



# Review of funding and management structures of Emergency Medical Teams (EMTs) and International Search and Rescue (ISAR) Teams

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## Question

*Please provide an overview of how countries fund and manage Emergency Medical Teams (EMTs) and International Search and Rescue (ISAR) teams? If possible, please identify the lessons learned from available evaluation reports.*

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# 1. Summary

When disasters exceed the capacity of the affected country to cope within its own resources, assistance from external source teams is required and typically requested (Bartolucci et al., 2019). Assistance can be Emergency Medical Teams (EMTs - *also known as Disaster Medical Teams [DMTs] or Disaster Medical Assistance Teams [DMATs]*) and/or International Search and Rescue (ISAR) teams. However, as the structures of these teams differ greatly, their management is paramount to success. Also, the cost of international relief, and the belief that such deployment is cost-effective, has been questioned by the international community.

Although overall management<sup>1</sup> and centrally pooled funding<sup>2</sup> is available for EMTs and ISAR teams, this rapid review focuses on organisation and funding at the country and/or regional level. As requested, EMT examples are taken from Australia, China, India, Israel, Malaysia, and the Caribbean. Data on ISAR teams is from Brazil, China, Germany, Indonesia, Scandinavia, and the United States (USA).

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 sudden onset disaster (SOD) affected countries. Findings from response to natural disasters (de Ville de Goyet et al., 2003), and conclusions of five Tsunami Evaluation Coalition (TEC) thematic evaluations (de Ville de Goyet, 2007) were used extensively. However, since these publications, there still are few detailed data and evaluations available on EMTs and ISAR teams (Gerdin et al., 2013; Bartolucci et al., 2019). Experts consulted for this rapid review also confirmed this.

Evidence found is gender blind, and does not address disability. Key points are highlighted below:

Funding:

- There is limited data available on the funding of country EMTs and ISAR teams, specifically the amounts needed for operation. 2017 data from Israel (United Hatzalah EMT) shows that approximately USD1.5 million of funding was applied to EMT organisational management (equal to less than 8% of its total budget).
- EMTs can be funded by governments (Australia, India), government and donations (China, Israel), or by sponsorship and disaster funds (The Caribbean). Innovative schemes to address donation shortfalls include using Zakat (Malaysia).
- At the country level, some agencies provide funding for SAR through their governments (Brazil, China, Indonesia, and the USA). In Scandinavia, donations only (ICE-SAR Iceland) or donations with memberships fees (Swedish Sea Rescue Society) is used for funding; although the EU Civil Protection Mechanism can fund a range of SAR projects. Germany has both government-funded (Federal Agency for Technical Relief, THW) and donation only-funded (ISAR-Germany) response teams.

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<sup>1</sup> e.g. The World Health Organization (WHO) EMT Initiative, and the United Nations International Search and Rescue Advisory Group (INSARAG) and United Nations Disaster Assessment and Coordination (UNDAC).

<sup>2</sup> e.g. The Central Emergency Response Fund (UN CERF), and County-based pooled funds (CBPFs) from the United Nations Office for the Coordination of Humanitarian Affairs (OCHA).

- ISAR Germany and THW now specialise in **longer-term aid projects**, which may be more cost-effective as these projects are organised directly after an aid mission (to ensure that help is started exactly where it is needed).

#### EMT management:

- China has the highest number of international EMTs granted WHO certification (five- with Sichuan, Shanghai, and Guangdong all given the highest classification level for provision of care in emergency settings).
- A **coordinated cell** used by the Indian EMT response to the Nepal 2015 earthquake is a good example of coordination between the relevant national authorities and operating EMTs. **Foreign Ministry officials** coordinating with the local authorities was successful in Finland's response to the Haiti 2010 earthquake. Volunteers can also help with administration (Israel), and logistics (China, Malaysia).
- Providing mandates for the affected country (Australia), or using protocols by the affected country (India) or by WHO (Israel), are both useful in managing EMT responses.
- The **Total Disaster Risk Management (TDRM)** approach to natural disasters, in line with the Hyogo Framework for Action (HFA), was successfully used by MERCY Malaysia EMT as well as by teams in the Caribbean.

