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Maternal, Newborn, and Child Health After the 2015 Nepal Earthquakes: An Investigation of the Long-term Gendered Impacts of Disasters

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Abstract

Introduction Natural disasters in resource-poor countries have differential effects on socially disadvantaged groups such as women. In addition to the acute reproductive health needs of women during the immediate response phase of a disaster, research suggests that maternal, newborn, and child health (MNCH) may continue to be seriously impacted for numerous months, even years, after the event. *Methods* This ethnographic field research investigates the impacts of the 2015 Nepal earthquakes on mothers and children under five on the 6-month anniversary of the earthquakes. *Results* Though families were not channeling household funds away from health care expenses for pregnant and lactating women and children under five, the findings suggest that a delayed response by the Nepali government in administering funds for rebuilding combined with an ongoing fuel crisis were negatively impacting families' abilities to provide adequate shelter, warmth, cooking gas, and transportation for mothers and young children. This study highlights the importance of understanding the impacts of specific social and political contexts on intra-household family finances as they relate to MNCH, not just variables related to the disaster itself. *Discussion* Future research and policies on

MNCH during the long-term recovery period after a natural disaster such as the 2015 Nepal earthquakes therefore should take into account the social and political context as well as institute multiple periodic assessments of MNCH in the first few years following the disaster.
AQ1

Keywords

Disaster
Gender
Qualitative methods
Maternal health
Intra-household resource allocation
Nepal

Significance

Global humanitarian organizations and scholars alike recognize the significance of the health needs of pregnant and lactating women and their children in the acute response phase following a natural disaster, but the long-term effects of disasters on maternal and child health are less well understood. This qualitative research contributes to building a better understanding of the latter in resource-poor countries through investigating one of the hypothesized mechanisms, intra-household resource allocation, in post-disaster Nepal.

Introduction

Natural disasters in resource-poor countries have differential effects on socially disadvantaged groups such as women. Challenges to women's health in post-disaster settings arise from interrelated biological and social determinants: reproductive health needs combined with an intensification of existing social inequities along the "intersectional" (Crenshaw 1989) lines of gender, wealth, caste, ethnicity, and education. In addition to developing the concept of vulnerability, which recognizes that subpopulations are at differential risk to a natural disaster according to social status, disaster

scholars have divided the stages following a disaster into the immediate response phase, which involves emergency relief, and the recovery phase, which involves rebuilding structures and infrastructure (Hewitt 1997; Wisner et al. 2004).

In the immediate response phase following a disaster, women face a wide range of reproductive health challenges. These include pregnancy or birth complications, breastfeeding challenges (DeYoung and Suji 2017), or difficulty obtaining adequate and sanitary supplements. Other women may experience a shortage of sanitary means to manage menstruation. These gender-specific challenges occur in combination with the more generally experienced lack of adequate shelter, clothing, food, or clean water (Committee on Health Care for Underserved Women 2010). A disruption of health services may create secondary difficulties for pregnant, birthing, or postpartum women who need medical care. When forced to live in temporary shelters or camps, women may be exposed to harassment and assault from non-family members. Women are more likely to experience physical and sexual violence due to the disruption of customary routines and relations that provide physical security (~~Committee on Health Care for Underserved Women~~American College of Obstetrics and Gynecology 2010; Farmer 2011; Thornton and Voigt 2007; United Nations High Commissioner for Refugees 2003). In addition, researchers have even attempted to study the biological effects of natural disasters on prenatal maternal stress and the implications for birth outcomes (Dancause et al. 2011) and early child development (King et al. 2012). In these multiple ways, women-- and their young children—are susceptible to specifically gendered health problems immediately following a disaster.

AQ2

In addition to the acute health needs of women during the immediate response phase of a disaster, research suggests that maternal and infant health may continue to be seriously impacted for numerous months, even years, after the event due to the gendered dynamics of household economics and care-giving. During the lengthy recovery phase, the pre-disaster familial duties of women are magnified and expanded, yet they have fewer resources and support compared to prior to the incident. Women typically bear the

duties of caring for children and the elderly as well as the injured and the sick. Moreover, what occurs at the household level with family finances during the long-term recovery period may significantly impact maternal, infant, and child health. In the wake of disasters, families may cut spending on medicine, education, and nutritious foods. In the case of typhoons in the Philippines, researchers observed an increase in infant deaths in the year following the disaster, including many infants who were not conceived until after the disaster. Their findings suggest an indirect, long-term economic impact of the typhoon on infant health, resulting from intra-household resource allocation (Anttila-Hughes and Hsiang 2013). Analyzing population data from India, Datar et al. (2013) found evidence that after disasters households diverted resources toward male children, suggesting that one of the ways disasters impact child health is through long-term effects related to the allocation of limited household resources.

