



The Regulation and Management of International Emergency Medical Teams

A study conducted by



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Inputs describing the response by international Emergency Medical Teams (EMTs) to Cyclone Pam in Vanuatu in 2015, the Ebola outbreak in West Africa, the Nepal earthquake in 2015 and the Ecuador earthquake in 2016 have subsequently been added to that core. This later work was carried out by the secretariat of the Emergency Medical Team initiative at the World Health Organization (WHO), with contributions from the International Federation of Red Cross and Red Crescent Societies (IFRC), the various ministries of health that were affected, and from key responders to these events. Much has evolved over the last five years in the area of emergency medical team response, and while the original text of this report highlighted the need for change, improvements demonstrated in the most recent responses may give cause for hope.

This report was prepared by international consultants Dr. Claude de Ville de Goyet, Luis Jorge Perez Calderon, Juan Pablo Saimiento, Roy Nobhojit and Taha Hirbod Alexandersson. Additional content relating to the Ebola outbreak and Nepal earthquake were provided by Taha Hirbod Alexandersson. Copy-editing was provided by Ewan Powrie. Technical and editorial oversight was provided by Dr. Ian Norton of the WHO, and David Fisher, Lucia Cipullo and Panu Saaristo from the IFRC.

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List of Acronyms

AECID	Agencia Española de Cooperación Internacional para el Desarrollo (Spanish Agency for International Development Cooperation)	NSARAG	International Search and Rescue Advisory Group
ALNAP	The Active Learning Network for Accountability and Performance in Humanitarian Action.	JICA	Japan International Cooperation Agency
AmCross	American Red Cross Society	LSS	Logistical Supplies System
AusAid	Australian Agency for International Development (now known as 'Australian Aid').	MSF	Médecins Sans Frontières (Doctors Without Borders)
CRED	Centre de Recherche sur l'Epidémiologie des Désastres (Centre for Research on the Epidemiology of Disasters)	NCCTRC	National Critical Care and Trauma Response Centre
DMAT	US Disaster Medical Assistance Team	NGO/s	Non-Governmental Organization/s
EMT	Emergency Medical Team (previously FMT: Foreign Medical Teams)	OFDA	United States Office for Foreign Disaster Assistance
ERU	Emergency Response Unit	PAHO	Pan-American Health Organization
ETC	Ebola Treatment Centre	RDC	Reception and Departure Centre
FACT	Field Assessment and Coordination Team	SCI	Spinal Cord injury
FFH	Foreign Field Hospital	SEARO	WHO South East Asia Regional Office
GHC	Global Health Cluster	SOD / SODs	Sudden-Onset Disaster / Sudden-Onset Disasters
USDHHS	United States Department of Health and Human Services	SUMA	Supplies Management
IASC	Inter-Agency Standing Committee	TEC	Tsunami Evaluation Coalition
ICRC	International Committee of the Red Cross	UNMEER	UN Mission for Ebola Emergency Response
IDC	International Development Center (Japan)	UN OCHA	United Nations Office for the Coordination of Humanitarian Affairs
IFRC	International Federation of Red Cross and Red Crescent Societies	US	United States of America
		USAR	Urban Search and Rescue
		USGS	United States Geological Survey
		WHO	World Health Organization
		WPRO	WHO Western Pacific Regional Office



Introduction and methodology

The purpose of this report is to provide an overview of the issues in regulating and managing international emergency medical teams in a selection of large and small-scale sudden onset disasters (SODs). In doing so, it aims to contribute to several key international commitments, namely Strategic Aim 1 of the IFRC's Strategy 2020 to "save lives, protect livelihoods, and strengthen recovery from disasters and crises"; Resolution 7 of the 31st International Conference of the Red Cross and Red Crescent and Resolution 6 of the 32nd International Conference of the Red Cross and Red Crescent¹; and the WHO's objective of "the attainment by all people of the highest possible level of health"² as well as its objective in disasters and emergencies to "reduce the consequences the event may have on world health and its social and economic implications".

With the support of the WHO's EMT initiative and the IFRC's Disaster Law Programme, this report aims to collate information about EMT response issues and to identify and propose best practices that could reduce potential harm and enhance the positive aspects of EMT deployment in disasters. In general, the views expressed in this report are those of the authors, and not of the WHO or IFRC.

Two methods were used for the research for this report: a comprehensive literature review, and key stakeholder interviews by telephone and / or email.

Literature review

A full bibliography is listed in Annex 2 of this report. Sources of direct quotations are noted in the text.

Published literature: A systematic search of medical peer-reviewed literature was carried out through PubMed / MedLine. The search terms used were deliberately broad, such as "Medical care – [Country name and disaster]". In the cases of less documented SODs, the search terms included only the name and place of the disaster. An initial high-level review of titles and / or abstracts allowed for a preliminary selection of potentially relevant publications. Clinical cases and promotional articles with an expressed conflict of interest were excluded. Meta reviews and analytical articles were reviewed in greater depth. Repeated searches of PubMed / Medline produced 361 references of which 90 were initially assessed for potential relevance. The 40 publications that were finally selected for this report are included in the bibliography.

'Grey' literature: The assessed 'grey' literature included: (i) external evaluations commissioned by funding agencies and / or humanitarian EMT providers; (ii) institutional reviews of lessons learned; (iii) after-action reports; and (iv) formal reviews commissioned by the authorities of some of the SOD-affected countries. 44 grey literature documents were selected and assessed, and these are listed

1 See Resolution 7 of the 31st International Conference of the Red Cross Red Crescent on "Strengthening normative frameworks and addressing regulatory barriers concerning disaster mitigation, response and recovery" (2011) and Resolution 6 of the 32nd International Conference of the Red Cross Red Crescent on "Strengthening legal frameworks for disaster response, risk reduction and first aid" (2015), available online at www.ifrc.org/dl

2 See the Constitution of the World Health Organization (1946), available online at http://www.who.int/governance/eb/who_constitution_en.pdf

in the bibliography. It should be noted that some documents were shared by stakeholders on the understanding that they may not be directly referred to, and although these formed part of the review, they are not listed in the bibliography.

Interviews

Interviewees were identified either with the assistance of the WHO EMT initiative and the IFRC's Disaster Law Programme, or directly from the extended network of the authors of this report. To ensure consistency in collecting and analysing stakeholders' input, the interviews were semi-structured and based on clear guidelines for the interviewers. Two guidelines were developed: one for providers of EMTs and one for recipient countries. However, as each interlocutor had a different contribution to offer and the objective of the data collection for this report was qualitative rather than quantitative, some flexibility was essential and allowed. Other than a few instances where face-to-face interviews were possible, all interviews were performed via telephone calls or emails. A total of 43 experts or officials representing EMT providers, national authorities and coordinating agencies were interviewed; 11 interviewees were from the affected countries receiving the EMTs.

Study Limitations and Disclaimers

Readers of this report should be aware of the following limitations:

- (i) The authors cannot rule out the possibility that the objectivity of some information has been overridden by the desire of the authors of reports and other materials to publicize or emphasize the role and importance of the organizations concerned. To the extent possible, any such documents were discounted by the authors of this report.
- (ii) Whether or not relevant interlocutors (i.e. those knowledgeable on the EMT response or management) could be identified depended heavily on the amount of time that had passed since an SOD; a longer amount of time meant a higher likelihood of the turnover of officials (whether from government or non-governmental organizations (NGOs)). In order to balance this challenge, the authors drew on their own earlier interviews and reports from extended field visits in the aftermath of most of the disasters covered under this study, as appropriate.
- (iii) Given the budget and timing for this study, field visits and face-to-face interviews were not possible. Readers should therefore bear in mind that interviews over telephone or email are more likely to result in overly cautious responses from interviewees.
- (iv) For some of the more recent disasters studied for this report (the West Africa Ebola outbreak, the Cyclone Pam in Vanuatu and the 2015 Nepal earthquake) a great deal of material has, from necessity, been derived from interim assessments compiled by the WHO EMT initiative or as communicated directly by the EMT Initiatives' technical leader Dr. Ian Norton.
- (v) As outlined above, it should be noted that the views expressed in this report are largely those of the authors, and not of the WHO and the IFRC.



Background

WHO

Sudden Onset Disasters (SODs)

All countries, irrespective of their level of economic development or risk reduction efforts, are vulnerable to natural disasters. While vulnerability to outbreaks is heightened by poor surveillance and weak health systems, several recent instances of highly infectious diseases have also had an impact on high income countries (such as Ebola in the USA or SARS in Hong Kong and Canada). While most disasters are national incidents that can be managed with local resources, a few are of such catastrophic magnitude and impact as to attract considerable international coverage and humanitarian response.

Table 1. Short-term effects of major natural disasters.³

Effect	Earthquakes	High winds (without flooding)	Tidal waves / flash floods	Slow-onset floods	Landslides	Volcanoes / Lahars
Deaths	Many	Few	Many	Few	Many	Many
Severe injuries requiring extensive treatment	Many	Moderate	Few	Few	Few	Few
Increased risk of communicable disease	Potential risk following all major disasters (Probability rising with overcrowding and deteriorating sanitation)					
Damage to health facilities	Severe (structure and equipment)	Severe	Severe but localized	Severe (equipment only)	Severe but localized	Severe (structure and equipment)
Damage to water systems	Severe	Light	Severe	Light	Severe but localized	Severe
Food shortage	Rare (may occur due to economic and logistic factors)		Common	Common	Rare	Rare
Major population movements	Rare (may occur in heavily damaged urban areas)		Common (generally limited)			

As a category of natural disasters, SODs that cause a large number of casualties pose great challenges to local health authorities and the international community. SODs include earthquakes, the impact of which can be compounded by tsunamis, cyclones (typhoons or hurricanes) occasionally associated with devastating sea surges, volcanic eruptions and, to a lesser extent, large scale flooding. Infectious disease outbreaks (such as Cholera or Ebola), whilst not technically classified as SODs (their classification as “natural” disasters are also contested) may also require massive medical assistance and the

3 PAHO / WHO (2000), NATURAL DISASTERS: Protecting the Public’s Health.

participation of international Emergency Medical Teams. Although the issues of appropriateness and relevance may be similar between these two categories of SOD, the health challenges, timing, and the nature of the assistance required are fundamentally distinct. Nevertheless, there is also overlap in the importance of a rapid response in the areas of water, sanitation and hygiene (WASH), shelter and food in both SOD and outbreak responses. It also holds true that rapid response health teams with trauma care capacity also need to be prepared for other public health issues such as reproductive and child health, endemic diseases, mental health and infectious diseases.

Earthquakes are considered the most challenging type of SOD. The difficulty of providing meaningful advance warnings means that in a matter of minutes an earthquake can cause extensive death and injury while crippling or destroying lifelines and critical care facilities, particularly the health infrastructure. Whatever the size, level of development and preparedness of the affected state, large-scale seismic events are likely to surprise the affected communities, the national authorities and the international community. Such events generate a scenario that necessitates immediate large-scale medical assistance, before any comprehensive assessment can be completed and full information is available.

Although they benefit from better advance warning and climatologic monitoring systems, cyclones (mainly those associated with sea storm surges) can create comparable health situations. This has been demonstrated in Cyclone Nargis in Myanmar (2008) and Typhoon Haiyan (locally known as Typhoon Yolanda) in the Philippines (2013). The damage is similar to that caused by a tsunami. The extent of the damage to the health infrastructure, the size of affected areas and the logistical constraints far offset the proportionally lower number of injuries per affected population compared to earthquakes. However, if effective advance warning capabilities are in place, “typhoons or tropical cyclones provide one of the few SOD that allow a reasonable intelligence led response plan to be developed” (Blanch et al., 2014).

Large scale floods, while not likely to cause as many injuries, are nonetheless leaving large populations without adequate critical health care due to the impact on health facilities and population displacements. Volcanic eruptions are also not known for very large numbers of traumatic injuries, in this case as major eruptions leave few survivors. However, the nature of any injuries (often including extensive burns) generally exceeds local capacity for specialized treatment (for example the eruption of Mount Merapi, Indonesia, in 2010).

In recent years (2003 until 2013), many SODs have led to the deployment, solicited or not, of an increasing number of EMTs from governmental or non-governmental sources. In many cases the deployment of EMTs is not solely based on the assessed needs of the affected state, and there can be wide variations in their capacities, competencies and adherence to professional ethics. Some teams are often unfamiliar with the international emergency response systems and standards, and may not integrate well into existing coordination mechanisms (WHO 2013 p 10). Similarly, the management and monitoring capacity of recipient states varies widely, with few countries being prepared for the unexpected challenges of balancing medical resources (national and international) to needs in a disaster scenario. This shortcoming in overall management has proven critical in the context of SODs that generate large numbers of injuries, where timely acute trauma care has the potential to save a greater number of lives than other humanitarian actions. Following the earthquake in Haiti in 2010, a statistical survey by Michigan University estimated that 37,301 persons died from their injuries in the days immediately after the impact (Kolbe et al. 2010). The number of people that could have been saved by better and faster medical care is a matter of speculation, but it is likely that this number would greatly exceed those recovered alive from the rubble by the massive international Search and Rescue effort (according to the UN Office for the Coordination of Humanitarian Affairs (UN OCHA),

there were over 130 live rescues by some 60 teams). Statistics from the 2015 Nepal earthquake are similar, with 16 lives saved by approximately 75 Search and Rescue teams comprising almost 2,500 personnel; 11 of which were saved by one team from India and 3 lives by a team from China. In the same response, almost 3,500 personnel from EMTs treated almost 120,000 patients, with over 20,000 of these suffering injuries directly from the earthquake.

Basic demographic, economic and health indicators of recent disasters requiring international emergency medical assistance are shown in table 2. Several items for consideration should however be noted:

- The number of injuries only provides an order of magnitude. The reliability and coherence of injury statistics are more contentious than the estimates of number of deaths, as no international definition or guidance exists on what the term ‘injured’ includes. It should also be kept in mind that in chaotic emergency situations, health information systems are often strained to the point of collapse.
- Population and economic data illustrate the highly variable capability (in terms of size and economic capacity) of affected states to provide assistance to a set number of injured.
- The table below attempts to offer a balanced perspective by comparing the number of injuries to the total population of the country. For example, 310 injuries in Samoa was a truly taxing situation while in a large country such as China or Indonesia it would probably have remained a local incident. The disaster and outbreak in Haiti do however stand in a category of their own, and lessons learned from these two events should be applied cautiously to other SODs.
- The table below does not take into account the capacity and level of development of the health system of the country. This development is often evolving in parallel to the economic indicators and is a key criterion to consider when assessing the need for and relevance of EMTs. As a case in point, the Haiti health system is considerably less developed than that of Sri Lanka, Japan or New Zealand.
- Whether the SOD impacted directly on the central government and the capital is another factor that statistics cannot take into account. The untold destruction of the capital city Port-au-Prince places the Haiti earthquake in a separate category, although it is by no means implausible that the same scenario could not occur in several major capital cities in the world.

Cyclones are one of the few SODs that allow the development of a reasonable intelligence-led response plan. SODs that may also allow intelligence-led planning or pre-deployment planning to be undertaken could include ‘predictable’ or seasonal flooding as seen in Nepal and Pakistan in 2010. The difficulty of providing advance warnings and predicting the severity of the impact of other SODs, particularly earthquakes, does not allow the opportunity for pre-planning or pre-deployment of resources. Irrespective, response effectiveness could still be enhanced by considering disaster impact and epidemiology against an understanding of the vulnerability of the affected population and available health care facilities, for example as informed by the Safer Hospitals Initiative.⁴

The impact that an infectious disease outbreak may have on an affected country varies greatly, with the nature of the pathogen causing the outbreak as well as the context in which the outbreak has occurred being major contributing factors to the severity of the impact. Historically, infectious diseases such as the plague, smallpox, flu and polio have caused devastating morbidity and mortality rates and, in recent years, outbreaks of cholera, severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) have become of international political and medical concern. Prior to the West African outbreak in 2014 / 15, Ebola Virus Disease (EVD) outbreaks typically occurred in

⁴ The Safer Hospitals Initiative, started in the Americas in the aftermath of the Mexico earthquake of 1985, has ultimately influenced the thinking of the 169 United Nations Member States, leading to one of the goals of the Hyogo Framework for Action 2005-2015: that all new hospitals should be built in such a way that continued operation in disasters is ensured and that existing hospitals should progressively improve their safety levels in this respect.

isolated areas of the African continent, and received minimal attention from the international medical community. The West African EVD outbreak – by far the largest outbreak in history and the first to spread to highly populated urban areas – has affected three countries with comparatively weak health systems and significant deficits in their capacity to respond. The high mortality rates (over 70% among untreated patients), the exponential escalation of cases in Guinea, Liberia, and Sierra Leone and the potential for the epidemic to spread globally through international travel resulted in a massively scaled and coordinated international response from EMTs which contributed to “bending the curve”.

Table 2 Comparative impact of recent SODs

SOD occurrence	Country population ⁵ (Millions)	Gross National Income ⁶	Killed and missing ⁷	Injured ⁸	Injured per thousand of total population
Bam Earthquake (Iran 2003)	68.5	1,690	26,796	22,628	0.3
Indian Ocean Tsunami (2004)					
– Indonesia	221.3	1,090	165,708	25,572 ⁹	0.1
– Sri Lanka	19.4	1,070	35,399	23,176	1.1
– Thailand	65.1	2,370	8,345	8,457	0.1
Pakistan Earthquake (2005)	158.0	710	73,338	128,309	0.8
Sichuan Earthquake (China 2008)	1,324.7	3,070	87,476	366,596	0.3
Cyclone Nargis (Myanmar 2008)	51.2	N A	138,366	20,000	0.4
Samoa Tsunami (2009)	0.185	3,020	143	310	1.7
Haiti Earthquake (2010)	9.9	660	222,570	300,000	30.3
Chile Earthquake (2010)	17.2	10,720	562	10,334	0.6
Pakistan Floods (2010 – 2011)	173.1	1,060	1,985	2,946	0.02
New Zealand Earthquake (2011)	4.4	31,890	181	1,500	0.3
Japan Earthquake (2011)	127.8	45,190	19,486	5,933	0.05
Philippines Typhoon (2013)	98.4	3,270	7,354	28,689	0.3
Haiti Cholera Outbreak (2010-2013) ¹⁰	9.9	660	6,908	277,451	28
West African Ebola Outbreak (2013-) ⁷					
– Guinea	11.7	460	2,524	3,786	0.5 ¹¹
– Liberia	4.2	390	4,808	10,672	3.7
– Sierra Leone	6.1	680	3,952	13,494	2.9
Nepal Earthquake (2015)	28.1 ⁸	730	8,778	22,303	0.8

5 World Bank Data <http://data.worldbank.org/> Data is adjusted to the year of the SOD occurrence

6 Ibid.

7 EM-DAT 2014: The OFDA / CRED International Disaster Database www.emdat.be – Université Catholique de Louvain – Brussels – Belgium. EVD outbreak and Nepal earthquake data from the WHO EMT initiative.

8 Ibid. EVD outbreak data represent number of confirmed, probable and suspected cases.

9 Doocy et al. 2009

10 The cholera and EVD outbreaks are not ‘true’ SODs and their classification as ‘natural’ disasters is also contested.

11 Dead plus confirmed, probable and suspected cases per thousand total population (same calculation used for Liberia and Sierra Leone).

Types of EMT

The providers of international medical assistance in past and recent disasters are by no means a homogeneous group, and the response from EMTs has differed widely in terms of their capacity, health objectives, and scale. The capacity and type of services offered by EMTs ranges from isolated and improvised groups of medical doctors with minimal resources or support, up to ‘third level’ 1000-bed ship hospitals. A classification and terminology of EMTs was long overdue until the EMT working group and the WHO (as Lead Agency of the Global Health Cluster (GHC)) proposed a simple global classification (WHO / GHC 2013). This classification can be summarized as follows:

- **EMT Type 1: Outpatient Emergency Care:** Includes EMTs offering outpatient initial emergency care of injuries and other significant health care needs. The majority of responders fall into this category.
 - **EMT Type 1 teams** can be further sub-classified as responding with a health facility (fixed) or without (mobile).
- **EMT Type 2: Inpatient Surgical Emergency Care:** providing inpatient acute care, general and obstetric emergency surgery for trauma and other major conditions.
- **EMT Type 3: Inpatient Referral Care:** Complex inpatient referral and surgical care including intensive care capacity.
- **Additional specialized care teams** such as: rehabilitation, burn injuries, and renal dialysis, specialist disease management teams such as for cholera or EVD.

During the first use of this classification for Typhoon Yolanda in the Philippines (2013), of the 150 EMTs known to be operating, 120 (80%) declared themselves as level 1, 11 (7%) as level 2, two (1.5%) as level 3 and one (0.5%) as a specialized care team; 16 (11%) did not declare a level (Blanch et al. 2014). The second time the classification was used, for EMTs responding to Cyclone Pam (Vanuatu 2015), the need for the EMT Type 1 sub-classification emerged and was used. 16 teams were declared as mobile Type 1, and four as fixed Type 1. Additionally, two Type 2 and two specialized care teams responded which brings the total of responding teams to 25. Only two teams failed to officially register upon arrival.

In the response to the 2015 Nepal earthquake, the WHO EMT initiative and / or the Nepalese MOH engaged with all 149 responding EMTs. One hundred and thirty-four of these were registered and coordinated by the Nepalese MoHP with support from the WHO EMT coordinator, whereas thirteen military EMTs were coordinated initially by the Nepalese army. Information on all EMTs was captured by the EMT coordination cell. Twenty-eight (19%) were mobile Type 1 EMT, sixty-nine (47%) were fixed Type 1. Of the remaining teams, seventeen (11%) were declared as Type 2 and thirty-three (23%) as specialized care teams. Only one Type 3 EMT responded to the Nepal earthquake. It is worth noting here that of the one hundred and thirty-four EMTs registered and coordinated by the MoHP, fifteen did not start operations because in the end, there was not a requirement for them to do so.

The healthcare provided in the aftermath of SODs is not limited to surgical treatment of traumas (up to and including reconstructive surgery) as was noted by Prado et al, 2010, or even to medical care. As will be discussed, it includes routine emergency care, primary healthcare, public health and disease control, rehabilitation and physiotherapy services (Nixon et al. 2010), mental health (IASC 2007), nursing (Kako et al.2014) and many other specialized services. The West African EVD outbreak, as well as previous medical aid for disease outbreaks such as the Goma cholera outbreak (1994) or the Haiti cholera outbreak (2010) are also examples where the healthcare provided by EMTs is not restricted to surgical trauma treatment.

Providers of EMTs

The main providers of EMTs on a no-cost basis¹² include governmental sources, non-governmental organizations, the Red Cross and Red Crescent movement, academic institutions, professional associations, the private sector and self-improvised groups.¹³ Below is a description of these different providers of these EMTs.