#### ISAR team management:

- Although ISAR team member organisational structures are also available for Germany (THW), Indonesia (BASARNAS) and USA, data for other countries is limited.
- According to their operational capabilities, urban search and rescue (USAR) teams deploying internationally are classified as 'Medium' or 'Heavy' ISAR teams through the INSARAG External Classification (IEC) system - based on their scales and capabilities, and familiarity with the rules and procedures set by the *International Search and Rescue Advisory Group* (INSARAG) (Okita & Shaw, 2018). 'Heavy' teams – which have the extra capacity (personnel, equipment, and management) to act simultaneously at two sites for the duration of the rescue phase - are found in China (China International Search and Rescue Team, CISAR), Germany (THW), as well as most of Scandinavia and USA.
- Some country search and rescue (SAR) teams have **joint (e.g. aeronautical and maritime) coordination centres** to aid with coordination of SAR operations (e.g. Joint Staff of the Armed Forces [JSAF], Brazil; Joint Rescue Coordination Centres [JRCCs] Scandinavian region - although only one leads the proceedings). These centres aid with daily management, as well as SAR resources for international projects. In Sweden, SAR Management supervises the JRCC, and evaluates SAR-missions of interest – including internationally. SAR services can be performed through a cooperative effort involving government agencies, voluntary organisations, and private enterprise.
- For marine SAR responses, **SAR Mission Coordinators (SMCs)** act as top level managers and designate **On-Scene Coordinators (OSCs)** for SAR units for responses (Wang, 2006). Logistical teams are also available e.g. Finland, which can be performed by the government e.g. Foreign Ministry (Iceland) or other federal agencies (USA).
- United Nations Disaster Assessment and Coordination (UNDAC) teams set-up and manage the UN **On-Site Operations Coordination Centre (OSOCC)** to help coordinate international USAR teams responding to the disaster (usually earthquakes) - essential if USAR assistance is to function effectively. The **organisational structure** of the CISAR

was seen as a reason for the fast deployment and successful response to the Nepal 2015 earthquake is explained in detail (Li et al., 2012; Yang et al., 2018). This involved liaison officers reporting to the **Reception and Departure Centre (RDC) of the OSOCC**, as well as interaction with the **Local Emergency Management Agency (LEMA)**.

#### Lessons learned:

- To offset costs of responses, **local resources** should be used, and local response plans implemented, supported by the regional and/or international systems (de Ville de Goyet et al., 2003; Bartolucci et al., 2019).
- Evaluations show that risk management programmes should be **sector-wide** through government (de Ville de Goyet et al., 2003: 1159). Programmes focussing on operational responses only were found to generally fail. Assigning responsibility for coordination and management among different technical departments according to the type of hazard (chemical or natural, for instance) does not work.
- Some countries have specific **guidelines** available for their national emergency medical services (EMSs) e.g. National Emergency Medical Service [EMS] Management Association (NEMSMA) in the US; AUSMAT (Australian Medical Assistance Team) and NCCTRC (National Critical Care and Trauma Response Centre) in Australia. These state-models have been used for international responses by EMTs/DMATs, as roles and expectations are defined, allowing the entire leadership team to have a clear understanding of each other's responsibilities during deployment.
- Although international guidelines are also available, e.g. from the Pan American Health Organization (PAHO) and World Health Organization (WHO) for foreign field hospitals [FFHs] and EMTs (Norton et al., 2013), evaluations show that these were often ignored, and need more promotion (de Ville de Goyet, 2007). Conversely, INSARAG Guidelines from the UN and its supporting coordination tools have had a positive response from international SAR agencies, and are used widely.
- Overall, the World Health Organization (WHO) certifies EMTs via the WHO EMT Initiative. The United Nations, through INSARAG, certifies ISAR teams via the IEC. Research found that "classified" EMTs were more likely to be requested by an affected country, resulting in increased coordination efficiency following the onset of an emergency. However, classification was not considered as criteria in receiving international USAR teams in the 2011 Great East Japan or 2015 Nepal earthquakes (Okita & Shaw, 2018).
- A **combination of military and civilian personnel** has been used successfully (e.g. by EMTs from Australia, India, and Israel) – especially if they are trained together. Training of teams is beneficial for both internal and international responses (de Ville de Goyet et al., 2003). The importance of having **prior response experience** was also highlighted by Australian DMAT members (Aitken et al., 2011).
- The literature shows that EMT deployments are characterised by **insufficient data and lack of detailed assessment** (Djalali et al., 2014; Arziman, 2015; Bartolucci et al., 2019); SAR deployments are considered by **limited outcomes in terms of lives saved** (Bartolucci et al., 2019).
- The lack of data collection and sharing of funding information hampers evaluations of emergency responses. **Without basic outcome data, there can be neither accountability nor lessons learned.**

## 2. EMT management and funding: country cases

### Introduction

When disasters exceed the capacity of the affected country to cope within its own resources, assistance from external sources is required and typically requested (Bartolucci et al., 2019: 415). This assistance can be provided by Emergency Medical Teams (EMTs),<sup>3</sup> whose goal is to provide treatment to patients affected by an emergency or disaster, at home or internationally (Arziman, 2015: 12; Bartolucci et al., 2019: 415).

EMTs have a long history of responding to sudden-onset disasters (SOD) such as earthquakes, tsunamis, and floods. Historically, EMTs had a trauma and surgical focus. However, now they include the ability to care for diseases such as cholera, Shigella, and Ebola; as well as teams to support populations affected by flood, conflict, and protracted crises such as famine.<sup>4</sup> This can be performed by the set-up of foreign field hospitals (FFHs).<sup>5</sup>

### Personnel

EMTs are groups of health professionals (i.e. doctors, nurses, paramedics) and can be from governments, militaries, charities (non-governmental organisations, NGOs), and/or international organisations (Arziman, 2015: 12; Bartolucci et al., 2019: 415). Each team has unique individuals with various skill sets. Identifying these differences and placing them into the field requires coordination and communication to ensure the correct gaps are filled.