Global humanitarian organizations and scholars alike recognize the significance of the health needs of pregnant and lactating women and their children in the acute response phase following a natural disaster, but the long-term effects of disasters on maternal, newborn, and child health (MNCH) are less well understood. This qualitative research contributes to building a better understanding of the latter in resource-poor countries through investigating one of the hypothesized mechanisms, intra-household resource allocation, in post-disaster Nepal. Previous studies in Nepal on intra-household decision making indicate that mothers eat last and consume the least nutritious food, which can lead to micronutrient deficiencies (Gittelsohn 1991; Gittelsohn et al. 1997; Messer 1997), and may not be able to modify their subsistence labor or diets during pregnancy or lactation (Panter-Brick 1989; Brunson 2017). Mothers also perceive the illness status of male and female children differently and seek medical care accordingly (Pokhrel and Sauerborn 2004). Such conditions may be intensified during times of displacement and financial stress.

This field research investigated the impacts of the 2015 Nepal earthquakes on mothers and children under five on the 6-month anniversary of the April 25th and May 12th earthquakes in Nepal. The project design was an in-depth, qualitative inquiry into decision-making processes at the household

level of families in a peri-urban region whose homes were destroyed. Six months after the earthquakes, I investigated whether they diverted their incomes or savings towards rebuilding and recovery and away from things like maternity care, doctor visits for a sick infant, or nutritious foods. Through the use of qualitative, semi-structured interviews, however, I was able to discover other significant factors that were impacting MNCH. As a result, I argue that future studies should expand investigations of long-term gendered effects of disasters to include the impacts of particular social and political contexts on intra-household family finances as they relate to MNCH.

Background

In the spring of 2015, Nepal was rocked by two major earthquakes, accompanied by a series of numerous aftershocks. The first earthquake, magnitude 7.8, struck central Nepal in the district of Gorkha on April 25th. It was followed by another 7.3 magnitude quake on May 12th in Sindhupalchok District. The epicenters were located northwest and northeast of the capital metropolis of Kathmandu. Nepal lies in one of the most seismically hazardous regions on Earth, so adequate planning and preparation could greatly reduce mortality and morbidity in future earthquakes in Nepal and the Himalayan region.

The 2015 earthquakes caused widespread destruction throughout the central districts of Nepal. Nearly 9000 people were killed and more than 22,000 were reported injured. More than 600,000 houses were destroyed and another 290,000 damaged, leaving hundreds of thousands of families without shelter (United Nation Population Fund 2015b). Damage to already limited infrastructure, in particular roads, interrupted the delivery of basic health care services and subsequent relief supplies. The total mortality from of the April 25th earthquake would have been greater had it not occurred on a Saturday just before noon, when children were not inside school buildings and people were less likely to be inside their homes.

Another critical factor for understanding the destruction is the fact that the epicenters were in rural areas, and therefore the greatest impacts were in the

countryside. This has multiple implications for who was affected. Highly impacted districts had far more people living in mud mortar structures than other areas, and mud mortar houses were far more likely to be destroyed than other construction types. Disadvantaged families living in mud houses were therefore more likely to have lost their lives or homes. The affluent are less likely to live in rural areas and tend to live in more robust structures (Michaels et al. 2015). There was also an important ethnic dimension to who was affected—a great number of Tamang families experienced loss of life and homes due to the fact that this ethnic group represents a significant proportion of the population living in the districts that were damaged the most. Even in the peri-urban location of this study, the northern edge of Kathmandu District, Tamang families live in most of the mud mortar homes constructed in the higher, rural periphery of the municipality. The fact that Tamang families were disproportionately affected cannot be dismissed as a coincidence related to historically inhabiting these areas in traditional style homes; scholars of Nepal argue that their vulnerability to natural disasters is related to poverty and a history of structural inequities and discrimination (Ghale 2015; Holmberg and March 2015; Magar 2015; Thapa 2015).

