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## (Un)natural Disasters: Health Responses after Natural Hazards in Southeast Asia

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Southeast Asia is certainly no stranger to natural hazards, having experienced some of the world's worst. This paper argues that the occurrence of a natural *hazard* does not inevitably lead to a natural *disaster*. Whether a disaster results largely depends on pre-existing conditions, such as a country's level of development and infrastructure, its social stability, and the availability and accessibility of healthcare facilities, as these are critical to the effectiveness of health responses.

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## Executive Summary

### Overview

This paper examines a number of natural disasters in Southeast Asia, namely, the Indian Ocean tsunami in 2004, Cyclone Nargis in 2008, and the Pacific typhoons of 2009, focusing on their impacts on Indonesia (Aceh), Myanmar (Ayeyarwaddy, or Irrawaddy, region) and the Philippines (Metro Manila) respectively. It seeks to highlight the distinction between natural hazards and natural disasters and argues that the occurrence of the former does not inevitably lead to the latter. Whether a disaster results is not only dependent on the intensity of a natural hazard, but more importantly, is contingent on the pre-existing conditions in a country.

### Discussion

A United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP, 2006:17) report states that Asia and the Pacific is the world's most disaster-prone region, accounting for 91 per cent of deaths from natural disasters in the past century and 49 per cent of the resulting economic damage. Further, 'Asia and the Pacific is one of the regions of the world most vulnerable to disasters, experiencing a wide variety of natural hazards that include floods, cyclones, earthquakes, drought, tornadoes, debris flows, hailstorms, storm surges, tsunamis and haze' (UN ESCAP, 2006:118).

Although the concepts of 'natural hazards' and 'natural disasters' are often intertwined and conflated, this paper would argue that it is imperative to understand the differences between them. A commonly accepted definition views natural hazards as 'those elements of the physical environment, harmful to man and caused by forces extraneous to him' (Burton et al., 1978). Natural hazards would include a number of hydrological, climatic and geological phenomena such as floods, tsunamis, typhoons and earthquakes. The impact of a hazard is dependent on human presence. If a natural hazard occurs in an area devoid of human

settlement, it would not result in a disaster. Thus, one view states that natural disasters 'occur when hazards meet vulnerability' (Wisner et al., 2004). According to the United Nations Department of Humanitarian Affairs, a disaster is 'a serious disruption of the functioning of society, causing widespread human, material or environmental losses which exceed the ability of [the] affected society to cope using only its own resources' (UN DHA, 1992). Whether a disaster results from the occurrence of a natural hazard not only depends on human presence, but is also heavily reliant on the ability of a population to deal with the hazard. In the absence of development, and sound and well-maintained infrastructure, a society would be less prepared to cope with a hazard, rendering it more susceptible to a disaster.

Despite the frequency and magnitude of the hazards seen in the region, it is not necessarily inevitable that those hazards should lead to disasters. This paper argues that conditions such as levels of development, social stability, infrastructure, and availability and accessibility of healthcare facilities are fundamental in shaping the impact of a natural hazard, and accordingly, that strengthening these aspects would help to reduce the prevalence of natural disasters in the region.

## Implications

The Southeast Asian cases covered in this paper demonstrate that policymakers would do well to place even greater focus on broader socioeconomic development. While disaster preparedness, disaster risk reduction and reconstruction efforts play a role in mitigating the impacts of a disaster, concerted efforts to further develop the region remain the best means of helping communities deal with the ramifications of natural hazards and may serve to safeguard them from damage and casualties. This is because socioeconomic growth leads to improvements in the health sector, for instance, the expansion of health infrastructure (see Li and Durodié, 2011). Such growth could also lead to a more sophisticated construction sector, which could in turn result in, for instance, geographical specificities such as a country's location in quake-prone areas as well as health- and sanitation-

related issues, being taken into account during the construction process.

Some attention should also be given to achieving broad-based development, so that the benefits of such growth could be more evenly distributed across a wider cross-section of society, including the regions and areas with the greatest need.

Socioeconomic development could also help solve many of the existing fundamental problems within a country that contribute, directly or otherwise, to a country's disaster risk reduction and response capacity. For instance, in Aceh, Indonesia, it could help address development problems resulting from the longstanding conflict in the region. In Myanmar, development would ideally address the lack of funding for the healthcare system, the evident urban-rural disparity in access to healthcare and the high endemic disease burden. Meanwhile, in the Philippines, economic growth and the accompanying infrastructure development could help bridge the infrastructural gaps caused by uneven urbanisation which has led to extensive slums in metropolitan areas. Economic growth could also contribute positively to making sewage and drainage systems more efficient and functional.

This paper also identified a need for a cohesive and comprehensive aid strategy in order to ensure more effective, efficient and equitable delivery of aid and services to affected populations. In addition, this paper advocates that rather than pursuing policies based on the dominant Western perspective which presumes human vulnerability (as opposed to strength) in the face of natural disasters, governments should capitalise on the resilience of communities, networks and organisations.

## Introduction

In the past decade, the Southeast Asian region has been affected by many natural hazards ranging from tsunamis to typhoons. According to the *Asia-Pacific Disaster Report 2010* (UN ESCAP and UN ISDR, 2010:vii), the inhabitants of the Asia-Pacific region are 4 times more likely to be affected by natural disasters than those living in Africa, and 25 times more likely than those living in Europe or North America. The report also notes that the region accounted for 85 per cent of deaths and 38 per cent of global economic losses due to natural disasters during 1980–2009.