Various EMT staff and models can help facilitate this coordination. EMT management structures for a selection of countries with available data are shown below:

## Australia

### Organisations

The EMT works through two major organisations: the National Critical Care and Trauma Response Centre (NCCTRC), and the Australian Medical Assistance Team (AUSMAT).

#### **NCCTRC<sup>6</sup>**

NCCTRC was established following the 2002 Bali bombings. It works on a regular basis with government agencies, in particular, Emergency Management Australia Attorney-General's Department (EMA-AGD), AusAID (intergrated into the Department of Foreign Affairs [DFAT] in 2013), and the Department of Health, as well as the office of the Prime Minister and Cabinet. It

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<sup>3</sup> Previously known as “Foreign Medical Teams” – also known in the literature as Disaster Medical Teams (DMTs) or Disaster Medical Assistance Teams (DMATs).

<sup>4</sup> <https://www.who.int/emergencies/partners/emergency-medical-teams>

<sup>5</sup> A FFH is a mobile, self-contained, and self-sufficient healthcare facility. It should be capable of rapid deployment, and able to meet emergency requirements for a specified period of time. It can be set up in an existing structure or in a temporary structure such as a tent, brought into the country by the EMT.

<sup>6</sup> <https://www.nationaltraumacentre.nt.gov.au/>

has formal representation on national working groups, such as the AUSMAT Working Group, through Department of Health and Ageing Canberra, and the Deployment Working Group through EMA, and on the WHO Foreign Medical Team (FMT) Working Group in Geneva (Norton et al., 2013). NCCTRC is focused on enhancing Australia's capacity to provide clinical and academic leadership in disaster and trauma care. **The NCCTRC provides both a local response capability and an internationally unique education, specialist training, and exercising capacity** known as Major Incident Management and Support courses (MIMMS) (Stephens & Vermeulen, 2018: 60).

## AUSMAT<sup>7</sup>

NCCTRC prepares AUSMAT clinical and logistics personnel for overseas deployment (WHO, 2017). AUSMATs are designed to be self-sufficient, experienced teams that can rapidly respond to a disaster zone to provide life-saving treatment to casualties, supporting the local health response (WHO, 2017). These multi-disciplinary health teams incorporate doctors, nurses, paramedics, fire-fighters (logisticians), and allied health staff (such as environmental health staff, radiographers, and pharmacists).

AUSMAT also has a **nationally agreed set of standards** governing all aspects of deployment.<sup>8</sup> AUSMATs can be considered in **two tiers**, state responses (intra- or inter-state), and national responses. A large cache of medical and self-sufficiency equipment that is stored in the Northern Territory is available to them, which is pre-packed ready for multiple health disaster scenarios.

AUSMAT is one of a few WHO globally-verified Type-2<sup>9</sup> EMTs in the world. In November 2016, AUSMAT became the fifth team to be verified by the WHO EMT Initiative Secretariat, as able to deploy and set up a fully staffed field hospital in the event of a natural disaster or other emergency (WHO, 2017). Verification provides an opportunity to evaluate their procedures and equipment against the minimum standards. January 2020 was the first time AUSMAT specialists were deployed to provide domestic assistance was for the Australian bushfire response.<sup>10</sup>

## Personnel & Management structure

Since 2010, the **AUSMAT concept**, derived from the global movement towards professional, trained medical disaster-relief teams, has become the national model for medical disaster response (Coatsworth, 2014: 633). Personnel is made up of **military and civilian combinations**, such as medical, nursing, paramedical and logistics professionals (Coatsworth, 2014: 632). The NCCTRC database has approximately 600 medical professionals who work in a range of specialities.

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<sup>7</sup> <https://www.nationaltraumacentre.nt.gov.au/what-we-do/disaster-management/ausmat>

<sup>8</sup> Australian Health Protection Principal Committee (2012). National AUSMAT manual. Canberra: Commonwealth Department of Health and Ageing.

<sup>9</sup> WHO has developed a global verification system where EMTs can be classified and ready to be deployed to health emergencies. EMTs are divided into three distinct categories (**Type 1, 2, or 3** -depending on their capacity and capability matched to the definition of each type, as well as any additional specialist services they can provide). EMTs are expected to declare which category they belong to (See Norton et al., 2013: 12 for details on classification).

<sup>10</sup> Medical support from AUSMAT for bushfire evacuees (2020): <https://www.health.gov.au/ministers/the-hon-greg-hunt-mp/media/medical-support-from-ausmat-for-bushfire-evacuees>



Previous international responses to natural disasters - such as those in Aceh (Indonesia), Yogyakarta (Indonesia), Samoa, and Christchurch (New Zealand) - were managed through the **state-based DMAT model**, with involvement of some **multi-jurisdictional teams**. For the 2004 Indian Ocean tsunami, the teams were coordinated and funded by AusAID Australia, and **Emergency Management Australia (EMA)**<sup>11</sup> (Waxman et al., 2006).

