Mandal, with a minimum of eight years of schooling, who are in charge of collecting information, as well as assisting in health projects in the village (REACH, 2011). Each CHV lives in the village for which he or she is responsible, and is assigned to visiting five households each day, with the goal of meeting with 30 households each week (Kusneniwar et al., 2011). These CHVs not only gather data on births, deaths, and marriages but also monitor the number of pregnant women in the village and serve as both resources and advocates for prenatal, intranatal, and postnatal care. In addition, they inform their village about when SHARE INDIA staff will visit to offer vaccinations and serve as village representatives in weekly didactic health sessions (Kusneniwar et al., 2011).

The CHVs are integral in increasing awareness of the causation of infant mortality in underserved communities. First-born children have a 10 percent higher risk of infant mortality than second and third born children (Kusneniwar et al., 2011). Simply spacing out births over a longer period of time has been shown to impact the risk of infant mortality, with gaps of two or more years increasing the likelihood that the infant will live through its first year of life. Low birth weight has been recognized as an additional risk factor for infants whose births are

not spaced far apart, making them three times as likely to die during infancy (Kusneniwar et al., 2011).

3.1 BACKGROUND OF MEDCHAL MANDAL

SHARE INDIA is located in Ghanpur village, in Medchal Mandal of the Rangareddy District of Andhra Pradesh, India, just outside the state capital of Hyderabad. A mandal in India is similar to a county in the United States. Medchal Mandal is made up of 40 diverse villages. SHARE INDIA is located in rural Southern India where access to and availability of heath promotion resources, information, and education are scarce. This community has been identified as a priority area for the improvement of maternal and child health. SHARE INDIA has been integral in helping the region of Medchal Mandal decrease its IMR to 38/1,000 live births (REACH, 2011).

The population of Medchal Mandal is approximately 50,000 residents, who reside in 40 villages of varying size and geographic landscape. The largest villages have well over 3,000 community members, while smaller villages have slightly more than 60 residents. In over half of the villages men outnumber women, although women outnumber men in the mandal by slightly under 200 (Reddy, 2012). The children born in these communities are at risk for infant mortality, but most deaths occur during the neonatal period. SHARE INDIA's REACH study details in its annual report "the proportion of infant deaths taking place in the project area within the first one month (<30days) is as high as 80.5%, with 61% occurring within the first week (REACH, 2011).

4.0 METHODS: THE LIFE STUDY

The Longitudinal Indian Family hEalth (LIFE) Study is a pilot study being conducted by SHARE INDIA to investigate the social, financial, ecological and health factors that women are exposed to before, during, and after pregnancy, and how these factors affect pregnancy outcomes (India, 2011). To be eligible women must be between the ages of 15 and 35, married, living in Medchal Mandal, and not pregnant or in their first trimester. Women who are pregnant beyond the first trimester, who have undergone a tubectomy or hysterectomy, who have husbands who have undergone a vasectomy, or who have been married seven years or more without children (primary sterility), who have not had a child in the past seven years (secondary sterility) are ineligible (India, 2011). While not all women recruited for the Focus Group Discussions (FGDs) were participants in the LIFE Study, the same criteria were applied.

The LIFE Study follows 1200 women longitudinally and involves the collection of data on household amenities and environment, family size, income, occupation, health, nutrition, smoking, drinking, pesticide exposure, waste disposal, cooking, cleaning, animals, livestock, water source, physical activity, birth history, fertility, pregnancy, and depression, among many other personal characteristics. Women are telephoned each month to obtain information on their last menstrual period (LMP). If LMP is more than five weeks from the time the woman was contacted, LIFE staff will visit the woman to administer a urine pregnancy test in her home (India, 2011). Blood, urine, stool, and vaginal swab samples are taken for each woman at registration, during pregnancy, and at delivery, along with samples of cord blood and meconium of the infants immediately after delivery.

4.1 METHODS: FOCUS GROUP DISCUSSIONS

4.1.1 PURPOSE OF DATA COLLECTION

In the month of July 2012, seven focus group discussions (FGDs) were implemented among mothers aged 18-35 in rural Andhra Pradesh, India, on the topics of health, sanitation, and hygiene promotion in the home. These FGDs, a subproject of the LIFE Study, were conducted to assess the health behaviors of mothers to gain further contextual background for previously collected data by the LIFE Study. The FGDs are meant to supplement the LIFE Study data. The LIFE Study collects quantitative data through questionnaires at the following time increments: prepregnancy, 1st trimester, 3rd trimester, immediately after delivery, 6 months postnatal, 12 months postnatal, 18 months postnatal, 24 months postnatal, and 30 months postnatal (India, 2011).

Focus groups were chosen as the preferred method for collecting qualitative data; however, one-on-one interviews were considered due to the sensitive nature of some topics. It was decided that it would be more helpful to meet with mothers in an interactive setting and that more data from more participants could be collected. Initiating a group meeting among young mothers was a strategy to attempt to empower local women and build connections in social networks for gaining knowledge and support. It was predicted that gathering a group of women to talk about these topics would allow them to become more comfortable discussing their opinions, and also allow them to learn from others' personal experiences.

4.1.2 SHARE INDIA RESEARCH TEAM

To further understand the social, ecological, financial, and environmental factors contributing to adverse health outcomes, the FGDs were implemented in seven of the 40 villages of Medchal Mandal. One pilot and six additional groups were implemented by three SHARE

INDIA staff members. A trained focus group moderator, who spoke Hindi, Telugu, and English, a transcriptionist who spoke Telugu and Hindi, and an MPH student who observed, took notes, and operated a digital audio recorder were present for each FGD.

4.1.3 FOCUS GROUP QUESTION DEVELOPMENT

These FGDs were adapted from the National Cancer Institute's Pink Book, a guide for health communication that provides comprehensive templates for drafting materials. With the use of this template, a protocol, assent script, and moderator's guide were developed by the MPH student to implement in the SHARE INDIA project area. Research questions were drafted prior to implementation of research activities at SHARE INDIA. Instances of neonatal mortality related to infection in the project area motivated researchers to explore health and hygiene practices in the home. Researchers wanted to understand what happened to infants in their transition to the household environment that resulted in these adverse health outcomes.

Focus group questions asked women about their daily routine of care for their infants and what materials were necessary to carry out these activities. Specific topics addressed in questions include comparison of breastfeeding and bottlefeeding, waste disposal, handwashing, menstrual health, laundering, water access, perception of village environment, sources of health information, and benefits and consequences of performing health promotion behaviors. SHARE INDIA researchers wanted to understand if women in the project area were aware of health promotion behaviors and their purpose, their level of practice of these behaviors, and how access to health promotion materials, such as soap and clean water, to complete these behaviors affected the performance of these behaviors.

The aim of the project was to not only understand women's perception of the importance and purpose of health promotion behaviors, but identify gaps in infrastructure for behavioral and health education interventions. Particular topics were chosen because

researchers suspected that infant mortality may be related to women's inability to complete these behaviors due to barriers of accessibility and awareness. However, researchers were unsure how issues of awareness and accessibility manifested in the project area and wanted to learn from women's personal experiences to identify women's perception of hygienic care in the home. The FGD questions were reviewed several times by SHARE INDIA researchers and field staff, including the FGD moderator. After the moderator guide was approved in English, it was translated by the moderator into Telugu for delivery in the seven villages hosting FGDs.

For each FGD, the moderator, transcriptionist, and observer were present to lead discussions and document the participants' responses to questions. As previously stated, the topics detailed in the FGDs were chosen by researchers at SHARE INDIA, who wanted to explore topics in an open-ended setting to gain insight into women's perception of health behaviors in the home, and provide a foundational framework for identifying future opportunities of interventions for health behavior and education. FGDs also began to explore the mothers' perception of the role their immediate environment has on their health and the health of their families. Researchers wanted to understand the relationship between infant mortality and lack of access to clean water and other sanitation resources such as proper latrines, showers, sinks, and waste disposal areas, along with antiseptic cleansers to complement these behaviors. In addition, researchers wanted to explore the relationship between infant mortality and a lack of awareness in the population concerning the benefits, consequences, and proper completion of hygienic behaviors.

4.1.4 PARTICIPANT RECRUITMENT

Convenience sampling was utilized to identify villages from each of the six regions of Medchal Mandal, whose participation in FGDs was confirmed after meeting with the CHV of the

village. CHVs were held responsible for recruiting six to ten married women between the ages of 15-35 to participate in focus groups of approximately one and a half hours duration on home health practices. Women were to have a child aged 12 months or younger to participate in FGDs. Mothers of infants were chosen as the target population because children under one year of age, particularly children in the neonatal period (28 days of age or less), are at the highest risk for mortality. Mothers are responsible for taking care of their children's and family's health and sanitation needs; therefore it is crucial to obtain their insight on current practices.

4.1.5 FOCUS GROUP IMPLEMENTATION

FGDs were held in the local Anganwadi Center or Gram Panchayat where light refreshments were provided to participants; discussions lasted from 65 to 97 minutes. Before the moderator initiated the focus groups, the transcriptionist asked each woman participating to answer questions on her personal characteristics for demographic sheets. These sheets assigned each woman an identification number and collected information on her age, age at current marriage, education status, work status, religion, number of children, number of children ever born, age of youngest child, whether she lived in a joint or nuclear family, and their caste status[1].

Each woman was given a number encased in a laminated envelope to pin to her saree for reference during transcription of data. Women were assigned identification numbers based on which FGD they attended (Pilot, 1-6) and which participant number they were in their focus group (1-10). Since mothers are the primary caretakers of children in this cultural setting, the youngest child almost always accompanied the mothers who participated in FGDs. While this caused some difficulty in transcribing audiorecorded responses from FGDs, written note of responses were used to complement audiorecordings of participant responses.

[1] See results section

The transcriptionist and observer each took notes on participant responses and drew diagrams of the seating arrangement for each FGD. The observer took notes on body language and non-verbal cues, as well as trends of consensus, disagreement, and assimilation into the group process. A digital audiorecorder supported written notes and was placed in the center of the circle of women during FGDs. Women were highlighted in red in later consolidated notes, if they did not attend the FGD to its completion. It was noted how many women arrived and when, how long they stayed, and how many children accompanied them, as well as other relevant behaviors. The moderator used her own discretion to announce breaks throughout the FGDs when children became distracting to participants or uncooperative. When possible, the observer tallied the frequency of responses from participants to identify monopolizers, who were especially verbal, and isolates, who were less talkative or reluctant to share with the group (Terry, 2011).

4.1.6 FOCUS GROUP DATA TRANSCRIPTION, TRANSLATION, AND ANALYSIS

FGDs were conducted over three weeks and were subsequently transcribed from audio recordings by the transcriptionist, who was present at each FGD. An additional bilingual staff member translated transcripts from the local language of Telugu to English for future analyses. Due to time constraints, the observer and the translator were able to review only a portion of focus group transcripts together. As a result, translations of transcripts are literal and no changes have been made, in order to maintain accuracy of the responses. In order to protect the integrity of participants' responses, translations were not altered. This allows for open interpretation of participants' responses and prevents misconstruing the meaning of participants' responses.