Methods

This qualitative field research was designed to explore whether the conditions of disaster recovery in Nepal experienced at the household level, such as the financial strain of saving to rebuild a home, created new or intensified existing challenges to MNCH. I selected a peri-urban, multi-ethnic region below the mountain ridge that separates Nuwakot and Kathmandu Districts, 2 of the 14 most affected districts designated by the Government of Nepal. Although all families in these districts faced financial and emotional repercussions from the earthquakes and aftershocks, and indeed the statement, “We are all earthquake victims,” was asserted to me again and again by various community members, for the purposes of this study I selected only families whose homes had been completely destroyed and deemed unrepairable. The area selected for this research is a meandering stretch of land, approximately three-four miles in length, which includes several rural villages and a few outlying neighborhoods of the bazaar below. The families living along this stretch of terraced, rural land experienced

significantly greater loss of homes than the families living a few miles downhill, towards the more developed economic center of the municipality. This was primarily due to their houses being constructed of mud rather than iron rebar and cement. The families who lost their homes were predominantly from the Tamang ethnic group, though being Tamang was not an inclusion criterion. Both of these points deserve further discussion below.

After identifying two settlements that experienced significant damage, two community volunteers assisted in identifying women in their respective settlements who fit the following criteria for this research. Families had to have experienced the destruction of their home, such that the remains of their houses were unrepairable, and either had a child under the age of 5 at the time of the interview or been pregnant at the time of the April 25th earthquake. I conducted semi-structured interviews in Nepali with 14 women over a period of 2 weeks, ranging from 45 min to an hour and a half, depending on the proclivity of the person to speak. In addition to the interviews with women who lost their homes, in the municipality center I observed and interviewed practitioners at the two pharmacies that provide health advice and medicine and at the Government Health Post where women had the option of giving birth for no fee. This research was conducted in accordance with prevailing ethical principles and reviewed by the university Institutional Review Board, and all participants gave their informed consent.

The majority of the 14 interviews were conducted in two small communities that experienced significant destruction. One location, for which I use the pseudonym Chiso Gau, was decidedly more rural and more difficult to reach. There was no paved road, and only narrow, steep footpaths connected a dirt road to the cluster of destroyed homes scattered across terraced fields. Vehicles, including everything from motorcycles to ambulances, had to stop at the dirt road below and could not reach the homes in this settlement. The other community, which I call Bikasi Gau, was undergoing major development, and becoming more of a neighborhood than a distinct village. A wide road was being paved through the community, along with clear-cutting and plotting for the development of homes and family businesses. Most of the homes were not immediately adjacent to the recently paved and expanding road, but the footpaths from their homes reached the new road in

less than 5 min.
AQ3

Three of the women I interviewed did not live in these two locations of concentrated damage, but were included since they lived in the municipality and had lost their homes. One lived on the paved road below Chiso Gau, and her house and her neighbor's had been destroyed in a small landslide. Another lived in the rural village just east of Chiso Gau, a location where, with additional research funding and time, I could have collected additional interviews. The third woman lived in the more urban economic center of the municipality, and the loss of her home, in contrast to those still standing around it, appeared to be due to poor construction.
AQ4

Most of the families interviewed were living in shacks made from corrugated galvanized iron (CGI), a few were living with relatives, and one was renting a room. DeYoung (2016) observed that these conditions create significant differences in the experiences of lactating women and infants in contrast to those who had to live in tarps and tents.

The semi-structured interview schedule included general questions on changes in living conditions, workload, income and savings, and allocation of intra-household funds since the earthquakes, as well as specific questions on access to nutritious foods, shelter, clean water, toilets, pre-natal care, trained birth assistance, post-natal care, infant care, and healthcare and medicine for children under five. English transcripts of the 14 interviews with mothers and the 3 interviews with health practitioners were analyzed using a combination of concept-driven coding and data-driven coding using NVivo (Kvale 2009; Emerson et al. 2011; Charmaz 2006).

Results

Women's Health Needs During Initial Response Phase

In the 14 most affected districts, a total of 1.4 million women and girls of reproductive age were affected by the earthquakes. An estimated 93,000 among them were pregnant at the time, with an estimated 10,000 delivering

each month and 1000–1500 at risk of pregnancy related complications requiring emergency obstetric care (United Nations Population Fund 2015b). Since a large number of reproductive health facilities, including district hospitals, were damaged or destroyed in the most affected districts, mobile reproductive health camps were conducted by the District Public Health Office and CARE with technical and financial support of the United Nations Population Fund (UNFPA 2015a). UNFPA, in coordination with the Ministry of Health and Population, launched a campaign called Dignity First that aimed to support women and girls "to maintain their self-respect and ability to provide for their families by supporting their needs for safety, security, hygiene, health and information" (UNFPA 2015b:5). This strategy included providing the mobile reproductive health camps, including reproductive health kits containing medical supplies, "female-friendly spaces" for women and children to congregate, and the distribution of "dignity kits" to individual women. Dignity kits consisted of a bucket containing essential supplies for hygiene and safety such as clothing, underwear, toothbrush and toothpaste, soap, towel, comb, reusable sanitary pad, and flashlight. UNFPA distributed approximately 56,000 dignity kits. Women participating in this research reported that volunteers from the Nepal Red Cross Society were the first to deliver relief kits to them, and local community volunteers, including youth organizations, monasteries, and political parties delivered various forms of relief as well .