The terms ‘natural hazard’ and ‘natural disaster’ are often used interchangeably, yet it is vital to distinguish between the two. A commonly accepted definition views natural hazards as ‘those elements of the physical environment, harmful to man and caused by forces extraneous to him’ (Burton et al., 1978). Natural hazards would include a number of hydrological, climatic and geological phenomena such as floods, tsunamis, typhoons and earthquakes. The impact of a hazard is dependent on human presence. If a natural hazard occurs in an area devoid of human settlement, it would not result in a disaster. Thus, one view states that disasters ‘occur when hazards meet vulnerability’ (Wisner et al., 2004). According to the United Nations Department of Humanitarian Affairs, a disaster is ‘a serious disruption of the functioning of society, causing widespread human, material or environmental losses which exceed the ability of [the] affected society to cope using only its own resources’ (UN DHA, 1992). Whether a disaster results from the occurrence of a natural hazard not only depends on human presence, but is also heavily dependent on the ability of a population to deal with the hazard. In the absence of development, and sound and well-maintained infrastructure, a society would be less prepared to cope with a hazard, rendering it more susceptible to a disaster. Despite the frequency and magnitude of the hazards seen in the region, it is not necessarily inevitable that those hazards should lead to disasters.

Existing issues in various countries necessitate different approaches towards mitigating the impact of disasters on public health. This paper seeks to explore and assess the forces that influence the effectiveness of health responses to natural disasters in Southeast Asia by examining three cases, namely, the responses in Indonesia (Aceh), Myanmar (Ayeyarwaddy, or Irrawaddy, region) and the Philippines (Metro Manila) to the Indian Ocean tsunami in 2004, Cyclone Nargis in 2008 and the Pacific typhoon season in 2009 respectively. This paper argues that conditions such as levels of development, social stability, infrastructure, and availability and accessibility of healthcare facilities are more significant in shaping the impact of a natural hazard than the magnitude of the hazard.

## Indonesia and Health Responses to the Indian Ocean Tsunami in 2004

An undersea earthquake measuring 9.0 in magnitude with an epicentre off the west coast of Sumatra, Indonesia, occurred on 26 December 2004. It resulted in a series of tsunamis which led to extensive destruction in a number of countries bordering the Indian Ocean. Indonesia was the worst affected, with an estimated death toll of 167,000 and economic losses of USD4.45 billion (BRR et al., 2005:16, Masyrafah and McKeon, 2008:2). Indonesia’s Aceh region bore the brunt of the damage, with 97 per cent of local gross domestic product (GDP) destroyed and 4 per cent of its population killed in the tsunami (Jayasuriya and McCawley, 2008:4).

### Pre-existing Challenges

At the time the tsunami struck, Aceh was already the site of a longstanding conflict between government forces and separatist rebels. Major natural gas deposits had been discovered along Aceh’s east coast in 1971. The discovery of the deposits led to extensive exploration of the area and the building of the largest refinery in the world at the time by the state-owned Pertamina and US-based Mobil Oil Corporation. According to Waizenegger and Hyndman (2010:790), the local Acehnese population was ‘largely left out





Villagers erecting a new market using communal labour, in an area in Aceh which had been the site of conflict.

of the royalties and prosperity that followed from this resource extraction’.

In response to the perceived injustice towards the Acehnese by the state, the Free Aceh Movement (Gerakan Aceh Merdeka, or GAM) was established in 1976 and the group conducted a number of attacks on non-Acehnese civilians. In response, the Indonesian armed forces (Tentara Nasional Indonesia, or TNI) launched counterinsurgency operations. The conflict rapidly escalated, affecting even the civilian population. An estimated 15,000 people were killed during the insurgency from 1976 to 2005 (Indonesia’s Aceh, 2005).

The separatist conflict which lasted almost three decades created an atmosphere of mistrust and hostility between the local Acehnese population and government authorities. It also led to instability and low levels of development in the region. The region’s health sector was largely undeveloped. In 2002, Indonesia’s per capita healthcare expenditure was USD26 per person, compared to nearly USD5,000 per person in the US (Zoraster, 2005:s14). Furthermore, public health expenditures in the majority of the

districts in Aceh were relatively low compared to the national average (World Bank, 2006:89). As one of the poorest regions in a country with comparatively low per capita healthcare expenditures, Aceh’s health services were particularly underdeveloped.

In addition to the overall lack of development in the Indonesian health sector, Aceh’s health infrastructure also suffered as a direct result of the separatist conflict. In 2003, during the first week of martial law, 3 health sub-centres and 35 village maternity clinics were burned down in two districts (World Bank, 2006:89). Instability in the region contributed to health workers moving to other areas in search of employment, placing additional stress on an already stretched health sector.

Due to the limitations in health resources and infrastructure in Aceh, the region was ill-equipped to deal with the immediate aftermath of the 2004 Indian Ocean tsunami. It lacked local surge capacity and was thus unable to react adequately to the increase in demand for medical services. Instead, it had to rely on post-tsunami assistance from governmental and non-governmental



organisations (NGOs) from outside of the region. This inability to respond locally would have a significant impact on the number of lives which could be saved as the time available for life-saving response was extremely short. Ultimately, 'local (national or regional) responders are best placed to respond effectively and actually save lives' (De Ville de Goyet and Morinière, 2006:47).

### Post-tsunami Challenges

The tsunami worsened the already dismal social, economic and political situation in Aceh. There was an enormous loss of life and many communities were displaced. Buildings, bridges and roads along Aceh's southwest coast (and to a lesser degree, its northeast coast) suffered extensive damage (Zeccola, 2011:314). The tsunami also wreaked substantial damage on medical facilities, homes, wells and drainage systems – 53 of 244 health facilities in Aceh were destroyed or severely incapacitated, and 42 of 481 health professionals were killed (PHAC, 2005:177). This infrastructural and human damage across various sectors inhibited post-tsunami emergency assistance.