Government EMTs: This group of providers includes the governments traditionally considered as humanitarian donors (high-income to low-income countries). However, neighbouring middle-income countries, more particularly in Latin America and the Caribbean, have a long history of rapid mutual assistance (middle-income to middle / low-income countries). In recent disasters such as the Indian Ocean tsunami, this trend included the Asian Region. More interesting is the middle / low-income to high-income country trend in provision of EMTs, as illustrated by the experience of Japan after the Great East Japan earthquake. See box 1 for further details, which quotes from the Comprehensive Review (IDC Japan 2014).

Government EMTs may be either military or civilian. Twenty-six per cent of the EMTs deployed to the EVD outbreak were government teams, of which 25% were military. Additionally, many of the non-governmental EMTs that responded to the outbreak were entirely sponsored by their governments, therefore blurring the line between state-funded EMTs and other actors. Similarly, 30% of the teams that responded to the 2015 Nepal earthquake were government teams, 37% of which were military.

There are now over 40 governments who have joined the WHO EMT initiative and have requested peer review and verification of quality of their teams. Many governments also have military medical corps that are increasingly capable of responding with field hospitals in humanitarian and disaster responses, while others have combined their civil and military teams in a hybrid approach for international deployments. A far larger number now have credible national EMTs ready to respond to domestic emergencies and who form the basis of the first response. Some government donors are joining forces to upgrade the type of EMT provided, as can be seen in the example of the governments of several European countries, who are working to pool their resources to offer a EMT Type 3.

The Red Cross and Red Crescent Emergency Response Units (ERU): An ERU is a standardized package of trained personnel and modules of equipment, ready to be deployed at short notice. The units are fully self-sufficient for one month and can be deployed for up to four months.

Box 1: Foreign Assistance to Japan

(from IDC Japan 2014)

“Out of 174 countries and regions [that provided assistance to Japan], 119 were Japanese Overseas Development Assistance recipients and 35 were among the so-called “Least Developed Countries (LDC)” in Asia and Africa.

In addition, regions affected by conflicts such as Afghanistan, Iraq, Palestinian Authority, and Sudan, countries in the Middle East that were under political and social upheaval due to “Arab Spring” such as Egypt and Tunisia, European countries in economic crisis like Greece, and countries that experienced natural disasters like earthquakes and heavy floods immediately before the 3.11 Great East Japan earthquake, such as New Zealand and Brazil, provided assistance.

In recent years, developing countries have joined developed nations in offering assistance after massive disasters. This global trend – a spirit of mutual aid – was shown even when a developed country like Japan was the victim.”

12 Private companies offering foreign health intervention on a for-pay basis will not be covered under this report. However, these private companies have in recent years changed some of the scope of the EMT response and filled major gaps, not the least during the West African EVD outbreak and more recently in the Mosul response in Iraq. To avoid bias it is therefore important to acknowledge their role as an important actor and encourage the inclusion of such players in future EMT reports.

13 The latter have been called ad-hoc or ‘mushroom’ agencies constituted immediately after a major disaster.

The medical ERUs are key disaster response tools of the IFRC and are funded and deployed by the following National Societies: Canada, France, Finland, Germany, Japan, Norway, Spain. The two types of medical ERU are shown in box 2. ERUs have been deployed in most of the large-scale disasters in low- and middle-income countries,¹⁴ including deployment of a CTC configured Emergency Clinic in response to the Cholera outbreak in Haiti and ETC configured teams to the EVD outbreak in West Africa.

Health or medical NGOs EMT: There are hundreds of NGOs incorporated in their own states that may either systematically or occasionally deploy medical teams to a disaster response. Some are highly experienced in this task and have a global reach, such as Médecins sans Frontières (MSF), while others may focus on health care (general or specialized) in a few countries or regions and will respond to crises in their geographical areas of coverage. Some other (and generally smaller) actors that lack field presence and humanitarian experience may also intervene on an ad hoc basis.

Academic institutions: Large academic institutions, alone or in consortium, have mobilized their faculty and resources to respond to SOD and most identify as NGOs if deploying in this manner. Some may intervene on the basis of standing cooperation agreements with counterparts in the affected country prior to the SOD.

The proliferation of actors

Given the different types and varieties of EMT providers, challenges will undoubtedly arise with regard to the proliferation, coordination, quality and capacity of these actors, which will be outlined in the sections below. In fact, the most noticeable and recent trend in the deployment of EMTs is the rapid increase in the number of teams arriving to assist in the aftermath of heavily publicized disasters. As an example, after the major earthquake in 1976 in Guatemala (which caused 23,000 deaths), only one field hospital (run by the United States military) and a handful of medical teams were provided assistance (de Ville de Goyet et al. 2007). In the aftermath of the Indian Ocean tsunami (2004), 180 agencies (from all sectors) had registered with the UN coordinating body in Banda Aceh, the most affected area. In Haiti (2010), the health cluster alone registered close to 400 agencies “providing health care”.¹⁵ The initial review of Typhoon Haiyan in the Philippines in 2013 revealed that 150 EMTs were monitored by WHO (Blanch et al, 2014), and similar numbers were registered in the response to the 2015 Nepal earthquake (149 EMTs).

This increase in EMTs presents a significant challenge for the government of the affected country to balance immediate needs against the scale of the response and the complications of coordinating and monitoring responders’ activities. Few national legal systems are adequately prepared for the potential of receiving international assistance, leading to ad hoc rule-making and confusion in the aftermath of a disaster, when it can least be afforded.

Box 2: The two types of ERU that qualify as EMTs:

Red Cross Emergency Hospital: This ERU functions as a first level field hospital, providing referral-level multi-disciplinary care to a population of up to 250,000 people. The inpatient capacity ranges from 20-160 beds, providing surgery, limited traumatology, anesthesia, internal medicine gynecology, obstetrics and pediatrics. (Equivalent to a Type 2)

Red Cross Emergency Clinic: Provides immediate basic curative, preventive and community health care for up to 30,000 beneficiaries, using a modular approach adjustable to local needs. EMT type 1.

¹⁴ <https://www.ifrc.org/en/what-we-do/disaster-management/responding/disaster-response-system/dr-tools-and-systems/eru/types-of-eru/>

¹⁵ Many more were believed to be operating directly without the knowledge of the Haitian government or the UN coordination mechanisms. Many of them may not qualify as EMT level 1, making comparison between SODs difficult.

Nevertheless, the lack of initial responders to the West African EVD outbreak reveals that this proliferation of actors does not necessarily apply to all hazards or emergencies. The number of organizations and EMTs willing to respond to protracted conflict and complex emergencies is in stark contrast to the proliferation of EMTs in “simple” SODs, as noted by an MSF¹⁶ report.

The quality and capacity of EMTs

Most observers agree that there is a widening gap in terms of the differences in quality and capacity between the two main types of EMT providers. On one side, the traditional, well-established (and larger) humanitarian actors and governmental teams, particularly those involved in domestic response who are constantly improving their preparedness, training and capacity by learning from experience and investing in their development. On the other side, the number of improvised, poorly prepared and underequipped EMTs appears to be increasing, as highlighted by stakeholders consulted for this report. There is however no formal documentation that reports on this trend as, until recently, there has been a lack of commonly agreed minimum standards and monitoring mechanisms for EMTs. Differentiating between the effective partners and the often counterproductive ‘amateurs’ requires familiarity with the humanitarian actors. Generally speaking, this is knowledge that local health authorities, faced for the first time with the effects of a natural disaster, often do not possess, which can lead to complications around quality control, capacity and effectiveness.

Current initiatives to address effectiveness of EMTs

The issue of effectiveness of foreign field hospitals and EMTs is one that has been considered for decades. As early as 1976 after the Guatemala earthquake, the US Office for Foreign Disaster Assistance included in its Lessons Learned Database the lack of effectiveness of deploying foreign field hospitals. Subsequent efforts to provide international guidelines for foreign field hospitals (WHO-PAHO 2003) have failed to reconcile the offer of assistance with the needs and expectations of the affected countries. In short, a more comprehensive and consensual approach was required. More recently, the Pan-American Health Organization (PAHO) passed resolution CSP28.R19 (PAHO 2012) that recommends “a flexible mechanism for registration and accreditation of rapid-response EMTs with the goal of improving the quality of the medical response in coordination with WHO”.¹⁷ This mechanism is now spearheaded by WHO through the creation of the ‘EMT initiative’ (originally Working Group) as well as its capacity as the lead agency of the GHC. Although not established solely to address issues around the management and regulation of EMTs, the IFRC’s Disaster Law Programme (‘DLP’) provides technical advice and undertakes research and advocacy initiatives which promote the effective facilitation and regulation of international disaster relief, including the use of EMTs, as will be explained below.

WHO EMT initiative

WHO has developed an EMT initiative to create a global classification system and minimum standards for the response of EMTs in the event of a sudden onset disaster.¹⁸ Rapid access to acute health care is a key requirement for a disaster-affected population, and when the national capacity for health response is overwhelmed there is often a well-intentioned arrival of EMTs into the disaster zone. Haiti and other large scale disasters have been witness to a wide spectrum of responses ranging from the well-prepared, timely and lifesaving to the ad-hoc, poorly trained, ill-equipped and even dangerous. Compounding this lack of standardization, classification and minimum standards was a history of coordination weaknesses, as seen in Haiti with the lack of “tasking” of teams on arrival by the health cluster as well as little support to the affected government to understand this need. The EMT initiative was set up to address such issues, and to improve coordination and the tasking of teams for time critical interventions under the auspices of the affected government during the initial relief phase.

16 “Where is everyone?” http://www.msf.org/sites/msf.org/files/msf-whereiseveryone_-def-lr_-_july.pdf.

17 http://www.paho.org/hq/index.php?option=com_docman&task=doc_download&gid=18953&Itemid=270&lang=

18 See http://www.who.int/hac/global_health_cluster/EMT_guidelines_september2013.pdf?ua=1

The response of EMTs is not limited to large-scale disasters or a particular natural hazard, nor is it limited to lower-income states or a particular type of health intervention. There is no single repository of documented case studies or field anecdotes for EMT responses to explain the variations in standards, levels of coordination and support for the national health response. Future success of EMT responses will not only depend on the compliance and change management of EMTs and their donors, but also to a great extent on the strengthening of affected countries' national disaster management arrangements and disaster laws.

The EMT initiative has produced two important guidelines to improve the quality of EMTs and to monitor and coordinate their on-site activities:

1. Classification and Minimum Standards for Foreign Medical Teams in Sudden Onset Disasters (WHO / GHC 2013-A)
2. Monitoring and reporting of Foreign Medical teams (EMT) arriving in the aftermath of earthquakes (WHO / GHC 2013-B).

Learning from the experience of the International Search and Rescue Advisory Group (INSARAG), the global directory of EMT providers, now fully operational, will provide key stakeholders with peer-reviewed data on the proposed capabilities of prospective teams. This will facilitate acceptance of teams and tasking for the decision-makers in the affected country.

The initiative has already developed a classification system for EMTs based on capabilities, and a first edition of the classification and professional standards that has been published by WHO (2013). Furthermore, it has also developed an outline for the process for on-site coordination and registration with national authorities, and mechanisms for authorizing arriving teams. This has been used to good effect in Vanuatu and Nepal, with leadership of the affected Ministry of Health in registering and tasking all arriving EMTs using a EMT Coordination Cell supported by the WHO. The EMT initiative and secretariat will:

1. promote wide ownership of and compliance with the classification system and standards for EMTs, and in so doing increase the professionalism and capacities of teams, particularly national government and non-government teams striving to achieve international standards;
2. develop and manage a global directory of potential providers of EMTs based on their capabilities and the agreed-upon classifications, including self-declared commitments to adhere to the standards, and peer and WHO verification of their compliance through accreditation visits;
3. strengthen the capacity of potential host countries to request, register, task and coordinate EMTs in the aftermath of an SOD or during an outbreak; and
4. enable WHO and international partners to provide technical and / or operational on-site support to coordinate and monitor the activities of EMTs in the case of a SOD or outbreak requiring significant external assistance.

The Disaster Law Programme of the IFRC

In 2001, the IFRC launched its International Disaster Response Law Programme (now known as the Disaster Law Programme or 'DLP') to examine regulatory problems related to international disaster relief. Over the course of the following six years, the IFRC gathered existing legal and guidance documents, conducted several dozen operational case studies, surveyed practitioners and organized regional and global consultations with governments, humanitarian organizations, and other stakeholders to

identify and address the main regulatory problem areas. The results of this work were consolidated in a 2007 Desk Study on law and legal issues in international disaster response (IFRC 2007). The desk study found that there is a consistent set of problems in response, including unnecessary bureaucratic bottlenecks to the entry and operation of humanitarian personnel, goods, equipment and initiatives, and oversight gaps leading to quality, coordination and communication problems.

In 2007, the IFRC conducted inter-state negotiations that led to the development of the “Guidelines for the domestic facilitation and regulation of international disaster relief and initial recovery assistance” (also known as the “IDRL Guidelines”). The IDRL Guidelines recommend that states provide a package of legal facilities to enable the swift entry of international relief, but that these facilities only be offered only to selected actors and on the condition that they comply with accepted quality standards, humanitarian principles and coordination mechanisms. The IDRL Guidelines include the consideration of EMTs within their scope of advice; however, they do not provide detailed advice for states as to how to select trustworthy EMTs. The WHO classification scheme provides guidance on this matter, and enables states to make more informed choices as to whom to trust for “fast track” procedures.

Since 2007, the IFRC and its member National Societies have worked in over 50 countries to support interested authorities to examine their existing laws and procedures for managing incoming international assistance in light of the recommendations of the IDRL Guidelines. To date, multiple countries have adopted new laws or rules based on this advice or have bills pending in their national legislatures. The IFRC Disaster Law Programme team has also been deployed to support operations and advocate for the facilitation and regulation of incoming international assistance after disasters in the Philippines, Nepal, Myanmar, Vanuatu, Fiji, Ecuador and Haiti.

INSARAG¹⁹

Another initiative which has served as a role model in the management and coordination of EMTs is the International Search and Rescue Advisory Group (INSARAG), established in 1991. INSARAG is a global network of more than 80 countries and organizations under the United Nations umbrella which deals with urban search and rescue (USAR) related issues. It aims to establish minimum international standards for USAR teams and methodologies for international coordination in earthquake response based on the INSARAG Guidelines. These Guidelines were endorsed by the United Nations General Assembly Resolution 57 / 150 of 2002, on “Strengthening the Effectiveness and Coordination of International Urban Search and Rescue Assistance.” INSARAG’s primary purpose is to facilitate coordination and improve the quality and effectiveness of international USAR teams who make themselves available for deployment to countries experiencing devastating events of structural collapse due primarily to earthquakes. Of particular value to the EMT initiative is INSARAG’s focus on quality control for USAR, as illustrated in its published guidelines and standards, a peer review external classification of USAR teams,²⁰ and frequently organized simulation exercises. Significant effort and funding has been invested into improving the international USAR response, as well as developing national USAR systems able to address the most common needs. Joint trainings and exercises have commenced under the EMT initiative, with regional exercises in the Americas, Asia and Europe involving joint deployments of USAR and EMTs working closely with UN OCHA and its coordination mechanisms.

19 <http://www.insarag.org/>

20 International USAR teams are classified as ‘heavy’ or ‘medium’ according to a strict criteria of capabilities and a peer review process.

Successes and shortcomings in international medical assistance



The United Nations' General Assembly resolution 46 / 182²¹ recognizes that **“the affected State has the primary role in the institution, organization, coordination and implementation of humanitarian assistance within its territory”**. Bearing in mind the different types of EMTs and the challenges mentioned in the sections above with regard to coordination, efficiency etc., the objective of the global EMT initiative is to strengthen national capacity to address suffering through improved coordination, monitoring and supervision of the broad range of EMTs that may be present in affected states.

Few countries experience more than one major SOD per generation, which means that current authorities are unlikely to have direct or recent experience and may not be familiar with lessons learned (good and bad) from EMTs. This part of the report aims to illustrate the issues faced in past SODs, outlining both successes and shortcomings. This report follows the different phases of the deployment of EMTs which will be outlined below, namely:

- pre-deployment;
- arrival on site and tasking of the EMT;
- on-site operations (delivery of medical or surgical care); and
- phasing down / hand over.

Pre-deployment

Before a EMT can even travel to a disaster-affected country, several time-consuming steps must take place both within the affected country as well as the with the provider of medical assistance. Firstly, the affected country has to decide whether it needs and / or wants international assistance in the form of EMTs and secondly, the deploying agencies must decide whether there is sufficient 'benefit' to deploying a team.

National decision to request / accept EMTs

The decision to request the support of EMTs is a vital prerequisite for the deployment of some (but not all) EMTs. Interviews conducted for this report confirmed that civilian or military teams sent by foreign governments will always wait for formal approval and in some cases a specific request from the authorities of the affected country. In some countries (Spain, for example), calling up volunteers from a roster and requesting their release from employers are all subject to receiving this formal request. Other provider governments may be willing to carry out these steps in advance of a decision from the affected country. The actual departure of the team will take place once formal approval is received. A formal decision from the affected state is also a prerequisite for the deployment of non-governmental EMTs that are sponsored, transported or funded by a donor government.

21 <http://www.un.org/documents/ga/res/46/a46r182.htm>

However, many other actors, especially NGOs with an existing presence in the affected state, do not see a formal request or expression of need from the authorities as a required pre-condition. This is probably due to the NGOs considering the arriving EMTs as merely reinforcing or expanding the existing activities, under the authority of existing agreements or memorandums of understanding. International support provided by the Red Cross and Red Crescent in non-conflict disasters is provided upon the request of the National Society of the affected country and in support of it fulfilling its existing national mandate.

There are also a significant but unknown number of EMTs or individual volunteers willing to travel and deploy locally irrespective of the affected government's decision. Generally speaking, such actors often consider themselves as accountable directly to the affected population. At best, if the affected government doesn't make clear a formal position regarding the acceptance of incoming EMTs, this could be interpreted as tacit approval for the entry of unregistered or unofficial EMTs.

During the Bam earthquake response in 2003, the Iranian authorities quickly decided to selectively open the borders to official EMTs, including from the USA. This was a highly-praised opening into an otherwise isolated political environment. Approval was however restricted to a limited number of NGOs familiar with Iran (according to an unpublished Health response evaluation by de Ville de Goyet) such as Médecins Sans Frontières (MSF), which had worked in Iran since 1995 in the regions of Mashaad and Zahedan.

In Asia, the official position of the states affected by the Indian Ocean tsunami (December 2004) varied from country to country. In India and Thailand (both countries with manageable needs and extensive health resources), a "no request" policy ruled out government sponsored teams but was somewhat less effective regarding the acceptance of EMTs from other sources. As one health official noted, "It is India's national policy not to request foreign aid. However, EMTs still do arrive on their own, and unsolicited, and they are cleared on a team-by-team basis." EMTs arriving in Sri Lanka, a country with a good public health care system, found a hospitable official environment - but few needs to meet. A group of European doctors interviewed for this report noted that even a few days after the impact, there was "little to do medically, but it is more a psychological gesture of human solidarity". This point of view, however, is not always shared by the overworked district health authorities.

The situation was very different in Banda Aceh, Indonesia, which was affected by internal conflict and under military rule, and as such was closed to international assistance with the exception of a few actors (such as the UN and ICRC). However, after the 2004 tsunami struck Indonesia, the government quickly opened the previously restricted province of Aceh to international humanitarian responders, although this decision was not made known widely for two days (see the IFRC 2007 case study on law and legal issues in disaster response). As is often the case, the decision to accept assistance came without specific instruction or requirements regarding medical personnel and teams. In a relatively short time period, the already taxed local authorities were faced with an overwhelming medical response of variable quality and effectiveness.

The aftermath of the earthquake in Haiti also presented an extreme situation. A quick consensus appeared to emerge among the mass media, public and humanitarian community that huge and immediate external medical assistance efforts were required due to the magnitude of the damages in a metropolitan area and the expected human losses.²² Many acted accordingly without considering or waiting for official clearance. The Haiti government had been weakened by direct losses of staff and infrastructure and the Ministry of Health's office in Port-au-Prince was, among many other government

22 A few hours after the impact, CNN reported that: "A major earthquake struck southern Haiti on Tuesday, knocking down buildings and power lines and inflicting what its ambassador to the United States called a catastrophe for the Western Hemisphere's poorest nation. Several eyewitnesses reported heavy damage and bodies in the streets of the capital, Port-au-Prince, where concrete-block homes line steep hillsides. There was no estimate of the dead and wounded Tuesday evening, but the U.S. State Department has been told to expect 'serious loss of life,'" <http://edition.cnn.com/2010/WORLD/americas/01/12/haiti.earthquake/>

buildings, totally destroyed by the earthquake. According to an interview with a key Haitian official for this report, the government never formally ‘requested’ EMTs.

Another example was during the response to Typhoon Yolanda in the Philippines in 2013, where considerable progress in the process for accepting international assistance was noted by the UN, as the government accepted the UN offer of international assistance one day after the disaster struck (UN OCHA 2013). Prior to the impact, the “WHO regional office had correctly identified the destructive potential of Yolanda and recommended to local authorities to request international community EMT3 to be placed on standby. Informal contacts were made with Australia and New Zealand. The absence of both a regional or global EMT registry and formal mechanism for ‘standby’ notifications meant that other EMTs could not be informed.” (Blanch et al, 2010).

The decision to request and accept EMTs in the response to the West African EVD outbreak varied in the three worst affected countries (Guinea, Liberia, Sierra Leone). On 25 March, 2014 the WHO Global Emergency Management Team had graded the outbreak as a Level 2 emergency and were coordinating daily conferences on risk assessment, operational planning and review between Ministry of Health officials in of Guinea, Sierra Leone, and Liberia, the WHO country offices, the WHO Inter-country support teams (IST) of West Africa, WHO headquarters and the WHO African regional office (WHO AFRO).²³ The Africa regional office and the headquarters deployed 19 experts in case management, epidemiology, infection prevention and control (IPC), outbreak logistics and medical anthropology to Guinea. Although there was no formal, specific request for EMTs from the government for a very long time, MSF deployed in its normal manner a strong clinical presence to the worst affected area and the capital. By July 2014 however, several requests for EMT assistance had surfaced but remained unanswered. The initial response agencies (MSF, Samaritans Purse, IFRC, IMC and Emergency) were the closest to planned EMT deployment of self-sufficient teams, with some having prior engagement in development programs that they expanded as the EVD outbreak worsened. Subsequent responders only deployed EMTs after a new model designed specifically for this response was put in place. This model involved offering specific assistance to teams for the building of safe treatment centres, supplies, IPC training as well as, in many cases, direct funding; once it was operationalized a large number of additional EMTs were encouraged to step forward, albeit slowly.