The observer coded transcripts according to prominent themes in participant responses through ATLAS TI Qualitative Data Analysis and Research Software. ATLAS TI enables the assessor to import FGD transcripts into the program and create codebooks to interpret themes and trends in responses from participants. Participants' responses during FGDs were coded according to prominent themes raised in discussions. Each time a participant response qualified for a specific coded theme, the response was coded in the transcripts. Although over 40 codes were identified from participant responses, codes with a minimum of approximately 100 occurrences are discussed in the results and discussion chapters, in detail. Supporting data on the local population collected through the LIFE and REACH studies of SHARE INDIA, and the most recent SHARE INDIA annual reports were obtained from the SHARE INDIA database to supplement FGD data.

4.2 FOCUS GROUP DISCUSSIONS: OBJECTIVES

Before FGDs began, the researchers and MPH student established research objectives to guide the planning and implementation of discussions. The following list delineates the goals of FGDs with mothers of Medchal Mandal.

1. Understand the social, ecological, financial, and environmental factors contributing to adverse health outcomes.
2. Identify women's current level of practice of health promotion behaviors.
3. Explore maternal and child health topics in an open-ended setting to establish a foundational framework for identifying future opportunities of interventions for health behavior and education.
4. Assess mothers' understanding of the influence their immediate environment has on their health and family health status.

Stakeholders wanted to gain insight into the strengths and barriers for optimizing health outcomes for children in the first year of life. FGDs were meant to assess mothers' understanding of healthy behaviors and their behavioral capabilities in an interactive group setting. In addition, researchers wanted to use FGDs as an opportunity to identify possible channels and behaviors to target in later research and intervention activities. Living in a limited resource environment such as Medchal Mandal has been the source of much struggle in the local community, and SHARE INDIA staff wanted to learn how mothers perceived the relationship between their surrounding environment and family health status.

4.3 FOCUS GROUP DISCUSSIONS: RESEARCH QUESTIONS

Before FGDs were implemented, the following research questions were posed about the potential findings from FGDs.

1. Is there a lack of awareness of effective health promotion behaviors and/or limited accessibility of basic health resources and how does this contribute to the IMR?
2. How is the IMR related to a lack of clean water access, and other sanitation resources such as: proper latrines, showers, sinks, and waste disposal areas, along with antiseptic cleansers to complement these behaviors?
3. Is the IMR linked to lack of awareness concerning the benefits, consequences, and proper completion of hygienic behaviors in the target population?

Overall, it was predicted that infant mortality was a two-fold issue related to knowledge of health promotion behaviors and access to health promotion resources. Researchers perceived that access to resources was limited because of barriers of affordability and availability of resources in the village environment. In addition, it was predicted that mothers had not had the

opportunity to learn the relationship between completing health promotion behaviors and improving health outcomes.

5.0 RESULTS: DEMOGRAPHICS

Sixty-one women recruited by the CHVs for the focus groups were present for some portion of the discussion and of those, 55 women attended the FGDs in their entirety. As shown in Table 1, of the 61 women who attended the FGDs, the average age for mothers was 24 years old, the eldest was 35, and the youngest was 20. The youngest age at marriage was 15 years old, the eldest was 25 years old, and the average age of marriage was 19 years old. Education status ranged from no formal education to 17 years, (signifying a higher graduate level of education), but the average length of education was approximately 7th grade. Sixty of the 61 women worked as housewives; however, one woman was in agricultural labor.

Women identified their religion status as Hindu (88%), Muslim (8%), or Christian (3%). The number of children of each woman ranged from four to one, with the average number of children for each woman falling between one and two. The majority of women (57%) belonged to a joint family, the traditional arrangement in India, in which the mother-in-law as well as other family members live in the same household as the husband, wife, and children. The remaining 42% lived in a nuclear family, which included their husband and children. Women who were native speakers of the local language of Telugu only were recruited for the FGDs; however, on more than one occasion women participated who only spoke Hindi. In order to accommodate these individuals, the moderator addressed questions to these women in Hindi, to ensure they understood questions, if they wanted to respond.

The status of each woman was collected for demographic comparison. Scheduled castes and scheduled tribes are assigned to these labels in Clause one, Articles 341 and 342

respectively, of the Indian Constitution based on their socioeconomic characteristics ("National Commission for Scheduled Tribes," 2005). Although populations are assigned to these labels because of they are perceived as more socially disenfranchised, members of the backwards caste also suffer from social inequities. Marriage often occurs within the same caste of the individual. Over 62% of women belonged to a backwards caste, 13% belonged to a scheduled caste, and over 11% belonged to other castes. The remaining women identified themselves as members of scheduled tribes or did not identify with a caste because of their religion. While Article 15 of the Indian Constitution prohibits the discrimination against any individual based on caste status, caste status is the still the cause of much unfair treatment of Indian citizens. One woman would not divulge her caste, but mentioned that her family was in the sweet business. The caste name of each woman was collected when possible. Women identified with castes that had histories of agricultural work, begging, trading, manual labor, laundering, cattle-herding, militarism, stone cutting, well digging, alcohol brewing, fishing, delivering messages, music-playing, tanning, overseeing, and Dalit or "untouchable" status. Castes related to manual labor and farm work were prominent due to Andhra Pradesh's agricultural opportunities and resources.

Table 3. Characteristics of Focus Group Discussion Participants

DEMOGRAPHIC FACTOR (N=61)	MEAN	MEDIAN	RANGE
Age	24.4	24	18-35 (17)
Age at Current Marriage	19.4	19	15-25 (10)
Education Status	7.7	10	0-17 (17)
Number of Children	1.7	2	1-4 (3)
Number of Children Ever Born	1.7	2	1-4 (3)
Age of Youngest Child in Months	10.7	9	2-57 (55)
Work Status **Housewives** **A. Cooli (Farmer)**		98% 1.6%	
Religion Hindu **Muslim** **Christian**		88.5% 8.2% 3.3%	
Family Type **Joint** **Nuclear**		57.4% 42.6%	
Caste **Scheduled Caste** **Backwards Caste** **Other Caste** **Scheduled Tribe** **Not Available**		13.1% 62.3% 11.5% 6.6% 6.6%	

5.1 EMERGING THEMES: USING THE SOCIAL ECOLOGICAL MODEL TO FRAME PARTICIPANT RESPONSES

FGD responses were coded each time a woman's response related to identified themes. The numbers subsequently following each of the themes outlined below indicates the number of times this code was used. Emerging themes included the following: adapting to limited resource settings (321), awareness of best health practices (662), conceding and conforming to the responses of others (299), nutritional knowledge (275), taking extra precautions to protect health (222), indifference or lack of awareness of hygienically appropriate alternative behaviors (210), indigenous cultural practices and beliefs (207), recognizing children as a priority (146), schedules and routines for childcare and home-related tasks (133), self-efficacy (125), family and social support (149), framing of a problem (103), and availability (98).

In the following sections, women are directly quoted based on the focus group they attended (Pilot, 1-6) and the participant number they were assigned at their focus group (1-10). While only certain quotes are included as examples of emerging themes, many other women contributed both similar and dissimilar views related to themes discussed in the following sections. Focus group themes are grouped into levels of the Social Ecological Model within which they are present. These themes are similar to the risk factors and determinants of infant mortality that have been previously discussed; they cannot be assigned exclusively to one level of the Social Ecological Model. Components of each theme are attributed to multiple levels of the Social Ecological Model where they interact with each other.

5.2 KNOWLEDGE AND AWARENESS OF EVIDENCE-BASED PRACTICES: THE INDIVIDUAL LEVEL

The level of knowledge and awareness of evidence-based practices, while informed by the insight of others, is considered an individual level factor for the purpose of this thesis. Mothers identified many evidence-based health practices, which signified their awareness of best health practices. However, on several occasions women cited examples that demonstrated a lack of awareness or indifference to completing these same evidence-based practices. When the moderator asked what to do after washing hands, women demonstrated their knowledge of options for completing healthy behaviors, and in some instances cited more reliable behaviors and less appealing alternatives. In response to this topic, women in several focus groups responded similarly or at the same time with comparable answers. Women in the first focus group responded with some explanation for different behaviors.

> *1.5: We wipe with the towel.*
>
> *1.9: So many people (after hand wash) wipe with their sari's edge, but I wipe with towel only because I don't like it.*

Women in the second focus group had various responses to this same question.

> *2.5: (with smile) Sometimes we wipe with our saree pallu(edge).*
>
> *2.6: Mostly we wipe with our saree pallu.*

Women admit that there are other, perhaps easier options for completing behaviors, but only some women chose the more effective option. Not all women follow evidence-based practices, even when they are aware of their existence.

In relation to health promotion behaviors, women were asked about breastfeeding practices. In the second focus group, some women expressed their own beliefs regarding cleanliness, while others prioritized their children's appeasement.

> *2.5: It is not necessary to wash because my son drinks only five times in a day.*
>
> *2.10: Small baby cries when she feel hungry, in that hurry moment, I feed without wipe or wash and I used to it.*

The first participant suggests that washing before breastfeeding is dependent on the number of times the woman is breastfeeding each day. However, the second participant is more concerned with pleasing her child to end his crying than with cleaning herself before breastfeeding. While this may temporarily please the child, it can also lead to the spread of illnesses. Handwashing was another behavior discussed by participants to determine their level of practice and understanding of the purpose of the behavior. The moderator asked women when they wash their hands and what materials they use to wash their hands. In the fifth focus group, several women responded concurrently and complemented each other's opinions.

> *5.1-5.8: After passing stool we wash definitely wash our hands with soap. Rest all times we wash sometimes with soap or water. We use soap after dumping the dust definitely.*
>
> *5. 8: Male people they wash their hands, legs, face after coming from outside. They wash their hands with soap after passing the stool and before eating they wash their hands with soap only.*
>
> *5.2, 5.3, 5.5: Male people when they return from their jobs then they wash their hands, legs, and face with soap, and before lifting the child also they wash their hands.*

A similar situation emerged in the sixth focus group, when the moderator posed the same question and participants answered together with similar responses.

> *6.6, 6.7, 6.8: After passing the stool, before taking the*

child and before eating.

6.5: Before eating and before taking the child.

6.1, 6.2, 6.3, 6.4, 6.5, 6.7, 6.8: Mostly we wash with the soap.

Women seemed to be aware of the importance of handwashing during the performance of toileting behaviors, but not during other unclean tasks. However, some women demonstrate a commitment by themselves and their husbands to maintaining personal cleanliness. There are various motivations for performing health promotion behaviors. Women did not always state why they chose one behavior or routine over the other when safer options are known. This trend was shown when the moderator asked women about their routine for treating water before use, and one woman in the pilot focus group displayed knowledge of evidence- based practices and her own level practice.

P.1: We should boil and drink, but we don't.

It is unclear in this instance if the woman did not have the necessary resources available, another prominent theme, to perform this behavior or if she did not understand the importance or purpose of boiling water. However, women in FGDs did recognize the link between the health of the child and the mother, and identified children as a priority by taking extra precautions to protect their health and the health of their children. Taking extra precautions was defined in instances when women performed health promotion behaviors not otherwise stated by participants, or performed these behaviors multiple times within a specific timeframe. Identifying children as a priority was coded in instances where mothers stated they specifically performed a behavior to benefit the children's health or welfare. The moderator asked women in each group if they use the same hygienic materials for all family members. In this

instance, the moderator asks about the use of towels after bathing and whether all members of the household use the same towel or a separate towel. In response to this question, several women in the first focus group responded alike at the same time.