## Funding

The Australian Government has provided AUD1 million (USD 690,495) in funding for WHO's coordination of the EMT initiative. The country also provides financial support to other areas of WHO's Health Emergencies Programme, including preparedness, the management of disease outbreaks, and the response to crises in Fiji and Vanuatu (WHO, 2017). As part of a AUD40 million (USD27 million) assistance package, the Australian Government deployed a FFH and a fully self-sustaining civilian medical team, with a mandate, to assist the Philippines Department of Health in immediate post-disaster medical care for the effects of Typhoon Haiyan in 2013.

## China

China currently has thirty-seven national EMTs, with thousands of trained volunteers ready to respond to emergencies should the need arise.<sup>12</sup> They have a variety of skills and equipment available for international deployment:

**China International EMT (Macao special administrative region, SAR)** successfully passed the evaluation and certification of the WHO in April 2019, becoming the fifth Chinese international EMT.<sup>13</sup> It is a Type 1 team. In the same year, **China International EMT (Tianjin)** was set up on the basis of the National Emergency Medical Rescue Team from Tianjin People's Hospital.<sup>14</sup> It is classified as a Type 2 team. In 2018, **China International EMT (Sichuan)** became the first Chinese medical team to be verified as Type 3, achieving the highest level of standards in WHO's EMTs initiative. Type 3 teams are deployed without delay, and are capable of treating 200 outpatients and performing 15 major surgical procedures and 30 minor surgical procedures per day.<sup>15</sup> Two other EMTs from **Shanghai and Guangdong** were also granted the certification in 2016 and 2017, respectively.

## Personnel

Each EMT has different personnel numbers and skills. For example, China International EMT (Sichuan) consists of 166 personnel, including 41 doctors and 65 nurses; the team is a **partnership of several hospitals** from China's southwest Sichuan Province.

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<sup>11</sup> EMA, a division of the Attorney-General's Department, is made up of the Crisis Management Branch, Disaster Recovery Branch, and the Disaster Preparedness Branch. Emergency Management involves the plans, structures and arrangements which are established to bring together the normal endeavours of government, voluntary, and private agencies in a comprehensive and coordinated way to deal with the whole spectrum of emergency needs including prevention, preparedness, response and recovery.

<sup>12</sup> <https://extranet.who.int/emt/content/china-international-emergency-medical-team-sichuan-joins-emt-community-classified-teams>

<sup>13</sup> [http://www.xinhuanet.com/english/2019-04/30/c\\_138025619.htm](http://www.xinhuanet.com/english/2019-04/30/c_138025619.htm)

<sup>14</sup> <http://www.chinadaily.com.cn/a/201905/25/WS5ce8abdba3104842260bdb76.html>

<sup>15</sup> [http://www.china.org.cn/china/2018-05/26/content\\_51523377.htm](http://www.china.org.cn/china/2018-05/26/content_51523377.htm)

In Macao, medical team members are drawn from the staff of **Health Bureau and Fire Department** of Macao SAR government. A total of 120 members are divided into four squads, each consisting of doctors, paramedics, pharmacists, engineers, and **logistics personnel** (Xinhua, 2019). The standard deployment of the whole team covers an area of 3,600 square meters with 41 tents, can diagnose and treat over 100 persons per day, and independently complete the clinical medical work for 14 days (Xinhua, 2019). Besides their mother tongue, the team members can also speak in English and Portuguese, and can be deployed to Portuguese-speaking countries (Xinhua, 2019).

### Management structure

Coordination is municipal. However, overall, this is led by the **Ministry of Emergency Management (MEM)**.

### Funding

The national government funds these EMTs. However, each EMT can also contribute to their own funding via donation events. For example, every year on the second Sunday in December, the Macao Charity Fund organises "Walk for a Million"<sup>16</sup> and raises funds for emergency issues, as well as care for the needy, education, and medical assistance to the poor, etc.

## India

### Personnel

The paramedical personnel (PMS) of the **Armed Forces Medical Services (AFMS)** operate in disaster relief, including foreign deputation assignments (Chopra, 2016: 6). However, responses can be a **combination of military and civilian volunteers**.

### Management structure

The Government of India was the first of many countries to react to the 2015 Nepal earthquake. India sent over 20 EMTs, which arrived within the first 24 hours after the earthquake (Amat Camacho, 2019: 262). The **National Disaster Management Authority** was directed by the Government to **coordinate** with the Nepal Centre for Disaster Management in managing the crisis. An evaluation shows that 10 teams of the National Disaster Response Force and two mobile surgical teams (MSTs) of the Indian Army were mobilised and airlifted (Chauhan & Chopra, 2017: 394). **Retired Gorkha soldiers** of the Indian Army were also at each hospital, volunteering their services as guides and translators for the medical teams.