Given the scale of the tsunami, some damage was inevitable. Nevertheless, according to some observers, 'some buildings could have withstood major damage if constructed to more robust standards based on local hazard analyses' (Kapila et al., 2005:369). It should also be noted that, as of 2004, Aceh was the fourth poorest province in Indonesia (World Bank, 2006:12). Thus, even with building standards in place, it is unlikely that it, being such a poor and undeveloped area, could meet them. Whichever the case – the lack of building standards or the high level of poverty – the result was the prevalence of weak structures that were far from able to deal with the tsunami's impact. Thus, inasmuch as the magnitude of the earthquake and tsunami were crucial in determining the extent of devastation, they were not the key variable, because 'people were not killed by the Earthquake that caused the Tsunami. They were killed by the collapse of poorly constructed buildings or by being in an area submersed by the Tsunami' (Gordon et al., 2005:439). The impact was perhaps greatest on the poorer areas of Aceh and nearby Nias – much of the severe physical damage to infrastructure in those areas could be attributed to the low quality of construction or inadequate maintenance rather than the intensity of the natural disasters (Jayasuriya and McCawley, 2010:79).



A UN/World Health Organization (WHO) representative inspects a well being dug at one of the camps in the town of Alue Bilie, Aceh, 2005.

In sum, more widespread development including the presence of a well-equipped, prepared health sector and stronger physical infrastructure could have helped to attenuate the immediate effects of the tsunami and laid the groundwork for effective post-tsunami emergency response. However, in the absence of an adequate network of health services and infrastructure, the ability of the Acehnese to cope with the sudden increase of casualties was impeded.

## Health Responses

In the first few days after the tsunami, the local response was largely driven by the TNI due to their significant presence in Aceh. Roughly 15,000 of the 40,000 TNI personnel in the region were deployed for humanitarian relief operations and another 12,000 were sent to Aceh on 14 January 2005 to aid in the clearing of debris and burying of bodies (Masyrafah and McKeon, 2008:4). With the TNI acting as primary aid deliverers, it gave their large presence in Aceh the appearance of legitimacy. It also placed the Acehnese who were reliant on the military for aid in an increasingly precarious position, as the TNI could have withheld aid to exert pressure on the local insurgency (Keys et al., 2006:198).

Beyond immediate local responses, there was an unprecedented outpouring of humanitarian aid from governments and NGOs worldwide. If the tsunami pledges were distributed equally among the estimated 1.9 million people who were directly affected, each individual would have received approximately USD7,100. This was significantly greater than the per capita international funding for other disasters, which amounted to as little as USD3 per capita in some cases (Telford et al., 2006:86). According to the Aceh-Nias Rehabilitation and Reconstruction Agency (Badan Rehabilitasi dan Rekonstruksi Aceh dan Nias, or BRR), the agency responsible for coordinating and implementing the post-tsunami recovery programme, there was an influx of groups to Aceh, including international NGOs (INGOs), local (and national) NGOs, donor and UN agencies, and foreign militaries (BRR et al., 2005:14).

The Tsunami Evaluation Coalition (TEC), a learning and accountability initiative jointly set up by 50 member agencies drawn from the UN, the Red Cross, NGOs and other donors, conducted several studies on the international response to the tsunami. According to one study, the reaction to the tsunami was ‘the most generous and immediately funded international humanitarian response ever’ (Flint and Goyder, 2006:8).

Yet, with more funding and support, it became increasingly difficult to coordinate the efforts of the multiple actors (with their plethora of aims and methods). In the weeks and months that followed, a myriad of organisations and individuals – external NGOs; humanitarian aid agencies; smaller groups which were harder to classify and were not registered, such as yoga groups and the Scientology Trauma Unit; and individual aid workers who just ‘showed up’ – streamed into Aceh to offer assistance (Zoraster, 2005:s15). The large number of people involved in the response meant that personnel sent by NGOs and other agencies were often inexperienced and unfamiliar with the local context and conflict. The proliferation of these organisations and individuals placed additional strain on the local infrastructure. The competition between INGOs for houses which survived the tsunami caused rents to rise tenfold, and in some cases local landlords kicked out Acehnese tenants in favour of the better-paying foreigners, leading to more displaced persons (Schulze, 2005:11).

There were attempts to improve coordination in the provision of health services by organising regular health sector and hospital meetings. However, according to Zoraster (2005:s15), a volunteer physician who served three weeks in January and February 2005 at Zainoel Abidin Hospital, the largest hospital and tertiary referral centre in Banda Aceh, those meetings were not systematically organised and failed to reflect the capabilities and competencies of the groups in attendance. Without the capacity to assess and monitor health delivery services, there was often duplication of efforts and wasted resources. It resulted in ‘some areas hav[ing] too many NGOs providing services while others [had] too little’ (WHO, 2005). Organisational costs were also extremely high. At the peak of INGO activity in



Banda Aceh in 2005, there were 180 INGOs present, costing an estimated USD35–45 million to operate a year (Telford et al., 2006:65).

This lack of coordination also meant that those involved in relief efforts were slow to respond to changes in demand. For instance, the initial shortage of hospital beds gave way to an oversupply. By the end of January 2005, there were too many beds in the region – less than half were occupied – while other regions of the world lacked such resources (Zoraster, 2005:s16). The resource gaps which emerged were not so much the result of a lack of funding, but allocation problems stemming from difficulties in coordination and engagement with local communities to establish their needs. There is additional wastage when scarce resources which should have been allocated to reconstruction end up being redirected to enhancing coordination (ACARP, 2007:4).