> *1.2, 1.5, 1.9: No it's separate.*
>
> *1.4, 1.3: We use separate towels because they are small children.*
>
> *1.1: We use separate towels for baby and us. We wash it daily. Soap everything separate. Small baby is equal to flower. We should save them from mosquitoes and bacteria. It depends upon the mother only that how to protect the child.*

These women understand the fragile state of infant health and prioritize the separation of health promotion materials to ensure their children are kept clean.

When discussing their daily household routines and their attention to their child's health, several women stressed the importance of completing tasks related to the child's health "immediately." In this instance the moderator asked mothers when they change their children's clothes if they pass urine, and several women in the third focus group responded together in consensus.

> *3.3: Immediate after passing urine.*
>
> *3.1: Immediate after passing urine we change the drawer (panty).*
>
> *3.8: When they pass urine then we change.*
>
> *3.5: Immediate after passing urine I remove that drawer and I change him another one.*
>
> *3.2, 3.4, 3.6, 3.7, and 3.10: Immediate after passing urine we change it.*

These responses echo the previously noted commitments to preserving their children's health by addressing their needs as they arise.

When discussing tasks related to work in the home and motherhood, nutritional knowledge and practices were cited, with the majority of mothers identifying breastfeeding as the preferred method of feeding for infants and children. However, in several instances women had to supplement their breast milk with outside sources. In order to understand women's perception of the benefits of breast milk as opposed to formula, the moderator asked women which source of milk is better. In the first focus group, several women responded at the same time and commented on the value of feeding breast milk instead of formula.

> *1.1-1.9: Breast milk is important.*
> *1.6: If breast milk is not sufficient (breast milk is not sufficient to the child) we give outside milk.*

Women acknowledge that breast milk is the best possible option, but also explain that when they are unable to produce sufficient breast milk, their options are limited. In the first focus group, the moderator asked women about the differences between feeding the infant breast milk and bottle-feeding formula, and one woman cited the benefits of breastfeeding.

> *1.1: Breast milk is good (nutrition) for babies. As long as the child grows, we feed powder milk, if at all breast milk is not sufficient, up to the age of one year we feed breast milk only. We give powder milk if it is necessary.*

A woman in the fourth focus group gave her opinion on why mothers give different types of milk to their children.

> *4.7: So many mothers they will not give milk thinking that their smartness will go off. They give outside milk. They think that if they feed breast milk they may become thin, but we will be very smart as many as we give breastfeeding.*

Women in the fifth focus group expressed several reasons why they believe breast milk is the best option.

5.3: Mother milk is good because we eat the food which contains all nutritional values. Children they cannot eat if we feed them also. That is why we should eat everything, by milk we should give it to baby.

5. 4: Outside milk they (milk supplier) bring in the containers, which are not cleaned properly. That is why we should not feed outside milk.

Women recognized that feeding breast milk is beneficial for their children's nutrition, but in the first focus group, women again discussed the problem of sufficiency.

1.2: Up to the age of six months we should feed breast milk only, nothing should feed.

1.4: I feed breast milk and outside milk because breast milk is not sufficient.

While women were aware that a diet of breast milk is the best option for their children, they did not always have the ability to provide breast milk for their children.

In some FGDs, women's behaviors and practices immediately prior to breastfeeding did not always represent evidence-based practices. For instance, women reported that they would wash other parts of their body before breastfeeding, but not their breasts. The moderator asked women about their typical routine before breastfeeding the child, and women in the first focus group explained the process.

1.7: Before feeding I wash my hands and legs, squeeze some milk (outside) and then I feed the child.

1.6: Before feeding we wash the breast, squeeze some milk, wipe the breast and then we give.

Many women cited squeezing out milk before feeding the child, especially when coming from outside, giving the impression that they believed this practice was associated with ensuring a clean and healthy environment for breastfeeding. An interesting trend among women in the

FGDs, as seen above, was the use of "we" instead of "I," when talking about their own behaviors. Women were asked what they specifically did in regards to each of the questions, but they assumed that all mothers did things the same, and oftentimes said that everybody does the behavior their way.

While some women may have thought that all women had the same routine for completing home-based health practices, other women recognized the discussions as a learning opportunity for increasing knowledge about other healthy behaviors. During one focus group, when the moderator summarized the discussion at its conclusion and said that the women had discussed so many topics, one woman in the pilot focus group voiced how the discussion impacted her.

> *P.4: We came to know that when four people gather at one place, we can get some knowledge.*

Similarly, one woman in the second focus group asked for further knowledge from research staff about safeguarding the health of their children.

> *2.2: Whatever we know we said everything. It will be good if you say anything about children.*

This quote suggests that women enjoyed spending time with each other to learn from their personal experiences, and are open to seeking advice and information from other sources.

5.3 SOCIAL SUPPORT: THE INTERPERSONAL LEVEL

Women are supported in various capacities by their family and community members, therefore the theme of social support has been assigned to the interpersonal level of the Social Ecological Model. The women are informed by members of the community how to keep clean and care for the house and children. Their current level of practice, whether evidence-based or not, is a direct reflection of the knowledge of family and community members, knowledge often transferred

orally by word of mouth. Family and social support were cited in instances when women discussed their source of learning and information, as well as assistance with completing household chores and taking care of the children. The moderator discussed sources of information with women, and asked them who taught them how to take care of themselves and their families. Women in the first focus group discussed learning from mothers and elders.

> *1.1: From mother, me from mother. My children will learn from myself. Children say that mummy whatever you teach we learn like that only. If we teach them good things they will learn good and they will become good children, or if we teach bad things, they will learn bad.*
>
> *1.6: I learned from mother and elders who are in my family.*
>
> *1.9: In our childhood, whatever teach by our elders we all will learn it.*

Women in the fourth focus group mentioned the impact of motherhood and the role of other women in their families.

> *4.8: I learned after being a mother. Till three months after delivery my mother used to stay with me like when I call her, she was present like that. She used to teach me so many things about the child and I learned myself as a child grows.*
>
> *4.3: Myself also same. My mother-in-law used to tell me, that I should gain experience. I should learn myself and as a mother I have to win like that.*
>
> *4.2: First of all I learned from mother and mother-in-law and after that I learned by seeing television.*

Women's decision to follow recommended health practices was influenced by their family's transfer of knowledge, especially their mothers and mother-in-laws. However, one woman in the third focus group also considered how her community and social norms helped to promote cleanliness.

> *3. 9: Now-a-days all are keeping clean, people are keeping clean one by one very best.*

Spousal support was cited less often as a dependable source of aid and relief from housework. The moderator asked women in each group if they are responsible for all caregiving responsibilities and if women are receiving any support from family members or other support sources. Women in the first focus group responded that work was their responsibility.

> *1: I don't get any support. My husband does not help for anything. All the household work I only does. Since ten days my mother-in-law is staying with us. She is looking after the children.*

> *1.9: Most of the work I only look after because my husband leaves for job by seven o'clock and he will be back only in the night. On Sundays he fills the water if water comes.*

> *1.7: We does the work by carrying the children also.*

One woman in the second focus group answered similarly to the first group's responses on this same topic.

> *2. 2: Everything look after by me only.*

Women in the third focus group cited more support from their husbands in household work and taking care of children.

> *3.7: My husband does cooking.*

> *3.8: My husband feeds my child and he will take the children when baby cries.*

Several women in the fourth focus group answered together and explained that their level of social support depends on their current health status.

> *4.4, 4.6, 4.8: Husbands they will become tired and come after doing the job, so we should do for them because*

we stay at home. If at all we fall sick then everybody helps us. My husband does not move from me.

Women in the sixth focus group answered similarly at the same time, explaining that all work is their responsibility.

6.4: We do our own because we don't have anybody.

6.1, 6.5, 6.6, 6.7: As usual we do because we don't have elders at our home. Always we only should look after all the work.

In this instance, women admit to doing much work around the home, and identify caregiving as an important component of their daily work routine. Some husbands supported their wives after returning from their jobs each day; however, more women stated that the household work was their responsibility. Women in the first focus group acknowledged that their household and childcare chores had taken a toll on their bodies when the moderator inquired how their work affected their health status.

1.7: I get leg pains, hand pains, back-ache.

1.2: Yes, madam, we feel tiredness while sleeping in the afternoon or in the night.

Women in the fourth focus group responded together and discussed the burden of work on their bodies and time schedules.

4.8: Myself feel very tired, after delivery I am getting back pain and I am feeding also isn't it, (so)? I feel like sleep but I am unable to get time for sleeping.

4.8, 4.6: Definitely we get tired.

Women in the fifth group received familial support when they were fatigued from work.

5.7: Sometimes if we feel weakness, mother-in-law does the work.

5.3: Whenever I feel weakness my mother-in-law does the work.

One woman in the sixth focus group responded that she did not have this same level of support when experiencing aches and pains.

6. 4: We have to do all the work because we don't have anybody else. By doing all these work hands and legs pain, head ache and get cold also because of doing work in water.

The mother is the primary caretaker of the children, and she is expected to complete these daily tasks, as well as share her knowledge and practices with her children, grandchildren, and in-laws. Mothers and mothers-in-law in particular demonstrated both educational support and support in household responsibilities. The mother's commitment to household responsibilities and autonomy within the household reflect the indigenous cultural practices and beliefs of her social network, her community, and also of her society. Nevertheless women in several focus groups said that their greatest encouragement and inspiration for completing their work is their children. Women in the pilot focus group discussed how having a healthy child impacted their health.

P.3: If children are healthy, we feel happy.

P.6: Nothing, when we look after the child we feel happy.

Women in the second and third focus group described the importance of prioritizing children's health and prioritizing the children's health improved their own health.

2.2: Because children is (more) important than everything. It is not good that if we do not take interest about the children we should look after about how should we keep the clothes of children, what type of food we should feed because others cannot look after.

2. 2: If I feel like getting fever it will be cured when I look (at) my child.

3. 9: Nothing will be there if we see the baby.

A woman in the fourth focus group voiced her own beliefs on how mothers view their children.

4. *8: Baby is our life and our world.*

The mothers demonstrate a sincere and genuine commitment to maintaining the home and taking care of the family. The mother is held responsible for the child's welfare, but if she is not living in a system that supports optimal health outcomes due to problems of social and financial support, accessibility, availability, education, and environmental limitations, she is unable to provide her children with the basic resources for survival.

5.4 SOCIAL AND CULTURAL BARRIERS: THE COMMUNITY LEVEL

In many instances women made observations about their surrounding environment but had special indigenous cultural practices and beliefs that dictated their behaviors. These customs and behaviors are influenced by community norms, therefore social and cultural barriers have been assigned to the community level of the Social Ecological Model. This theme was recognized in instances where women explained that they routinely performed certain behaviors or expressed beliefs that are not supported as beneficial or promoting health by sufficient scientific evidence. The theme of availability sometimes coincided with these same statements, which suggests that the behavior, while indigenous to the culture, is linked to larger problems of access.

Women would often agree with the most recent statements of participants, and these instances of conforming to group norms were noted. As a result, when women gave personal examples of their health promotion behaviors that were not evidence-based practices, it was difficult to know if other women agreed with these practices or did not want to contradict other participants. This trend arose when the moderator inquired about the accessibility of water to

women in the fourth focus group, in particular the difficulties of providing sufficient water for all members of the household.