As noted by the Tsunami Evaluation Coalition (TEC) evaluation on the needs assessment (TEC 2007 / A), ultimately accepting (or offering) EMTs is a political decision and not a technical evidence-based one. National pride in self-reliance is balanced against geopolitical considerations and domestic politics. Disasters are highly emotional

Box 3: Japan policy on EMTs (IDC 2014)

“Firstly, the decision was made after considering all the factors including the needs of the affected local governments and also the level and types of medical services that could be provided by each offering country. In fact, there were not many persons with injuries in the affected area requiring support from medical doctors, but rather emotional / psychological support was needed for people living at evacuation shelters and medical treatment for elderly persons suffering from chronic illness.

Secondly, compared to other overseas support, medical doctors from overseas often require careful preparation and support structure at the affected area because those medical doctors will be directly interacting with disaster victims.

Thirdly the Japanese government made it clear to all countries that were planning to dispatch medical teams and search / rescue teams to be “self-sustained,” which included translators for their operations, food, and accommodation at the disaster-stricken area. This government policy may have limited the amount of assistance to Japan.”

and political events, with a high risk for the incumbent political parties and personalities. Even in high-income countries, few governments' domestic responses to disasters are well-received by the general public, as illustrated by the response to Katrina Hurricane in the US (2005) and the Great East Japan earthquake (2011).

The dilemma of requesting or accepting EMTs is therefore not an issue that is unique to lower income countries. Japan, China, Chile and New Zealand had to directly consider the fact that any country can potentially face a SOD where casualties overwhelm the local health services. All these countries did however issue clear official requests for EMTs, which were then accepted on a case-by-case basis.

For example, the response to the Great East Japan earthquake and the management of EMTs has been particularly well documented. More than 30 countries offered to dispatch medical teams, although the government of Japan received medical teams from only four countries, namely, Israel, Thailand, Jordan, and Philippines (IDC 2014). Other EMTs arrived through different channels²⁴ (see box 3).

Chile, much like Japan, is a country with a strong culture of disaster preparedness. Yet after the earthquake in Central Chile in 2010, "the government did not know (in some cases for several days) the impact and needs of the local governments due to communications failures" (USGS – AmCross 2011). The government later realized that external assistance would be required in light of the extensive damage to health facilities. Acceptance of EMTs was on a case-by-case basis, and they were received mainly from other countries in Latin America, as well as from Spain and Japan. Full respect for local norms and integration with local health services were pre-requisites for acceptance, which were also applied to NGOs that had been locally registered prior to the earthquake, such as MSF, for example.

Another example is following the Sichuan earthquake in 2008, where China's central government "received aid and rescue support from the municipal governments around China. As a result, they succeeded in cooperating within the country during the Sichuan earthquake..However, because the Chinese government was unable to respond quickly to offers of assistance from other countries, the acceptance of international rescue teams took days." (Otani et al. 2012).

In the aftermath of the Christchurch earthquake in 2011 in New Zealand "Christchurch Hospital was never really overwhelmed by the amount of trauma... Staff came from hospitals around New Zealand, especially to provide relief... The Australian field hospital was accepted but essentially as a contingency. The main hospital was very fragile especially since its operating theatres could have become unusable if the tunnel conveying services had collapsed. This use of the Australian field hospital was prudent." (McLean et al. 2014, p 121).

In the US in 2012, the Institute of Medicine²⁵ defined standards of care in disaster events, stating that "medical care will be delivered across the continuum from conventional to contingency to crisis surge response paradigms. Permitting and integrating EMTs should be considered only during catastrophic events, when all available domestic medical response resources have been committed to the response, and a gap in delivering medical care remains" (Hanfling and Bouri 2013). Despite some ad-hoc collaboration from Mexico and Canada during the response to Hurricane Katrina in 2005, the "broader refusal of assistance, including from allies in Europe, the Middle East, and Asia, could have been attributed in part to unclear policies regarding the integration of foreign medical assets" (Hanfling and Bouri 2013). The same authors note that the US could benefit from experienced EMTs in response to large-scale domestic disasters.

24 "Indonesia, Netherland, Canada, Sri Lanka, Taiwan, Turkey and the US dispatched medical teams through NGOs or directly to the disaster stricken areas without contacting the Japanese government" (IDC Japan 2014).

25 According to its website, the Institute of Medicine is an independent, nonprofit organization that works outside of government to provide unbiased and authoritative advice to decision makers and the public. Established in 1970, the Institute is the health arm of the National Academy of Sciences. <http://www.iom.edu/About-IOM.aspx>

They also mentioned significant challenges to the potential use of EMTs in response to a catastrophic event in the continental US, which included: “political concerns regarding the acceptance [of EMTs]..., adherence to accepted standards of care expected of health and medical providers delivering emergency care in the US..., [compliance with] the legal and regulatory framework as it pertains to the delivery of health and medical care. Medical providers, as licensed independent practitioners, or non-licensed practitioners dependent on certification and registration, work in a highly regulated environment. EMTs would likely only be permitted to deliver care in the US based on some measure of verification of their capabilities. However, licensing, credentialing, and verification cannot be accomplished in real time during a disaster.”²⁶ Although these comments were made in the context of the US, many countries face these issues.

One issue common to most of the affected countries surveyed for this report was a breakdown in communication between the national level and the affected provinces or regions. An interlocutor in Philippines noted that “local government offices and public health centres that were to lead the disaster relief activities were hit severely and lost their capacity to function. Thus, the ability to grasp the extent of damage and coordinate relief activities did not go as planned in the manual”. This issue appeared in most of the SODs regardless of the level of development or preparedness. In Haiti, problems in communication were compounded by the severe damage to the capital and infrastructure. Central level capacity (i.e. national ministries and international HQs) suffered severe losses, further complicating any rapid assessment. Furthermore, details of the magnitude of a SOD tend to emerge very slowly. It can be a matter of days (and, in exceptional cases, weeks) before hard data becomes available to guide decision makers. As was demonstrated in an independent evaluation by the TEC on the role of Needs Assessments (TEC, 2006 / A),²⁷ information is often too late to influence major decisions and commitments. In this context, it is worth noting that, in the acute trauma care field, the “golden period” for primary treatment of wounds is around 6 hours (i.e. the time period during which there is the highest likelihood that prompt medical treatment will prevent death). (Peterson, 2010). Therefore, delays and breakdown in communications can have significant impact on a) gathering information on which to base decisions for deploying EMTs, b) reaching affected areas in which EMTs are needed and therefore; c) providing life-saving assistance and primary treatment of wounds to affected individuals.

Provider decision to mobilize and offer an EMT

Potential providers of medical assistance are rarely found passively waiting for a formal request or decision from the affected country. Research for this report showed that willing governments often place their teams on alert or stand-by, sometimes stationing them at an airport for rapid dispatch upon confirmation of approval from the affected state. Many donor countries use the resources of their domestic response system for this purpose. However, for some states, legal constraints prevent them from taking any measures that may suggest a commitment or involve expenditure until a formal appeal or request has been received.

The findings of this report are consistent with the conclusions of a post-tsunami assessment study, which found that, in general, assessments of responses to SODs were of variable quality, and that assessment reports often failed to influence relief action (TEC 2007). Interviews conducted for this report revealed that larger NGOs, especially those with an established presence in the affected country, relied mainly on the recommendations of their field staff before deploying EMTs. Evidence also suggests smaller actors often appeared to base decision-making on the level and nature of coverage given to the disaster in the mass media.

²⁶ The other issue in the US is related to the fact that granting of medical, nursing, and pharmacy licensure is a state's responsibility and not a federal one.

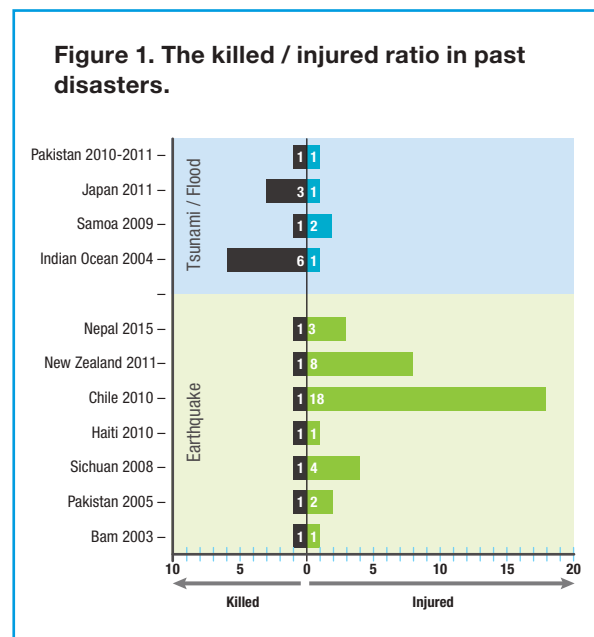
²⁷ <http://www.alnap.org/resource/3531>

Criteria and factors influencing the decisions to offer or accept EMTs

An optimal decision to offer or request EMTs should be based on clear evidence, such as an assessment of medical needs, the appraisal of damage to the existing capacity of health services and the identification of gaps to be filled. However, this is rarely the case and, in practice, a number of different criteria are often used. These include:

- **Geological data**, such as the magnitude scales used for earthquakes (Richter scale) which are used to determine the potential impact on people and health services. This has inherent limitations, however, as shown by a study of the US Geological Survey and American Red Cross (USGS 2010), which compared the Haiti and Peru earthquakes with the scenario of the Andreas Fault in California: “magnitude alone does not determine what the experience of an earthquake will be... The extremely high death toll and level of damage in that (Haiti) earthquake is directly attributable to the poor quality of buildings in the area. The Haiti experience, therefore, does not provide a basis for comparison to either the Chilean or [Andreas Fault scenario] earthquakes.” In addition to this, the Active Learning Network for Accountability and Performance in Humanitarian Action (ALNAP)²⁸ advised the humanitarian community that “[t]here is no simple way of predicting the ratio of dead to injured. This ratio can vary widely.” (ALNAP 2008).
- **Broad knowledge of past SODs.** Although knowledge and experience from past SODs can be extremely useful, caution is required as the same errors of judgment appear to be repeated after most SODs. For example:

- o On the one hand, needs for medical care tend to be over-estimated by those humanitarian actors keen to intervene. Tsunamis are also often wrongly expected to cause as many injuries as earthquakes do (Figure 1). For example, the number of traumas and injuries requiring life-saving interventions was overestimated for the Indian Ocean tsunami. A similar trend was observed in Japan: “Unlike the Great Hanshin Awaji earthquake, necessities for emergency medical treatment for earthquake victims of the Great East Japan earthquake were limited in spite of the fact it was the cause of a number of deaths by tsunami”. (IDC 2014 p.43)



- o On the other hand, there was a massive mobilization of national medical teams for all SODs reviewed in this report.

National and regional teams are described to be the best equipped culturally to respond in the majority of events (Starkey J and Maeda S. 2011). These teams are able to respond much earlier than the majority of international EMTs. To illustrate this point, table 3 summarizes the Japanese medical response to the Great East Japan earthquake. The additional deployment of nurses, physiotherapists, psychologists and pharmacists brought the total to 35,062 health personnel. The magnitude of the national medical mobilization sets the contribution of EMTs in a very distinct context, namely that it places emphasis on the need for a clear added value. Haiti, due to its small size and poor routine coverage of its population (according to PAHO / WHO 2007 data, only 47% had access to health care), was an exception to this. If prior to the

28 ALNAP is a system-wide organization dedicated to improving the accountability and performance of humanitarian action by strengthening the humanitarian evidence base through sharing lessons, researching key issues and, where appropriate, providing leadership to find collective approaches and solutions. See <http://www.alnap.org/about>

disaster 75% of Haitian health care was provided outside the public sector, it was closer to 100% in the immediate aftermath.

Table 3: Extent of mobilization of national resource

Japanese medical response	Disaster Medical Assistance teams (DMAT)	Non-DMAT Medical	Health care “License Holders”
Teams	340	2,720	230
Staff	1500	12,385	11,267

- **Trusted institutional (internal) sources:** Most of the providers have access to staff members, contacts or community leaders directly involved in the in-country response. Interviews for this report showed that the weight of the opinion of those contacts often exceeded that of more official sources, which were external to the institution concerned and therefore less trusted. More often than not, such internal sources pressed for intervention rather than caution.
- **Mass media coverage:** In the immediate aftermath of the SODs reviewed for this report, the international mass media were not reliable, objective and actionable sources of information on actual needs. Nevertheless, as has been mentioned previously, the importance of the mass media as a criterion for accepting or rejecting external medical assistance in natural disasters cannot be over-estimated. Regardless of the quality of health services or the scale of national mobilization, international media reporting will often focus on interviewing wounded members of the population facing “unacceptable” delays for proper care and identify critical medical supplies in short supply. Unbalanced and sensationalist coverage can put even principled and resourced self-reliance at risk due to the impact on public opinion. As an example (observed by one of the authors of this report), the Mexican government reversed its policy of medical self-reliance 24 hours after the earthquake in the capital city in 1985, opening its borders to EMTs and field hospitals despite the bed occupancy rate in the capital hospitals being under 95%.²⁹

The interviews conducted for this research and the authors own past experiences in evaluations has shown that the humanitarian field is essentially ‘offer-driven’. This can be seen in the response to the Bam earthquake in Iran in 2003, where IFRC “ERU deployments were made irrespective of Field Assessment Coordination Team (FACT)³⁰ assessments, which in this case was probably too slow and not relevant to deployment decisions anyway” (IFRC 2013). The same was found after the tsunami in Banda Aceh, Indonesia, in 2004 with the FACT team strongly discouraging the dispatch of ERUs, ultimately in vain (TEC 2006 / A). Strong institutional interests can override such recommendations, combined with the desire to ensure that one’s team is present and visible on site. As observed by the independent authors of the IFRC Bam earthquake review: “If the priority is to get there first – who cares about assessment? Is the best approach to hold back from deploying a field hospital (for example) because 10 other countries are already sending one, or is the priority to be the first of the 11?”³¹

The mobilization of optimal resources to respond appropriately to an SOD remains challenging. The fast national medical mobilization seen in Japan emphasizes the need for a clear added value. A comparison of the timing of EMTs with a foreign field hospital (FFH) facility and inpatient capacity (EMT2 and EMT3) that arrived in Nepal as compared to what occurred in Haiti³² reveals how lessons from the past have contributed to our knowledge that ‘more not always is better’ (Figure 2). In the case of Nepal, at 6:49 PM (local time) April 29, 2015 (four days after the earthquake) the EMT coordination

29 C de Ville de Goyet. Personal observation in his capacity of regional PAHO / WHO disaster coordinator.

30 Field Assessment Coordination Teams are a vital part of the IFRC’s global emergency response tools. They are made up of experienced Red Cross Red Crescent disaster managers who support National Societies and IFRC field offices to respond effectively to disasters. FACT team members have technical expertise in relief, logistics, health, nutrition, public health and epidemiology, psychological support, water and sanitation, finance and administration, as well as language capabilities. FACTs are constantly on standby and can be deployed anywhere in the world within 12-24 hours, for a period of 2 to 4 weeks. <http://www.ifrc.org/fr/introduction/gestion-de-catastrophes/operations-en-cours-/disaster-response-system/regional-and-international-disaster-response-tools-and-systems/responding-to-disasters-field-assessment-coordination-teams-fact/>

31 p.17, IFRC, Bam Review, 2013.

32 Haiti data derived from Gerdin et al. Emerg Med J. 2013 Jan;30(1):e8. doi: 10.1136/emered-2011-200717. Epub 2012 Mar 7.

cell communicated a clear message: “The ministry of health leader for international response coordination, with the agreement of the minister for health, has stated that no further teams are required at the current time. The MoHP and partners from military, government and NGOs that have provided EMTs are noting decreased rates of trauma cases, and the MoHP currently feel there are no gaps. All EMTs that are enroute without firm tasking location, and all that are on standby should STAND DOWN.”. By the time this message was conveyed, 14 teams with FFH had arrived and during the next 20 days, only 2 additional teams with FFH. As a comparison, only 9 teams with FFH were in Haiti on day 4 and an additional 22 FFH arrived during the next 20 days. This decline in the number of arriving teams to Nepal ought to be considered a communication accomplishment.

Officials from the affected states interviewed for this report tended to have an optimistic estimation of the speed with which a decision would normally be taken on whether to accept EMTs. Government interlocutors noted that typically there should be no more than one day of delay. A review of relevant literature reveals a different story on the part of responders, for example in response to the Chile earthquake where they “expressed the opinion that the decision to declare a catastrophic event in this case took longer than would have been preferred” (USGS and AmCross 2011).

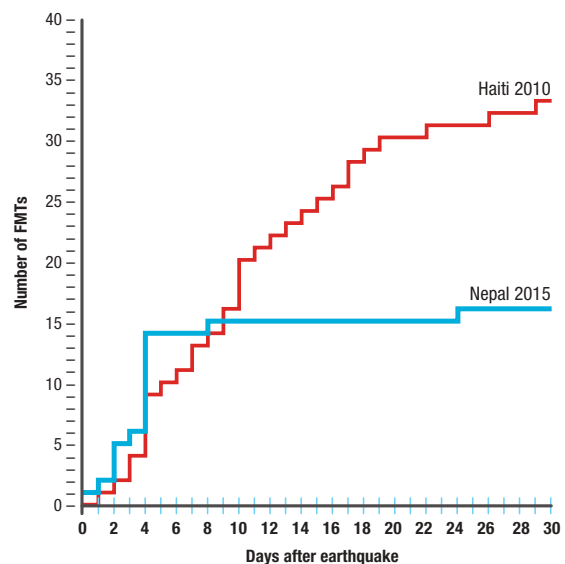
In Myanmar, after Cyclone Nargis, opening the country to external humanitarian assistance was a political turning point. This decision was not taken quickly, and was only determined three weeks after the cyclone struck, when the government agreed to accept international assistance and to collaborate with the Association of Southeast Asian Nations (ASEAN) and the UN in a unified approach (WHO 2008). It should be noted that this is a much greater length of time than that acknowledged by the Myanmar government official interviewed for this report.³³

In the Philippines after Typhoon Yolanda, assessments were delayed but this did not appear to affect the issuance of an international appeal and the acceptance of EMTs (which occurred only one day after the disaster struck, according the national official interviewed, and after three days according to international interlocutors).³⁴

In the case of the 2015 Nepal earthquake, the government of Nepal declared a state of emergency within two hours of the earthquake. The government’s cluster mechanism was immediately activated and an official request for international assistance was made. Military medical teams, mostly from neighbouring countries, were among the first to arrive and within the next few days, EMTs from 38 countries streamed into Nepal and reported to the EMT coordination desk that was set up in the Ministry of Health premises.

On the provider side, the decision to offer medical assistance is generally fast, owing largely to the need to respond to public opinion and ensure humanitarian assistance is visible. As has been noted above, commitments may be made in the absence of strong evidence to support the need for assistance. Again, the EMT response to the EVD outbreak is an exception to this general pattern; although there is

Figure 2. The arrival of FFH in Haiti (2010) and Nepal (2015)



³³ Estimates offered by an official from Myanmar were distinctly shorter (6 days).

³⁴ The potential magnitude of the damage, the geographical extent and above all the risk for tidal waves were reportedly underestimated prior to the impact.

little doubt that the humanitarian community aspired to respond to the crisis, the lack of sufficiently prepared outbreak teams stalled the response.

Who is the decision-maker at country level?

In line with key principles of international law, such as state sovereignty and territorial integrity, only the government of the affected country can make the decision whether to accept or reject EMTs in non-conflict disasters. No international organization, however qualified technically or operationally, can override this. Decision making on the acceptance of medical assistance should be the technical responsibility of the local (national or provincial) health authorities, as they are generally the best-equipped to assess the gaps in health care. In practice, all forms of relief assistance (USAR, EMTs or in-kind donations) for the SODs covered by this study were coordinated at a multi-sectoral level. For example, the affected state's Ministry of Foreign Affairs and / or National Disaster Management Agency are usually the institutions that formally accept the offers (although sometimes coordination between the two bodies is not effective).

The international appeals examined for this report were often lacking in specificity and failed to include the professional requirements (i.e. minimum technical standards) relevant to the medical context. Offers from donor countries often consist of a comprehensive package within which the provision of medical care is a relatively small financial amount. It may also be difficult for the receiving state to argue technicalities of specific health items, as this could jeopardize or delay the overall package of relief assistance.

All officials interviewed for this report noted that their countries lacked adequately specific plans and procedures for dealing with the flood of EMTs that they experienced, and 'partial improvisation' was the rule. To counteract this, some form of effective 'institutional memory' is needed; this has recently proven valuable in the Philippines, a country that faces an unusually large number and frequency of SODs.³⁵ Stronger advance warning of an incoming SOD (warning phase) and improved materials and guidelines issued by the WHO EMT initiative have considerably improved the process for the management of EMTs, allowing the Philippines Department of Health to play a significant role.

The success in coordinating EMTs in the Philippines has depended ultimately on the capacity of the Ministry of Health and its determination to assert leadership and overall authority on health-related actors and clusters. A review of the evaluations for the responses to the Pakistan (2005) and Haiti (2010) earthquakes (PAHO / WHO 2011) reveals that this was not the same case in these instances, however the example of the Philippines presents a possible way forward and good example for other affected states.

In Nepal in 2015, the government initially responded with medical services delivered via its military resources, supported by foreign military units. Therefore, a very substantial part of the initial EMT coordination was under the command of the Ministry of Defense. When civilian teams arrived later on, they were under the coordination of the Ministry of Health. As a result, during the first week of the response, two different and overlapping government entities were coordinating the medical response in Nepal. At the end of the first week, the coordination and tasking was combined to a single meeting through the work of a deployed WHO EMT coordinator. A coordination cell was created within the Ministry of Health premises with the assistance of members of the UNDAC team from UN OCHA, International Humanitarian Partnership members, and volunteers from Japan, Germany, India Red Cross and MoHP staff.

35 The need for an institutional memory is particularly clear for those countries with a lower occurrence of SODs, due to lower vulnerability or size.