The humanitarian response in Aceh was further complicated by the distinction between tsunami and conflict victims. Conflict areas largely did not overlap with tsunami-affected areas, creating two groups with different needs. The utilisation of funds brought in by NGOs was driven by donor intent – the aid was meant only for tsunami-related needs. There were cases where conflict and tsunami internally displaced person (IDP) camps were adjacent, and it was ‘strictly forbidden to let any assistance cross the line between “humanitarian” tsunami IDPs and “political” conflict IDPs’ (Waizenegger and Hyndman, 2010:790). Even among the agencies which knew about the lack of aid to conflict victims, very few were willing or able to do something about it (Waizenegger and Hyndman, 2010:798). The attempt to distinguish between the two groups, both of which were in need of assistance, suggests that in the eyes of relief agencies there exists a divide between those who deserved aid and those who did not.

The diversity of aims and means between governments and various support groups simultaneously derived from, and contributed to, a lack of an overall strategy for the development and rehabilitation of affected communities. Governments were interested in demonstrating their concern and pledging funds, but the

statements they made revealed the basic desire to assert their unity and morality. UK Prime Minister Tony Blair said that the funds amassed were ‘the best illustration of the British character’ (HC Deb, 2005). US Secretary of State Condoleezza Rice revealed the rationale behind the Bush administration’s munificence when she stated that ‘the tsunami was a wonderful opportunity to show not just the US government, but the heart of the American people, and I think it has paid great dividends for us’ (Tsunami Relief, 2005). This suggests that many Western governments and relief agencies view disasters more in terms of the benefits to their own citizens than what they can provide to the people they are ostensibly seeking to help. The display of solidarity and compassion belied a desire to affirm their altruism, turning humanitarian aid efforts into an exercise to establish political and moral legitimacy.

## Myanmar and Health Responses to Cyclone Nargis in 2008

On 2 and 3 May 2008, a category 4 storm named Cyclone Nargis struck Myanmar, bringing 200-kilometre-per-hour winds, 4-metre high storm surges and heavy rains to the Ayeyarwaddy Delta and the former capital city Yangon (Johns Hopkins Bloomberg School of Public Health, 2008).

Nargis caused extensive destruction in Myanmar, killing nearly 140,000 (Tripartite Core Group, 2009). This number is more than half of the overall dead and missing in 15 Asian and African countries as a result of the 2004 Indian Ocean tsunami (Osornprasop, 2008:1). Overall, an estimated 3.2 million people were affected by the cyclone, including 1.5 million displaced persons (Johns Hopkins Bloomberg School of Public Health, 2008).

### Pre-existing Challenges

There were several pre-existing challenges within the health system that hindered responses in the aftermath of Nargis: financing issues, rural-urban disparities, a limited social security system, low levels of basic primary care, a high





**One of the many families affected by Cyclone Nargis. These families often lack a regular source of income, and are highly dependent on aid.**

existing disease burden and a limited specialist workforce.

The Myanmar healthcare system has both public and private components. The private healthcare sector underwent rapid growth in the late 1980s to 1990s following the launch of market-oriented government reforms. However, private healthcare is still limited to urban areas. Many rural Myanmarese still depend on basic health services provided by the government, which is primarily handled through a township-level health system.

The health sector is financed by the government's annual budget allocation, external aid, social security, trust funds, community contributions, and fees paid by users of health services. Myanmar's total health expenditure as a percentage of GDP is estimated to be 2.1 per cent in 2008, significantly less than the 16 per cent spent by the US (WHO, 2010a, 2010b). Further, it has been reported that the Myanmar State Peace and Development Council (SPDC) spends less than USD1 per person per year on healthcare and that there has been a decline

in government expenditure on health over the last two decades (Lateef, 2009:107–8). These patterns in health expenditure point to deeper structural, organisational and political problems in Myanmar, which would have to be addressed.

Although Myanmar has a social security system in place, it covers only 1 per cent of the country's population. Also, the limited healthcare facilities across the rural Ayeyarwaddy Delta coupled with the limited transport and road infrastructure give rise to problems of access: 24 per cent of people in the Delta area need more than an hour to reach the nearest health facilities (Osornprasop, 2008:2–4). Post-Nargis, these accessibility issues worsened response times – many could not reach medical facilities in time for treatment.

Some have described basic healthcare services in Myanmar as rudimentary, with low levels of healthcare awareness and public health education (Lateef, 2009:107–8). Access to clean drinking water and sanitation services is also lacking in rural areas. According to Lateef (2009:107–8), there remains a general lack of medicines in Myanmar and, if available, these



are often shared or split with others, rendering prescribed treatment ineffective. The use of traditional medicine is widespread and forms an integral part of the country's health services, which may reflect public demand for such treatment, but which may also indicate a shortage of more advanced methods of treatment.

Myanmar also has a high disease burden. Malaria is a leading cause of morbidity and mortality, with over 538,000 cases and 1,647 deaths reported in 2006. There are regular seasonal epidemics of dengue and dengue haemorrhagic fever cases. Additionally, Myanmar is among the 22 countries with the highest tuberculosis (TB) burden – an estimated 1.6 per cent of the population are infected annually (Lateef, 2009:107–8).

Inadequacies in the healthcare workforce add to an already strained healthcare system. As of 2008, for every 1,000 population, there are currently only 0.36 doctors, 0.2 nurses, 0.79 midwives, and 0.99 general health workers. This compares unfavourably with the US where there are 2.56 doctors, 9.37 nurses, 1.63 midwives and 20.96 healthcare workers per 1,000 citizens (Lateef, 2009:107–8). The differences in the number of healthcare personnel stems partly

from the low levels of economic development in Myanmar: Myanmar is ranked 161st in the world with regard to GDP per capita (IMF, 2010).