> *4.4: Wherever bore pumps are available my husband goes there and get the water with the containers and fill the water tubs at home.*
>
> *4.8: Same like we also go and get the water with vessels from the bore pumps whenever we get time. Sometimes we won't have bath and we don't wash the clothes for two days but for children we make them do for twice in a day and we wash their clothes very neatly.*

A participant in the third focus group responded to the same question by detailing her own experience with providing water for her family.

> *3.1: ... It is sufficient because we are using bore water. For bathing, utensils we have a big swamp. Whenever water comes swamp will fill with water. That's why water is sufficient. Bore pipe comes every day we wash the clothes over there.*

The first mother demonstrates her family's determination to provide water for all by traveling to wherever water is available. The second mother identifies how she makes personal sacrifices in her hygienic routine to maintain proper hygiene for her child. While the mother may recognize the health benefits of keeping her children clean, she has not acknowledged how handling her children in an unclean state will affect their health status. The third mother is utilizing unclean sources of water (a swamp) that are available in her village, to bathe and clean housewares. These problems are exacerbated by indigenous cultural practices such as cosleeping, which are practiced by the majority of the population regardless of SES and level of education. When the mother and children sleep in close proximity and are not bathed with sanitary resources, illnesses can be transferred to others.

The moderator asked women about their breastfeeding habits and women discussed co-occurrence of their cosleeping and breastfeeding behaviors. This topic was discussed in all

focus groups, but responses from women in the first focus group are listed below. In these responses, women demonstrated a commitment to not breastfeeding in the sleeping position.

> *1.2: Morning I give by sitting, afternoon by lying down, and night also by lying down.*
>
> *1.6: Always by sitting only…Yes I give because small child. In spite of feeling sleepy also always I sit and give.*

Women in the third focus group gave several different responses when asked the same question.

> *3.1: No time for that. After three months even daytime also I give by lying position only. Whenever child cries while playing then only I sit and feed.*
>
> *3.3: Up to the age of three months we must give milk in sitting position only.*
>
> *3.8: Up to the age of three months we feed them always in sitting position only. After that whenever child cries I make my baby to sleep in my lap and feed otherwise I sleep and give.*

Some women did demonstrate awareness of the risks of breastfeeding while lying down, and one woman in the first focus group not only discussed but also modeled necessary practices to follow immediately after feeding.

> *1.9: Think that if we give them in lying position, after feeding we should just do little massage on the backrest, then milk will digest (burping baby). (She showed her child to make sit in her lap and was massaging on his backrest.) Milk will be in the inside of the neck due to drink by lying down position, that's why we should feed them very carefully. For all babies including newbown babies we should massage on their backrest. All the advice given by doctor only.*

Women in the second focus group discussed the dangers of breastfeeding while lying down.

> *2.3: I sit and give. Even in the nighttime I sit and I will take my baby into my lap and I keep my hand under child's head then I give. Milk will come out if I feed him in a sleeping position the chances are more that it will stuck in his neck and he feels uneasy. That is why even lot of difficulty also I sit and feed in the night hours. If we feed them in a sleeping position, excess of milk will come and it will stuck into the neck and it is very difficult to take breath because we will be in the sleepy movements.*

> *2.10: I have a small baby, whenever I feed my child I sit and give. Milk will flow excess if I give in a sleeping position and it will go inside the nose. I will sit and give up to my child grow.*

These women recognize the dangers of breastfeeding while lying down and demonstrate their knowledge on how to prevent related adverse health outcomes. Women did not often address their reasoning for cosleeping with children although one woman in the first focus group did cite her own beliefs on this topic.

> *1.1: Morning times we make them to sleep in the cradle because we do our work, night times we make them sleep with us only, why because children needs mother's hotness.*

Although the evidence-based practice of kangaroo-care for infants encourages skin-to-skin contact for helping sick infants overcome illness, the issue of Sudden Infant Death Syndrome (SIDS) and its origin is not something that was addressed in this population.

When the moderator asked women how and where their children sleep, women in several focus groups often cited the same practices for preparing a special space for their children to sleep.

> *1.2: We make them sleep along with us only but we put separate bed sheets for them and will make like a bed.*

1.9: We make them sleep beside us by making separate bed with few bed sheets.

1.5: We all does like that only on the same bed we put separate bed sheets and make them sleep beside us.

4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8: Beside us, we all sleep in the same bed we make a bed with the bed sheets of baby beside us on the same bed. To cover the baby also we have a separate bed sheet.

Again the women's use of "we" instead of "I," is apparent and women explicitly state that "all" women do things the same.

Although the opinions of the group majority seemed to have influenced women's participation, some women based their level of participation on other factors. In the first focus group, a woman appeared anxious about her participation in the focus group and worried about the privacy of her responses.

1.3: Is this telecast in TV? (twice she was asking to other ladies) If it comes everybody will see.

Even much later in the discussion, the woman demonstrated hesitation in participating.

1.3: Getting fear.

1.1: This is not any live telecast.

In this instance, the participant was assured by another participant that her answers were private. This lack of trust in the confidentiality of the discussions may have also affected the manner in which women answered questions and their willingness to volunteer their own insight.

5.5 ADAPTING TO LIMITED RESOURCE SETTINGS AND PROBLEM IDENTIFICATION: THE ORGANIZATIONAL AND POLICY LEVELS

Adapting to limited resource settings refers to situations in which women carry out a behavior or task in a setting that is not optimal. The presence of resources in the environment, while

influenced by many factors, relates to the reach of services of organizations and policies at the local, state, and national levels of government. In addition, the occurrence of chronic gaps in service and resource acquisition relate to organizational and policy infrastructure, therefore these themes have been assigned to the organizational and policy levels of the Social Ecological Model. In several instances women stated that they "make do" with the resources that are available to them, which may change depending on the location of their village, the season, their socioeconomic status, and their immediate environment. When the moderator inquired where women washed their hands, two women in the pilot focus group discussed how they adapt.

> *P.1: If possible outside, if we want to wash inside the house, we wash inside only.*
>
> *P.2: Wherever possible we wash there.*

The code adapting to limited resource settings was often associated with another code, which related to framing a specific issue as a problem. Several of the focus group questions asked women if they perceived any problems within their village environment, such as access to water. In some instances women would identify water or other specific needs and define them as problems. The moderator inquired at each focus group about whether the access to water in the village was sufficient, and how women adjusted during these time periods. A woman in the pilot focus group described the situation in her village.

> *P.1: We don't have any water problem here. If we not get from the tap, we will get the water from the tank, we don't have any water problem. (*showing a big water tank in the village)*

Two women in the first focus group each contributed their insight when asked the same question about their own village.

> *1.1: Sufficient, some people gets in the morning and some people gets in the evening.*

1.9: We don't have any problems to get water, in summer season we get water in alternative day.

In the fourth focus group, a number of women discussed the availability of water in their village. The first response lists several women's identification numbers, because they each reached consensus and responded simultaneously to the question. The second response is another woman's follow up to the preceding group's response.

4.8, 4.4, 4.6: Every year in summer season we get water problem. In winter and rainy season there is no problem for water.

4.3: If it is a small family we can get two containers of water from anywhere and we clean it. If at all it is a joint family then only it's problem.

Many women adopted this attitude when they discussed accessibility and availability of water, as well as other healthcare resources. This perspective demonstrates a level of self-efficacy. Self-efficacy is another code, which is used to identify situations where women specifically outlined or explained their ability to take care of their health and needs, as well as the needs of their family members. When the moderator asked women in the first focus group how they address the needs of their family and adjust when availability of water is uncertain, one woman explained how she is accustomed to rationing her use of water.

1.9: We make less our work schedule, we wash our clothes every alternate day, if we have more water we use four buckets to wash the clothes, if we have less water we use two buckets to wash the clothes.

In the second focus group, another woman gave her opinion on the same question.

2. 2: Morning after wake up from the bed we need water only. For cooking, washing of clothes, utensils and bathing of children we use it. If water is there or not we should use it in a same way. If water is available we should not waste the water and after that we should not f*eel for it.*

These women did not appear stressed or upset with their lack of sufficient water, nor did they identify it directly as a problem. In order to understand what problems women did have, the moderator asked women if they had experienced instances where they were not able to provide something they wanted for their children. Women in the pilot focus group described their own experiences.

> *P.1: Nothing like that we can (do) whatever we want.*
>
> *P.4: All these things leave for mother only because mother knows everything. Child does not know anything. Whatever we say they listen, whatever we do they cooperate (with) us, so we are not having any problems.*

Women in the sixth focus group contributed their personal experiences on this same question.

> *6.4: My husband only does the job. I am housewife. In that meager salary we have to pay for rent, milk, rice etc., the salary is sufficient for all these. Everything depends upon one person. So little bit only we can take care of our children, we want to give him more also we cannot.*
>
> *6.6: We have the feelings of giving fruits like that, but we are unable to do it.*

Although women did not identify instances where they experienced problems related to their own behavioral ability, they did suggest that financial restraints affect their ability to perform a behavior or provide for their families.

Women in the first focus group followed up this discussion with identification of problems related to village infrastructure.

> *1.1: People say that buses are there but it won't come in time, even autos are also not available properly.*
>
> *1.9: We have some drainage problem madam!*
>
> *1.1: In our area we don't have any drainage problem, it's clean only.*

1.9: In our area, water is flowing on the roads due to the leakage of drainages. Because of this bad smell is coming out and the children are moving in those surroundings only.

In this dialogue, women disagree about problems in their village, suggesting that differences exist not only between villages but also within villages. However, just as there were differences between villages, there were also similarities. In another village, women in the second focus group cited problems related to transportation systems.

2.2: As our village is long, buses are not available. It's like a forest, if we go out also there are no buses or autos to come home. We get fear to come.

2.4: We have the problem of buses in our village.

2.5: We don't have hospital; we are having small doctors (Registered Medical Practitioner). They don't treat nicely. If we want to show to big doctor's we have to go very long. It is nice if we have big doctors in our village.

In one particular village, space, although not identified as a problem by women, clearly affected women's health behaviors. In this response to the moderator's question, several women in the second focus group responded at once with similar answers.

M: DO YOU PEOPLE ALL HAVE SEPARATE BATHROOM?

2.2, 2.3, 2.4, 2.6, 2.8, 2.9, 2.10: We does not have separate bathroom. We have common bathroom because we stay in rented house.

M: IT'S COMMON FOR HOW MANY FAMILIES?

2.2: There is one bathroom for seven rooms.

M: THEN FOR CHILDREN?

2.2: For children we make them on floor.

2.6: Elders only will do inside.

M: SO YOU LADIES?

2.1: We have one bathroom for three rooms. I make my baby to bathe on the floor, which is outside.

Household crowding is directly affecting the living conditions and the ability of household members to use sanitation facilities. Mothers and children adjust to the settings by having their children perform health-promotion behaviors, where it is less crowded, but possibly cleaner. In order to ensure a clean environment for children, women have demonstrated the capacity to address gaps in service delivery. Although villages are supposed to have waste disposal services, one particularly large village where the third focus group occurred had created its own solution to disposing of trash that was not picked up by waste disposal.