Arrival: registration and tasking

Once an EMT is deployed, it is crucial to inform authorities and other relevant actors of the impending arrival, and to be able to facilitate registration of the team (assuming the team has of course been deployed with the consent or at the request of the affected state). Providing advance notice, the timing of the arrival, expedited customs and immigration procedures and registration of EMTs are all crucial components of the arrival process, as explained below

Advance notice

Most interviewees from the countries studied for this report noted that they did not have advance notice of the impending arrival of EMTs. Details of the teams' capabilities, skills, staff or equipment were generally unknown to relevant domestic officials, especially at local level. One of the contributing factors to this lack of detailed communication on EMTs' capacities may be that the official interlocutors (i.e. embassies / foreign affairs ministries and disaster management agencies in donor and recipient countries) are not familiar with the complexity of the emergency medical care domain. If the Ministry of Health is not present and active in the deployment process, an exchange of reasonable queries and answers on technical specifications before actual deployment is less likely to take place. Another issue may be that the information was provided but not properly disseminated through the appropriate lines of command or with the relevant Ministries, and simply did not reach the official coordinating on-site. This appeared to be the case in Philippines after typhoon Yolanda, as provincial and national level interviewees points of view differed with regard to their level of satisfaction on available data for EMTs.

Based on interviews for this report, as well as the authors' own experiences, the best organized and most professional EMTs (government or NGOs) would always provide advance information to the authorities of the affected countries. The smaller actors in the Philippines that were constituted for response to typhoons ('volunteer groups') usually arrived unannounced, according to UN and other officials interviewed for this report.³⁶

In the Philippines, Vanuatu and Nepal, coordination was based on a EMT registration form which was issued to teams who had identified that they intended to or were deploying. They were requested to complete and email the form to the WHO health cluster coordinator or, in the case of Nepal, to the WHO EMT initiative (Blanch et al, 2014). The model form used (WHO / GHC 2013 – A) was only released in 2013.

A lack of detailed advance notice regarding EMTs is unfortunately common in most disasters. Interviewees and evaluation reports that did not raise this issue were the exception rather than the rule. Although general awareness of the issue is high, a lack of robust measures to overcome or regulated this situation means that it is still likely to be repeated in future large-scale SODs.

Timing of arrival

A strong consensus emerged from the interviews and literature review undertaken for this report that, in the past, EMTs have almost systematically arrived too late to provide life-saving acute trauma care. To illustrate the existing time constraints, it is useful to consider the time required for activation and positioning of teams at departing airports or deployment bases in developed countries like the US or Canada. The US Disaster Medical Assistance Team (DMAT) leaders require six hours to mobilize for deployment, the rest of the (non-medical) team requires 12 hours.³⁷ The Canadian Red Cross EMTs type 1 and 2 need 48 hours from activation to the time of departure.³⁸ This does not include the delay between the impact of the disaster and the decision to activate the teams, nor the travel time between the country of origin and the affected area, which can often be isolated and difficult to access.

36 "Volunteer groups are not under any control or umbrella. Out of 150 groups in Typhoon Haiyan, 120 were reportedly volunteers." (WHO official involved in the response).

37 Interview with US officials.

38 Interview with Canadian Red Cross staff.

After the Bam earthquake in Iran, the first field hospital arrived on the third day after the event.³⁹ This was long after most of the injured had been evacuated and distributed among the hospitals in the 13 provinces affected. In light of these figures, it is of little wonder that the occupancy rate of all foreign field hospitals (FFH) remained low.⁴⁰

In the aftermath of the Haiti earthquake, a country at a relatively short flying distance from the USA and the French Departments, the first medical experts (not teams) arrived after 18 hours, long past the vital 'golden period' for acute trauma care (PAHO / WHO 2011).⁴¹ In Chile, arrival times ranged from three days (Cuban EMTs), to four days (Russian FFH rerouted from Haiti), to five-seven days for others.⁴²

Schreeb et al. (2008) assessed the timing, activities and capacities of 43 FFHs deployed after four recent SODs (Bam, Iran in 2003, Haiti in 2004, Aceh, Indonesia in 2004, and Kashmir, Pakistan in 2005), and noted: "A striking finding was the lack of detailed information on FFH activities. None of the 43 FFHs arrived early enough to provide emergency medical trauma care". The authors concluded that "the deployment of FFHs following sudden-onset disasters should be better adapted to the main needs and the context and more oriented toward substituting for pre-existing hospitals, rather than on providing immediate trauma care".

Not surprisingly, the more sophisticated the EMT (type 2 or 3), the more difficult it is to deploy, largely due to having to deal with the logistics of moving more staff, equipment and supplies. In spite of this logistical challenge, some government EMT interlocutors noted that timing has been improving over the last six years, especially for type 2 EMTs. Typically, EMTs can now be mobilized as fast as the USAR teams. Type 1 EMTs, the most common and more mobile type, usually arrive first. After the Nepal earthquake in 2015, 15 teams had already arrived within 36 hours of the disaster, with the majority being type 1 EMTs. However, five teams with surgical capacity (three type 2 EMTs and two specialized cells) managed to arrive within the crucial first 36 hours. These were all military or civilian government teams.

Immigration and customs

Ensuring the swift entry and clearance of medical equipment, supplies and personnel through customs and immigration in compliance with local regulations is extremely important to a timely and successful intervention of EMTs. It is important to include customs and immigration authorities in domestic preparedness planning processes in order to ensure that procedures for rapid entry and clearance of goods and personnel in the event of a disaster are in place, especially for those providers already present in the affected country (i.e. Red Cross and Red Crescent actors, established NGOs, bilateral donors).

Rapid clearance of EMTs is not the only priority however; this is something that needs to be regulated particularly for quality control purposes. Experience has shown that oftentimes large amounts of inappropriate or out-of-date-medication arrives after disasters. Other common problems are that the medicines are not legal in the affected state, labelled in a foreign language, past their expiry date, or not relevant to the actual needs (or a combination of all four of these problems). This issue has formed the basis of several major publications and guidelines from the WHO, IFRC and individual experts. Addressing this topic more broadly is beyond the scope of this report, however, and the examples in this section will focus only on the supplies brought in by EMTs for their own use and the fast-track procedures that were experienced by EMTs.

39 Data from Iranian authorities, literature search and interviews for the unpublished evaluation of the Health response carried out by the main author on behalf of WHO and confirmed by Schreeb (2008).

40 "The occupancy rate [of the 200-bed ERU] has been low, with the highest number of inpatients being 47, mostly due to a lack of demand and referrals." (IFRC 2004).

41 Acute trauma care was provided immediately by the many NGOs and humanitarian teams already in Haiti prior to the impact.

42 From interviews with the Chilean Ministry of Health, PAHO and Red Cross officials.

In the Philippines, a special ‘one-stop shop’ was established at entry points to expedite the formalities for incoming EMTs, as well as other international assisting actors. Agencies presenting detailed inventories experienced little delay once they had registered with the one-stop shop.⁴³ Following the earthquakes in Bam in 2003 and Pakistan in 2005, and for countries affected by the tsunami of 2004, the interviews and literature from this research suggests that the entrance process for the supplies of EMTs was at least ‘perceived’ to be expedited.

In Latin America, national authorities occasionally entrusted Supplies Management (SUMA) / Logistical Supplies System (LSS) – the supplies management system developed by PAHO), to perform rapid inventories of bona fide humanitarian shipments immediately upon offloading from the aircraft.⁴⁴ For some SODs (e.g. hurricanes in Haiti and Honduras), commodities registered by SUMA were automatically given customs clearance (World Bank 2008 Chapter 2).

In September 2014, lengthy import and clearance procedures at Lungi airport in Sierra Leone delayed the delivery of supplies for the Ebola response. As noted by one account:

“Landing and cargo handling fees were not waived. There were also reports of shipping containers of medical supplies waiting to be cleared up to two months in the port of Freetown, in some cases allegedly for failure to pay bribes. Similarly, in Liberia, there were reports of relief supplies taking up to a month to be cleared from customs because of a failure of the clearing agent to sign the appropriate forms. The Logistics Cluster in Liberia started working as soon as it was established [in September 2014] with partners and the relevant authorities to resolve constraints faced by partners regarding access to cargo in the port and airport in Monrovia, as delays and challenges were reported due to a lack of clarity surrounding procedures required for entry.”⁴⁵

These examples demonstrate the need to combine quality control and oversight of medical supplies brought into a disaster-affected country, with expedited or fast track procedures for verified, pre-registered or legitimate teams.

Registration at point of entry

A mechanism is now operational for the pre-registration of those EMTs who would be available for deployment in the event of an SOD, or other form of emergency requiring a surge in clinical care teams. However, pre-registration cannot be a substitute for registration or accreditation of the actual EMT at the point of entry. The WHO EMT initiative has developed a directory where potential providers of EMTs can list their capabilities against the minimum standards and internationally adopted classifications. The template for national reception and registration was issued only shortly before Typhoon Yolanda in the Philippines, but was used within a few days of the response. It was also used for the response to the Nepal earthquake April 2015, where 12% of the responding EMTs pre-registered before departure from their home country and 98% registered on arrival, with the host Ministry of Health and Population. Research into the SODs considered for this report (i.e. those prior to Nepal 2015) revealed no evidence of national pre-organized standing systems or templates for the registering and recording of data on incoming EMTs. The EMT initiative has now worked with several governments including the Philippines, Indonesia, Ecuador and others to start this process, with multiple other high risk countries beginning to follow suit.

In the call for assistance in response to the EVD outbreak, eligible EMTs were asked to pre-register information similar to that which would be asked for in response to an SOD. This included, but was not limited to:

43 Interview with Health Cluster officials.

44 <http://www.lssweb.net/>

45 HERE Geneva, The Impact of regulatory problems and the gains from legal preparedness in recent response operations (2015). http://www.ifrc.org/PageFiles/195860/IDRL%20Impact%20Study%20Draft%20for%20Expert%20Meeting_270215.pdf

- (i) equipment / type of field hospital infrastructure available with hospitalisation capacity;
- (ii) number of staff to be deployed by type of expertise;
- (iii) time needed for staff and infrastructure deployment;
- (iv) capacity of the team to be self-sustainable;
- (v) duration of availability; and
- (vi) any other specific requirements from requesting countries and / or WHO to allow deployment.

No international teams other than MSF had field experience from an Ebola operation at the initial stage of the West African Ebola outbreak, therefore the EMTs that were approached were mostly trained for SOD response, with a particular focus on surgical and trauma care.

Improvised EMTs⁴⁶ by their very nature are unlikely to be pre-registered. As noted by Djalali et al (2014) in their questionnaire survey of EMTs: “One of the main problems with EMTs is that...a team is always formed ad hoc”. Part of the reason for this is that advance detailed information on the medical personnel may simply not be available. This is not the case for well-organized EMTs based in national systems or militaries, and in some of the larger professional INGOs and organizations such as the IFRC. The changing dynamic of EMTs being primarily national and regional (particularly since 2014 onward) has changed this. The quality assurance process of EMTs now checks that robust rosters, training and deployment mechanisms exist to prevent this ad hoc management of team members. Ad hoc EMTs are increasingly unlikely to be allowed access to the field as they do not reach these basic minimum standards.

Turning to other specific examples, an effective on-site registration and accreditation process was run by the Ministry of Health in Iran following the Bam earthquake (to which only 13 larger EMTs responded). No such on-site process existed for the tsunami response in Indonesia, and that which did exist for the response to the Pakistan earthquake was observed as relatively weak.⁴⁷ A serious attempt was made in the most developed countries to properly screen and monitor incoming teams; one rather untoward result of this was that some of the most controversial improvised groups of medical volunteers reportedly entered with tourist visas.⁴⁸

Poor screening and registration in a response can lead to significant, if not overwhelming, coordination challenges. For example, the tsunami in Sri Lanka in 2004 presented a particularly difficult challenge for provincial authorities. A senior WHO official observed a typical scene in Kalmunai, on the eastern coast of the country: “As he joined the crowd in the small office of the Deputy Provincial Director, the Director seemed overwhelmed. He was trying to cope with not only the enormity of the situation, but the onslaught of NGOs and dozens of well-meaning but often inexperienced groups which acted independently” (WHO-SEARO, 2005).

We had seen some actors take steps to overcome these issues in disasters, for example in Haiti where the Health Cluster invited EMTs to register before receiving information or participating in cluster meetings. Simultaneously, the Haitian health authorities required them to formally register with the Ministry of Health. Three hundred and ninety EMTs registered with the Cluster, which is believed to be a small proportion of the total number of medical teams. However only 46 complied with the requirement to register with the Ministry of Health (PAHO / WHO 2011 PP 50 & 116).

46 Note that use of the term ‘improvised’ does not necessarily denote a lack of quality: some improvised EMTs are or have been of an extremely high standard, as was the case for the EMTs organized by large US universities for the Haiti earthquake response.

47 Observation based on interviews and research undertaken by C. de Ville de Goyet as part of evaluations commissioned by WHO and the TEC.

48 Conversely, some faith-based non-health groups have been reported by UN interviewees as attempting to impersonate medical staff to benefit from humanitarian transportation facilities.

In the Philippines, an effort to make an inventory of and monitor the incoming EMTs merits further study. Here, EMTs were registered with the Ministry of Foreign Affairs, and information was shared with the Department of Health. Small, unannounced EMTs were easily identified through the necessary customs clearance for their medical supplies. According to interviewees both from EMTs and coordinating agencies, immigration and customs procedures for EMTs were expedited for short-term stays.⁴⁹

Typically, in large-scale disasters, the UN Office for the Coordination of Humanitarian Affairs (UN OCHA) will establish an Onsite Operations Coordination Centre (OSOCC) in the worst affected area of a sudden onset disaster, and a Reception and Departure Centre (RDC) at the main airport or other point of entry.⁵⁰ This RDC facilitates the entry and briefing of incoming USAR teams. It was not originally designed for the registration of medical personnel and teams. The WHO EMT initiative has worked with UN-OCHA to establish a co-ordination procedure. In Nepal in 2015, for example, the RDC recorded arriving medical teams and referred them to the MoHP and the EMT registration, licensing and coordination mechanisms. The EMT coordination function was first established and fully operational within 36 hours in the OSOCC following the arrival of a member of the EMT secretariat from WHO. This OSOCC EMT function was transferred to the MoHP under ministry leadership 24 hours later, and monitored the increasing number of incoming civilian EMTs and registered their size, capacities, skills, and level of self-sufficiency. While this was useful, it was not the sole mechanism that kept track of EMTs, as they were required to register their arrival through various other channels such as the Nepalese Military, the WHO HQ in Geneva, the 'Virtual' OSOCC, the Ministry of Health Reception Desk, and the RDC at the airport. While registration is important, what is even more crucial is to ensure coordination in the registration process. Due to the proliferation of registration points in the Nepal earthquake response, it took 3 days to establish a consolidated overview of who was on the ground, what their capacities were, and where they were working.

Onsite registration must strike a balance between the need to certify and document the capability, competence and experience of each EMT's staff, and the need to expedite the entry of said staff. The danger is that without robust checks and too heavy a reliance on self-declaration, this leads to self-serving and potentially deceitful statements from EMTs. It has been explained that "Some teams that label themselves 'heavy rescue teams' respond with a small number of personnel that is below the stipulated requirement. In fact, they create an expectation of capability that they are unable to deliver" (Djalali A. et Al. 2014). An example from the recent response in Nepal shows the risk of self-declaration, as four out of five EMTs that declared themselves type 3 had to be re-classified as type 2 by the EMT coordination cell.

The need for onsite registration and accreditation is not only felt by low or middle income countries with fewer resources. In New Zealand, for example, "the large numbers of health professionals attending the Christchurch Hospital emergency department raised the need for a formalized plan for their reception and accommodation...Problems associated with too many doctors or too few doctors available to help have been reported after these and other earthquakes" (Ardagh et al. 2011).

The response to the Ecuador earthquake gives further cause for hope, building on the coordination improvements of Nepal. WHO / PAHO had delivered training on the set up of an EMT coordination cell within the MoH emergency operations centre just 8 days before a powerful earthquake struck the country. The MoH immediately set up the EMT coordination cell function and deployed 30 of its own Type 1 EMTs and its two Type 2 field hospitals to the scene. Through their own needs assessments, they clearly articulated the need for two further Type 2 teams to the international EMT community, with this request amplified by WHO / PAHO. There was no need for Type 1 teams, and while some arrived

49 Immigration and visa issues were only experienced when foreign staff needed to exceed the 3-month waiver period.

50 UN OCHA <http://www.unocha.org/what-we-do/coordination-tools/osocc-rdc/overview>

and were eventually given tasks most were declined and were not registered if they did arrive, and returned home within a day or two of arrival.

For 25 years, WHO / PAHO has mobilized teams of volunteers to operate a Supplies Management System (LSS / SUMA).⁵¹ A small team of experts is assigned at the airport and other main points of entry of a SOD-affected country to inventory and classify incoming health (or occasionally all) relief supplies entering the country. There is still room for improvement on the expedited arrival and customs clearance of EMT equipment and supplies, and the combined approach of quality assurance of EMTs and better prepared registration systems at a single point within the host government is likely to further speed up arrivals of EMTs.

Licensing, accreditation and insurance

In all countries, the medical profession is subject to licensing and accreditation specific to the different medical specialties, and sometimes even for the employment of specific types of procedures. Often, humanitarian EMTs exist in a legal grey area in terms of their practice of medicine and liability. Only a few countries had taken formal legal steps to either provide a temporary license (as in China and Philippines) or to adopt a positive legal interpretation of existing laws. (See box 4 on Japan). In Chile, the official report on the 2010 earthquake response stated that “immediate authorization to carry out their activities was granted to the international health professionals for temporary activities of those arriving with the field hospitals and as members of the international relief teams.” (Contraloria General de la Republica de Chile 2010). As Chile and other countries (including Iran (2003), New Zealand (2011) and Japan (2011)) granted access to carefully selected and “reputable” partners, the risk of malpractice was considered acceptably minor. In Nepal in 2015, the normal process for international health personnel to obtain a temporary license from the Nepal Medical Council was waived, and instead the Ministry of Health and Population required EMTs to simply submit a copy of the passport of the team members, together with a copy of their professional medical license, a covering letter to the Ministry expressing their interest in providing services, and the registration form prepared by WHO headquarters. They were then “licensed” to work as health professionals for a period of 30 days (renewable upon application), so long as they practised medicine within their EMT and in line with their training etc.

Donor countries and large humanitarian agencies providing medical personnel generally ensure that they have insurance measures in place before entering a response operation, this is now mandatory for all teams being quality assured by WHO. For example, the IFRC and National Societies that manage EMTs establish a contractual agreement with each individual in the team, under which health and life insurance coverage is provided. EMTs undergoing the quality assurance process are also now required to demonstrate that their members are also covered for liability from malpractice while performing their duties in foreign countries.⁵² All EMTs are also required to ensure their staff be accredited in

Box 4: Japan’s use of criminal law

In Japan, EMT activities may be accepted with certain conditions under the statutes of criminal law, which overrule the medical license requirements as stated in the Medical Act.

After the 2011 tsunami, the Ministry of Health, Labour and Welfare issued a note to the Local Emergency Management Agency stating: “international teams’ minimum medical treatment to victims can be acceptable under the statute of criminal law...It can be interpreted that the criminal law would overrule the Medical Act, which stipulates the medical license, as it does not foresee emergency situations”.

(excerpt from intrview with the Ministry of Health, Labour and Welfare

51 <http://lssweb.org/>

52 Australia is an example of this.

their own country for the surgical procedures they may need to carry out in disaster situations.⁵³ This means that, for example, a general medical practitioner would not be allowed to perform amputations in the absence of sufficient accreditation from his or her home country. While this is good practice among those organizations who are complying with the new WHO EMT quality assurance process, unfortunately with the historical proliferation of ad-hoc volunteer groups in response to highly visible SODs, these types of stringent requirements do not always apply.

Interviewees for this report frequently mentioned the risk of malpractice, however, to the authors' knowledge, there have so far not been any cases where a member of an EMT has been sued for malpractice. In general, there are no formal mechanisms or incentives for coordinators or local authorities to undertake time-consuming and sensitive investigations during the early response stages of the SODs concerned.⁵⁴ Also, often the overwhelming numbers of responders that emerge in the aftermath of a SOD can allow the inexperienced practitioners (even if well-intentioned) or even the unethical to slip through the cracks – especially if the situation is not regulated adequately. This can lead to malpractice and other ethical concerns. This is a major driver of the ongoing work of the EMT initiative to ensure such ad hoc teams have reduced access, while a needs-based response by professional and well prepared teams access is streamlined.

During the medical response to the EVD outbreak a number of ethical concerns were raised regarding the use of experimental treatments on patients. Although some drug use was considered semi-successful (ZMapp),⁵⁵ other interventions were deemed reckless by senior scientists (namely the use of the heart medication Amiodarone).⁵⁶ Additionally, one specific case of malpractice, involving an international physician who was intoxicated while working in an ETU resulted in the doctor's dismissal from his medical practice and the voluntary surrender of his medical license.⁵⁷

Self-sufficiency and logistics

An essential pre-requisite for EMTs, especially in the first weeks of response, is to be fully self-sufficient. To impose an additional burden on the local authorities through lack of self-sufficiency could almost be considered equivalent to breaching the medical precept of *primum non nocere* ("first, do no harm"). A number of comments and observations can be highlighted with regard to the SODs considered for this report:

- "Individuals and institutions that sent human resources cooperation from overseas and did not contact the Japanese central government came to Japan without accommodation or transportation to the coastal disaster area, and asked the disaster-affected prefectural or city / town government for support. These requests were burdensome especially during the early period after the disaster." (IDC 2014, p.47)
- "Small NGOs believe that having medical staff is enough! They depend on food and hospitality from us." (MSF / UK 2013 external evaluation of the Philippines response)
- "Many EMTs had a misunderstanding of the concept of self-sufficiency." (WHO interlocutor, Typhoon Yolanda, Philippines)

53 The US Disaster Medical Assistance Team (DMAT) personnel are required to maintain appropriate certifications and licensure within their disciplines. When personnel are 'activated' they are considered Federal employees, and their licensure and certification is recognized by all US States. Additionally, DMAT personnel are paid while serving as intermittent federal employees and have the protection of the Federal Tort Claims Act in which the federal government becomes the defendant in the event of a malpractice claim. There is however no clarification of what would happen if the act occurs overseas.

54 Sensitivity may arise due to the assumed political clout in, or close relation of the alleged offender with, their home constituency or the mass media. Lack of incentive was often based on the perception that no administrative action could be taken in time considering the short duration of the medical response.