Representatives from the Indian Army Medical Corps were positioned at the National Emergency Operations Centre, Kathmandu, to participate in the **inter-cluster meeting** convened by the Nepali Ministry of Home Affairs. **Trauma treatment protocols** developed by the Nepali Ministry of Health and Population (MoHP) were distributed to the Indian Army MSTs and outreach teams (Chauhan & Chopra, 2017: 395). A **coordination cell** was created within the Nepali Ministry of

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<sup>16</sup> <http://www.fmcoprc.gov.mo/eng/zxxw/t1620703.htm>



Health premises, with the assistance of members of the UNDAC<sup>17</sup> team from UN OCHA, International Humanitarian Partnership members, and volunteers from Japan, Germany, India Red Cross, and MoHP staff. On the 13th of May (after the second earthquake) the Indian MoHP deployed a Type 2 field hospital, **jointly managed** by Nepalese and Indian teams (civil and military), to support the existing EMTs in Dolakha district.<sup>18</sup> This was seen as a good example of coordination between the relevant national authorities and the operating EMTs.

## Funding

AFMS draws its budget from the Government of India (Ministry of Defence).<sup>19</sup> However there is no literature available on the specific amount available for EMT services.

## Israel

Israel EMTs use a model that is based on **military personnel with civilian reservists**.<sup>20</sup> They have the ability to integrate civilian and military agencies at all levels.<sup>21</sup> Two EMTs, which have been deployed nationally and internationally, are described below:

## Personnel & Management structure

1. **Magen David Adom** (Red Shield/Star of David, MDA<sup>22</sup>) is the national emergency medical, disaster, ambulance, and blood bank service.<sup>23</sup> It has provided medical treatment for many natural disasters around the world, such as the Haiti 2010 and Nepal 2015 earthquakes. Although MDA currently staffs approximately 2,000 emergency medical technicians, paramedics and emergency physicians, it still relies heavily on over 15,000 volunteers who serve **in both operational and administrative capacities**. More than 10,000 people volunteer over one million combined man-hours per year. All volunteers pass a 60-hour course that covers a wide range of topics ranging from

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<sup>17</sup> It was INSARAG that triggered the creation of the United Nations Disaster Assessment and Coordination (UNDAC) system in 1993, and developed the methodology for the On-Site Operations Coordination Centres (OSOCC) and Reception/Departure Centres (RDCs) that are essential coordination tools of OCHA and its partners in sudden-onset disaster (SOD) responses. It is designed to help the governments of disaster-affected countries during the first phase of a sudden-onset emergency. UNDAC also assists in the coordination of incoming international relief at national level and/or at the site of the emergency. UNDAC teams can deploy at short notice (12-48 hours) anywhere in the world. They are provided free of charge to the disaster-affected country, and deployed in consultation upon the request of the United Nations Resident or Humanitarian Coordinator and/or the affected Government.

<sup>18</sup> Health Cluster Bulletin No. 3, May 18 2015.

<sup>19</sup> Chopra BK (2015): <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4297840/>

<sup>20</sup> Anton Breinl Centre for Public Health and Tropical Medicine, James Cook University, Health Protection Group. *Disaster Medical Assistance Teams: A Literature Review 2006*: <http://www.public.health.wa.gov.au/cproot/347/2/disaster%20medical%20assistance%20teams%20literature%20review%202006.pdf>

<sup>21</sup> Benin-Goren O, & Blumenfeld A (2005). Internalization of medical protocols during medical responses to conventional and unconventional mass-casualty incidents. *Prehosp Disast Med*, 20, 85-86. <https://doi.org/10.1017/S1049023X00013959>

<sup>22</sup> For indicative use in abroad missions, MDA can, depending on the specific situation in the host country, either incorporate the Red Star of David inside the Red Crystal, or use the Red Crystal alone (to symbolise countries with populations of mixed religions). In June 2006, MDA was recognised and admitted as a full member of the International Federation of Red Cross and Red Crescent societies, following adoption of the Red Crystal symbol in the statutes of the International Red Cross and Red Crescent Movement on the same level as the Red Cross and Red Crescent symbols.

<sup>23</sup> <https://www.mdais.org/about>

common medical conditions and trauma situations, to managing mass casualty events. In January 2020, MDA delivered its innovative Disaster Scenario training programme for emergency nurses, developed with the Health of Ministry and the International Committee of the Red Cross – the first in the world.<sup>24</sup>

2. **United Hatzalah**<sup>25</sup> (Hebrew for “rescue”) is an emergency medical service (EMS) based in Jerusalem. It has treated more than two million people since 2006, when it was founded. There are approximately 3,500 volunteers. United Hatzalah also has a Psychotrauma and Crisis Response unit with 150 responders, all trained mental health professionals, to apply psychological first aid (to medical volunteers as well as victims). An EMS **GPS dispatch system** is used for coordination. All medics get an app on their phone and the dispatch centre has the ability to send a call through the application to the volunteers in the vicinity of an emergency situation. Only the three closest medics get the alert. Once they respond, they receive directions via Waze or Google maps, along with other information pertinent to the emergency. On 6 July, United Hatzalah inaugurated a new dispatch centre, which they claim is “the most advanced command and control centre for EMS in the world”.<sup>26</sup>

To date, United Hatzalah has been actively involved in providing two international rescue assistance responses: the earthquake in Nepal (April 2015), and Hurricane Matthew in Haiti (September 2016).<sup>27</sup> **A protocol developed by the WHO** to respond to emotional trauma, resulting from incidents from traffic accidents to terror attacks, is used.