### Post-Nargis Challenges

Prior to Nargis, the Ayeyarwaddy Delta 'had the country's poorest health infrastructure and the country's lower [sic] proportion of health care personnel per population' which 'only worsens the situation, making the Delta the region least equipped and least prepared to face natural disasters and the sudden rise of demands for health care services following a catastrophic event' (Osornprasop, 2008:5).

In the affected regions, 75 per cent of health facilities were destroyed. Rebuilding these facilities would cost an estimated USD2 billion. The UN Office for the Coordination of Humanitarian Affairs (OCHA) estimated the required assistance for immediate rehabilitation of the Ayeyarwaddy region at approximately USD481.8 million, of which USD46.7 million would be needed for health recovery alone (Amador III, 2009:6–7).



A United Nations High Commissioner for Refugees (UNHCR) worker distributes blankets to Cyclone Nargis survivors.



The extensive damage to health facilities and loss of health personnel in affected areas represented a sudden loss of access to health services which could be viewed as increasing the risk of illness and fatality to many. The displacement of 1.5 million people, the resulting overcrowding of sites for IDPs, and according to the World Health Organization (WHO), the loss of access to safe and clean water, dramatically increased the risk of communicable diseases in the post-disaster period (WHO SEARO, 2008). These included water-borne diseases such as typhoid, dysentery, cholera and *E. coli*.

Vector-borne diseases were also identified as an important health concern, particularly mosquito-carried diseases endemic in Myanmar before the cyclone such as malaria and dengue fever. Other vector-borne disease risks included plague and leptospirosis, both of which are endemic in Myanmar. There were also widespread concerns over the spread of food-borne diseases from eating poor quality, old or spoiled food (Johns Hopkins Bloomberg School of Public Health, 2008).

This rise in demand for healthcare services came at a time when medical supplies, including medicines, plunged abruptly. Nargis mostly affected smaller public health facilities across the Ayeyarwaddy region, causing a disruption of health services to the rural poor – the group most reliant on these services and most affected by the cyclone (Osornprasop, 2008:2, 7).

## Health Responses

The WHO has stated that, despite negative media reports, the government cooperated with international organisations and worked hard to meet the health needs of the people after Nargis. The government allowed the WHO Southeast Asian Regional Office (SEARO) to release USD350,000 to buy essential supplies such as health kits, mosquito nets and chlorination tablets for those affected. However, the WHO admitted that larger relief operations were hampered because the government of Myanmar would not provide visas for additional health relief aid workers. The WHO also acknowledged that post-disaster disease outbreak surveillance was

difficult as the government of Myanmar imposed strict control over access to information on the incidence of diseases and suspected outbreaks (WHO, 2008:662–3). On the other hand, it could also be argued that a degree of interest in acting independently rather than waiting to receive external assistance represents a significant display of post-disaster social resilience.

In light of these challenges and the persistent need for more aid to affected populations, ASEAN Secretary-General Dr Surin Pitsuwan stepped in and commenced negotiations with Myanmar government officials. On 21 May, the government of Myanmar agreed to open itself up to more international assistance, allow surveillance teams to enter the country, and collaborate with the UN and ASEAN in a unified approach to manage the post-disaster situation. The Johns Hopkins Bloomberg School for Public Health and the Emergency Assistance Team praised the role of ASEAN in facilitating the entry of relief into affected regions (EAT and JHU CPHHR, 2009).

Notably, despite prior concerns of infectious disease outbreaks and high incidences of trauma and injury among those affected by the cyclone, the most common health problems discovered were diarrhoea and the common cold (WHO, 2008:662–3). This suggests that international agencies and organisations entered into relief operations assuming the worst post-disaster health effects on the affected population. In making such an assumption, however, they may have overlooked how pre-disaster circumstances play into post-disaster disease burdens. It could be argued that poor health infrastructure and lack of access to safe food and water – pre-existing problems that became increasingly severe after Nargis – were the real causes of the rise in diarrhoea and common cold cases.

One of the main challenges to health responses in the aftermath of Nargis was the political dimension of international aid. Immediately post-Nargis, Myanmar accepted aid mostly from neighbouring countries such as India, Thailand and China. However, it showed an unwillingness to open its borders to the West. Some aid agencies and Western governments used the crisis to push for political change, making aid conditional

on the government of Myanmar agreeing to political reform, dialogue and democracy (Leech, 2008). Other international organisations chose to negotiate their way into providing more limited forms of aid and other relief services post-Nargis by signing memorandums of understanding (MOUs) with the SPDC (Mahn et al., 2009).

At the time, much of the criticism levelled at the government of Myanmar highlighted the fact that it was willing to allow aid, but not aid workers, into the country (Leech, 2008). However, it is also important to note that more material aid was urgently needed immediately after the cyclone struck. This argument was echoed by an assessment of a group of 21 relief agencies which indicated that although most villages did receive some form of aid after the cyclone, until as late as April 2009, 'the aid that did reach villages was often inadequate to meet the needs of the communities' (Action Aid et al., 2009:2–3).

However, in spite of these post-disaster health challenges, the Tripartite Core Group (2009:2–3) suggests that Myanmar communities were relatively socially cohesive and had strong capacities for collective problem-solving and decision-making in the aftermath of the disaster. Three main reasons were identified for this strength of social capital. First, development resources from higher levels were scarce, which accentuated the importance of working together at the community level and prioritising resources for public goods. Second, in the absence of a state or an employer safety net, community members supported each other in times of need – something particularly evident in their response to Nargis. Third, the existence of traditions and values of reciprocity, evident across Myanmar, further encouraged community-level cohesion and resilience. According to a number of NGOs, 'thousands of local Burmese organisations, relief workers and civic-minded individuals stepped in to respond immediately and worked to provide significant amounts of aid to those affected' (Action Aid et al., 2009:2–3).