55 <http://www.nature.com/nature/journal/v514/n7520/full/nature13777.html>

56 <http://www.theguardian.com/world/2014/dec/22/ebola-untested-drug-patients-sierra-leone-uk-staff-leave>

57 <http://bangordailynews.com/2015/06/11/health/maine-doctor-fired-for-intoxication-at-liberian-ebola-unit-surrenders-license/>

The definition of self-sufficiency varies from person to person, and from organization to organization. However, a basic, widely accepted understanding is to minimize the burden on local authorities. “As a minimum this should provide for the accommodation, communication, potable water and feeding of the team” (Blanch et al, 2014). Some specific ‘areas’ of self-sufficiency for EMTs to consider and major issues related to them are as follows:

- **Fuel:** almost no EMT can be genuinely self-sufficient in terms of fuel, a commodity that is difficult (and risky) to transport and store in large quantities. Blanch concluded that fuel should, from the start, be a responsibility of the host country. Interestingly, one NGO has identified this shared need of the affected population and the humanitarian community and organizes its work around it. The “Fuel Relief Fund” is a non-profit organization providing free fuel immediately after a major disaster, and it helped many relief agencies in the Philippines.
- **Water** is another commodity difficult to import in sufficient amounts. Receiving authorities could help by clarifying to what extent the EMT or hospital will need an independent source of water (and whether it will require treatment by the EMT, a minimum standard requires EMTs to be able to purify its own water supply from local water sources, for large teams and field hospitals this can mean over 10,000 Litres a day).
- **Medical and other waste treatment:** Following the Indian Ocean tsunami and the Pakistan and Haiti earthquakes, the presence of medical waste (including human remains in the case of Haiti) was reported around the sites of some foreign surgical facilities (as recounted in WHO and health cluster interviews for this and other reports). Basic storage and ideally incineration of medical waste should be a key part of a EMT’s self-sufficiency.
- **Translation capacity:** It is worth highlighting the significant number of comments from interviewees regarding the language barriers for EMTs. The language barrier was repeatedly mentioned as a key factor for the poor performance of some otherwise highly qualified official EMTs in recent SODs. The Japanese government made it clear to candidate EMTs that translation services must be provided by the incoming team. In addition, the Comprehensive Review of the response (IDC 2014) stated that “[l]iaison persons such as doctors and nurses, who had experience in working as Japan Overseas Cooperation Volunteers,⁵⁸ and persons from Ministry of Foreign Affairs who could speak foreign languages, accompanied overseas medical teams in order to reduce the workload of the affected prefectural governments”.⁵⁹ In Chile, “the Field Hospitals from foreign countries and their medical teams were very helpful, since most of the teams were self-sufficient and had no language barriers.” One of the key factors for this success was that most teams were regional and shared the same language. Exceptions were noted however: “One large government EMT arrived one week after the event when their surgical and trauma experience was no longer needed. None of the team members spoke Spanish and could not communicate with the national counterparts and remained in Chile for 4 days only” (WHO and MoH officials). In Nepal, “the ability to speak the local language was a huge advantage for EMTs and the Bhutan Army EMT was said to be very popular with the locals for this reason. Other EMTs used local translators and reported it was very important considering misunderstandings are common after a major disaster because people are emotionally charged” (WHO and MOH officials).

Ultimately, planning for self-sufficiency is one thing, but actually accomplishing it requires adequate logistical capacity, which is an expensive and complex undertaking. From direct observations and interviews, one can only reiterate the statement of a major medical NGO active in the Philippines: “Logistics was the key to success in this operation”.

58 http://www.jica.go.jp/english/our_work/types_of_assistance/citizen/volunteers.html

59 This would have been difficult and less relevant in the Philippines with the large number of EMTs and the widespread local knowledge of English.

Few of the smaller actors are capable of properly managing their own logistics (and therefore self-sufficiency). In spite of their potential capability, larger EMTs also achieve mixed results. For example, according to an interviewee from the UN, five days after the earthquake in Haiti, a South American government ordered the deployment of a EMT with a field hospital. The team travelled to Haiti with the Prime Minister in one plane and their equipment and the modules of the Field Hospital assigned to a second plane. The second plane never left the country, thus the Field Hospital never arrived in Haiti. The Medical Team did not speak French, and therefore had to integrate with other Spanish-speaking teams, who in turn had to assist them since they did not have any equipment.

Furthermore, transporting type 2 and 3 EMTs to the local level takes time. The significance of the transportation time must be appraised according to the intended period of use and objectives of the facility. In the Philippines, a 200-tonne MSF inflatable hospital was delayed for two weeks due to logistical constraints. It was ultimately transported by barge to Tacloban. This was an acceptable delay according to the deploying agency as the hospital was designed for non-trauma surgical care (i.e. regular polyvalent workload including gynaecology) and was scheduled to remain in place for one year (MSF / UK 2013 evaluation and interviews with MSF staff). UN and government interlocutors also reported that some faith-based groups had no equipment or supplies for the medical care they claimed to offer.

Some exceptions are made, like the Australian EMT which arrived fully supported by the Australian Air Force. However, it is worth noting here that they didn't have to move from the airport where the EMT was deployed so in that sense they faced fewer logistics challenges than others.⁶⁰

The Cuban brigade and the West African Ebola outbreak

Given the urgency of the Ebola outbreak, the Cuban Ministry of Public Health, in consultation with WHO, agreed to deploy up to 300 of its health professionals to Sierra Leone on 2 October 2014, followed by successor teams to Liberia and Guinea on 21 October 2014. WHO was to be responsible for providing direct support to the EMT as stipulated in an MOU between WHO and the Cuban Ministry of Public Health. This was the first time an EMT which did not meet the criteria of self-sufficiency was to be deployed by the WHO.

The workforce comprised of specialists in epidemiology, intensive care, infectious diseases and primary care, as well as graduates in nursing and health promotion, to be accompanied by logisticians and administrative support personnel for each of the three most affected countries. In total, 256 personnel were deployed to work in Ebola Treatment Centres (ETCs) in the affected countries. The generosity of the Cuban government was much appreciated by the governments of the affected countries as well as by the WHO and partners. The influx of health personnel improved the country's ability to staff the newly built ETCs, and according to the Cuban EMT leads, some 2000 patients were treated.

The most challenging issue for the deployment of the Cuban brigade (in all three countries) was the language barrier. Efforts were made by several partners, including WHO, to employ Spanish-speaking trainers to address these language constraints, however the availability of Spanish-speaking resources was a limiting factor. As a result, the Cuban health workers were in many instances not tasked to participate in 'triage'. Additionally, the patient charts in one of the ETCs were adapted and simplified (to the use of crosses and numerical entries) to take into account the language constraints.

In most of the large SODs reviewed for this report, the military contribution to the deployment of civilian EMTs was noted by several interviewees, including some from NGOs that are usually cautious to emphasize the military role in humanitarian response. In the Philippines, for example, “The international military effort was essential to the success of the response. They provided significant assets and were vital in early stages with planes, boats and manpower, under the command of the Filipino Armed Forces and the civilian national disaster management agency”.

The experience in Japan, where the role of the military was restricted to that of a “transporter”, is a well-documented example where neither civilian nor military staff properly appreciated the nature of the civil-military liaison. “[W]hat Disaster Medical Assistance Teams (DMAT) expected from the Japan Self-Defense Force was not medics’ assistance, but transportation by high mobility vehicles or helicopters. Given such expectations, the DMATs may have been turf-conscious towards the Japan Self-Defense Force medics.” (Centre for Excellence in Disaster Management and Humanitarian Assistance, 2012).

The UK and US militaries contributed a great deal to suppressing the EVD epidemic in 2014. The massively scaled and coordinated international response with EMTs started to commence in August 2014, but without the military ensuring safe ETCs to work in, the large-scale mobilization of medical volunteers would have been of little use. Fully staffed and functional ETC bed capacity grew from 315 beds on the 8th August, to 599 beds on 8th September, to 1,166 beds on 8th October, and the UK and US military committed to building an additional 700 and 1700 beds respectively. This was the largest ever US intervention in a global health crisis.⁶¹ Deploying 3,000 troops alone cost \$360 million, and this did not include the construction, staffing and operating expenses for the ETCs.⁶² In line with the other delays from the international community, unfortunately the 11 treatment units built by the US military remained more or less empty, with only 28 Ebola patients having been treated in these facilities according to American officials. It should however be remembered that when the facilities were planned and building commenced the outbreak looked set to peak at over 1 million cases. Overall, the self-sufficiency required by EMTs in the EVD response was very different from what most international responders were accustomed to. Given the unprecedented nature of the disaster, the WHO together with the UN Mission for Ebola Emergency Response (UNMEER) and key partners decided to facilitate the request for an increase in responding EMTs by offering support both before and during deployment (see box 5).

Box 5: Self-sufficient teams responding to the EVD outbreak in 2014 were requested to:

- Provide a team of medical and non-medical personnel of >25-35 people, including leadership, medical staff, and logisticians, who can independently run an ETC.
- Manage daily logistics, habitat and administration.
- Coordinate to ensure sufficient contingency for national and/or foreign health care worker infection (e.g. in-country care, medevac).
- Be responsible for hiring and management of all national medical and non-medical staff required for the ETC.
- Ensure reporting of epidemiology to WHO and local governments.

were adapted and simplified (to the use of crosses and numerical entries) to take into account the language constraints.

61 <http://m.state.gov/md233996.htm>

62 http://www.nytimes.com/2015/04/12/world/africa/idle-ebola-clinics-in-liberia-are-seen-as-misstep-in-us-relief-effort.html?_r=0

The WHO, UNMEER and major donors would in turn support the EMT with:**Pre-deployment:**

- Funding assistance if needed.
- Provision of ETC facilities designed to minimize risk.
- Logistics from airport to ETC if needed
- Pre-deployment and in-country training of medical staff on IPC measures, Ebola clinical standards and protocols.

During deployment:

- Epidemiological support including contact tracing, laboratory services and safe burials.
- Management of on-going ETC operations (e.g. fuel, water, waste)
- Provision and restocking of medical supplies.

Tasking

The process

‘Tasking’ means the process of assigning of a location, a specific role and a reporting channel to arriving EMTs. For large SODs with correspondingly large international assistance efforts, a consensus was evident among interviewees of this report that improvement was urgently needed in the tasking of EMTs by the health sector. In order to better understand the effectiveness of the receiving process for EMTs, seven officials from affected countries were invited to score the process from 0 to 9 (see box). Although the results, being a simple snapshot of 7 interviewees’ opinions, are subjective and not statistically representative, they are nonetheless illustrative and correspond with wider opinions on EMT tasking researched for this report. Four country officials gave a score below average (3.4) while two were more satisfied (arguably the Haiti score appears somewhat lenient).

Country	Type of SOD	Year	Score
Cambodia	Floods	2013	1
India	Tsunami	2004	2
Myanmar	Typhoon	2008	2
Lao	Floods	2011	3
Haiti	Earthquake	2010	4
China	Earthquake	2008	5
Philippines	Typhoon	2013	7

In slower-onset disasters such as the Pakistan floods in 2010, tasking of some EMTs took place before departure of the teams.⁶³ For the SODs in Haiti and the Philippines, most of the EMTs interviewed for this report indicated that they had no prior idea of the specific location (city and community) where they would establish their facilities, what role (i.e. pre-hospital care, post-operative care, substitute to a collapsed hospital, and so on) they would be expected to play and to whom (UN OCHA, WHO, Ministry of Health, Health Cluster, director of hospital, head of medical district) they would routinely report and / or refer patients. This may be understandable given the confusion and lack of information on the health situation and availability of services in the first week following the disaster. As indicated earlier, the receiving health authorities generally had limited details on the experience, capabilities and staffing of the incoming EMTs.

In SOD-affected countries where the health services remained capable to assume the bulk of the medical relief work, tasking can be a relatively straightforward process. In Haiti, the Ministry of Health was too severely affected and the health cluster too understaffed to properly task the large number of arriving EMTs. Nevertheless, the magnitude of the health impact ensured that every competent EMT had no trouble finding patients in need in the capital and, contrary to many other disasters, there was

63 Security issues also played a role in the team being assigned a location and role before departure.

no ‘competition’ as such between humanitarian actors to find patients or beneficiaries or to mobilize funds for medical assistance (PAHO / WHO 2011). In the first days and weeks, type 1 EMTs chose where to set up their facilities themselves, occasionally commandeering health premises (including the Public Health institute or wards of the General Hospital) with little consultation.⁶⁴ Only the larger type 2 and 3 EMTs seem to have sought official permission for their locations. As a result, the Director of the General Hospital of Port-au-Prince and his staff had to share their facilities with tens of EMTs and staff, with some unwilling to accept instructions from and report to the representatives of the Ministry of Health or even to allow Haitian staff to enter ‘their’ premises. Due to the massive number of wounded and the almost total collapse of the local health services, there was no oversight or real means to avoid critical duplication of efforts.

In the Philippines, the Department of Health, with the support of WHO, quickly assumed leadership in registering and tasking incoming EMTs. The main decision taken at national level was usually to direct each team to one province or city where it would receive a more precise location and instructions from local authorities. At provincial level, the health cluster directed by the Department of Health was responsible for assigning precise locations and linkages with the existing local health services. Note the Philippines have DoH led “clusters” that do not correspond to the classic “UN cluster system”, and the term cluster refers to the government response sectors which number 15 in total. The UN established a RDC at the airport in several affected areas (e.g. Tacloban). Normally designed for USAR and other non-health teams, it made an important contribution to the tasking of the EMTs. However, duplication of efforts or even conflict with Department of Health tasking could not always be avoided: “One issue on EMTs came up when the local authorities and the UN RDC thought that an EMT should go to one of the most affected evacuation centres (the Astrodome) when the national authorities said they should go elsewhere – this slowed coordination but is not un-expected politicking”.⁶⁵ Several teams faced the problem that on arrival in Tacloban they were asked to register at the UN run RDC and then at a registration desk set up by the DoH 100 metres away.

The decentralized process in Philippines was rational but hampered by problems of communication between the central and local levels.⁶⁶ Information flows were frequently duplicated due to oversight. Central authorities, at the request of key donor countries, occasionally assigned a EMT to a provincial hospital already provided with adequate external support under the decision of the local authorities.⁶⁷ Technical specifications on the capacity and capabilities of the EMTs dispatched to the provinces were rarely available at the decision-making level: “The practice of not consulting at the local level was neither effective nor satisfactory”, claims a local health official.⁶⁸

In Nepal, the responsibility for tasking EMTs to worksites lay with the WHO EMT Coordinator and the Ministry of Health focal point for international teams. Some issues arose when deployment letters were issued before all members of the coordination cell could be informed about the decision, highlighting an inherent weakness of a centrally-controlled system, namely that the workload on key people and structures in the system can become excessive and lead to mistakes or simply create a lack of time to disseminate information, as was the case here. “It would have been ideal if at least one permanent EMTCC staff member had been available with the capacity to act on tasking issues”.⁶⁹

The tasking of teams responding to the EVD outbreak followed a 4-step process. Firstly, teams either stepped forward and offered their assistance (very few actually did this), or were directly approached by the WHO EMT initiative. Secondly, local needs were assessed and as far as possible met by the

64 From interviews with Health Authorities, UN staff and EMTs- PAHO / WHO 2011.

65 Interview with a RDC manager.

66 Problems of communication were not limited to the Philippines. In New Zealand, the official review of the Civil Defense noted “poor communication between central and local crisis centres” (Mclean et al. 2012).

67 From team Leader of a government EMT and local UN coordinator.

68 Interview with a local health official.

69 Interview with EMT Coordination Cell team member.

WHO and its partners. Thirdly, the WHO helped channel the offers of assistance to the respective Ministries of Health. Fourthly, tasking to an ETC location was undertaken by the Ministry of Health with support from the WHO EMT coordination cell. Importantly, this process could only begin once there were sufficient numbers of EMTs offering their assistance; therefore the majority of steps 3 and 4 did not take place until November and December 2014. The complexity of a three-country response to Ebola was further compounded when individual donor countries supported specific countries that were affected, rather than all three (e.g. the US supported Liberia, the UK supported Sierra Leone, and France supported Guinea). The building of ETCs rapidly put a strain on the available number of EMTs willing to step forward to staff them. Donors began to encourage EMTs to come to one country over another, often ignoring the WHO pre-agreed discussions with the EMT and offering incentives to come to one country and not another and in some cases filling a single ETC with multiple EMTs to ensure redundancy when not enough teams were available for ETCs in other countries.

Detailed assignment and tasking at central level in the context of a multi-region SOD can be a major difficulty. Information may not be available for either the health situation at local level or on the true proven capacity of the EMT. In many SODs, there have been examples of EMTs misrepresenting their capacities, namely claiming that they have more resources and capability than they actually have in the hope of raising them once they are assigned a location and task.⁷⁰ As far back as the 1976 earthquake in Guatemala, communities were assigned into the care of some NGOs that were never able to deliver on their commitment due to lack of resources (de Ville de Goyet, 1976).⁷¹

Administrative delays and misunderstanding also become more commonplace at local level. For instance, a EMT assigned by central authorities to Tacloban after Typhoon Yolanda noted the relative saturation of EMTs in the urban area and requested a rural location. However, urban authorities delayed the decision for days until the team took the initiative and moved itself out of the municipality.⁷²

It is not unreasonable to imagine that such administrative delays can originate from the desire of local authorities to retain useful medical resources within their own jurisdiction.

In Chile, the express purpose of the selection and acceptance of EMTs was to support local health services. The tasking was taken seriously by the authorities and had strong political support, as illustrated by an article in *La Nación*, a leading Chilean newspaper (see box 6, translated by the authors of this report).

Box 6

“A government EMT was transferred to Chile from Haiti, and the team expected to find a situation similar to Haiti and not a country with a tradition of preparedness and response teams and efficient field hospitals. They arrived one week after the event when their surgical and trauma experience was no longer needed”.

(Interview UN Official in Peru)

The role assigned to EMTs

The diversity of roles that EMTs play is considerable, and will depend on the type of EMT as well as the remaining capacity of the national health services (volunteers included). These roles include:

1. The triage and initial medico-surgical treatment of trauma victims. Few teams arrive in time or are properly equipped for this task.
2. General care of traumas (post-operative and complications) if the local health services cannot cope.
3. Substitution or strengthening of local facilities and services destroyed or disrupted by the SOD.
4. Attention to displaced populations.

70 Drawn from extensive interviews of the authors with national authorities and humanitarian actors over the last 35 years.

71 From interviews with the chairman of the Emergency Committee in Guatemala and from direct observations.

72 Interviews with Bilateral EMT.

With time, national priorities will shift from 1 and 2 to 3 and 4. A EMT accepted in the early days to treat casualties but arriving late will invariably witness a change in the tasks assigned to it.

Trauma versus primary health care

Findings from the interviews and literature review for this study are consistent with field visits undertaken for other evaluations, with the major observation being that routine emergencies, chronic diseases and traumas unrelated with SODs are rapidly dominating the clinical picture. The following examples illustrate this point:

- **Bam** (Earthquake 2003). By the time of the arrival of the first FFHs, most of the injured had been evacuated to hospitals in the 13 affected provinces. Pathology included a significant number of drug-related problems (von Schreeb, 2008).
- **Peru** (Earthquake 2007) Malish et al. (2009) concluded from their experience that “the arrival of foreign surgical teams after 48 hours is not quick enough to make a major contribution to the provision of acute surgical care”.
- **Myanmar** (Typhoon 2008): The most common health problems were diarrhoea and the common cold rather than the trauma and injuries that had been predicted. “We were expecting dramatic injuries but there were far fewer deep wounds caused by the cyclone than the Asian tsunami”.⁷³ The Korean Disaster Relief Team clinic (established one month after the cyclone) conducted a review of their 2,641 patients. Of those, only approximately 5% presented with trauma / injury, and only in 29% of these trauma cases was the problem directly related to the cyclone (Kim et al. 2010). The authors concluded that “a huge unmet medical need in at-risk populations and a relatively large proportion of chronic medical conditions should be considered in any future planning of a similar type of disaster”.
- **Samoa** (Tsunami 2008): The nature of the injuries could be deceptive, “Because of the coral and the dirty water a tsunami generates when it meets shore, there were a lot of what looked to be superficial or minor injuries that very quickly became infected and created lots of problems within two to three days.” A lot of the work needed was surgical debridement or removing foreign matter from those wounds (Department of Health, State of Victoria, 2009).
- **Chile** (Earthquake 2010): “All the Field Hospitals arrived late and took some days to set them up, where they were deployed, so that none were to provide surgical or trauma services, that had been provided by the Chilean Field Hospitals, and they were used with their staff for Outpatient activities and follow up of surgical procedures”.⁷⁴
- **Japan** (Earthquake 2011):
 - o First 24 hours: The number of patients seeking healthcare was relatively small on the actual day of the disaster. This can be explained by the fact that the majority of the victims were killed immediately after the earthquake with the injury-to-death ratio for the disaster being remarkably low (0.372) (Ochi et al. 2013 – Yui 2011).
 - o 2-10 days afterwards: The day after the disaster, the number of hospital admissions surged, though injuries remained fewer than anticipated. For example, in the Ishinomaki Red Cross Hospital, among the patients seen within 48 hours of the disaster, injury and crush syndrome accounted for only 22% of patients. Instead, the medical teams were preoccupied with saving patients with chronic diseases. This hospital and the Iwate Medical University hospital reported that hypothermia and ‘tsunami-lung’ (allergic reaction and pneumonia by immersion) were the main severe diseases that were treated (Ochi et al. 2013).

73 Interview with WHO staff.

74 Interview with an inter-country PAHO/WHO coordinator and confirmed with health authorities in Chile.

- **Pakistan** (Earthquake 2005):
 - “More than 20,000 patients received care during a 4-month period. Initially high surgical workloads quickly decreased while the volume of primary care patients increased, eventually accounting for 90% of patient visits. Our experience supports deploying primary care-oriented units for humanitarian missions” (Fernald and Clawson, 2007).
 - “Of the 2 194 patients treated by the Chinese Medical Rescue Team arriving 20 days after impact, trauma patients only accounted for 29%, only two thirds being caused by the natural disaster.” (Bai 2009).
- **Nepal** (Earthquake 2015)
 - “The EMTs provided a wide range of service delivery ranging from emergency care, public health and rehabilitation services. Although initially the EMTs were classified according to type service offered, some EMTs later changed the type of service delivery to meet the health care needs of the local population (e.g. from clinical care to public health, WASH, rehabilitation services)” (WHO EMT coordinator).

A notable exception to the picture established above is the Haiti earthquake, where traumas constituted most of the attendance in EMT facilities for the first ten days. Although this type of situation is exceptional, it is still highly likely to reoccur given the likelihood of future major earthquakes affecting metropolitan areas in lower income countries.

On-site medical operations

Timing of deployment

As mentioned previously in this report, a clear distinction should be made between the time of deployment to the affected country and the time of arrival in the affected country (i.e. the time that the EMT is ready to attend to its first patient). Reliable data on the time of deployment of EMTs is lacking in most SODs. Publications in scientific journals will often state the time of arrival in the affected country, which can potentially give a misleading picture of the speed and effectiveness of an EMT.