3.3: At our area we all put the dust at one place and we burn it.

This collective action helps to remove trash from the village and is a result of community collaboration. Although it may not be the most environmentally safe solution, this is one example of the community's motivation to keep the village clean.

6.0 DISCUSSION

Focus group discussions with mothers (aged 18-35) of children (2-57 months of age) in seven villages of the rural community of Medchal Mandal identified social, environmental, and personal barriers to completing evidence-based health practices in the home. Discussions explored perception, understanding, and completion of home health practices to begin to discern the relationship between routine and effective performance of health promotion behaviors and infant mortality in the local population. Research objectives included understanding factors contributing to health outcomes, identifying women's practice of health promotion behaviors, exploring health topics to recognize areas of future improvement, and assessing perceptions surrounding the influence of environment on family health status.

6.1 RESEARCH OBJECTIVES

The following objectives were posed before the FGD implementation process. In this section, each objective is addressed in regards to the FGD participants' responses.

6.1.1: OBJECTIVE 1: *Understand the social, ecological, financial, and environmental factors contributing to adverse health outcomes.*

Women identified personal experience related to the presence or absence of social support and explained how they appreciated and valued any assistance from family and friends. Affordability of health promotion materials and geographic and seasonal factors affected abilities to perform health promotion behaviors.

6.1.2: OBJECTIVE 2: *Explore maternal and child health topics in an open-ended setting to establish a foundational framework for identifying future opportunities of interventions for health behavior and education.*

Women had not previously been engaged in discussions about their perceptions of health promotion behaviors and family health. Women shared their opinions on a variety of topics and demonstrated interest in learning more about infant health and care.

6.1.3: OBJECTIVE 3: *Assess mothers' understanding of the influence their immediate environment has on their health and family health status.*

Women took care to keep a clean home environment and maintain proper hygiene of their children. However women were not always aware of evidence-based practices such as handwashing with soap before and after toileting, waste disposal, cooking, cleaning, and breastfeeding. While women did pay close attention to the hygiene of their children, they did not always care for their own hygiene, especially during times of limited access to health promotion resources.

6.2 RESEARCH QUESTIONS

The following research questions were outlined by researchers of SHARE INDIA to explore during FGDs with mothers of Medchal Mandal. In this section, each question is highlighted and discussed in regards to the responses of FGD participants.

6.2.1: QUESTION 1: *Is there a lack of awareness of effective health promotion behaviors and/or limited accessibility of basic health resources and how does this contribute to the IMR?*

Issues of awareness of health promotion behaviors and access to health promotion resources are apparent in each village assessed during FGD activities. In many instances, women were aware of evidence-based behaviors but did not have accessibility or availability of health promotion resources to perform behaviors. While women demonstrated awareness of health promotion behaviors they did not always perform the gold standard for behaviors. For example, women would wash hands with water, but not

with soap. Problems of awareness and accessibility will need to be addressed in the future to systematically measure the impact of these factors on the IMR.

6.2.2: QUESTION 2: *How is the IMR related to a lack of clean water access, and other sanitation resources such as: proper latrines, showers, sinks, and waste disposal areas, along with antiseptic cleansers to complement these behaviors?*

Women explained that access to water varied within villages and by time of year. Women rationed use of water and ensured that water was available for the children's health promotion behaviors. Unfortunately women did not always prioritize their own health and cleanliness, which may be maintained to prevent transmission of infectious diseases to the infant during everyday childcare activities. Latrines when available were sometimes used for particular family members such as elders. Bathing occurred both in the bathroom and in public areas where water sources were available. Only one participant explicitly mentioned the use of a sink. While some villages had regular visits from waste disposal services, other villages collected waste in the drainage system, in the streets, or burned excess trash. Lack of infrastructural support in creating and maintaining an environment that promotes healthy behaviors is a barrier that will need to be addressed and investigated for areas of sustainable community improvement. Further research and intervention activities must attempt to quantify the impact of a clean home and village environment on the IMR.

6.2.3: QUESTION 3: *Is the IMR linked to lack of awareness concerning the benefits, consequences, and proper completion of hygienic behaviors in the target population?*

Several FGD participants explained and demonstrated the proper completion of health promotion behaviors. Consequences of not completing hygienic behaviors identified by

participants included sickness and fevers. Women were able to understand when children were sick but expressed concern about not knowing if sicknesses were common illnesses or related to more serious health conditions such as malaria or dengue fever. A number of women explained the benefits of health promotion behaviors. The majority of women mentioned that keeping clean ensured that family members did not become ill, in particular the infant. While some women were aware of benefits, consequences, and procedures of health promotion practices, they did not always understand the severity or susceptibility of particular diseases. In addition, while women seemed to understand that health promotion behaviors were important, women's perception of the purpose of behaviors was not always conveyed. Women often said that their mothers, mother-in-laws, elders, and doctors had advised them to perform certain behaviors and that they listened to their instructions. Performance of behaviors was related more to experiences where members of social networks encouraged healthy behaviors, but did not necessarily explain the purpose of behaviors.

6.3 FGD PARTICIPANT RESPONSES BY LEVEL OF THE SOCIAL ECOLOGICAL MODEL

In the following sections, FGD themes are discussed in detail according to different levels of the Social Ecological Model. As discussed throughout this thesis, responses are not confined within one level of the Social Ecological Model. Responses address issues and topics that are multifaceted and impactful at several levels of the Social Ecological Model.

6.3.1 INDIVIDUAL LEVEL

Several women highlighted the importance of mothers being well-nourished to breastfeed their children, but not all women were aware of the importance of their own health. The majority of mothers upheld breastfeeding as the main source of nutrition for infants. Nevertheless, women

identified indigenous cultural practices such as not feeding colostrum to infants, which is not supported by scientific research, and results in the infant not receiving nutritional benefits. Women displayed self-efficacy by explaining the process and the benefits of performing specific health behaviors, and consequences of not performing appropriate behaviors. However, trends in responses to focus group questions indicate that women exhibited a tendency to agree with the responses of others without explaining themselves in their own words.

Women expressed commitment to their children's health by discussing separation of children's materials and clothes from the possessions of all other family members. Women took extra care of the children by dressing them warmer to keep them from coming into contact with unclean surfaces and bathing them multiple times a day even when water was scarce. Mothers have the best intentions in reserving water to ensure their children's cleanliness, but they did not understand that since they are handling the children, they are doing them a disservice by not taking care of their own hygiene. Despite altruistic behaviors, infectious diseases affecting the mother can be easily transferred to the child during routine childcare activities.

Many of the mothers discussed the importance of handwashing but did not mention the inclusion of soap in the handwashing process, or the use of soap during toileting behaviors only. As shown in Figure 2, aspects of Social Cognitive Theory explain the ability of mothers to accurately complete the handwashing behaviors. Women must first understand the relationship between health and handwashing, and how regular handwashing can improve or maintain their health. Their behavioral capability is based on the level of knowledge necessary to perform this behavior, but also on the results of performing the behavior. If the women do not perceive benefits for handwashing or handwashing with soap or have the self-efficacy

to complete these behaviors, they will not wash their hands accurately or routinely. In addition, someone must correctly model the behavior for them to ensure that the behavior will be performed effectively and accomplish the goals of the behavior. As a result, health improvement or maintenance of health status will be sustained and reinforce the behavior's completion.

CONCEPT	EXAMPLE
Reciprocal Determinism	Women's behaviors affected by environment, but can change environment with evidence-based behaviors
Behavioral Capability	Accessibility and affordability of clean water, soap and skills to complete hand washing process
Expectations	Understanding benefits of hand washing
Self-Efficacy	Awareness of health promotion behaviors (i.e. handwashing) and confidence in completing behavior independently
Observational Learning (Modeling)	The behavior has been correctly modeled for future completion
Reinforcements	Rate of diarrheal disease within family decreases after incorporating behavior into routine

Figure 2. Social Cognitive Theory ("Theory at a Glance: A Guide for Health Promotion Practice" 2005)

In almost every FGD, women expressed that their children are their lives, they would do anything for them, and even in times of great stress and sickness, seeing their face would cure any illness immediately. These women are selflessly dedicated to preserving the health of their children and family, but they are not always living in an environment that supports evidence-based health practices and positive behavior changes. Some women identified family, social, or spousal support as strengths, while other women did not seem to know anyone who could ease their workload. Women stated multiple times the role of a mother and obligated duties that all mothers should do on their own; therefore, it may be an issue of encouraging the women to not accept the belief that mothers must do everything on their own. Women need to have consistent

and stable supports to protect their health and the health of their children.

Unfortunately, creating a physical and social environment that supports empowering women to complete health promotion behaviors is only one strategy to improve behavior performance. This may increase opportunities to perform these behaviors, but other factors must be taken into consideration to motivate women to perform the behaviors routinely and effectively. For example, one woman's response about washing her hands "mostly" with soap can be interpreted in multiple ways. The woman may be referring to a lack of access to soap or to an issue related to routine use of soap during completion of handwashing behaviors. Another woman's response about knowing that it is best to boil water before use, but admitting that women do not always complete this behavior demonstrates that motivation to perform evidence-based practices is multifactorial. Knowing which behaviors are best is not always enough to ensure proper hygiene of the infant.

As detailed below in Figure 3, constructs of the Health Belief Model such as perceived susceptibility to illness were addressed when mothers voiced fear of infectious tropical diseases such as malaria and dengue fever, which they knew to be deadly and higher in incidence during the monsoon season. However, perceived severity of other issues varied, such as the women's outlook on the water situation in the local villages. In one particular village, a woman stated that access to water could be obtained only every four days. However, because this is a situation that the women had encountered before, it was not framed as a problem but as a social norm that requires them to overcome and "make do" with what they have. Because they were not accustomed to routine access to water, they may not be aware of the real or perceived benefits to carrying out health promotion behaviors that require clean water. Regardless of the number of women reporting insufficient access to water, if availability of clean water is not

consistent adverse infant health outcomes related to access to health promotion resources will remain an issue of public health concern.

CONCEPT	EXAMPLE
Perceived Susceptibility	Fear of infectious tropical diseases such as Malaria, Dengue Fever
Perceived Severity	Awareness that lack of completing health promotion behaviors leads to adverse health outcomes
Perceived Benefits	Awareness that completion of health promotion behaviors leads to optimal health outcomes
Perceived Barriers	Lack of monetary resources, transportation, geographic isolation from resources
Cues to Action	Areas of improvement and situations for potential behavior change recognized
Self-efficacy	Confidence and capability to perform behavior and control health status

Figure 3. Health Belief Model ("Theory at a Glance: A Guide for Health Promotion Practice" 2005)

6.3.2 INTERPERSONAL LEVEL

Although the FGDs mainly explored the range of needs women have when addressing the health of their family, they also outlined strengths such as familial support. Even in situations where health information and resources were extremely limited, family members worked together to make ends meet. Social support was a prominent strength identified by participants, which can also be considered as a foundation to build further capacity and empower mothers in the community in later studies. Future projects can measure women's support by asking them how many people in their lives they can go to for financial or social support in times of need. Comparing their responses to their demographic information and current health status, as well as the health of the family would help measure the impact of perceived social support on health.

Women are informed by various members of the community, healthcare professionals, family, and friends about information related to proper childcare and household practices.

