



Disappearing everyday materials: The displacement of medical resources following disaster in Fukushima, Japan[☆]

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ABSTRACT

This study draws upon interviews of medical staff working in the city of Minamisoma, Japan, following the 2011 Triple Disaster. It investigates staff responses to the disruption of material resources as a consequence of the disaster and its management. The disruption of spaces, and the loss of oxygen supplies, food, and medications impacted upon staff experience and the ability of institutions to care for patients. This resulted in a restructuring of spaces and materials as workers made efforts to reconfigure and reestablish healthcare functions. This is one of the few qualitative studies which draws upon the experience and perspectives of health workers in understanding material disruption following disaster. This is particularly important since this case did not involve the breakdown of lifeline infrastructure, but rather, brought to attention the way everyday material objects shape social experience. In highlighting these effects, the paper makes the case for the social scientific investigation of the impact of disasters on healthcare, shedding light on an area of research currently dominated by disaster medicine.

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1. Introduction

On 11 March 2011 at 2:46 p.m., a magnitude 9.0 earthquake hit the Tohoku region of north-east Japan. Now known as the Great East Japan earthquake, this event caused significant damage to inhabitants and dwellings. The off-shore epicentre precipitated a series of tsunami waves – travelling as far as 10 km in-land – along the East coast, resulting in nearly 20,000 recorded deaths (Nakahara and Ichikawa, 2013). A further consequence was damage to the Fukushima Daiichi Nuclear Power Plant, and the resultant release of radioactive materials. The combination of these three events – referred to as the 2011 Triple Disaster – has had a long-lasting impact upon the affected region.

This paper examines five health institutions across Minamisoma, a city with a ‘centre’ approximately 25 km from the Daiichi Plant, with (at the time of disaster) a relatively small population of approximately 71,000 (Zhang et al., 2014). The city spreads across three evacuation zones, created by the central government of Japan in response to the nuclear accident (Hasagawa, 2013). These were the 0–20 km Mandatory Evacuation Zone, the 20–30 km Voluntary Evacuation Zone (a liminal zone where evacuation was ‘voluntary’ but residents were subjected to indoor sheltering), and 30 + km non-evacuation areas (please refer to Fig. 1). Minamisoma is the closest regional centre to the Daiichi Plant and its placement across all three zones had an important impact on the experience of healthcare.

While there is a well-developed literature around the impact of disasters on healthcare institutions, this arises principally from the perspective of hospital management (Bar-Dayan et al., 2000; Wattanawaitunechai and Jitpratoom, 2005) and disaster preparedness (Kaji and Lewis, 2006; Manley et al., 2006). In particular, this literature emphasises the importance of maintaining ‘lifeline’ infrastructure – water, electricity, gas lines and buildings – in

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allowing hospitals to contribute to disaster response (Kai et al., 1994; Kuwata and Takada, 2003), and focuses on management decisions. Accounts of previous disasters, such as Hurricane Katrina (Klein and Nagel, 2007; Rodríguez and Aguirre, 2006) blackouts (Klein et al., 2005) and the Three Mile accident (Maxwell, 1982) point to the role of materialities, and their impact in creating and reinforcing inequalities. However, this literature too tends to focus on hospitals where lifeline infrastructure has been affected.

Also from the hospital management literature, work on the effects of disasters on healthcare staff empirically focus on quantitative investigation, for example accounting for health system breakdown, staff loss or in measuring stress (Qureshi et al., 2005; Wallace et al., 2007). There is little extant qualitative literature on the experience of staff in managing a disaster, with a limited literature of descriptive qualitative findings arising primarily from a nursing studies perspective (French et al., 2002; Sebastian et al., 2003). First person reports or narrative accounts also prevail. In respect to Fukushima, these have been produced by individual doctors (Nangaku and Akizawa, 2011) or hospitals (Irisawa, 2012; Koyama et al., 2011), and serve to highlight the role played by medical staff and provide insight from direct experience.

Social scientific analyses of disasters tend to focus on the social construction (Bankoff, 2004; Petryna, 2004; Stallings, 1995) or production (Perrow, 2011) of disaster risk, or the (inequitable) distribution of vulnerability (Branshaw and Trainor, 2007; Bolin, 2007; Klinenberg, 2015; Phillips et al., 2010; Tierney, 2006; Wisner et al., 2004). A smaller literature examines the material experience of individuals who have survived natural disasters (Harada, 2000; Hastrup, 2010; Wilford, 2008), focusing on the way in which individuals rebuild social identities through (re)forming material surroundings and re-establishing home. There is an increasing and varied literature on the effects of the Fukushima disaster from sociological and anthropological perspectives (Gill et al., 2015; Hindmarsh, 2013), and within this an acknowledgement of the key role played by medical professionals. For example, Fortun and Morgan (2016), in making the case for comparative disaster studies, note the technical and operational challenges and communication issues faced by physicians post-Fukushima. Understanding the experiences of healthcare staff is key to fully accounting for the impact of disaster, and is a perspective that is currently under-examined.