## Funding

Funding is from a variety of sources. Each year, supporters contribute more than GBP5 million (USD6.5 million) to MDA UK.<sup>28</sup> The 6-week MDA overseas volunteer training programme, which was originally financially supported by the Jewish Agency for Israel,<sup>29</sup> has recently been taken over by the Israel Experience<sup>30</sup> organisation. The Israeli Defence Force, which receives funding from USAID,<sup>31</sup> spent USD1.7 million on its EMT Type 3 in Haiti (Bartolucci et al., 2019: 417).

The Israeli government does provide limited funding for United Hatzalah, and local municipalities provide project related support. However, the majority of United Hatzalah's support comes from individuals and foundations in Israel and internationally.<sup>32</sup> All equipment is provided by donations. United Hatzalah's 2017 budget was approximately USD20 million. Of this amount, approximately 92.4% was applied directly to the organisation's services (training, vehicles, equipment, and volunteer activities), and approximately 7.6% was applied to organisational management (approximately USD1.5 million).

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<sup>24</sup> <https://www.mdais.org/media/1986/020120.pdf>

<sup>25</sup> <https://israelrescue.org/>

<sup>26</sup> <https://www.wired.co.uk/article/united-hatzalah>

<sup>27</sup> <https://israelrescue.org/blog/international-programs/>

<sup>28</sup> <https://www.pressreader.com/uk/the-jewish-chronicle/20190208/282827897395033>

<sup>29</sup> The Jewish Agency for Israel is funded by the Jewish Federations of North America, United Israel Appeal (Keren HaYesod), major Jewish communities and federations, and foundations and donors from Israel and around the world: See The Jewish Agency (June 2019): "Jewish Agency 2019 Operating Budget by Strategic Areas of Activity": <https://content.jewishagency.org/bp/#/folder/5693013/>

<sup>30</sup> <https://www.israeleexperience.org/home/>

<sup>31</sup> US Foreign Aid to Israel (2019): <https://fas.org/sgp/crs/mideast/RL33222.pdf>

<sup>32</sup> <https://israelrescue.org/faqs.php>

## Malaysia

The **Malaysian Medical Relief Society (MERCY Malaysia)** began in 1999.<sup>33</sup> Initially focused on medical relief, MERCY Malaysia has evolved through the years into a full-fledged humanitarian organisation, one of the few operating in the Global South. It focuses on providing medical relief, sustainable health-related development, and risk reduction activities for vulnerable communities, in both crisis and non-crisis situations.

### Personnel & Management structure

Volunteers are the backbone of this EMT. MERCY Malaysia boasts an EMT that can be deployed within 24 hours from the onset of a disaster, and operate onsite for up to four weeks. This state of readiness is made possible with yearly EMT Training: a 3-day, 2-night intensive workshop on medical emergency relief during a disaster. The training prepares volunteers for the setting up of a Level 1+ Field Hospital and/or Child Friendly Spaces, mobile clinics and more.

MERCY Malaysia's first mission was to war-torn Kosova in June 1999. Many more missions followed. MERCY Malaysia adopted the **Total Disaster Risk Management (TDRM) approach** to their work in 2005. The TDRM approach is in line with the Hyogo Framework for Action (HFA), which was adopted by 168 countries at the 2005 UN World Conference on Disaster Reduction in Kobe, Japan.

### Funding

As MERCY MALAYSIA is an international non-profit organisation, it does not receive government funding. It relies on **donations** and addresses shortfalls through alternative sources of donations, such as the Zakat initiative.<sup>34</sup> Quarterly reports on MERCY MALAYSIA's Zakat initiative collection and distribution are reported to the respective Zakat Authorities.<sup>35</sup> **Fundraising** is conducted throughout the year to support their emergency relief and other developmental programmes, not only when a disaster takes place.<sup>36</sup>

## The Caribbean

The Caribbean has a newly devised **regional structure** in terms of organising EMTs. In September 2019, the **Barbados Defence Force (BDF)** achieved WHO verification as the first International Type 1 Fixed EMT in the Caribbean.<sup>37</sup> Being a team of **military origin**, it also became the first of its kind in the Americas to achieve this recognition from WHO. The BDF EMT will be able to quickly respond in case of emergencies and disasters in the Caribbean, and to

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<sup>33</sup> <https://www.mercy.org.my/about-us/our-history/>

<sup>34</sup> Zakat is the obligatory alms that Muslims are required to pay as an obligatory alms tax. Zakat is taken from specific sources of wealth and given to specific categories of recipients. The specific sources of wealth include livestock, savings, trade goods, crops, and minerals. Muslims are encouraged to pay their zakat to the respective Zakat authorities through MERCY Malaysia, as it has been appointed as a Zakat Collection and Distribution Agent.