Children are consistently recognized as a priority, and women take extra precautions to safeguard their health. However, when mothers sacrifice their own health and hygiene status for their children, they lose sight of evidence-based practices, and their indifference to or lack of awareness of appropriate health behaviors puts children at risk for adverse health outcomes. Women mentioned feeding their children whatever food was available, but they did not once talk about how they supported their own nutritional needs. Women are in need of additional support on the interpersonal level to address their health and the health of their infant when necessary.

6.3.3 COMMUNITY LEVEL

On more than one occasion, mothers brought several, if not all, of their children with them to FGDs. Although the goal of the project was to learn more about behaviors and barriers contributing to adverse health outcomes for infants, creating solidarity among females in the community was highly encouraged. Creating a venue for women to continue these discussions in the future among other community members may create an opportunity for women to increase their self-efficacy and optimize related family health outcomes. Women may have awareness of evidence-based practices or problems affecting their health, but it is not sufficient to protect their health when health promotion resources and services are not available, affordable, or accessible.

Interestingly enough, there was much talk of differences in accessibility and awareness between women in FGDs, which shows that disparities exist not just between but also within villages. This often resulted in back and forth discussions between two or more women who each felt themselves more knowledgeable about the realities of living in their village. Despite these debates between participants, there was still very much a sense of camaraderie, and

women would not only support the views of other women, but also support them in FGDs by hushing their children or holding them so the mother could participate. In some FGDs, this created an interesting dynamic, where women seemed more friendly towards each other after the discussions had ended. These interactions suggest that there is the capacity for women in the village to conduct future meetings to identify important structural changes that must be addressed within villages.

Perhaps the most intriguing observation was of the level of cooperation and solidarity among women in the community. Not only did women assist in the caregiving of other women's children during the FGDs, but they acknowledged the value of listening to others. In addition, women in several FGDS, some of whom had never received formal education, specifically asked for education, stating that, if something further should be done to protect the health of themselves and their family members, to tell them. It is precisely this advice that must be taken from the women who largely represent the community. Women both perceive the need for education and actually need education, and once the limitations of knowledge are addressed, they can build community capacity and implement sustainable changes to take control of their health and the health of the community.

6.3.4 ORGANIZATIONAL AND POLICY LEVELS

Women demonstrated a lack of depending of organizational systems, such as transportation, which affects health outcomes when community members are geographically isolated from health and sanitation resources. Waste disposal was another service that was not always provided, which resulted in one village burning its excess trash. Burning may eliminate the presence of trash, but it also increases air pollution and as a result respiratory illness in the village area. These problems identified by women are not problems they can readily address individually.

Mothers have identified strategies for adapting to these limited resource settings, while still maintaining hygienic practices in the home. Women demonstrated motivation and determination in their ability to obtain water and other vital health resources. When asked to identify problems related to accessibility and availability of these resources, women rarely identified problematic situations. Living in a limited resource setting has resulted in the normalization of these "problems," which are identified as common daily obstacles that must be overcome. They are structural problems that require attention from organizations and governing bodies; however, building community capacity and support around these issues would allow community members to raise awareness and address necessary stakeholders for assistance.

Disparities related to caste status must be addressed in future research to understand the health concerns of these disadvantaged populations in Medchal Mandal. Further research on caste should try to measure how caste status impacts health status in SHARE INDIA's project area. Over 75 percent of the FGD sample was composed of women of scheduled or backwards castes, suggesting that a significant portion of the population may experience adverse health outcomes related to their caste status. Identifying the variance and representation of different castes in Medchal Mandal is only the first step in addressing the needs of this population and understanding strategies for optimizing the quality of life from infancy onward.

6.3.5 THE INTERACTION OF BARRIERS AND DETEMINANTS ON THE INDIVIDUAL, INTERPERSONAL, ORGANIZATIONAL, COMMUNITY, AND POLICY LEVELS

Barriers such as lack of monetary resources and transportation related to geographic isolation from healthcare resources were perceived obstacles that participants did not know how to address. Cues to action are few, most likely because campaigns to encourage health promotion behaviors are not present. Improvements in individual, family, and community health are possible, but there are not presently opportunities to cue community members to health

promotion behaviors, therefore, they may feel that changes are beyond their control. Further meetings where community members can discuss shared opinions could be used to build capacity and support of community members, plan structural interventions, and promote awareness of local health issues and efficacious behaviors.

The Social Ecological Model is helpful when trying to understand the strengths and weaknesses raised in the responses of the FGDs. Issues of accessibility and awareness of health promotion behaviors and resources are not just a problem on the individual level, but on every level. The absence of schools and local supports affects health at the community level, and lack of education of the mother either related to her caste, financial background, or status as a woman also affects her health, as well as the health of her family. Scholarly research upholds completion of education, financial responsibility, and household autonomy as crucial determinants of both the health of the mother and infant (Mistry et al., 2009). Despite these statistics, India currently spends 1.3 percent of government expenditures on health and three percent on education (*India Country Statistics*, 2012). The health of the mother is directly dependent on her level of education, and while 74% of all girls in India aged 15-24, the prime age for motherhood, are literate, there are still many disparities between rural and urban populations (*India Country Statistics*, 2012).

7.0 CONCLUSION

7.1 PUBLIC HEALTH IMPLICATIONS FOR FUTURE WORK ON INFANT MORTALITY IN MEDCHAL MANDAL

The issue of infant mortality in India is attributed to underlying issues of poverty, caste status, geographic isolation, healthcare access, environmental sanitation, and access to clean water and health promotion resources. Focus group discussions with mothers of infants in the rural southeast Indian villages of Medchal Mandal were conducted to assess the relationship between health promotion behaviors in the home environment and the occurrence of infant mortality. Women's responses during discussions supported researchers' perceptions that access to health promotion resources, and awareness, understanding, and performance of health promotion behaviors are topics for future research and intervention activities in the target population to begin to address the infant mortality rate. In the following sections, the implications of focus group discussion results are detailed to inform future research and intervention activities among the target population.

7.1.1 THE USE OF FOCUS GROUPS TO CONDUCT RESEARCH IN INDIA

It is recognized by the researchers at SHARE INDIA that families residing in geographically isolated and underserved areas are at a highest risk for mortality, especially if the mothers have not received a formal education (Kusneniwar et al., 2011). These FGDs were the first qualitative project on health promotion practices among the target population in Medchal Mandal. In-depth interviews have been used among health workers to discuss their attitudes towards health services in rural populations, and the Young Lives Project has worked with children and community leaders to understand quality of life in different areas of the world (Vennam &

Komanduri, 2009; Rao, Ramani, Murthy, Hazarika, Khandpur, Chokshi, Khanna, Vujicic, Berman, & Ryan, 2010). The utility of focus groups has been tested among rural populations in the state of Gujarat, India and focus groups in the state Maharashtra have been used to understand differences in weight between men and women in India (Bilkis, Abdool, & Dupere, 2002; Chorghade, Barker, Kanade, & Fall, 2005). However, literature reviews suggest that focus groups have not been implemented to the same extent as they are in other countries. As a result these focus groups will add depth to previous quantitative research among other populations in limited resource settings.

7.1.2 UTILIZING FOCUS GROUP DATA TO IDENTIFY NEEDS

Researchers of SHARE INDIA predicted the needs of Medchal Mandal residents to be related to awareness of health promotion behaviors, as well as accessibility of resources to promote specific evidence-based health behaviors. Through the analysis of participants' responses, themes of awareness and availability were identified as relevant public health concerns. FGDs were utilized as an exploratory approach for measuring the community's needs and to observe if their expressed needs overlapped with the researchers' predictions of perceived needs. Participant observation, although utilized by the observer of the FGDs on visits to the local villages, could be extremely helpful in beginning to identify the accuracy in performing health promotion behaviors. Further interventions that occur on a one-on-one level would allow for greater attention to participants and would give them an opportunity to ask questions and apply health promotion behaviors effectively in the appropriate situations.

FGD data will allow SHARE INDIA researchers to have a better understanding of the interactions between family members and how these relationships influence priorities in hygienic routines and actions related to health prevention. Meeting with local women in a small

and intimate setting enabled researchers to discuss influential risk factors and their emergence in the home environment. Data will guide future research activities in identifying obstacles to receiving optimal resources for proper sanitation and evaluate possible channels to educate women who do not have prior knowledge of effective public health practices, in hopes of decreasing the development of infections and other preventable health outcomes.

7.1.3 UTILIZING FOCUS GROUP DATA TO DESIGN A COMMUNITY-BASED INTERVENTION

The FGD assessment has allowed researchers to discern formidable obstacles in accessibility and awareness of health promotion behaviors and resources, and will provide a foundation for creating tangible and practical solutions to address community health needs. Future research should prioritize collaborating with the local community members to create and implement an effective community-based behavioral intervention. The success of the intervention is entirely dependent on the involvement of the community members in assessing their needs. A community-engaged approach in future research would be especially helpful in ensuring that the perspectives of the local residents are represented accurately in collection and interpretation of data results. Working with the community as a partner to deliver needs-based educational interventions will help community members begin to address the issue of infant mortality and preserve the health of the family.

Although the FGDs were useful in assessing participants' knowledge base, the environment was not appropriate for educational purposes. Educational workshops with mothers who are each accompanied by one or more of their children results in far too much distraction, and is not time or cost effective. Implementing a health behavior and education intervention during the prepregnancy and pregnancy period, as well as throughout the first months of life of the child is necessary to decrease the rate of neonatal and infant mortality, because this is

the time when children are most vulnerable. Although the mother's involvement is paramount, educating other present family members in the home, especially other women would be very efficacious in increasing awareness. In addition to education, the home environment should be assessed to determine the feasibility of proper completion of health promotion behaviors.

Creating and implementing an effective community-based behavioral assessment is entirely dependent on the involvement of the community members in the assessment of their needs. Due to a significant lack of assistance and surveillance by institutions and governing bodies, and a lack of community resources, it is necessary to intervene at multiple levels of the Social Ecological Model. This will ensure that strategies for behavioral changes are being directed at individuals at highest risk for adverse health outcomes and their local leaders, who can set an example for their constituents. The community members and their leaders experience the constraints of living in a limited resource setting each day of their lives. The community members are aware of the barriers to improving health; they are the experts and their input is necessary to address fundamental health issues and create sustainable change. Future discussions with additional local members of social networks such as spouses, mothers, and mother-in-laws could also benefit researchers, and help in the designing of tailored health promotion and education messages that appeal to all stakeholders.

7.1.4 FUTURE DATA COLLECTION

While theories and current literature are relevant when trying to understand behavior and motivations for behaviors, further information about the cultural, environmental, social, and geographic history of the local community may be obtained in the future through ethnographic research. Gaps in national database systems must also be addressed to increase awareness of the health outcomes in rural, limited resource settings of India. Comparisons to national data on the

topics of infant health and mortality were made; however, data within states and villages is not complete and therefore unavailable for comparison. Census data on many villages in Medchal Mandal are absent from the national government's database; some villages do not even appear when searched in the census database. However, data from SHARE INDIA or other local sources on this population may be available to establish a baseline. This further supports the suggestion to conduct ethnographic and demographic research on the villages of Medchal Mandal for future health research purposes. Creating demographic profiles for each village would be invaluable in assessing barriers to accessibility and availability of resources, and help to prioritize villages that are at the highest risk for adverse health outcomes. Recruiting an anthropology student in the future to do an ethnographic study on the villages of Medchal Mandal could provide the foundation for a comprehensive database of individual village strengths and needs. Future assessments of access to healthcare amenities must acknowledge the importance of the holistic and alternative medical systems of India and their capacity to treat health concerns.