While disaster management literature acknowledges the difficulties faced by medical professionals, this is under-studied through a use of qualitative data investigating the perspective of the actors themselves. This paper provides a qualitative sociological investigation of the experiences of these actors, which is novel in both the fields of disaster management and in medical sociology (where studies of disaster contexts are rare), despite calls for deeper sociological engagement with the problem of disasters (Tierney, 2007; Williams, 2008).

2. Methods

When the disaster occurred, Minamisoma was served by 8 hospitals and over 30 out-patient clinics. In combination, these institutions catered to the health needs of residents of the city and the wider rural area. Japanese universal health coverage operates under a pluralistic system; but, despite multiple sources of insurance, the national fee schedule means that payment is invariable regardless of where the care takes place (Ikegami et al., 2011; Ikegami and Campbell, 1995). Ikegami and Campbell (1995: 1296) note that “[v]irtually all physicians are in solo practice, and most hospitals are small, family enterprises that developed from physicians’ offices. ... [L]arge hospitals are owned by the national or local governments, voluntary organizations, and universities. For-profit

investor-owned hospitals are prohibited.”

Two hospitals in Minamisoma provided to a large number and variety of patients. The first is a comprehensive public hospital which is situated in the 20–30 km ‘Voluntary Zone’. The second is a large private hospital which tended to deal with emergency and surgical cases as well as general medicine, also situated in the ‘Voluntary Zone’ at the time of disaster. Both the public and private hospital were of a similar size (between 180 and 240 beds). This paper documents the disaster’s impact on these hospitals. It also rests on accounts from staff from three small private clinics, two of which have re-started operations, and one which is no longer in operation. The study is based on interviews with 35 medical staff who had been working at the point of the Triple Disaster, including doctors, nurses, allied health professionals, medical technicians, and administrative/support staff. The study focus is also informed by the secondary analysis of five informational interviews with medication suppliers and pharmacy operators conducted by Tsubokura.

One of the effects of the disaster – and of the confusion around radiation – was that a large proportion of medical staff evacuated the area (Kodama et al., 2014; Ochi et al., 2016). The region continues to suffer from a shortage of medical staff, one factor which makes understanding the disaster from the view of staff vital. At various points following the disaster fewer than 10 doctors remained in the public hospital, the largest research site. This limited the number of individuals available to interview. As such, and considering the high degree of saturation in the data around the issue of resources, this provides a representative account of staff experiences during the disaster. All remaining staff who were willing to be interviewed were actively recruited. The interviewees were enlisted by Ozaki, through a combination of formal recruitment (emails and personal communications), and by a snowballing from an initial sample and through gate-keepers. Ethics approval was granted by the committee of Minamisoma General Municipal Hospital (case number 28-6) and the University of Edinburgh. The research participants were provided with written (Japanese) information sheets. These were also verbally reviewed at the start of each interview, including the explicit consent for the interviews to be recorded and information on the extent of anonymization. Both verbal and written consent was obtained from each participant.

Each interview was conducted in Japanese with interpretation being provided between the English-speaking primary interviewer (Abeyasinghe) and the interviewees. Interpretation was provided by Leppold, Ozaki and Morita with at least two interpreters being present at each interview to provide real-time checking. Transcripts were also checked to pick up additional translation issues prior to coding of interview data. All interviews were conducted by Abeyasinghe, apart from one small-group interview of four medical technicians, who agreed to be interviewed only on the condition that they do so as a group. This interview was conducted in Japanese by Ozaki, with Leppold and Abeyasinghe present, and subsequently translated. Translation can impact the nature of the data (e.g. choices about the most accurate translation of culturally-specific words/ideas and potential issues around implied meaning). However, the data was analysed using a broad thematic analysis, focusing on explicit narratives and key themes produced by the interviews, rather than discourse or semiotic analysis (for example), which would involve a close reading of language. All authors identified initial themes, which were coded and iteratively developed into sub-codes by Abeyasinghe, following the approach to thematic analysis set out by Braun et al., (2012).

Interviews lengths ranged from 45 min to 2 h and 20 min following a semi-structured approach (Silverman, 2006) and were conducted in May–August 2016. The questions focused upon the interviewees’ experience of their work during the time of the

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