<sup>35</sup> <https://www.mercy.org.my/islamic-social-financing-zakat/>

<sup>36</sup> <https://www.mercy.org.my/fundraise/>

<sup>37</sup> [https://www.paho.org/disasters/newsletter/index.php?option=com\\_content&view=article&id=648:barbados-classified-as-the-first-emergency-medical-team-in-the-caribbean-by-the-who&catid=317&lang=en&Itemid=390](https://www.paho.org/disasters/newsletter/index.php?option=com_content&view=article&id=648:barbados-classified-as-the-first-emergency-medical-team-in-the-caribbean-by-the-who&catid=317&lang=en&Itemid=390)

deploy in time to meet the immediate health needs of the affected populations. This is the fourth EMT to receive this designation in the region of the Americas.

The Pan American Health Organization (PAHO), through the Global Affairs Canada Project, has been supporting the BDF to become an EMT Type 1 first, and then a Type 2 facility. From December 2019, the American University of the Caribbean School of Medicine (based in Florida and Sint Maarten), will focus on disaster medicine education and training for EMTs in the area.<sup>38</sup>

With a field medical facility to be used in Barbados and the Eastern Caribbean in times of emergencies or disasters, the BDF will provide medical care and assistance to the affected population.<sup>39</sup> The BDF EMT can operate from a fixed structure, providing clinical care for up to 100 outpatients a day for seven days a week, with a wide range of health services that includes triage, first aid, stabilisation, and remission of serious injuries.

### Personnel & Management structure

In February 2010, the Caribbean Community (CARICOM) sent a regional 9-member team of voluntary health personnel to Haiti. The team of specialists from Barbados (8) and Saint Lucia (1) provided two weeks of emergency and specialised health care to earthquake victims, and complimented the work of teams from the **Sub Regional Focal Point Jamaica**.<sup>40</sup>

**Both CARICOM and Caribbean Disaster Emergency Management Agency (CDEMA)<sup>41</sup> organise international EMT responses.** However, the UNDP mid-report on *Caribbean Implementation of the Hyogo Framework For Action* (2011: 41) found that the sub-regional focal point in Jamaica - which mounted an initial response to Haiti within 48 hours of the earthquake - was placed under a severe burden, as Jamaica had to find necessary personnel and supporting equipment and supplies without any support from CARICOM or CDEMA for several weeks.

### Funding

Since the beginning of 2018 PAHO, along with assigned mentors, supported the BDF EMT in achieving this milestone. The mentoring team consisted of clinical and logistic experts from the **Costa Rican Social Security Fund EMT**, classified globally as EMT Type 1, and a surgical expert from Argentina.

The **Canada Caribbean Disaster Risk Management Fund (CCDRMF)<sup>42</sup>** assisted 10 countries in the Caribbean, including the BDF, from 2008-2018. The **Caribbean Development Bank (CDB)** joined forces with the Department of Foreign Affairs, Trade and Development of Canada and DFID to strengthen the sustainable development agenda of CARICOM states. Through the USD24 million **Community Disaster Risk Reduction Fund (CDRRF)<sup>43</sup>**, CDB - for the third time - announced the availability of grants to build community-level capacity for disaster risk

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<sup>38</sup> <https://www.cdema.org/news-centre/press-releases/1999-caribbean-disaster-emergency-management-agency-caribbean-center-for-disaster-medicine-establish-partnership-to-improve-region-s-health-care-preparedness>

<sup>39</sup> [https://www.paho.org/ecc/index.php?option=com\\_content&view=article&id=688:barbados-defence-force-emergency-medical-team-deploys-to-saint-vincent-and-the-grenadines-during-tradewinds&Itemid=332](https://www.paho.org/ecc/index.php?option=com_content&view=article&id=688:barbados-defence-force-emergency-medical-team-deploys-to-saint-vincent-and-the-grenadines-during-tradewinds&Itemid=332)

<sup>40</sup> <https://www.cdema.org/news/1/441-more-caricom-health-personnel-for-haiti>

<sup>41</sup> <https://www.cdema.org>

<sup>42</sup> <https://www.cdema.org/90-projects-and-programmes/canada-caribbean-disaster-risk-management-fund>

<sup>43</sup> <https://www.cdema.org/143-projects-and-programmes/community-disaster-risk-reduction-fund>

management in 2015. In Jamaica, the private sector provides sponsorship for many national disaster risk management activities (USAID, 2011: 40).

### 3. ISAR team management structures and funding: country cases

#### Introduction

Following severe natural disasters, International Search and Rescue (ISAR) teams also provide essential services. If there is a major incident, people can become lost and trapped. This is where the Urban Search and Rescue (USAR) teams are important. They specialise in finding and freeing people from buildings that have collapsed, getting them to safety. USAR can also involve **the initial medical stabilisation** of victims trapped in structural collapse (e.g. due to natural disasters, mines, and collapsed trenches). The causes of USAR incidents can be categorised as either accidental or deliberate.