In the ethnography process, social network patterns may also be identified to further understand how women seek health information or make decisions about healthcare-seeking behaviors. These particular questions were addressed in FGDs; however, they were discussed on a limited basis. Another approach that assessors originally considered involved discussing topics from the FGDs not only with the mothers, but also with their mothers-in-law. When women in India marry, traditionally the couple immediately moves into the home of the parents of the husband. As a result, the mother-in-law becomes the matriarch and her opinion is valued above all others. Involving members of women's social support network would help to add context on how behaviors occur within specific social networks, and allow for researchers to explore differences between different cohorts or generations.

The influence of social support in taking care of the children, household duties, and other responsibilities was explored in FGDs, but further research on these topics is necessary to distinguish motivations for seeking health information and resources, as well as reasoning for consulting with different members of social networks. In addition, measuring the value women place on information they receive, and their perceived credibility of sources such as comparing the advice of a local doctor as opposed to a mother-in-law could be insightful. Subsequent information revealing whose advice women decide to follow would help in selecting a secondary population to target in further health education interventions.

7.1.5 SUSTAINING OPTIMAL HEALTH OUTCOMES IN A LIMITED RESOURCE SETTING

Public health implications must consider less controllable situations that arise when working in a limited resource setting. In order to complement the data found from FGDs, mapping the resources of participants in each village by outlining the Strengths, Weaknesses, Opportunities, and Threats (SWOT) could be highly beneficial. Each village, although within the same mandal, has its own advantages and disadvantages based on its cultural, environmental, and social landscape. However, analyzing the multifaceted structure of each of the villages collectively will help to identify commonalities and contribute to the designing of a more informed and efficient intervention program.

The most formidable limitation of the project area is that if women and community leaders do not have regular access to water, providing health education and promotion materials is not a sustainable solution on its own. Change must come at the governmental/policy level to sustain optimal health outcomes.

Risk factors that are immediately affecting the mother and baby's environment are considered, but it is the socioeconomic and environmental influences in the home, which are considered the "root causes" of infant mortality (Kusneniwar et al., 2011). In the future it may be helpful to ask what women think are the root causes of infant mortality, as well as what they believe makes a child healthy and what makes them ill. Although this research project acknowledges the limitations of the home environment and suggests that home health practices may contribute considerably to rates of infection and subsequent infant mortality, cost-effective interventions such as handwashing, must consistently be performed in all environments to ensure necessary precautions are taken at each level of the Social Ecological Model.

At the individual level, data analysis suggests that community members want and need education on evidence-based health practices. Residents should be educated on how to wash hands properly, but if they do not have regular access to water, let alone clean water and disinfectants, then education is not a sustainable solution on its own. In addition, even when access to clean water and education is widespread, health behaviors are still not regularly practiced. Awareness campaigns and one-on-one consultations on home health practices could help to ensure that community members understand the consequences and benefits of health promotion behaviors.

Working in a limited resource environment among a growing population can present challenges for researchers and staff. While staff work tirelessly to improve health outcomes among disadvantaged populations, this leaves little time for evaluation of health program processes, because staff must meet the demands of a rapidly growing population. However, much has been accomplished and learned from previous work conducted at SHARE

INDIA, and recognizing staff at all levels for their contribution to the field is essential for informing future research activities as well as staff retention. It is a necessary component of research that allows researchers to give back to the communities they are serving, and strengthen their partnerships for future collaboration.

7.2 LIMITATIONS OF FOCUS GROUP DISCUSSIONS

This section discusses the limitations related to the focus group discussion activities that were conducted in the months of June and July of 2012 by the SHARE INDIA organization in seven villages of Medchal Mandal. Each of the following section discusses issues that should be considered in the implementation of future research and intervention activities in the project area.

7.2.1 SAMPLING AND RECRUITMENT

Due to the selection of convenience sampling as the preferred methodology for recruiting participants, sampling bias could represent a source of error in the collected data. Although villages were selected from each of the regions of the mandal, villages were selected according to their ability to identify enough mothers willing to participate in FGDs. The first FGD was originally planned and implemented in a tribal village of the mandal, but due to an issue of misinformation, participants were not aware of the actual purpose of the FGD as a research activity, and the FGD was not completed and all data gathered were destroyed. This decision was made by the observer and moderator, in order to uphold ethical guidelines, as well as to ensure the collection of reliable qualitative data. As a result, a tribal village was not included in the FGDs, and therefore the participants in FGDs are not representative of the population of Medchal Mandal. Tribal populations may have differed in their responses to focus group questions and expressed different sociocultural, environmental, or financial barriers, as

well as protective factors for addressing infant health. The specific strengths and concerns of this particular population should be identified and addressed in future research and intervention activities. In addition, it must be recognized that there will be a difference between mothers who volunteered to participate in the FGDs and those who declined to participate, since involvement in FGDs was completely voluntary.

While the inclusion criteria for the FGDs stipulated that each woman must have a child 12 months old or younger, not each participant met this criterion. It was decided by the moderator and observer of the FGDs that it would still be beneficial to include these women in the FGDs. Age of youngest child for each woman ranged from two months to 57 months, with the average age of the youngest child falling just over ten months old. Another demographic factor that should be highlighted is the number of children ever born to each woman. Each woman identified the same number of living children as the number of children they had ever given birth to in their lives. This signifies that none of the women reported the death of a child. However, female gendercide is a common practice in India, and it is possible women who have lost a child from infanticide or other causes may not report this loss. Since the sex of participating mothers' children was not collected, further hypotheses and correlations cannot be drawn on this topic from this data.

7.2.2 BIAS AND CONFORMITY

Another possible source of error involves participant bias in the delivery of responses to FGD topics and questions. Since mothers were asked these questions in the presence of other mothers, it is very possible that mothers answered questions with responses that they believed researchers desired. In addition, mothers may not have wanted to be judged or labeled according to their home health practices; therefore, conforming to the group by agreeing with responses given by a

previous mother would make the mother feel less threatened, as opposed to stating an opinion that was atypical from group norms. This could also be a result of the use of the word "we" instead of "I" by women participating in FGDs. By assuming that all women do things similarly, this assumption creates difficulty when women want to participate in discussions but represent a viewpoint that goes against group norms.

Trends were observed in certain villages for similar responses to the same question; however, it is hard to discern if these trends are due to conformity to group response or due to trends in actual social norms. Women may also be too shy to share their insight or in situations of social hierarchy, not understand the importance of hearing their voice. One woman in particular was also reluctant to respond because she did not trust that her responses would be kept confidential.

Instances of self-contradiction were observed and documented in FGDs, particularly when mothers were asked what is the ideal age range for breastfeeding a child. Several mothers changed their answers throughout the FGDs according to the collective opinions of other group members, which could also signify that women are paying attention to the responses of others and learning from their experiences for their own personal knowledge. This organic process of qualitative research is a limitation; participants have the opportunity to change their mind instead of deciding on one response to a question. This drawback is not as common in quantitative research, which often requires participants to choose one option in a close-ended rather than an open-ended format. However, the quantitative research setting is also usually more private than a focus group setting.

7.2.3 TRANSCRIPTION, TRANSLATION, AND LANGUAGE BARRIERS

The responses of focus group participants were translated literally and are presented in their original form in this thesis. As previously mentioned in the methods section, these responses

have purposely not been changed to be grammatically correct. Rephrasing participant comments into grammatically correct responses may result in the loss of the original meaning of the participant's response. Presenting the original translation ensures that the participants' disclosures are not distorted and allows for the reader to openly interpret the meaning of responses. However, the possibility of multiple interpretations of data can result in more questions about the participant's actual beliefs.

An additional limitation of the transcription and translation process is the grouping of participant responses. Because one transcriptionist was responsible for handwriting all responses and translating audiorecorded responses, it was difficult to note individual responses when multiple women spoke at once. As a result, when women responded together to a question and were in agreement in their responses, it was noted in the transcript that multiple women responded identically. The response cannot be attributed to one woman, because it is not certain exactly which woman responded as quoted. Instead multiple women are listed as responding similarly at the same time. The presence of crying, talking, and other noises from small children in attendance may have further complicated accurate translation of women's responses. This is an important observation to remember and address when conducting qualitative research in the future.

The FGDs served as a valuable assessment of community health in Medchal Mandal, by adding rich qualitative and contextual background to previously collected quantitative data. However, FGDs would have been more interactive and insightful if more discussions could have been conducted among smaller groups of women, or with women who did not have their children present. Linguistic barriers of the MPH student who observed FGDs were also an

obstacle, which must be considered when conducting future research projects among the indigenous population. In retrospect, the needs and capacity of the stakeholders, primarily the mothers in the villages who directly impact the health of the family, could have been initially assessed through meetings with CHVs. However, due to the language barrier of the MPH student and dependence on other native speakers, this activity was not possible in the time allotted for the research activities. Meetings with the Sarpanch, Gram Panchayat leaders, and Anganwadi workers could also be useful in beginning to understand community leaders' perceptions about their community's health.

7.3 RELEVANT EVIDENCE-BASED INTERVENTIONS FOR FUTURE RESEARCH ACTIVITIES: INCREASING COLLABORATION BETWEEN ALL LEVELS OF THE SOCIAL ECOLOGICAL MODEL

The complicated global issue of infant mortality is manifested in various countries and societies throughout the world. While the same outcome occurs in each of these settings, the pathways and mechanisms that lead to infant mortality are multifarious and burdensome. While some challenges are more prominent in some societies than others, consistent communication and collaboration between international maternal and child health stakeholders is invaluable in establishing a global partnership and commitment to overcoming high rates of infant mortality. In the following sections, evidence-based interventions targeting outcomes of maternal and child health, and more specifically infant mortality at each level of the Social Ecological Model, are addressed to provide potential strategies to inform future research and intervention activities at SHARE INDIA. These interventions each support a combined interdisciplinary effort from stakeholders at multiple levels of the Social Ecological Model to address adverse infant health outcomes.

7.3.1 THE INDIVIDUAL AND ORGANIZATIONAL LEVELS

Research on in-home interventions with mothers of newborns has shown that early education and promotion of evidence-based health behaviors decreases the risks of stillbirth, neonatal, perinatal, and infant mortality (Bang, Bang, Baitule, Reddy, & Deshmukh, 1999). Programs have utilized community health workers to implement interventions, which have been found to increase performance of efficacious health behaviors in the home for costs as low as 5.30USD per woman (Bang et al., 1999). Programs placing health workers in the home following delivery have successfully helped women to manage adverse health situations as they develop, and provide them with the necessary knowledge and tools to take control of their health and the health of their family. An intervention utilizing community health workers in the state of Haryana, to implement postnatal visits and women's group meetings to address issues of infant mortality and sustain effective health practices in the home found that IMR was significantly lower in the intervention group, when compared to the control groups (Bhandari et al., 2012).