AQ5

Maternal, Newborn, and Child Health During the Recovery Phase, Investigated at the 6-Month Mark

Interviews with mothers on the 6-month anniversary of the earthquakes revealed the emergence of a surprising combination of long-term effects of the disaster, preexisting social and structural challenges to MNCH, and the impact of politics. Analysis of interviews with women who lost their homes, local pharmacists, and medical practitioners at the local Health Post identified the following issues.

Family expenditures on women's and children's medical expenses were not being limited as a result of the earthquakes. Their husbands were typically

without income for approximately 1–3 months after the earthquakes, but at the 6-month mark family expenditures were similar to what they had been prior to the earthquakes. This was due to the fact that people were not rebuilding or even attempting to save for rebuilding; rebuilding was so far out of reach financially that it was not considered to be an option. A 24-year-old mother of one stated, “There is no money to begin building. We will keep living in this if we do not receive money from the government.” She was referring to a temporary shack built from CGI. Another woman stated that they probably could not begin to build a house for 2–3 years, and even if they received the government stipend for rebuilding, it would be insufficient to build a new home.

Families’ biggest concerns were the onset of the cold winter months while living in substandard housing. Many were living in houses constructed from CGI sheets. The temporary structures were drafty, cold, and damp, completely lacking insulation. A severe national fuel crisis of petrol and natural gas (unrelated to the earthquake) was making it difficult for families to cook. Many had run out of gas and had switched to using firewood gathered from the mountainside. Gathering firewood is a time- and labor-intensive task since it is in short supply in this area, and challenging for pregnant or lactating women. The forest on the ridge above their homes is a national forest, and cutting down trees is prohibited.

The women who were pregnant at the time of the earthquake reported concerns that it might have damaged their fetuses. A few reported going for an ultrasound, seeking reassurance that their fetus was healthy, and one woman reported terminating her pregnancy from a combination of fear that it had been harmed by the shaking and concern about the difficult living conditions the infant would face after birth due to the earthquakes. Relatives had insisted that they stand up during the earthquakes and aftershocks, instead of sitting or lying down, in order to protect their developing fetuses. Several women had husbands who were working abroad when the earthquake occurred; another had a husband who left to work abroad after the earthquake. The absence of husbands was a source of stress according to women.

Several of the major challenges to MNCH identified at the 6-month mark after the earthquakes were, in fact, preexisting ones and not a result of the disasters. Despite a recently updated Health Post facility which offered pre-natal, delivery, and post-natal services, a few of the most destitute women reported delivering or planning to deliver babies at home with no type of skilled birth attendant. Low rates of skilled attendance at delivery continue persist at the national level as well (~~Situ~~KC and Neupane 2016). Such scenarios can lead to delays in being transported to a hospital in the event of an obstetric emergency (Brunson 2010). As mentioned previously, Chiso Gau was not accessible by road. Ambulances or taxis could not reach homes during an obstetric emergency, and women or children needing emergency transport had to be carried on makeshift stretchers or in large baskets down to the road.

Several women also reported that *medical* shops, using an English word to refer to small pharmacies that sell medicine and medical supplies, were their preferred source of medical advice and treatment when their infants and children became ill. One study participant who happened to serve as a community health volunteer in Chiso Gau summarized the typical steps women take, saying, "The *medical pasal* (small pharmacy) is close; that's why they go there. If medicine from there works, then (the matter is) finished. If not, then they go to the children's hospital." The quality of such pharmacies varies greatly, and the diagnosis and treatment of children under five by pharmacists of varied levels of training whose business interests involve selling medicine is potentially hazardous. In addition, a few women reported not attending prenatal check-ups due to the difficulties of reaching the Health Post or hospital and/or of bringing their young children to the appointments.

Although this research focused on the gendered nature of the disaster, one of the important findings is that MNCH was being impacted by larger and ongoing political and socioeconomic challenges that confound a simple analysis of the impacts of disasters. First, 12 of the 14 families who lost homes were of the Tamang ethnic group. This was not due to coincidence or a small sample size. As explained in the "Background", a great proportion of

the families who experienced loss of homes in Nepal during the 2015 earthquakes were Tamang, due to a complicated history of rural settlement and their relegation by dominant social groups to being agriculturalists or laborers. Second, the effects of the ongoing fuel crisis compounded the effects of the loss of homes for study participants.