The year 2009 was a difficult one for the Philippines. Typhoon Ondoy (international codename: Ketsana) hit large areas of Metro Manila and the Southern Tagalog region on 26 September 2009, bringing the heaviest rainfall in 40 years to the affected regions. A week after, Typhoon Pepeng (international codename: Parma) struck eastern and northern Luzon twice, flooding roads, damaging bridges and triggering landslides. Then, Typhoon Santi (international codename: Mirinae) hit Metro Manila and the Southern Tagalog region on 30 October 2009. Together, the three storms affected 9.3 million people, killed 956, and left 736 injured as of December 2009. Total damage and losses were estimated at USD4.38 billion, or 2.7 per cent of national GDP (Hofman, 2009). Metro Manila was one of the areas worst affected by the three typhoons, and this section will focus on this region.

As late as 17 November 2009, the WHO Western Pacific Regional Office (WPRO) reported that thousands remained in temporary shelters and more than a million people still resided in flooded areas. Total damage to health facilities in affected regions was estimated to exceed USD21.7 million. Infectious diseases, especially acute respiratory infections, skin infections, fever and diarrhoeal diseases spiked in the wake of the typhoons. There was also a leptospirosis outbreak, with over 3,000 cases and 240 deaths reported between 1 October and 5 November. A report presented by the WHO Global Outbreak Alert and Response Network (GOARN) on 13 November showed that almost half of leptospirosis patients did not undergo adequate laboratory tests, and less than half of the patients requiring dialysis actually received the treatment they needed (WHO WPRO, 2009).

The information suggests that health responses in the Philippines to the Pacific typhoons may have been inadequate. However, in order to properly assess the responses, it is crucial that we examine the history of natural hazards in the Philippines and the pre-existing conditions influencing the responses to the typhoons.





Lives, businesses and infrastructure were adversely affected when Typhoon Ondoy brought a month's worth of rain in a six-hour span.

## Historical Context

The Philippines has a long history of natural hazards, with records of quakes and typhoons going as far back as the 15th century. According to findings by the Belgium-based Centre for Research on the Epidemiology of Disasters (CRED), the Philippines is the most disaster-prone country on earth. The Philippine archipelago is vulnerable to earthquakes, El Niño, volcanic eruptions, tsunamis and typhoons. It is hit by an average of 20 tropical cyclones per year, half of which are destructive. The CRED also estimates that the country incurs USD346 million of annual damage as a result of natural disasters (Philippines, 2011).

However, it was not until the early 1990s that the Philippine government began to address the importance of disaster risk reduction and response plans. The Philippines was hit by the Baguio earthquake in July 1990, followed by Typhoon Ruping (international codename: Mike) over four days in November the same year. The following year, the eruption of Mount Pinatubo and the Ormoc floods caused widespread damage. Then, Super Typhoon Rosing (international

codename: Angela) hit Luzon in 1995, killing almost a thousand and incurring USD241 million in damage. Between 1985 and 1995, damage from natural hazards cost the Philippines a total of USD4.83 billion, or the equivalent of 4.6 per cent of the combined national budgets over that period (Bankoff, 2003b:76).

In Manila, flooding has been a feature of daily life since at least the 19th century. When rains are particularly strong or tides are higher than usual, the metropolitan area's natural drainage system would be unable to cope with the sudden volume of water, causing large parts of the city to be submerged. The gradual expansion of the urban area into the surrounding marshes has only increased the frequency and magnitude of such inundations. More recently, rapid population growth, differences in land usage and environmental factors have combined to magnify the nature and extent of flooding in the metropolitan area (Bankoff, 2003a:225–9).



## Pre-existing Challenges

It can be argued that a major pre-existing challenge for health responses to the Pacific typhoon season of 2009 is the highly centralised Philippine public healthcare system. The Department of Health (DOH) has sole ownership and responsibility for all health facilities, personnel and programmes in the country. In the early 1990s, the national government granted local government units (LGUs) administrative autonomy. This policy change made LGUs independent implementers of health programmes, but the DOH retained oversight of, and primary responsibility for, priority health programmes that had national impacts, including immunisation programmes and the prevention, treatment and control of endemic diseases such as malaria and filariasis. As such, the DOH is responsible for providing all the essential logistic and technical requirements to run these programmes. Therefore, in disaster settings, the DOH is responsible for subsidising emergency health programmes related to the aforementioned diseases and any other disease programmes that are heavily reliant on logistics (Government of the Republic of Philippines et al., 2009:60).

Within a post-disaster setting, however, this means that LGUs, which have the power to implement local-level immediate health responses but not necessarily the resources to do so, remain dependent on the DOH for financial and logistic support. Also, many of the diseases that are held to surge in the aftermath of a natural disaster are the very same diseases that are under the DOH umbrella. This means that the material capacity of LGUs to respond rapidly to the health needs of affected populations in the immediate aftermath of a disaster is determined by the DOH – and that the speed of the delivery of the responses is also determined by how quickly or slowly the DOH provides LGUs with the necessary resources to carry out their mandate.

The second major challenge is related to the existence of large slum areas within the Metro Manila region. These slums are heavily populated, filled with substandard housing, and located in areas that have inadequate or poorly maintained public services (roads, sewage system, garbage disposal system, electricity and water). According to Ballesteros (2010:17–18), 25 to 30 per cent of slum inhabitants have no access to safe water and sanitary toilets. Additionally, these slums are highly congested: each slum inhabitant has an



A week after Typhoon Ondoy struck, rubbish and debris were still strewn on the road along the Marikina River, a main river system in Metro Manila.



average of only 3 to 5 square metres of living space. The high population density also means that in emergency situations, it would be harder to evacuate communities living in these areas, thereby complicating relief efforts.