In the Philippines, the monitoring system implemented by the Department of Health gathered data on 91 EMTs, and the findings appear representative of the deployment delays that have occurred in other SODs. According to Blanch et al (2014), two teams took a surprising 18 days between arrival and deployment.⁷⁵ Other EMTs took an average of 2.9 days, with the entire range being from 0 to fourteen days. Fourteen teams deployed on the day of their arrival. Interestingly, there was little variation in deployment time between the different EMT types (1 to 3). In Nepal, of the 148 EMTs that were assessed, the average number of days between arrival and deployment was 1.8 (range of 0 to 8 days). Some variation was seen between EMT types, where the specialist cells (namely EMTs without their own health facilities, including rehabilitation specialties) had the highest average number (2.4 days) between arrival and deployment. The only EMT type 3 in Nepal (Israeli army) became operational on the day of its arrival.

Prior to the announcement of a Public Health Emergency of International Concern by the WHO after the West African EVD outbreak, EMTs were requested to deploy to the three worst affected West African countries in July 2014. Around 30 governments were known to have EMT capability when this initial pledge from the WHO EMT Initiative was issued. Although willing to send supplies and funding, few organizations and governments were willing to deploy teams: “Though all three of the worse-hit countries have received some assistance from foreign governments, these actors have focused

⁷⁵ The main cause for this was the logistic issues around the transporting of heavy and bulky equipment.

primarily on financing and/or building Ebola case management facilities, leaving staffing them up to NGOs and local healthcare staff who do not have the expertise to do so.⁷⁶ A number of factors likely contributed to this delay in response, with fear or perceived risk being most prominent in the initial phase: “Few EMTs had the accurate training in the Infection Prevention and Control protocols that apply in an outbreak setting, and even if they did, where were they supposed to work safely?”⁷⁷ The affected states’ under-resourced hospitals had no isolation units and were unable to cope with the overwhelming number of EVD cases; indeed these hospitals quickly became the source of many transmission chains, ultimately resulting in EVD infections for a large number of healthcare workers. As of July 5, 2015, there were 875 cases and 509 deaths among medical staff in the three worst affected countries. Building safe work-places and accommodation for deploying EMTs quickly became a priority for WHO, UNMEER and their partners. Safe work places can a) decrease the risk of cross-infection; b) allow the EMTs to treat the EVD infected patients, rather than just isolating them from the community and; c) help to encourage patients and families to present early and to seek help.

The lack of medical evacuation options was also one of the main contributing factors that delayed the deployment of EMTs to the EVD outbreak. An additional obstacle was that no countries were willing to accept evacuated, non-national (i.e. foreign) EVD patients. Germany was the first country to voluntarily offer to accept non-nationals. Following this announcement, the European Union passed a resolution that requested member countries to also accept non-national EVD patients to be treated. Since the beginning of the epidemic and by 7 August 2015, 65 individuals had been evacuated worldwide from the EVD-affected countries (combining staff post-high risk exposure and confirmed cases). Of these, 58% had been evacuated to Europe and 41% had been evacuated to the US.⁷⁸

Coordination / information / communication

Coordination, information management and communications are interrelated and critical for good governance in a crisis. Some issues of coordination have already been addressed under the section on tasking, notably a lack of information from the incoming teams to the central authorities compounded by communication failures from central to local levels. This shortcoming was noted for all major SODs examined for this report. Even in a well-prepared country as Japan, such communication problems hampered medical relief activities (Fuse and Yokota 2012).

In fragile states such as Haiti, the challenge was particularly acute for the health sector. According to a Harvard University and NATO study in 2012, “Coordination among donor nations, the government of Haiti, UN agencies, militaries and relief agencies was a complex web. Personal relationships and friendships among leaders of response entities were instrumental in facilitating coordination mechanisms. During both the earthquake and the cholera responses, there were difficulties and missed opportunities in processing and sharing important situation awareness information among all actors, despite considerable efforts to do so. All of the above lead to the overarching finding from this study, that coordination mechanisms and institutional arrangements necessary to undertake a disaster response of this size and magnitude remain underdeveloped and inefficient”.

With the protracted nature of the EVD outbreak, arriving EMTs found themselves in a shifting picture, where ETCs were transitioned between EMTs or to the government. For each such transition, there was a pressing need for good communication between the stakeholders involved. Among the EMT coordination cells, a weekly teleconference was held with staff at the WHO headquarters in Geneva and the EMT coordinators in Liberia, Guinea and Sierra Leone to share information and discuss key problems that had been encountered. Nonetheless, the EMT coordinators in all three affected countries expressed a need for better and more systematic information sharing.

76 MSF, Ebola Response: Where are we now? MSF Briefing Paper; December 2014.

77 Interview with an EMT coordinator.

78 http://ecdc.europa.eu/en/healthtopics/ebola_marburg_fevers/Pages/medical-evacuations.aspx

Coordination of EMTs by the local health services

One observed trend among EMTs has involved, whether acting unilaterally or under instruction from the tasking authorities, integrating themselves into the existing health facilities and services. According to interviewees, Spanish and Swiss teams have made a general policy of this approach, with a similar approach from many other government EMTs now becoming the norm. In the Philippines, the Spanish EMT provided direct logistical support to the local hospital. Accepting instructions from the local hospital director or district medical officer, they saw themselves as supporting the national authorities' response for the benefit of the population.

These principles are now included in the operating guidelines issued by the Spanish Agency for International Development Cooperation (AECID) in 2013 regarding the deployment of EMTs. See box

7 for a translation of the abstract to the AECID guidelines. A previous evaluation of Swiss Development Cooperation humanitarian activities carried out by one of the authors of this report revealed a very similar approach for the Swiss response to the Haiti earthquake.

Having a national health professional assigned as liaison officer within each EMT was proven to be a helpful practice in Japan, but was not possible in Philippines due to the high number of EMTs. On a similar note, the integration of national public sector medical personnel (including surgeons) into the staff of better-equipped civilian EMTs has proven hugely beneficial for coordination when properly done on an equal basis (i.e. national personnel working with foreign personnel as colleagues and partners).

In the Philippines, a large type 2 EMT enrolled 15 Department of Health nurses to assist with consultations and post-operative care. This initiative was praised by some as a valuable effort towards integration but misperceived by a minority within the ministry as 'poaching' of local staff. Health officials and WHO experts in Africa and some other countries with a chronic shortage of health staff often mentioned such 'poaching' of local staff as an issue in humanitarian programs and was a significant issue among several NGO EMTs in past responses. Government EMTs in recent responses have avoided the practice (e.g. Japan), or done it only with explicit agreement with the MoH.⁷⁹

In Nepal, EMTs were deployed via an official letter from the Ministry of Public Health granting them permission to work in a certain health facility or directing the District Health Facility to assign the team to a worksite in that district. The EMTs were also given patient management and medical waste management protocols to follow, and additionally they were required to maintain detailed records of all patients that had required major interventions and those that required follow-up and rehabilitation. It should be noted that, as mentioned previously, military teams were mostly deployed through an entirely separate process managed by the Nepalese Army, though the two systems became integrated after a week of negotiation by WHO. This integration of local medical providers into EMT operations in Nepal as early as possible and in a sustained fashion was highly encouraged by the WHO and Ministry of Health EMT coordination cell.

Box 7: Position of AECID on integration of EMT

AECID is strategically committed to an integrated and comprehensive approach. An institutional approach to strengthening national health systems is essential to ensure that public health institutions, with active participation of the population, have the ability to exercise their stewardship and control to ensure coverage, equity, sustainability and a positive impact of health interventions.

AECID is supporting the necessary integration of the priority programs of child health, sexual and reproductive health and communicable diseases in health plans. Integration is key to reducing the transaction costs of health interventions avoiding fragmentation and also ensuring sustainability and an equity approach to our health cooperation.

79 'Poaching' is the practice of recruiting health staff from the public sector by offering far better salaries, as has been noted for the SODs in Pakistan and Haiti and following the Indian Ocean tsunami. Poaching contributed to further weakening of the health services in Haiti.

Some EMTs appear to take the position that they are entitled to provide medical care directly to the population affected by a disaster irrespective of the capacity of the local health services, the need for agreed quality standards and accountability to the authorities of the affected country.⁸⁰ This situation is well illustrated in the PAHO report on Haiti: “According to interviews conducted with hospital authorities and international actors, some of the non-Haitian teams operating in the first week in the Haiti University Hospital HUEH reportedly commandeered part of the premises, recruited personnel from outside the hospital, and denied the HUEH staff the roles they considered as their own. Instead of assisting local authorities, they displaced them and took over. The same situation was reported in other facilities in Haiti. Interviews and reports from the Indian Ocean tsunami and the Pakistan earthquake indicate that the problem is common in the humanitarian community.” (PAHO / WHO 2011) Defendable as such actions may be in a complex emergency, where the government in question may be a party to the conflict, such an attitude and actions have no place in SODs from natural events.

It is not overly difficult to find examples of reportedly unprofessional medical assistance in each disaster considered for this report, as well as others. In Sri Lanka in 2004, “a perturbed health official in the Epidemiology Unit in the Sri Lankan Health Ministry found that some international medical teams had begun typhoid and hepatitis A vaccination in Galle, without any authorizations from the Sri Lankan medical officials. Besides the fact that the teams were operating outside the medical system, the efforts were unnecessary and potentially risky. WHO provided the guidelines for vaccination in emergencies, for the Ministry of Health [to] use as technical documentation” (WHO / SEARO 2005).

In the Philippines, the efforts of the government to exercise leadership after the 2013 typhoon helped to reduce such examples. One intervention, heavily criticized by interlocutors, involved a group of doctors from a Californian NGO who were scheduled to travel to Mexico being rerouted to Tanauan, Central Philippines. They were among the first responders to arrive, and they did little to help their standing by bypassing consultation and coordination mechanisms and actively seeking media coverage. As reported by a UN official, “worrying stories circulated – in one case from the team who were bragging about conducting complicated surgical procedures on kitchen tables when there were more appropriate facilities available (Field Hospitals etc.)” They left after a few days, but not without publicly expressing strong criticism of the existing coordination measures.⁸¹ It is unclear from reports or observations whether their lack of popularity among the humanitarian community was due to them not meeting minimum EMT standards for medical practice or not.

In the aftermath of the SODs affecting China, Chile, New Zealand and Japan, there was simply no opportunity for this type of behaviour. Also, even in chaotic situations following large-scale SODs, seasoned interlocutors concur that ‘professional’ EMTs are increasingly showing a greater willingness to approach local health authorities with a spirit of collaboration and support.

In the EVD-affected countries, building a Ministry of Health integrated EMT coordination cell or working with an appointed Ministry of Health liaison was the ultimate goal. However, owing to the WHO country offices’ insisting that there was no need for additional people, any integration was very difficult; “The start was difficult, as almost nobody within or outside the [country office] knew about this new WHO initiative”.⁸² As the months went by, a stronger understanding of the need and role of the EMT coordination cell in the countries emerged: “After achieving the understanding and support of the WHO representative the next step was to extend similar strategy to other heads of agencies, institutions or missions having, supporting or working closely with EMTs in the outbreak response”.⁸³

80 This was a recurrent complaint noted by health authorities and coordinators interviewed for this study. It is also evident from other evaluations and literature.

81 One EMT staff concluded that ‘the smaller the NGO, the shorter the stay’.

82 Interview with early phase EMT coordinator.

83 Interview with EMT coordinator for the EVD outbreak January 2015.

The coordination cell eventually consisted of several key players that functioned as a team in-country. Their roles included a deputy, coordinator, clinical advisor, information manager and training associate, together with a Ministry of Health-appointed liaison. In a briefing paper from December 2014, MSF stated that in their view there had been an overall inadequate response to the epidemic, but they did also note, “There have been positive steps forward: for example, a number of bodies have been established to improve coordination at the national and regional levels; a handful of field hospitals for healthcare workers have been set up in the region; and governments – with some support from the international community – are now leading on efforts against Ebola in all three countries”.⁸⁴

In Nepal, many EMTs observed that the registration process was a new development which meant that a number of EMTs, whether intentionally or unintentionally, ended up bypassing the system in the early phase. The support from WHO and collaboration with the Nepalese MoHP are considered the main factors contributing to the overall high level of compliance to the EMT coordination mechanisms in place in Nepal.

Coordination between EMTs

The everyday medical needs of a population are complex and diverse, and as such national healthcare systems have evolved to attend to this multitude of specialized needs in a hierarchical manner based on referral of patients and strong linkages between all elements of the system.

In severe SODs, a health system is often temporarily overwhelmed or, in the worst-case scenario (i.e. Haiti), it collapses entirely. Each EMT can offer expertise and services to meet a small set of needs. Some work at primary health care level (mainly type 1), some are specialized in primary orthopaedic or general surgery and other emergency care such as caesarean section (type 2), and a few in tertiary level referral services (type 3). An increasing number excel in narrow but critical niches such as burn treatment or dialysis, while others focus on reproductive health, psycho-social assistance / mental health, public health surveillance or post-trauma rehabilitation services. The point is that all these constituent parts of a post-disaster health service need effective hierarchical linkages to function properly.

Such hierarchical linkage was particularly lacking in Haiti: primary health care units lacked information and a mechanism to refer patients; military field hospitals geared to maximize the use of their surgical facilities expected other EMTs to dedicate attention to the time-consuming and lower skill post-operative care (Ofer Merin et al, 2010); and the Renal Disaster Relief Task Force needed extensive networking efforts in order to capture patients requiring dialysis (see box 8).⁸⁵ The hospital ship (USNS Comfort), a referral facility of a standard and sophistication unavailable in Haiti prior to the earthquake, had the potential to serve all EMTs. However, in the absence of a suitable and trusted mechanism, arrangements were instead made with a few handpicked NGOs for selective referral.⁸⁶ The same issue had been observed in Banda Aceh, Indonesia in 2005 with the hospital ship USNS Mercy. In the absence of decisive leadership from the Ministry of Health, and due to the lack of resources and legal authority of the Health Cluster, most EMTs slowly

Box 8: The Renal Disaster Relief Task Force in Haiti

A mobile dialysis center with eight units was operational in Haiti by day 5 following the earthquake. Efforts to publicize their availability and expertise to other medical partners in Port-au-Prince were limited. In particular, they did not routinely participate in the coordination meetings, and as a consequence, did not receive a large number of referrals to their facilities (only 19 in total). The lack of participation of the task force in the cluster meetings resulted in a facility that could accommodate up to 200 patients a day running at only 20% of its capacity (PAHO / WHO 2011).

84 Ebola Response: Where are we now? MSF Briefing Paper; December 2014.

85 <http://www.theisn.org/isn-information/renal-disaster-relief-task-force-rdrft/itemid-531>

86 Source: Extensive interviews with US officials, UN and WHO experts and NGOs in Haiti and Indonesia, undertaken for previous evaluations by the authors.

and haphazardly networked amongst themselves to advertise their particular expertise or to try and meet their particular needs.

Box 9: US internal Partnerships in International Disaster Response

There are three different types of institutional associations that have been used by the United States, as an example, I disasters response. These are public-public, public-private, and private-private partnerships.

Public-public partnerships. This is a common association between central, sub-national and local public institutions. The complex US operation after the 2010 Haiti earthquake illustrates the collaboration between federal agencies operating overseas: “In the health sector, the U.S. Department of Health and Human Services worked in an environment in which the Department of State served as the lead for the fatality management mission, USAID served as the lead for public health and medical care to the Haitian population, the Department of Homeland Security was the lead for repatriation of U.S. citizens, and the Department of State with the Federal Emergency Management Agency (FEMA) coordinated patient movements. That was just for Health and Human Services’ own activities. In addition, health assistance was provided by the Department of Defense and Department of State agencies.” (PAHO / WHO 2011 p135)

Public-private partnerships. This describes when a public institution (central, sub-national and local) works in collaboration with a private organization (including private companies and foundations), as well as non-profit organizations. A good example is the U.S. response to the December 2004 Indian Ocean tsunami and the related Nias Island earthquake, where more than 200 civilian volunteer physicians, nurses, and medical professionals were recruited, oriented, and logistically supported by Project HOPE, an international nongovernmental organization, to serve aboard the hospital ship USNS Mercy off the coast of Banda Aceh, Indonesia. This endeavor demanded careful interaction between volunteer health professionals, NGO technical staff and managers, and military personnel (Peake, 2006 p27-9). Other examples include when two public research universities from the US (University of Chicago and University of Illinois at Chicago), decided to work with two private universities (Northwestern University and Rush University) to send teams of health-care workers to Port-au-Prince. The partnership sent 64 doctors and nurses to staff a large hospital and mobile clinics run by the International Medical Corps (University of Chicago, 2010).

Private-private partnerships. This refers to collaboration among for-profit / private organizations, private foundations, and non-profit organizations. Two interventions during the aftermath of the 2010 Haiti earthquake illustrate this type of alliance: firstly, Partners in Health, a not-for-profit University of Harvard affiliate with an already established presence in Haiti, operated nine medical sites in Haiti. Harvard teaching hospitals sent 50 medical and surgical personnel, and planeloads of medical supplies. Secondly, the University of Miami Global Institute/Project Medishare field hospital was established on January 13, 2010. During the first 9 days, the hospital functioned in the UN compound in two storage tents capable of holding up to 250 patients. Initially, the facility had approximately 12 volunteer staff members and no critical-care units or organized operating rooms. After 9 days, the hospital moved to a four-tent facility on the grounds of the Port-au-Prince airport; 17 critical-care beds and three fully organized operating rooms were added. The hospital was staffed by 220 volunteers from the US and Canada, each serving rotations of 5-7 days. The initiative had strong administrative and logistical support from Miami, including telemedicine consultations, communications, and coordinated flights to transport medical staff, supplies, equipment, and victims between Haiti and the United States. (CDC 2011)

Box 8 illustrates the three major types of institutional partnerships, using the US as an example. ⁸⁷

The lack of government leadership was particularly severe in Haiti due to the destruction of the capital city and the ensuing loss of governance (which was already in a fragile state before the earthquake). Nevertheless, problems of coordination-dialogue between EMTs were a common issue. For example, one WHO staff member noted that “In the Indian Ocean tsunami, 2004, there was a very bad coordination between the different Health ground teams”. A Japanese participant in the response to the Pakistan earthquake in 2005 observed that “*There was no Health Cluster meeting held in Battagram district, hence we invited other parties concerned, a EMT from Lithuania, Local Health Authorities and Pakistani Army Hospital doctor(s), to gather and talk*”.

In SODs where local authorities had more control over the selection of EMTs (and used this control to exercise caution), the problem of coordination between EMTs was less of an issue, as generally they were assigned to an existing hospital or health service and had little need for interaction with other EMTs.

Coordination with national medical teams

In countries with large populations, it has been found that international EMTs are often far outnumbered by national responders and volunteer groups, and there are often significant issues in terms of coordination and communication among the relevant actors. In Indonesia, for example, teams were sent to Banda Aceh from the trauma centres and major hospitals in Jakarta, Surabaya and other metropolitan areas. There was no communication or cooperation between those local teams and international EMTs. The former were often seriously lacking equipment (medical, transport, communications) and funding, and could have benefitted from material support from the international EMTs.⁸⁸ However, the international EMTs were unable to address either the language barrier or the administrative barrier in order to strengthen the coordination.⁸⁹ These factors combined can create a number of issues including delays in the provision of service, and impact on the quality of the service provided.

In the response to the Pakistan earthquake in 2005, of the 128,304 injured patients, 19,700 were managed in two centres established by the medical university of Lahore during the first few months after the earthquake (Syed 2012). Many other teams of medical volunteers operated with no substantial collaboration or support from the EMTs or from the international community in general.⁹⁰

After the Nepal earthquake in 2015, the Ministry of Health and Population deployed over 50 national medical teams to respond, and several of these teams worked in close collaboration with EMTs. For example, on the 13th of May (after the second earthquake) the Ministry of Health and Population deployed a type 2 field hospital, jointly managed by Nepalese and Indian teams (civil and military), to support the existing EMTs in Dolakha district.⁹¹ This was a good example of coordination between the relevant national authorities and the operating EMTs.

During the West African EVD outbreak, a critical gap that remained long into December 2014 was to locate self-managing EMTs who could also manage and pay embedded national staff. Even in the initial requests for assistance that were issued in late July 2014, detailed information was provided as to the ultimate desired structure of responding EMTs, which were to consist of 25-30 people per team divided into one leadership cell consisting of 5 people (team lead, deputy, clinical, nursing, logistics), three-five other doctors, 13-16 other nurses and clinical staff and 4 other logistics staff. Each ETC was calculated to need 200 staff per site, of which only 20% (40 staff) should be comprised of international responders.

88 For example, travel expenses for government medical personnel could not be paid as the budget was closed for the year on 24 December. WHO covered this cost (interviews with WHO representative in 2005).

89 Interviews with Ministry of Health and WHO coordinators, and direct observation (C. de Ville de Goyet).

90 Interviews for health response evaluation by C. de Ville de Goyet, 2006.

91 Health Cluster Bulletin No. 3, May 18 2015.

Reporting

Reporting is an essential element of the management of EMTs and they should always report on their activities to local health authorities, to the extent possible under the conditions of the response. After the Bam earthquake in Iran, the Ministry of Health required (and received) a daily report from the dozens of FFHs.⁹² As most of the treatments were for the routine care of the rural population (most of the wounded having been evacuated by the time the first EMTs arrived),⁹³ the reporting did not place excessive time pressure on the EMTs. In China and Japan, regular reporting by EMTs was routine, although no information on format and content was made available for this research report.

In the response to the tsunami in Indonesia and Sri Lanka, and the earthquake in Pakistan, no specific instruction or template for reporting was provided to EMTs. Therefore, reporting was often only carried out at the discretion of the local counterpart and the EMT. In Haiti, little time was available for EMTs to prepare reports on daily activities for the Ministry of Health or the health cluster. At the same time, reports were not requested from them. Most of the government-sponsored teams and those of the more established and larger NGOs (including the Red Cross) reported to their Headquarters in their agency's set format. As far as research for this report has established, those reports were rarely shared with the health authorities or the health cluster. One should bear in mind that the staff of those agencies were so overwhelmed by the tasks at hand that analysis of the reports and taking any timely corrective action would have been highly unlikely in those circumstances.⁹⁴

Only months before Typhoon Haiyan struck the Philippines, the WHO EMT Working Group had developed and proposed a reporting template for EMTs (WHO / GHC 2013–B). This one-page template was reviewed by the Philippines health authorities and the WHO office, but was still found too complex for use by EMTs during such an acute emergency.