Discussion

Recent arguments about what counts as evidence for the evaluation of MNCH in resource-poor countries point out that in a global health industry increasingly driven by metrics (Adams 2016), it is necessary to be reminded of forms of "alternative accounting" (Adams et al. 2015) and the value of qualitative research. Qualitative research has the capacity to capture evidence that would have been missed by stricter and narrower forms of data collection. In this research, it became apparent—through the flexibility offered by semi-structured interview schedule and open-ended questions—that families were facing an unexpected set of circumstances that made the idea of saving for building a new home unrealistic.

One consequential finding of this research is that the so-called temporary shelters that families constructed after the earthquakes were becoming *permanent* shelters—at minimum for a few years until funding for reconstruction from the government is sorted out, and perhaps longer. Several families stated that even the 200,000 Nepali rupees promised by the government to those who lost their homes would not be sufficient to rebuild. Due to the fact that families were nowhere close to being able to afford to build a new home, they were not channeling household funds towards saving for rebuilding and away from medical services or food. Solely in terms of expenditures, they were living in similar ways as before. However, they faced the major physical and emotional hardships of living in CGI shacks or, for a few families, in the overcrowded homes of relatives. At the time of this research, October–November, the CGI shacks offered little protection from increasingly cold temperatures and wind chill. These are potentially life-threatening conditions for infants, especially at night.

Another key finding is that women were highly concerned about the effects

of the ongoing petrol and natural gas crisis. Due to a combination of protests by the Madheshi parties, a group in the Tarai region along the Indian border, and India's dissatisfaction with the new Nepal Constitution, transport of petrol and gas from India into Nepal—Nepal's only source of fuel—came to a standstill. From September 2015 to February 2016 a severe fuel crisis occurred in Nepal, and for a stretch of time petrol for private vehicles could only be purchased at inflated rates on the black market. As a result, by the time I interviewed women in late October and early November 2015, most of the families had run out of natural gas for their two-burner stoves. Women had to cook using firewood, which involved spending hours finding and collecting it. The metal shacks were not designed with adequate ventilation in mind, so exposure to smoke from cooking fires was also a potential hazard (see also DeYoung and Suji 2017).

Since the swath of destroyed homes in this research was located in proximity to a municipality center that had not experienced widespread destruction, the families in this study were able to resume their activities 6 months later with regular access to infrastructure such as hospitals and schools. This was not the case in the more rural districts to the north where limited infrastructure was destroyed, such as Gorkha, Nuwakot, and Sindhupalchok. While the results of this study are relevant to many of the peri-urban communities that experienced destruction in the 2015 earthquakes, they cannot be generalized to more remote areas that experienced complete loss of infrastructure. Concurrent research in Gorkha and Rasuwa districts documented that accessible wards, typically near roads, main trails, or helipads, were receiving greater humanitarian assistance than the less accessible wards (Spoon 2017).

This study has highlighted the importance of understanding the impacts of specific social and political contexts on intra-household family finances as they relate to MNCH, not just variables related to the disaster itself. Though families were not channeling household funds away from healthcare expenses for pregnant and lactating women and children under five, the findings suggest that a delayed response by the Nepali government in administering funds for rebuilding combined with an ongoing fuel crisis were negatively impacting families' abilities to provide adequate shelter,

warmth, cooking gas, and transportation for mothers and young children. The impact of the assistance or negligence of the government and humanitarian groups during the recovery and reconstruction period are critical variables to understand families' allocation of household funds. It is difficult, if not impossible, for Nepali families to strategize about rebuilding when they are dealing with great uncertainty regarding the timing and conditions on which the government will assist them financially. Families exerted much effort to continue living their lives as normally as possible, to the extent of rigging televisions and satellite receivers on their CGI homes and decorating the interiors with posters, family photos, and house plants. They met the inability to rebuild with pragmatism and focused on the aspects of their situations that they could control.

Ideally this research would be followed by a series of intermittent surveys in the future to determine whether a particularly risky period for mothers and children is yet to come. For example, the government of Nepal had begun mobilizing funds for rebuilding as of March 2016, and that could trigger the kind of effect on household budgets that was absent during my period of research at the 6-month point in October 2015. Future research and policies on MNCH during the long-term recovery period after a natural disaster, such as the 2015 Nepal earthquakes, should take into account the social and political context as well as institute multiple periodic assessments of MNCH in the first few years following the disaster.

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