Meta-analyses of intervention programs that utilized community health workers in South Asia for home antenatal visits found a decrease in risk of neonatal mortality and stillbirth, as well as an increase in the performance of evidence-based antenatal health promotion behaviors (Gogia & Sachdev, 2010). In-home interventions and an emphasis on both preventative and treatment based activities were found to increase the rate of child survival (Gogia & Sachdev, 2010). Another in-home intervention utilized interviews to evaluate the effectiveness of health promotion behavior training by community health workers and found that infants receiving postnatal visits during the neonatal period had a 34 percent lower rate of mortality than the control group (Baqui, Williams, Rosecrans, Agrawal, Ahmed, Darmstadt, Kumar, Kiran, Panwar, Ahuja, Srivastava, Black, & Santosham, 2008). Seventy-five percent of the decrease in mortality was observed in the first three days of life (Baqui et al.,

2008). A similar intervention that utilized community health workers in the home to manage, diagnose, and treat neonatal care issues found a 37 percent decrease in neonatal mortality and a 24 percent decrease in perinatal mortality (Bang et al., 1999). Neonatal care was provided to each mother in her home for approximately 5.30USD (Bang et al., 1999). These interventions are primary examples that not only confirm the importance of educational interventions during the neonatal period, but provide evidence that behavioral interventions can produce tangible results and be cost-effective.

In these interventions, concepts of Social Cognitive Theory are utilized and explain the process of introducing evidence-based home health practices. Reciprocal determinism is demonstrated when the community health worker, a layperson with rapport and trust between the participant, addresses the situation in the immediate home environment of the participant, where they are most comfortable and aware of their surroundings. The worker models the behavior until the participant can master the skills on her own, giving the participant the opportunity to observe how correctly performing the behavior aligns with expectations and perceived benefits. The behavior is reinforced by a lack of illness in the home, as well as the encouragement of the community health worker, eventually resulting in increased self-efficacy of the participant.

The Integrated Management of Childhood Illness strategy has been utilized in various regions of India since 2003, and has resulted in the training of over 200,000 health workers (Bhandari, Mazumder, Taneja, Sommerfelt, & Strand, 2012). After implementing this strategy in the state of Haryana in a cluster randomized trial, a significant interaction was identified between the location of the birth and the impact of the intervention on neonatal mortality (Bhandari et al., 2012). This study also found that there was a lower neonatal mortality rate

for children born in the home who received the intervention than the children born in the hospital who received the Integrated Management of Childhood Illness intervention (Bhandari et al., 2012). This finding could be attributed to the lack of a definition available for identifying an institution as a healthcare facility, yet it presents evidence on the effectiveness of conducting in-home interventions. Regardless of the location of birth, there are also simple cost-effective interventions, such as kangaroo care immediately after birth, which has been shown to decrease the risk for infant mortality (Singh et al., 2012).

7.3.2 THE ORGANIZATIONAL AND POLICY LEVEL

Deliveries within healthcare institutions are encouraged worldwide, and while homebirths are often thought to be associated with a lack of education and lower rates of postnatal care, studies have shown positive outcomes associated with homebirths (Singh, Padmadas, Mishra, Pallikadavath, Johnson, & Matthews, 2012). In fact, it was shown in the 2011 report for SHARE INDIA that delivery within healthcare institutions is not a protective factor for infant survival (Kusneniwar et al., 2011). However, the exact definition of delivery in an institution is unclear, because institutions vary in their number of medical employees, resources, size, training qualifications, and services offered to the public.

Additional interventions have been conducted in rural geographic regions of India, which promote the previously addressed Special Care Newborn Units (SCNUs) in various hospitals to address high rates of neonatal mortality (Neogi et al., 2011). Case-fatality rates and mortality attributed to sepsis and low birth weight declined over a two-year period; however, issues of "repair and maintenance of equipment" created difficulties for staff in meeting the needs of patients (Neogi et al., 2011). This study recognized that a lack of human capital, social capital, and resource acquisition persists, and must be addressed to improve the health status of future

patients. Having a "higher density" of physicians available for treatment was shown as a protective factor in infant mortality, while the existence of "out-of-pocket expenditures" for healthcare was identified as a risk factor (Muldoon et al., 2011). Creating a standard list of criteria that must be met by each healthcare facility, such as availability of trained birth attendants, knowledge in addressing emergency care situations, accessibility of proper medical equipment and supplies, and promotion of environmental hygiene measures could enhance the immediate child delivery environment. Creating a safe environment that supports optimal birth outcomes for the child is paramount in ensuring that children are properly cared for in their early and most vulnerable stages of life and development.

7.3.3 THE INDIVIDUAL AND COMMUNITY LEVELS

While it is crucial to improve the quality of healthcare settings, the conditions of the home environment are equally capable of sustaining or diminishing the potential for positive health outcomes. Availability of potable water sources and proper sanitation and hygiene resources is a barrier for individuals living in rural, limited-resource settings of India. Global analyses on the relationship between accessibility of sanitation facilities and materials, accessibility of clean water, and the rate of infant mortality found a decrease in IMR when access to water and sanitation resources were improved (Muldoon et al., 2011; Cheng, Schuster-Wallace, Watt, Newbold, & Mente, 2012). These same factors were also linked to a decrease in the rate of maternal mortality (Muldoon et al., 2011; Cheng et al., 2012). While there was an independent association between the acquisition of clean water and sanitation materials and better health outcomes for mothers and children, each of these determinants have an overwhelming impact on creating sustainability and stability for disadvantaged populations (Cheng et al., 2012). The intricacy of and interrelation between environmental sanitation, water quality, and health status

cannot be ignored, and further consideration of how each of these millennium development goal targets has a multidirectional relationship will allow key stakeholders to address future complex health situations.

7.3.4 THE INDIVIDUAL, INTERPERSONAL ORGANIZATIONAL, COMMUNITY, POLICY LEVELS

A review of the current literature on infant mortality and health behavior interventions with mothers has revealed a myriad of opportunities for future health education programs. Addressing trends of high IPV and creating access to quality healthcare resources for emergency cases will require the involvement of health professionals and government leaders, while increasing utilization of postnatal care and the number of available skilled birth attendants and delaying births to increase chances for child survival will require the commitment of community members. Inequalities in access to postnatal care will need to be confronted, especially for marginalized populations of women, and evidence-based practices must be utilized to ensure the greatest chance for survival and development. Routine evaluations of healthcare facilities and systems based on quality improvement are necessary to recognize efficacious approaches to this complex global health issue. Working to build community capacity and involvement in poor limited-resource settings will provide benefits in increasing positive health outcomes when there are issues of geographic isolation. Infrastructure issues such as government corruption, establishment of more sanitary environments, and improvement of water quality are long-term goals, which can be addressed over time to ensure sustainability. Finally, further efforts to increase the number of opportunities of education and employment for Indian women and promote gender equality are necessary initiatives to improve the health of the family.

PERSONAL REFLECTION

It is impossible for me to put into words the impact my work in India has had on me. I attempted to write a speech to share with staff on my last day in India, and was never able to share its contents. However my thoughts of my coworkers and my gratitude are now as they were last summer.

> *Just over two months ago, I arrived at 6 in the morning, after 36 hours of traveling in the village of Ghanpur. I was sweaty, exhausted, and after months of preparation, completely unprepared. The first few days I was terrified, but then I started talking to people and realized something. It is the people, not the places, sights, or food, although those all help, that make everything worthwhile. There have been so many times here where I have missed home, and then you all reminded me that this could be my home, too.*
>
> *I find it very ironic that our organization is called SHARE, because that is all anyone here ever does. They share not because they have to, but because they want to. They share their food, always too much and too spicy for me, they share their stories, and they have let me into their homes and their hearts. I originally came here for my project to focus on changing people's behavior in order to improve their health. But now I wonder, when I have come to this country, where people have welcomed me so graciously, why I would ever want to change a thing. Why would I ever want to change people here and their behaviors? I am scared to think of what else would change along with it.*

I have come to each of you at one point or another with nothing, but questions and requests and you have all helped me never expecting anything in return. There are many people here I can't even have conversations with, but they would bend over backwards to do a favor for me. It makes me sad that I cannot talk to them all. Because I would tell them each personally how much they mean to me and how they have each in some way changed me as a person and given me the most unforgettable summer of my life.

India is a wonderful country with the most welcoming and kind-hearted people I have ever met. If there are people like you all anywhere else in the world, it's surely not anywhere I've ever been. People are impersonal, task-oriented, and don't stop to take the time to enjoy the moment. An acquaintance here told me, "you live in time, we live in eternity," and it's so true. And I could live an eternity here and be happy.

So today is my last day and this is something I am not ready to grasp. You have treated me like a daughter, a sister, and a friend. I can never repay you all for your kindness. But just offer my thanks, love, and blessings. But I will be back, I promise. There is no way that I could not come back. So thank you all for the most amazing summer of my life. I will miss you all terribly. Hopefully when I return, I will be fluent in Telugu, but I make no promises.

Chala thanks.

APPENDIX: FOCUS GROUP DISCUSSION QUESTIONS

Women's Perceptions and Behaviors Involving Care of Infants

1. We are interested in the way that mothers care for their babies. Tell us what mothers do from morning to evening to take care of their baby. (Probe: materials for completing tasks, special place for bathing or separate bathroom, materials for bathing, actions after bathing)

2. I'd like to talk to you about feeding your child. How do you currently feed your baby? What is your opinion of bottlefeeding versus breastfeeding? How important is the way that mothers decide to feed their babies? Describe to us everything mothers do before feeding the child. Do you wash your nipples before breastfeeding? Do mothers give anything to the infant other than breast milk or formula? How are you situated when you feed the child? (Probes: sitting during the day or sleeping with them at night) Where does your child sleep? (Probes: In bed, on floor, on mat, with you and husband, alone, with siblings)

3. Where do mothers put the baby's waste? What do mothers do after they dispose of the baby waste? How do mothers keep the environment of the baby clean?

4. Now I would like to talk to you about cleanliness. How do mothers keep their hands clean? Do mothers and other family members wash their hands? When do mothers wash their hands? What do mothers use to wash their hands? Do families have a special place in the house for washing their hands? What do mothers do after washing their hands?

5. How do you take care of yourself and what practices do you do during your menstrual cycle? (Probes: use rags, wash self) How often do you perform these practices? Are there certain activities you no longer perform during this time? (Probe: bathing, cooking)

Environment and Home Health Practices and Beliefs

1. Do you have sufficient access to water for your family? When water is not available how do mothers care for themselves and their family? (Probes: affordability, accessibility, quality)

2. Do mothers do the laundry in the household? If not, who does? Are all of the family members' laundry done at once? Are the family members' clothing washed in the same container with the infant's clothing?

3. How do you perceive your village environment? What would you change about your immediate surroundings?

4. We have talked about hand-washing, taking care of the health of the child, bathing, and laundering. Where did you learn about these practices? (Probes: family members, television) Do mothers think that their knowledge of bringing up children increases when they become mothers? What is the level of involvement and support of your husband and family members? How does this affect a mother's health?

5. Why do you perform these health practices? What are the benefits and consequences of these health practices? Do you have sufficient freedom or any restriction in the household from doing what you want to do for your health? (Probe: Affordability) What are some of the health problems that mothers personally worry about (not necessarily health problems you have, but which you are concerned about getting)?

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