Also in the Philippines, the Department of Health activated the Surveillance Post Extreme Emergencies and Disasters (SPEED) system that had been developed with support from the WHO and AusAID. The SPEED system aims “to detect early any unusual increase of major public health problems including both communicable diseases and non-communicable diseases such as injuries, animal bites, and uncontrolled hypertension, to name a few” (WHO-WPRO 2014) (see Box 10).

Among the 21 health conditions defined by SPEED as the most common after a disaster, only two were trauma-related; wounds and bruises, and fractures. Although SPEED can be a critical component of the health response, thanks to providing an efficient model of emergency epidemiological surveillance and an early warning system for public health purposes, it is not optimally designed for monitoring the activities and interventions of EMTs. According to some commentators, clinical activity reports were not systematically requested from EMTs at the national level.

Box 10: The SPEED system

- Utilizes syndromic surveillance
- Adopts available information and communication technology (ICT) such as text messaging and the Internet for data collection, analysis, and report generation
- Focuses on the 21 most common health conditions encountered after a disaster
- Features an alert notification system that instantaneously cues the health system where immediate response is most needed
- Complements the existing routine surveillance systems

92 Incidentally, the information provided by an EMT in those reports to the Iranian Ministry of Health conflicted with the version of their achievements published shortly after the return in a leading medical Journal.

93 The first medical evacuations took place in the morning of the 26th and air evacuation started at 2pm. 12,000 people were medically evacuated by private car, ambulance, helicopter and aircraft (IFRC 2004).

94 From interviews in Haiti and review of documents by C. de Ville de Goyet and P. Sarmiento (Haiti evaluation – PAHO / WHO 2011).

After the Nepal earthquake, EMTs were required to maintain a daily report of patients treated in the Health Emergency Operations Centre (HEOC) in a specified format. However, the EMTs who were working in the district hospitals often did not report specifically to the EMT coordination cell, probably because of difficulties separating the work done by the EMT members alone from that undertaken as a team together with the district hospital staff. However at least one daily report was sent by 54% of the EMTs, the majority of which were NGOs (72%). In 2016 the WHO EMT initiative finalized the work of a “Minimum Data Set” working group to develop a standardized form that can be adapted by countries to manage the information available for operational coordination by MoHs. This form allows teams to daily send their operational and location details, early warning of diseases seen and other humanitarian needs such as WASH, shelter, protection and nutrition in the area they are working.

National, regional and international roles in coordination

Coordination between national, regional and international actors is another important element of managing EMTs. After the Bam earthquake in Iran in 2003, for example, the national authorities played a decisive role in coordinating EMTs. This task was mandated to Iran’s National Red Crescent Society, generally considered a well-prepared and well-established entity. The role of the Ministry of Health during the emergency was somewhat minimal, partly due to the loss of all the health facilities in Bam, but also due to the absence of any disaster management capacity at central level.⁹⁵ This overly centralized management system was identified as a negative factor in the external evaluation of the IFRC and the National Society response, and decentralization of decision-making was recommended as an alternative (IFRC 2004).

In the response to the Indian Ocean tsunami of 2004, the central administration of all affected countries assumed the key function around the acceptance of external medical assistance. “The [TEC] evaluation found that, in all countries, the government’s ability to coordinate effectively was constrained by its own limited capacity and access to information” (TEC 2006/B). The UN system attempted to coordinate the response, but met with mixed success. “The [TEC] evaluation found widespread dissatisfaction with the quality of coordination meetings, particularly during the first six months of the response...With more than enough money to spend, some INGOs preferred to hold on to information as an exclusive entry point to a client population, and to use coordination meetings as a means of broadcasting this exclusivity” (TEC 2006/B). Among other factors, language barriers were another impediment that prevented the Indonesian Ministry of Health taking a greater role in the management of EMTs.⁹⁶

Following the Pakistan earthquake in 2005, national health authorities were overwhelmed by the magnitude of the disaster and the huge influx of international actors. It was also the first time that the cluster system had been activated, an experience that was determined to be a success by an independent Real Time Evaluation (IASC 2006). The extent of this success was questioned, however, by some interviewees in the Ministry of Health,⁹⁷ and their feedback suggests that the overall management of EMTs was not effective.

For the response to Cyclone Nargis in Myanmar, central authorities assumed management with national resources, and initially did not allow foreign assistance. This situation has now changed largely due to the influential role played by ASEAN during the response, and the country is now much more receptive to the support of EMTs as well as the supporting roles of the WHO and other UN Agencies.

Another example has been found in a comparative study of the response to the Great East Japan earthquake and the Sichuan earthquake in China, which raised some interesting observations about

95 Unpublished WHO / SEARO external evaluation by C. de Ville de Goyet.

96 “where coordination meetings are dominated by international agencies, English becomes the medium of communication at the expense of already relatively marginalized local participants, whether independent NGOs, government officials or even INGO local staff” (TEC 2006/B).

97 Interviews for a post-earthquake evaluation commissioned by WHO.

the nature of the response in both states (Otani Y, et al. 2012). During the response to the Great East Japan earthquake, the study states that “the Japanese government made quick decisions, exchanged information, and co-ordinated well to create a support team. In addition, the help of independent organizations such as the Japan International Cooperation Agency (JICA) was requested by the central government. JICA teams assembled non-governmental organizations.” In China, it states that “the reasons why most government efforts went smoothly in China after the Sichuan earthquake was that all the actors were co-ordinated by central government” (You et al. 2009). Furthermore, JICA provided logistical support for the United Nations Disaster Assessment and Coordination team and assigned some of its medical advisors to the Israeli medical team in Japan (JICA 2011).

Another example was in Haiti, where the seasoned but small staff of the health cluster could not match the magnitude of needs for coordination and information. The meetings of the health cluster, with hundreds of participants, were seen by many actors as serving mostly as a forum for exchange of information rather than coordination. Cluster meetings were held in English for over one year, thereby frustrating the (mainly francophone) Ministry of Health as they tried to maintain meaningful leadership.⁹⁸ In the absence of strong national government leadership, the humanitarian and donor communities were unwilling to compromise their long-standing operational independence for a more coordinated approach, although the WHO regional office did support and facilitate input from the Latin American and Caribbean EMTs (PAHO / WHO 2012).

In response to the 2010 floods in Pakistan, the central government maintained a strong leadership and direct coordination due in part to security issues in the affected area. “Cluster meetings, which, rather than being utilized as a forum to coordinate assistance served as platform to share information. As a result of communication failure there were gaps in coverage, duplication of aid in certain areas and delays in assistance” (Polastro et al, 2011).

In the Philippines after Typhoon Yolanda in 2013, the distribution of responsibility between national and provincial levels remained an issue. “The complexity of large-scale disasters such as Typhoon Yolanda undermines existing policies and structures. In the immediate aftermath, there was confusion in some areas on which government officials were in charge of managing relief...Typhoon Yolanda took the country’s disaster management system back to the drawing board, with many experts and practitioners calling for a central, stand-alone disaster management agency” (Asia Foundation 2013). This is an interesting observation as it runs contrary to recommendations for decentralization made in the wake of SODs such as in Iran in 2003, which illustrate that there can be no ‘one size fits all’ approach. A proactive attitude from the UN multi-sectoral coordination body is no guarantee of success; as indicated in the section on tasking, although EMTs benefitted from the UN Reception/Departure Centre, evidence suggests that there was conflict between the Centre and the Philippines Department of Health.⁹⁹ No consensus regarding the role of the cluster emerges from the interviews and literature reviewed for this report. An evaluation by MSF argued that “the UN system was too heavy and duplicated or in some cases stifled Filipino organizational arrangements”. Other interlocutors found that the strain between the cluster system and the national government (as observed in Haiti) was minimal in the health sector in the Philippines, though they may not have realised that the Philippines clusters are national and not UN based. Local health authorities were the de facto cluster lead agencies at provincial and local levels, and it can be said that this almost certainly contributed to the relatively harmonious and effective coordination of EMTs in the Philippines.

98 An exception was the Cluster on Water and Sanitation (WATSAN). The Water Authorities agency claimed its role as chair of this meeting and conducted most of the sessions in French. (PAHO/WHO 2011).

99 According to interviews with UN coordinators, Department of Health officials and health cluster experts, the Reception/Departure Center and the Department of Health were assigning different locations and tasks to some arriving EMTs. Consensus suggests that the prime responsibility for medical tasking of EMTs should lie with local health authorities.

Clinical management¹⁰⁰

As has been seen in examples already discussed in this report, EMTs and the international community have often miscalculated the type of pathology needed for, and the number of patients anticipated due to, SODs. A common misconception is that an earthquake will almost automatically generate a large number of traumas that will exceed the response capacity of the affected state. International media coverage also does not generally help to dispel the illusory image of an injured population waiting for external medical assistance while the local authorities and health services struggle to adequately respond.

Firstly, the magnitude of an earthquake (Richter scale) is a poor predictor of casualties. Tsunamis associated with earthquakes may be responsible for a high death toll but without a proportional increase in non-severe injuries (generally speaking, the majority of injuries caused by tsunamis, tidal waves and floods are severe). Secondly, the information used to make decisions and projections on the first day of a response is usually not valid for more than three to eight days (on average), which is around the time that an EMT would historically commence its operations (though Nepal showed that it is possible for international teams to arrive in hours). Only in the truly catastrophic metropolitan earthquake in Haiti, for example, did a high number of traumas remain untreated for such a long period.¹⁰¹

Short-term post-operative care

While orthopaedic surgery may take a few hours of an EMT's time, short-term post-operative care in a SOD environment will require weeks of nursing care, medical supervision and rehabilitation. In countries with a large health infrastructure outside the affected area, short-term post-operative care may not be a major problem. In countries like Haiti where all major facilities in the capital were destroyed, and any remaining facilities were poorly equipped and already overcrowded, the few orthopaedic and surgical type 2 EMTs faced a huge demand for short-term post-operative care. Relying on the Ministry of Health with the support of the health cluster to ensure that this demand was met was not always realistic. As an example, the field hospital from the Israel Defense Force, a type 3 EMT active in most of the SODs analysed for this report, received a large number of victims, many of whom spontaneously queued for care.

Patient referrals

Patients already receiving basic care from a type 1 EMT may require more advanced therapy, possibly including surgery from a type 2 or 3 facility or in one of the affected state's hospitals. This is where the process of patient referrals comes in. In larger SOD-affected countries, EMTs often refer their patients preferably to secondary or tertiary level hospitals of the health services, outside the affected province if necessary.

In the case of Haiti, the challenge was mostly for type 1 EMTs to find higher-level facilities willing to accept the referral of their patients, as essentially all facilities were at saturation point. The Israel Defence Force hospital "notified each light hospital and other health facilities that for every patient referred to us for a higher level of care, we would expect the referring facility to be willing to accept one of our patients for immediate post-operative care. This policy enabled us to maximize the use of our operating room by increasing the number of operations and procedures that we were in a unique position to perform, while ensuring that our patients were not abandoned" (Yitshak Kreiss et al 2010).

In the Philippines, EMT officials interviewed found that their main challenge was to find the transportation and fuel to physically move their patients to a higher-level facility. A notable response to

100 Further detail on the specific clinical techniques or pathologies as applied to SODs can be found in Annex 1.

101 Over 270,000 were wounded and the already weak health infrastructure, concentrated in the capital, was severely damaged.

these types of problems was the DoH health cluster's establishment of an online medical coordination centre for referrals and information-sharing (CICOM) supported by two ambulances. 31 patients were transferred between facilities in all.¹⁰² In addition to the referral of patients, the CICOM facilitated access for less-equipped EMTs to procedures such as X-rays, selective surgery and laboratory tests. This is the first time a Ministry has attempted to offer such important services in coordination with international EMTs. The WHO and the Department of Health worked together efficiently in this process, according to a Japanese EMT member.

Long-term rehabilitation of the patients

The need for long-term rehabilitation of patients is also an issue which requires well thought-out processes to ensure the effective provision of care after SODs. Many of the injuries brought on by SODs require long term rehabilitation. In Jammu and Kashmir, an area affected by the Pakistan earthquake, a significant number of seriously injured victims (40%) required rehabilitative services and assistive devices (Ali et al 2010), for example.

The benefits of having access to rehabilitation are also important for the recovery and resilience of persons affected by SODs. In 2011 the International Committee of the Red Cross listed three classes of benefits from rapid post-op physiotherapy, for example:

- (1) functional benefits for operated victims of the disaster;
- (2) psycho-social benefits for the patient; and
- (3) financial benefits for the health project.

A literature review found that “the current situation on post-operative physiotherapy in humanitarian crises is poorly documented.... Among the 31 reviewed articles mentioning physiotherapy in disaster relief, none specifically studied the relevance of post-operative physiotherapy nor described the impact of acute rehabilitation services in humanitarian crises” (Hasselmann 2014).

Fortunately, there are a few highly competent EMTs with decades of experience in offering this service.¹⁰³ The number of humanitarian actors in this discipline has also proliferated over the years and in Haiti, 38 EMTs were offering to fit prostheses (although not all EMTs were sufficiently experienced to do so) (PAHO/WHO 2011). However, the initial challenge in the first few weeks is to match capacity to demands. Furthermore, there is a misconception that physical rehabilitation services are often restricted to long-term care settings and a misallocation of resources in purely life-saving interventions, which leads to a poor recognition and underutilization of early foreign physiotherapists' involvement in humanitarian relief responses (Hasselmann 2014). It has been found that while many EMTs have saved lives, they have at the same time dedicated insufficient attention to putting in motion a program of rehabilitation for their patients. The difficulty is that it requires a significant time commitment and specific knowledge, which few EMTs possess.

At the time of research, more than 13,000 Ebola survivors were experiencing physical symptoms such as joint pain, fatigue, uveitis (which occasionally progresses to permanent visual impairment), tinnitus and hearing loss. The precise extent and prevalence of disability among the Ebola convalescent population was still being researched, however a rapid assessment undertaken by the WHO clearly showed the urgent need to address the skills shortage in providing rehabilitative care and to ensure that rehabilitation is proportionally represented in survivor clinics, specialist centres and the wider community.

102 This initiative was supported by the Spanish government: see http://www.aecd.es/Centro-documentacion/Documentos/Acción%20Humanitaria/La_ayuda_humanitaria_española_Filipinas_tras_paso_tifon_Haiyan.pdf and http://www.iecah.org/web/index.php?option=com_content&view=article&id=2454:el-apoyo-logistico-y-humano-que-ha-prestado-la-otc-de-filipinas-ha-sido-determinante-para-el-exito-de-la-mision-medica&catid=37:entrevistas&Itemid=88

103 Among them are the International Committee of Red Cross and Habitat International.

Nepal saw a new approach to the coordination of rehabilitation services using EMTs. With reports from partners such as Handicap International within the first week after the earthquake of large needs in rehabilitation, a specific working group was formed within the EMT coordination cell of the MoHP. This group helped coordinate the rehabilitation needs of multi-trauma victims and spinal injured patients. The EMT initiative subsequently created a working group to create standards for rehabilitation care within EMTs that has been officially launched by the WHO in May 2017. This outlines the need for rehabilitation coordination and defines the minimum equipment, rehabilitation staff and areas of care that must be provided by EMTs of Type 2 and 3.

Primary health care and strengthening of local health services

There is a strong consensus among health officials from affected countries and a decent evidence-base to suggest that as most EMTs arrive several days after a SOD, they are too late for providing resuscitative and acute trauma care. Initial treatment is usually already provided by local health services.¹⁰⁴ This is dramatically changing, as witnessed with earlier arrivals in Nepal and Ecuador of EMTs. For all SODs reviewed, primary health care (including attention to common medical emergencies) constituted the bulk of their activities either on or within a few days of arrival. In Haiti, earthquake-related pathology declined during the second week. “Owing to the 17-day delay between the earthquake and the establishment of [the Canadian] surgical capacity, most of our case load was not directly related to the earthquake. Most casualties had, at that point, been brought to other facilities or had died of their injuries” (Talbot et al 2012).

EMTs who had initially prepared for acute surgical and orthopaedic care had to adapt for the care of SOD-related complications (such as secondary infections, premature delivery, cardiovascular accidents, acute diabetes due to lack of access to medicines, mental health disorders) but above all to the panoply of daily emergencies and routine consultations that the now all but collapsed local facilities had been attending to before the impact.

As noted after the Sichuan earthquake in China, “the long-term disability following sudden onset natural disaster and the wider impact on healthcare delivery may prove to be a greater burden to the country than the immediate medical needs... Although international teams usually arrive too late to support resuscitative measures, they can respond to specific requests for specialized assistance, for example plastic and reconstructive surgery to assist with the ongoing management of complex injury; providing relief to those who have worked continuously through the disaster; and, when required, maintain routine day-to-day services while local staff continue to manage the disaster. The timing of this does not necessarily need to be immediate” (Redmond 2010).

In most SODs reviewed for this report, the main function of the EMTs was to replace, support or enhance the lost capacity of the local health services. Only in the very special situation of Haiti did so many EMTs ignore and even weaken local health institutions instead of strengthening them.

Rehabilitation is not limited to physical trauma but should include also psychosocial assistance and specialized mental health services. For the response to the Bam earthquake in 2003, psychosocial assistance was identified as a priority.¹⁰⁵ The American Red Cross Society mobilized and dispatched teams of young social assistants who had been recruited in metropolitan areas in the US. However, this raised wider issues regarding the cost-effectiveness and appropriateness of foreign volunteers unfamiliar with the local culture providing mental health support in a post-earthquake setting, and was rightly questioned at the time. Several offers of professional mental health EMTs were made in recent SODs including the 2004 tsunami. The most, if not only, successful response has been from those teams geared to assist the Ministry of Health in integrating mental health into primary health care services.

104 In Haiti, these services were provided by the participating Red Cross national societies, the many NGOs already active in medical care, and Cuban volunteers, all present in the country at the time of the earthquake. (PAHO / WHO 2011).

105 Interviews with WHO and Ministry of Health interviews in 2004

The number of EMTs offering or specializing in psychosocial response has also increased dramatically over recent years. In Haiti, 110 EMTs registered with the cluster system as providers of mental health or psychosocial assistance; however, some of these offered only limited services such as providing entertainment to children in camps (PAHO/WHO 2011 p. 99).

Phasing down and hand over

Timing and flexibility

With regard to the timing and effectiveness of EMTs, the research undertaken for this report demonstrated that the length of time that an EMT stayed in an affected area was often critical to their level of success. Officials from the affected countries interviewed were almost unanimous in their opinions that EMTs remained on-site for too little time. From interviews and the analysis of cluster data, the following observations have been made:

- Government EMTs and particularly military teams, usually leave within the first few weeks. There are many exceptions to this, like the Canadian military which stayed for one month in the Philippines, and the Australian team that stayed for eight weeks after the Pakistan floods; the Czech and Chinese medical teams which stayed for over a month in Nepal; and the Cuban brigade that remained for several months after the Nepal earthquake and the West African EVD outbreak.
- The smaller and less prepared a NGO EMT is, the faster it leaves. This observation was also valid for local teams of medical volunteers. Some were present for only a few days because they were not well-prepared or self-sufficient enough.
- MSF, Red Cross ERUs and other larger international NGOs with in-country programs often plan for one or more years of presence after a SOD. In Nepal and other recent responses, the changing needs and request from government saw all of these teams withdraw in three to six months.

In Chile, the amount of time approved EMTs stayed ranged from four days in the case of the Russian Field Hospital coming from Haiti to one month for the EMTs from neighbouring countries. Better statistics are available for the 96 EMTs that arrived in the Philippines after Typhoon Yolanda. Seven of these EMTs transitioned to long-term support and partnership. The 89 others split broadly into two categories, with the vast majority (81) deployed for an average of 28 days (range 4-67 days), while 8 stayed for an average of 98 days (range 78-133 days) (Blanch et al. 2014). This was made possible in most instances by the repeated rotation of personnel, which brings its own particular set of challenges and issues.

The duration of an EMT's stay is not in most cases pre-determined or known in advance. Research for this study revealed a great degree of flexibility from the providers, appropriate in a situation where information on needs and the usefulness of the offer is often slow to emerge. This flexibility is relative. A US official interviewed for this report noted that for the response to the Haiti earthquake "the main challenge [was] to determine the phasing out and departure time. Usually it is defined by the budget availability or the political reasons, but not necessarily by technical reasons". He suggested the need for a clear indicator: when local health services recover their functionality and the EMTs start to 'compete' with the local services.

The same flexibility was noted in the response to the Indian Ocean tsunami and the Pakistan earthquake. Few teams had a fixed date of departure; most were ready to provide rotating staff for the facilities (with turnover generally ranging from one week to one month). As for the United States Department of Health and Human Services (USDHHS), the main factor in not extending the stay was simply lack of funding.

Continued care of patients

Well-established EMTs will have plans and procedures in place for the transfer of any remaining patients to other EMTs or the health services. They will generally use their own internal transfer forms that provide a summary of the patient data. Evidence does not point out the use of either a global template (as promoted by the GHC in 2013) or a national template designed by local health authorities for the referral or final transfer of patients in any of the SODs reviewed for this report.

Several procedures to provide continuing care were however reported: in several instances, a contract was made by the donor country with an international NGO, or in a few instances a local NGO, for continuation of the treatment and care provided by the EMT. Supplies and part of the equipment brought by the EMT were transferred to the contracted partner.

Smaller EMTs and those improvised responders staying only a few days all too often failed to make arrangements for the continuing care of their patients.

Final reporting and information sharing

Other than the examples of Philippines and Nepal, none of the officials from affected countries interviewed for this research report could provide examples of government reporting procedures or formats for the debriefing of departing EMTs. This is a general shortcoming of most if not all national disaster plans that needs to be addressed. In the absence of formal guidelines, some EMTs advised the authorities in advance of their departure and shared information on their completed activities. Unfortunately, most of these reports were verbal, leaving no records for further use.

In Nepal, however, EMTs were required to inform the authorities of their expected departure at least a week before the end of operations. The exit process is described in box 11 below. The exit form and information on the exit process were sent via email to all EMTs. Hard copies were made available at the EMT coordination meetings. At the time of writing this report, around 50% of the EMTs who had finished operations and/or exited the country had submitted their exit reports. The WHO EMT initiative is to date still pursuing the remaining missing exit reports.

Box 11: EMT Exit Process after the Nepal earthquake (2015)

1. Complete and submit the Exit Report Form after the end of operations.
2. Submit a letter of recommendation from the District Health Office.
3. Submit a copy of inventory and receipt of any donations made.
4. Verify daily surveillance reports were submitted.
5. After requirements 1 to 4 are completed, the Ministry of Health and Population issues a Letter of Appreciation to the EMT.

Handover of assets

An increasing number of civilian EMTs leave behind some of their equipment and supplies following their response to a SOD. It is a gesture often appreciated by the recipient institutions as well as an often cost-effective approach for the EMT provider, considering the high cost of transporting the equipment and supplies. Somewhat unsurprisingly, this practice it is mostly limited to type 1 EMTs.