Many of these slums are also located in areas which are highly susceptible to flooding, water pollution and congestion after a natural disaster:

- Along river lines frequently affected by typhoons and sea surges.
- Along coastal lines or seashores affected by seasonal rains, sea surges and erosion.
- Dumpsites (communities develop in infill or open dumpsites, where households earn a living from scavenging).
- Along major highways or heavily trafficked roads (Ballesteros, 2010:10–12).
- Along the system of *esteros* (drainage canals and waterways) (Durodié, 2009:2).

A third challenge is related to the multifaceted urbanisation of Metro Manila itself. The ‘nature of (the) political system in the Philippines with [its] emphasis on patronage, regionalism and lack of strong central government’ had led to decades of unregulated industrialisation leading to rapid urbanisation (Bankoff, 2003b:99). This uneven process of development and urbanisation in Metro Manila has given rise to many factors which increase the city’s susceptibility to floods, such as poor government regulation of urban building and planning, and a lack of attention to waste management and the construction and maintenance of drainage channels.

Inefficiencies in metropolitan waste management due to rapid urbanisation can also contribute to the types and scale of health impacts. According to 2008 statistics from the National Solid Waste Management Commission, about 7,000 tons of solid waste is generated per day in Metro Manila. Of this, 6,000 tons per day is disposed of at city dumpsites; thrown into creeks, canals or rivers; burned; or left on streets. The leachate from solid waste then contaminates soil, groundwater and surface water, rendering many natural sources of water unsafe for drinking or daily use (Ballesteros, 2010:13–14).

The absence of sewage systems in the country contributes to this problem: only about 15 per cent of sewage generated by Metro Manila is treated. Water pollution is also worsened by sanitation problems in slum communities, especially along rivers, creeks and coastal areas. This then increases the risk of water-borne diseases, which is particularly pronounced in the wake of a natural disaster (Ballesteros, 2010:13–14).

The final major challenge faced by the Philippines in the aftermath of any natural disaster is economic in nature. Bankoff (2003b:104–5) describes the relationship between disaster and debt in the Philippines as symbiotic. In recent years, the Philippine government has increased its overseas borrowing requirements to fund post-disaster reconstruction and rehabilitation. This increase in debt has contributed to a decrease in spending on national development and infrastructure, causing the economy to remain in a state of underdevelopment. Bankoff also argues that, on a national level, this creates a vicious cycle linking poverty, environmental degradation and vulnerability. On an international level, slow economic growth (re)creates the conditions that link the vulnerability of a society to natural hazards and back to underdevelopment. Within this context, it is not entirely evident that mere risk management would best alleviate the situation. After all, in the absence of solid infrastructure, there is little to manage.

### **Post-disaster Challenges and Responses**

The total recovery and reconstruction needs of the health sector after Pepeng, Ondoy and Santi amounted to USD118.8 million, the bulk of which (USD96 million) was allocated towards a four-step reconstruction programme. The priorities of this programme were resumption of normal service delivery, recovery from negative health and nutrition impacts, reconstruction of health facilities, and improvement of health systems for better disaster response (Government of the Republic of Philippines et al., 2009:62–4).

Health facilities were severely affected by the strong winds, heavy rains and subsequent flooding brought about by the three typhoons. Infrastructure was rendered inaccessible due

to isolation or submersion, health services were severely disrupted, and equipment and medical supplies were damaged. Thus, immediate relief operations focused on ensuring the safety of health personnel and patients in affected facilities and other areas through rescue, transfer to other facilities and/or provision of essential food, water, clothing and medical supplies. Water testing was also undertaken at strategic sites, in order to ensure that the water is safe for use and consumption. Tetanus injections were given to all who suffered injuries as a result of the typhoons. Relief efforts also concentrated on ensuring that displaced people were adequately treated for acute diseases while continuing to provide services to regular patients (Government of the Republic of Philippines et al., 2009:60).

However, despite the various efforts, the post-disaster period of 2009 saw marked increases in cases of leptospirosis, typhoid and influenza. This rise in the number of cases, especially compared to the aftermath of similar events in 2008, was attributed to higher congestion at evacuation centres and in households, and the lack of adequate shelter for evacuees. The leptospirosis surge, in particular, was attributed to prolonged flooding in some areas that forced people to traverse through infected floodwaters to resume normal activities (Government of the Republic of Philippines et al., 2009:61).

### **Preparing for Future Disasters**

Ultimately, these three typhoons and the difficulties faced in managing their health responses pushed the Philippine government to recognise the importance of mitigating pre-existing conditions when dealing with the after-effects of a natural disaster – and more importantly, to actively bridge the gaps that prevented effective health responses to disasters.

The Philippine government finally passed a major piece of legislation on disaster risk reduction and management on 21 May 2010. The Republic Act 10121, '[a]n act strengthening the Philippine disaster risk reduction and management system, providing for the national disaster risk reduction and management framework and institutionalizing the national disaster risk reduction and

management plan, appropriating funds, therefor and for other purposes', was passed after 21 years of revisions and re-filing (Congress of the Philippines, 2010:1). One of the bill's main points is the immediate release of calamity funds to LGUs for disaster mitigation and preparedness purposes. Prior to this, an LGU could only use calamity funds for quick-response post-disaster activities (Philippines, 2011).

Also, the Office of Civil Defense (OCD) undertook the Hazard Mapping and Assessment for Effective Community-based Disaster Risk Management (READY) Project. The project has identified 27 high-risk priority locations and will focus on three components, that is, geohazard mapping, community-based disaster preparedness, and the mainstreaming of disaster risk reduction management into local development planning (Philippines, 2011).