IFRC and National Society policies have taken steps to ensure smoother processes of handover of equipment. The Canadian Red Cross “defines three main options for handing the equipment over: 1) hand-over to the local RC so they can continue providing medical care; 2) hand-over to hospital or local health units; or 3) split the equipment between local Red Cross and health centres. The process to

hand over the equipment takes weeks, and it requires a formal MOU. There are special considerations in the MOUs such as training and maintenance”.¹⁰⁶ This diplomatic and well-balanced policy was applied to the Red Cross ERUs deployed in Chile. One ERU from the Spanish Red Cross was handed over to the Chilean Red Cross. Two others, one from Japan and one from a consortium of partner national societies, were donated to the Ministry of Health for storage.

One other option used by other EMTs is the donation of equipment to a NGO entrusted to carry on the medical assistance after departure.¹⁰⁷ This can be in the form of a short-term loan, with ultimate handover to the national or local health services. Some items are however unlikely to be donated or accepted, for example:

- ‘high-tech’ medical devices due to their high value and low capacity to maintain them locally;
- communications equipment and computers, as is the case for USDHHS; and
- medicines: although occasionally donated, they may then be disposed of by local authorities concerned with misuse by local doctors.

Donation of equipment does not only happen in low-income countries. On departure, the Israel field hospital in Japan “left all the medical facilities and equipment to Minamisanriku Town. This was highly appreciated by the people in Minamisanriku Town as everything had been lost in the tsunami and helped contribute to accelerating the opening of a temporary clinic in the town” (IDC Japan 2014).

Potential complications can occur for donations if equipment has been imported under a regime of temporary admission.¹⁰⁸ However interviewees for this report did not mention any specific problems, suggesting that the authorities of the affected countries took a flexible approach (or that the issue was simply overlooked). In addition, most of the equipment was usually handed over to government health services.

In light of the decline in new Ebola cases, strategies were developed to scale down the activities and bed capacities in all Ebola care facilities, and the EMT response had (at the time of researching this report) reached the decommissioning phase. The governments of Guinea, Liberia and Sierra Leone, the WHO, the United States Centres for Disease Control and Prevention; the Infection Control Africa Network and UNICEF have jointly developed a rapid guideline for the closure of such facilities or for repurposing them for other uses not related to the treatment of Ebola. The major challenge was, unsurprisingly, the decontamination of the facility areas and assets. Procedures for the cleaning, disinfection and/or sterilization of medical devices (including medical equipment, single-use devices and surgical instruments) and medical furniture vary in complexity depending on the type of medical device. In Liberia, the EMT coordinators were asked by the Ministry of Health to decommission a number of the ETCs and to participate in the discussions on the next steps in health systems strengthening. One example of this is the decontamination and re-opening of essential services at the Redemption Hospital in Monrovia, which was handled by the EMT coordinator and its partner organizations (ICRC, MSF, the International Rescue Committee, the Academic Consortium Combating Ebola in Liberia, the African Union, and Medical Teams International).

¹⁰⁶ Interview with Canadian Red Cross Society.

¹⁰⁷ The Belgian field hospital was handed over to the German NGO Arbeiter Samariter Bund and the water purification system was donated to the Philippine government. Until today, both the field hospital and the water purification system are still operational. <http://b-fast.be/en/operations/typhoon-philippines>

¹⁰⁸ “Temporary admission” refers to the waiver of import duties and taxes and simplification of documentation for the temporary import of specific types of items. See Annex B.9 to the Istanbul Convention that provides that relief equipment and items (such as medical, surgical and laboratory equipment, vehicles, blankets, tents) may be imported free of customs duties or charges, provided that: they are intended to be re-exported; they are “owned by a person outside the territory of temporary admission” and are “loaned free of charge;” and they are “dispatched to persons approved by the competent authorities in the territory of temporary admission.” (IFRC 2007 / A).



Conclusions and recommendations

Based on the findings of this research, a summary of conclusions and recommendations has been developed as follows:

The need for international emergency medical assistance

Catastrophic SODs are likely to become more frequent, the effects of which will be compounded by population density, with large metropolitan areas facing the greatest risk of mass casualties. This is particularly so in countries with limited health care capacity. By their very nature, SODs will strike unexpectedly, and could affect any number of vulnerable cities. An SOD affecting a capital city can also devastate even the most sophisticated health facilities, jeopardizing the capacity of local actors and facilities to respond. However, many countries vulnerable to future SODs are developing their own field hospitals and disaster medical teams, adding to the pool of providers of EMTs.

The potential for national and regional response is increasing. Specific preparedness and risk reduction programs are ongoing for urban disasters in Lima (Peru), Teheran (Iran), Istanbul (Turkey), Manila (Philippines) and Kathmandu (Nepal) among others. Some of those countries have reasonable back-up capacity and neighbours willing to intervene if necessary. Nepal and the Kathmandu valley was prepared for a situation similar to that experienced in Haiti; the government of Nepal was quick to realize the potential impact of the disaster and swiftly called for international assistance.

The international impulse of humanitarian solidarity will ensure that EMTs, solicited or not, will try to respond to most SODs that receive international media coverage. Rising interest from low and middle-income countries means that the numbers of EMTs will continue to rise. As illustrated by the 2011 tsunami and earthquake in Japan, requiring assistance from EMTs is by no means the preserve of those countries with low socio-economic development. No country, however industrialized or developed, can exclude the possibility of requiring some form of external medical assistance for an extreme SOD. Refusing such assistance under any circumstances is not a viable technical or political option. There is no doubt that the international community must avoid the tendency for EMTs to “just arrive and save lives”, as many did in Haiti, but it must also not veer too far to the other extreme and avoid responding, as was the case in the West African EVD outbreak. EMT providers should ideally aim for a wide array of specialties within their teams. Outbreak response teams are a much-needed specialty, particularly teams who can build capacities to respond to outbreaks caused by other pathogens in addition to the Ebola virus.

In addition, it is the authors' opinion that civil-military liaisons are critical as has been shown in many of the more recent disasters. EMTs need to learn to better communicate and collaborate with military forces in SODs and outbreaks, given their increasing role and significant logistical capacity to respond quickly and in hard to reach areas.

The competence gap

While the expertise and professionalism of well-established EMT providers is improving, unprepared and poorly equipped teams continue to surface during response efforts. The number of individuals and ad-hoc teams moved impulsively by emotional solidarity, or even in some instances self-interest (for visibility or even proselytising) has increased over the past decade. Unfortunately, this can result in blurring the boundaries between the officially mandated teams from a donor country and private or NGO EMTs. “In the Philippines, there were at least two teams from the same country: one official and one from a private foundation that were in very similar uniform with prominent country name and flag” (Blanch et al, 2014). Such situations blur the lines between a trusted, approved EMT, and others that are perhaps not so well qualified or approved. Additionally, it is not just seasoned and accredited professionals who are responding; increasingly, universities and medical schools are mobilizing their faculty and students to respond to disasters, often with official support from both the university in question and the Ministry of Health in their respective country (Reyes, H. 2010). All teams, no matter if officially sanctioned, NGO, academic or private, are perceived as representing their country of origin; a dilemma which is now being considered by countries with ad hoc EMTs that have performed poorly in the past.

The end result is that the multiplying number of sources for EMTs is becoming increasingly overwhelming for the affected countries. As indicated, each source has its own strength, constraints and procedures. Certain EMT types have a substantial logistical advantage and are best suited for acute emergency trauma triage, surgical and orthopaedic care for a short period of time, whereas others can be more versatile and adapt to the wide scope of health needs of the general population once the emergency life-saving trauma care phase has passed.

EMTs may also have their own vested interests, which will not necessarily dovetail with those of the affected country. Sending a national medical team to respond to a SOD is an invaluable hands-on training experience, a boost to domestic credibility and visibility, and ensures continuing support (and possibly funding) at home. This is not to say that these factors are not legitimate considerations, as they can ultimately improve the effectiveness of the EMTs, but the need to sensitively place those interests within the context of the affected state must be paramount. Less acceptable may be the motivations of some faith-based groups in recent disasters, who have been found to be using minimum standard medical care as a convenient vehicle to convert others to their beliefs.

All of these considerations and gaps can cause problems for local authorities overburdened by the urgent tasks involved in managing the response. Officials from countries who have worked in positions involving the assessment and selection of incoming EMTs based on their true capacity have expressed a surprisingly high level of satisfaction. Others who have employed a more indiscriminate ‘open door’ policy have mixed reactions, acknowledging the humanitarian contribution of most but regretting the negative impact of others. Prior to an agreed classification system, health authorities had little guidance on how best to be selective.

To combat this, the WHO has developed a directory whereby potential providers of EMTs can list their capabilities relative to the minimum standards and the internationally adopted classifications. This directory provides a clear picture of the projected capacity of the EMTs and therefore guide affected countries in their selection process. The international EMT directory is a guidance tool, and actual staffing and equipment deployed for a SOD may differ depending on the availability of experts from the roster, funding and ‘competition’ from other crises requiring a response worldwide. The quality assurance of EMT organizations has gained momentum from 2015 onwards, with eight teams fully quality assured by WHO and peer review processes, and over 80 teams in various stages of preparation

for their quality assurance visits. This voluntary verification of ability to comply with the minimum standards is a requirement to join the EMT directory.

The dissemination and adoption of the global Minimum Standards issued by the WHO EMT initiative together with this Global Directory of Providers of EMTs will be an invaluable tool to guide affected countries. However, global standards are and should be truly minimal. It is up to the receiving countries to strengthen their own norms and to set appropriate entry requirements. Several countries have now declared their intention to preferentially select teams that are quality assured for their next SOD (e.g. the government of Philippines during its response to typhoon Hagupit did this in December 2014). The IDRL Guidelines and those developed by the WHO EMT Initiative are good tools that can reveal gaps in existing regulatory procedures and help responsible authorities to design stronger ones.

The experience of INSARAG is also a valuable lesson for improving the performance of EMTs, although the complexity of the medical sector (in terms of diversity, specialties, duration, and so on) must be borne in mind. The health sector prior to 2014 failed to emulate the INSARAG effort and to match the USAR investment, although the potential to save lives through the rapid provision of basic acute trauma and medical care to the wounded is far higher than the number of lives saved by external search and rescue.

Timing of the EMTs' response

If there is one consensus in this study that should be emphasized, it is that EMTs have historically arrived too late for initial medical response, i.e. acute trauma care. Deploying most international EMTs in only a few days is a complex logistical and administrative affair that is to the credit of the providers and regulators on the receiving end. Nevertheless, apart from truly exceptional circumstances, most traumas will have already received initial medical care by national EMTs or have been referred to hospitals long before international EMTs become fully operational.

EMTs and USAR teams share the same urgency due to the rapidly diminishing returns in terms of lives saved the longer the response takes. The longer a victim remains trapped or an injured citizen remains untreated, the lower their chance of survival. Tasking search and rescue teams is one area where INSARAG has achieved some success after years of efforts.¹⁰⁹ Although the tasks of USAR and EMTs are distinct, there are common needs and approaches. In 2014, UN OCHA and WHO launched joint simulation exercises in order to increase coordination and synergy between USAR and medical teams. These now occur three times per year in different regions and countries (for example in Turkey, Indonesia and Colombia in 2016).

This delay in deployment means that the Ministry of Health of the affected country effectively has a 'grace period' of 2 days for establishing a registration / receiving cell at the main arrival point (usually an airport) to monitor all EMTs, exchange data and information on capabilities, needs and local procedures, and assign them a task before they move out to their assigned areas. Such a cell could be integrated into a 'one-stop shop', a mechanism pioneered by countries such as the Philippines, Indonesia and Central American countries (where they are called 'Humanitarian Assistance Coordination Centres'), featuring co-opted officials from multiple ministries with a role in expediting the entry of incoming relief.¹¹⁰ This procedure should ideally be part of a Ministry of Health disaster plan, and embedded within their Health Emergency Operations Centres, as a EMT Coordination Cell.

The need for medical care and assistance evolves rapidly. Interviews and literature suggest that EMTs are increasingly adaptive and are prepared to provide a far wider scope of services than just acute trauma care. Still, EMTs and health authorities could do more to respond to expected requirements

109 As noted in an interview with UN OCHA.

110 <http://customs.gov.ph/news/2013/11/12/boc-creates-one-stop-shop-to-expedite-release-of-donated-relief-goods-from-abroad/>

at the time of deployment as opposed to the needs as at the time of the initial request or decision to deploy. Significant shortening of the delay between SOD impact and EMT deployment could best be achieved through greater reliance on regional solidarity, as opposed to global response. Neighbouring states can be, and often are, the first ones on site. The affected government must take decisions very rapidly and all parties would benefit from them making it extremely clear:

- (i) under which conditions, if at all, EMTs will be accepted;
- (ii) what is not wanted or acceptable;
- (iii) that all offering EMTs should be self-sufficient and that this will be verified on arrival, ideally through the Quality assurance mechanisms now in place through WHO.

Even one day of delay in issuing an appeal may have little consequences for shelters and non-food-items, but will literally be a matter of life or death for acute trauma care.

Health care versus medical care

Timing of arrival is only one factor that can affect the types of tasks required from EMTs. Participation of health services in non-affected provinces and the vulnerability of health facilities are also contributing to EMTs being tasked to substitute or strengthen local health authorities to provide a broad range of health services in addition to trauma care. Increasingly, primary health care and routine emergencies are representing an important caseload. This function does require that EMTs be available for more than a couple of weeks. EMTs specialized in acute trauma care and orthopaedics should also include some capacity for emergencies unrelated to the SOD and for general primary health care. This will be particularly important if their deployment is not rapid.

The diversity of health functions may also require ongoing adjustments in the new trauma-oriented classification. Presently, 80-90% of EMTs are classified as type 1, a category including trauma, primary health care, psychosocial or epidemiological / public health teams. In addition, the importance of logistics in the success of any EMT cannot be overstated: an experienced and effective logistician is vital in order for the medical doctors in his or her EMT to be of real use.

National preparedness

Research for this report revealed many encouraging signs of improved national preparedness for disasters, including the following notable examples:

- In Japan, a comprehensive survey recommended the formulation of a disaster management strategy on the premise of receiving overseas assistance. It also recognized the offer-driven aspect of EMT: “Though assistance from overseas is received based on offers by the providers, and not by the Japanese side, it is suggested that a wish list be prepared with specifications to distinguish “what is needed and what is not”, and a manual be prepared on communicating information, in anticipation of offers from overseas” (IDC 2014).
- In Chile, the IFRC and the Chilean Red Cross are working with the Ministry of Foreign Affairs on the elaboration of a manual specifically on the how to handle International Emergency Medical Teams and Field Hospitals after future disasters.

Most if not all countries could benefit from the expertise and support of the WHO and EMT coordination mechanisms.¹¹¹ The activation of clusters must be adapted to each country, and has been decreasing dramatically in the last 5 years. National wishes for greater coherence between cluster or sector functions and those of the line ministries cannot be ignored. The international community and the

111 The US for example did quietly seek UN technical advice after the Katrina Hurricane.

WHO, in addition to further promoting the minimum standards, are now assisting affected countries to establish coordinated mechanisms for this as part of the compliance and enforcement processes under the auspices of the International Health Regulations and the development of all-hazard Emergency Operations Centres.

National preparedness should ultimately be guided by the following priorities:

- **Local response is best.** Medical teams from within the country should receive the same material or logistic support from the international community that they so would provide to their own EMTs.
- **Regional** (mutual assistance between neighbours – ‘South to South’) is often the next best alternative. Mutual assistance agreements need to be promoted by regional political institutions.
- **International EMTs** should either respond when the gap between demand and offer is wide, as was the case in Haiti, or ensure that they offer truly cost-effective added value through speed of response, scale, expertise, specialization and/or sustained commitment.

Finally, each entity involved in response must be willing to learn from its experience and mistakes: “These experiences should be well documented by the Ministry of Health, so that they can learn about the positive and negative events and consequences this type of international health assistance, so that they can be applied the next time a new disaster affects Chile”.¹¹² A mechanism for systematic real time evaluation of EMTs should be developed in line with the review undertaken by WHO-WPRO (Blanch et al) after the Philippines typhoon.

Legal preparedness

To support stronger national preparedness to facilitate the entry, facilitation and coordination of EMTs during disaster response, it is crucial for national authorities to put in place the relevant laws, rules and procedures to provide an enabling environment for this. The IFRC continues to support the efforts of National Societies and their key partners, like WHO, to aid governments to develop these procedures, and more importantly, ensure that they are well-understood and effectively implemented before any disaster strikes. Recent experience like the Nepal earthquake in 2015, in addition to many disasters beforehand, has shown that authorities can become overwhelmed by the amount and variety of incoming international actors, including EMTs. Without the right rules and procedures to regulate these increasingly complex contexts, it can be challenging to ensure that teams are well-coordinated, that they effectively support national and local efforts, and meet the medical needs of the affected population.



Annex 1 Clinical aspects in SODs

Operating conditions

Doctors and nurses used to working in modern facilities in an industrialized country may well be unfamiliar with the conditions of work and type of pathology required in the aftermath of a SOD.

Well-trained EMTs will ensure that most of their staff has prior relief experience and is prepared to work with limited technological or laboratory support. The lack of a modern support environment does not mean that health authorities should accept practices such as surgery without anaesthesia or proper sterilization. EMTs undertaking amputations or other procedures without anaesthesia have occasionally been praised in the media as working under heroic conditions. However rather than showing heroism, this thankfully infrequent incident instead reflects the lack of preparedness and professionalism of such EMTs.

Traditional forms of anaesthesia may not be possible but substitute techniques are available and are widely published: “A total of 149 patients received emergency surgery using ketamine anaesthesia with benzodiazepine premedication. This was found to be safe, effective” (Mulvey et al. 2006). This technique is still widely used by well-established EMTs while improved and context appropriate techniques continue to develop through technical working groups of the WHO EMT initiative in the areas of trauma care, rehabilitation, infectious disease care etc.

Pathology linked to earthquakes

Casualties from earthquakes will include severely infected wounds and open fractures resulting either from delayed care or from improper primary suture, often by poorly trained medical personnel. “Emergencies such as this one can be very fertile ground for antibiotic resistance” (WHO Philippines). In the only standing surgical hospital in the Kashmir region of Bagh District (Pakistan 2005), 37% of patients required extensive wound debridement. Nurses were often in shorter supply than medical doctors.

- Crush Syndrome (or **traumatic rhabdomyolysis**) can lead to fatal renal failure. It can also be misdiagnosed by EMTs unfamiliar with earthquake pathology. The International Society of Nephrology has established the Renal Disaster Relief Task force, which provides essential medical care to people in the wake of natural disasters. The Task Force consists of a worldwide network of experts in the management of patients with acute renal failure. It was created after the severe earthquake in Armenia in 1988 to provide future renal aid in action wherever needed around the globe. The Task Force works in close collaboration with MSF. Its effectiveness does however depend on the success of communication and promotion of this service among other EMTs; this resulted in it achieving mixed results in Haiti (PAHO / WHO 2011).

- Spinal Cord Injury (SCI): In **Pakistan** (2005) “Poor pre-hospital management of spinal injured patients depicts the lack of emergency preparedness as well as the lack of basic knowledge rescue teams and health care providers [had] about the common trauma management measures. There is a dire need of educating rescue workers and volunteers about spinal injury in order to save lives minimize the secondary damage to already affected spine” (Ayub 2011). In **Haiti**, the earthquake caused an unprecedented number of SCIs. A preliminary report by Handicap International estimated that there were more than 100 survivors with SCIs (O’Connell et al 2010). Post-earthquake Haiti serves as a reminder that it is not only important to save life but also to improve function, independence, and quality of life for the fortunate who survive” (Burns et al 2010). Nepal saw a far earlier coordination of care for those requiring rehabilitation, with a sub-group formed with technical experts from Handicap International in the EMT coordination cell, and an operational plan developed that then became a part of a longer term health sub-cluster, working in close collaboration with the MoHP.

Pathology associated with tsunamis and tidal waves

It is worth reiterating here that tsunamis are killing many but injuring relatively few compared to earthquakes (see table 1 for more information).

The ‘tsunami lung’ or near-drowning pneumonia is often quoted as a frequent pathology unfamiliar to EMTs. After the tsunami in 2004, one referral hospital “saw infections not seen in the United States since before the development of antibiotics”. Among them were about 25 cases of tsunami lung. “No one expected the number of tsunami lung cases we saw...It was not on the radar screen” (Systemom 2005).

In Japan, incidences of pneumonia caused by near-drowning were relatively low: “A marked increase in the incidence of pneumonia was observed during the 3-month period following the disaster; the increases were largest among residents in nursing homes followed by those in evacuation shelters”. A total of 550 pneumonia hospitalizations were identified, including 325 during the pre-disaster period and 225 cases during the post-disaster period. The majority (90%) of the post-disaster pneumonia patients were over 65 years old, and only eight of these cases (3.6%) were associated with near-drowning in the tsunami waters (Dayto et al. 2013).

The importance of tsunami lung syndrome compared to other cases of pneumonia in those displaced by the disaster remains to be determined.

Amputations: an iatrogenic pathology?

Concern about the rate of disaster-induced amputations has emerged from the most recent SODs. One interview of small EMTs in the aftermath of the Pakistan earthquake suggested that the number of amputations under harsh operating conditions was seen as an indicator of the heroism of the volunteers, none of who had previous experience in SODs.

It was only after the earthquake in Haiti that a survey by Handicap International offered preliminary data and raised alarm about a particularly high rate of amputations. The situation is well presented by Gerdin, M et al (2014): The authors “use[d] management of limb crush injuries in earthquakes as a concrete example of how systematic reviews could inform disaster health decision making. The international health response to the 2010 Haiti earthquake resulted in many calls for an evidence-based approach to limb management after crush injury. Although initial reports are likely to have given too crude a picture of the situation, Haiti was referred to as a “nation of amputees” (Padgett 2010). The 2011 Humanitarian Action Summit led to a consensus statement from the surgical working

group on managing limb amputations in disasters (Knowlton 2011). This highlighted two things. First, the performance of limb amputations after earthquakes has, up until now, been a largely subjective decision. Second, objective measures and tools are needed to guide decision making, such as outcome prediction models, but there is a lack of evidence regarding such tools in the earthquake context.

The fact that a decision to condemn a person to a permanent disability in countries generally vastly under-equipped to meet their needs could lie in the hands of a young foreign volunteer who may never have seen a crush injury is extremely concerning. EMTs must sensitize their staff and develop appropriate protocols to minimize the use of this 'last resort' procedure.

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