However, the enforcement of any new laws and the effectiveness of technologically advanced mechanisms are contingent on the infrastructural capacity to do so. Therefore, the key to mitigating disaster impacts is development, as opposed to limiting development. While the dominant narrative in climate change advocates restraint in development and highlights human responsibility in creating the problem, Durodié (2009:4) suggests that 'what the poor need most may well be further growth and a heightened sense of their own agency in resolving things'.

### **Comparing the Case Studies**

The three cases examined in this paper demonstrate that a number of pre-existing conditions affected the ability of the three countries to respond to the respective natural hazards. The fundamental lack of development in these countries rendered the communities more susceptible to the impact of natural hazards and ultimately led to natural disasters wreaking significant damage.



## Conclusion

The level of development in each country is the result of differing historical contexts, such as the longstanding conflict in Aceh; a limited social security system, rural-urban disparity problems, and other challenges to the health system in Myanmar; and the slow development and implementation of disaster risk reduction plans in the Philippines. Yet the implications of the uneven or low levels of development were similar in each of the case studies, in that each country was significantly affected by the natural hazard as a result. In turn, their ability to respond to a natural disaster was also hampered by the general state of underdevelopment and its associated conditions, such as weak and poorly maintained infrastructure, and relatively low availability and accessibility of public health services for the local communities affected by the natural hazards.

The magnitude and type of the natural hazards may have varied, but a lesson that could be derived from the three case studies is the need for equitable and even infrastructural growth, which could be attained through overall economic development. A comparison could be drawn between the responses seen in these case studies and those observed in the aftermath of a natural disaster in a more developed country, such as the most recent earthquake in Japan on 11 March 2011 which also triggered a massive tsunami. Despite the significant damage wrought by the largest earthquake in Japan's recorded history, Japan is well on its way to recovery, with rapid reconstruction taking place (Japan Quake, 2011). For instance, the earthquake caused extensive damage to a section of the Great Kanto highway, leaving a deep chasm in the road. However, by the end of six days, the highway had been repaired, and was open to the public (Mail Foreign Service, 2011). Reconstruction of such speed and magnitude could not have been possible in the countries highlighted in this paper.

The case of Japan also highlights the importance of continuous effort in light of unpredictable natural hazards (UN ESCAP, 2006:124). It has spent approximately 1 per cent of its GDP on disaster countermeasures since the 1950s, and this has contributed to a substantial reduction in annual economic damage.

In each of the three cases examined in this paper, the government and local community's pre-existing limited abilities to address the natural hazards that befell them meant they manifested as natural disasters. In a region already weakened by conflict and underdevelopment, Aceh was struck particularly hard by the tsunami. In the case of Myanmar, Cyclone Nargis hit an extremely impoverished region where rural-urban disparities were apparent and unaddressed, rendering the community less able to cope with the aftermath. Similarly, the Philippines found it difficult to address the challenges posed by the Pacific typhoons in 2009 because of the uneven development of Metro Manila and its surrounding areas.

The impact of a natural disaster is not only determined by the intensity of a natural hazard but is also influenced by other factors. In each of the case studies, the countries were badly affected by natural hazards of varying intensity due to their limited socioeconomic development. The weak infrastructure, and the shortage and inaccessibility of healthcare facilities affected each country's ability to cope with the disasters and their aftermath. For instance, such existing problems were the main causes of a rise in the number of cases of diarrhoea and the common cold post-Nargis in Myanmar.

These natural hazards became disasters as the communities they struck were largely ill-equipped to deal with the impacts. With more investment, higher standards of construction and better infrastructure, Asia-Pacific countries blighted by natural hazards could mitigate their losses and be better able to deal with the aftermath. Humanitarian aid could be helpful in the recovery period after a natural disaster, but piecemeal relief assistance, 'while ... often highly effective ... nevertheless rarely leads to rapid, effective and productive recovery and long-term reconstruction' (Masyrafah and McKeon, 2008:3). A broad strategy that addresses fundamental infrastructural and socioeconomic development would be necessary in the long term to lessen the

immediate impact of natural hazards and enable communities to recovery more quickly thereafter.

Disaster responses may also reveal attitudes towards groups that require assistance. For instance, the reaction to the Indian Ocean tsunami was overwhelming, with an unparalleled amount of funds pledged. Yet, it also underlined a distinct difference in how two different groups in the area were perceived. Those affected by the tsunami were seen as 'victims' and thus deserving of aid, while those affected by the longstanding conflict in Aceh were not. Those attitudes then affected how assistance was distributed, largely marginalising the latter group.

Furthermore, the discourse surrounding Western aid exposes the culturally defined perspective of the developed countries of the West. They take a rather pessimistic view which stresses human vulnerability in the face of natural disasters. Instead of emphasising social resilience and reconstruction in the face of natural hazards, these events are seen as inevitable disasters that reveal social helplessness. These natural disasters are also seen more in terms of what it means to Western governments and their citizens rather than what could be done for the people they are seemingly trying to help.

Some have argued for a greater emphasis on disaster risk reduction and reconstruction. However, as seen in the case of the Philippines, post-disaster reconstruction and rehabilitation led to an increase in national debt, and a decrease in national development and infrastructure spending. Concerted efforts to rebuild and further develop the region by improving its economy, infrastructure and health sector remain the best means to safeguard communities from disaster-related damage and casualties. In order to minimise the impact of natural hazards, it is crucial to improve development, and strengthen communal stability and resilience in the region, rather than find ways to mitigate risk in the event of a natural hazard.

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