#### Personnel

ISARs are USARs with members that are trained to work overseas. ISARs can be **military or civilian voluntary, or a combination of both**. The main tasks for military forces in the emergency rescue and disaster relief can include: rescue and evacuate stranded personnel; security of important targets; transporting vital supplies; participation in road (e.g. bridges, tunnels) repair; maritime SAR; Chemical, Biological, Radiological and Nuclear (CBRN) rescue; epidemic control, medical care, and other specialised rescue, and elimination/ control of other dangers and disasters (Ling, 2014: 6). Volunteers can also be trained to help in these situations.

ISAR services are governed by several conventions and agreements. However, countries also have their own specific guidelines on USAR management. As with the EMT countries, the following list of countries have been selected by DFID. Information on their funding is taken from data published on previous USAR or ISAR responses:

#### Brazil

Search and rescue duties in Brazil are the responsibility of the Salvarmar Brasil (MRCC Brazil – the Maritime Rescue Coordination Centre), the Brazilian Navy (*Marinha do Brasil*) Divisão de Busca e Salvamento (D-SAR: Search and Rescue Division), and the Brazilian Air Force (*Força Aérea Brasileira*).

The Brazilian Navy is the largest navy in South America and in Latin America, and the second largest navy in the Americas, after the United States Navy. The Air Rescue Squadron (PARA-SAR) instructs the Combat Rescue Course in the Evasor Module (CRC-ME), which has the objective of preparing all air personnel for an eventual escape in hostile territory. The squadron is responsible for land navigation instructions, crossing obstacles, traps, removing traces, crossing water courses, camouflage, obtaining water and food, signalling, and marking aircraft. It currently

teaches the SAR Course, which lasts ten weeks, to volunteers from the Armed Forces, as well as Auxiliary and Military forces of friendly nations.<sup>44</sup>

## Organisational structure

**Joint Staff of the Armed Forces (JSAF)** is an agency of the Ministry of Defence of Brazil, which centralises the coordination of command of the armed forces: Army, Navy, and Air Force. It was created by Complementary Law No. 136 of 25 August 2010, with **operating guidelines in Ordinance No.1429**. It is up to the JSAF to plan together and integrated employment of staff of these forces, optimising the use of the military and logistical support in the defence of the country and in peacekeeping, humanitarian, and rescue operations.

Although coordinated as one, the army, air force, and navy all contributed separately in the Haiti 2010 earthquake response. They already had a presence in the country due to the UN Stabilization Mission in Haiti (MINUSTAH), which ended in 2017. This ISAR team has not been classified by INSARAG.<sup>45</sup>

## Funding

This is government funded. According to the National Strategy of Defence,<sup>46</sup> improving of the existing means and training of the staff involved in SAR activities is a priority task for the country. However, there is no information available on the specific amount of funding necessary.

## China

The management and funding of two major SAR teams are described below:

### 1. CISAR

**China International Search and Rescue Team (CISAR)** was established in 2001. In November 2009 it was recognised by INSARAG as a high-level international rescue team: CISAR was IEC and IER re-classified as 'Heavy' in 2014. CISAR has participated in many relief tasks in different regions, including SAR in Algeria and Iran in 2003, providing a medical care team in Indonesia after the 2004 tsunami, and other comprehensive rescue tasks in Pakistan (2005), Haiti (2010), and Japan (2011), amongst others.

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<sup>44</sup> <http://ordemdebatalha.com/fab/eas.htm>

<sup>45</sup> The primary intention of the **INSARAG External Classification (IEC) system** is to provide better understanding of the individual abilities of USAR teams making themselves available for international assistance. Having teams classified according to a standard will enable disaster affected countries to prioritise acceptance of international response support from USAR Teams who can add proven value to their national capacity. The IEC is an independent, verifiable, voluntary process that has received unanimous acceptance through INSARAG since 2005. IEC is renewed through the INSARAG External Re-classification (IER) process.

'Heavy' International USAR teams (ISAR teams) must have all the abilities and capabilities of a 'Medium' team, as well as the additional capacity of being able to operate simultaneously at two sites for the duration of the rescue phase.

<sup>46</sup> [https://www2.gwu.edu/~clai/recent\\_events/2010/Brazil\\_Defense/National\\_Strategy\\_of\\_Defense.pdf](https://www2.gwu.edu/~clai/recent_events/2010/Brazil_Defense/National_Strategy_of_Defense.pdf)



## Personnel

Members of CISAR consist of the China Seismological bureau, administrators and technical experts from the China Earthquake Administration (CEA, now under the **Ministry of Emergency Management, MEM** established in 2018), the engineering department of the People's Liberation Army (PLA), the 38th division of the military SAR corps, and medical staff from the General Hospital of Chinese People's Armed Police Force (PAP). This amounted to 230 people, which was expanded to 480 in 2010.

## Management structure

CISAR is divided into **3 branches and 1 directly commanded team**. Each branch consists of 5 units: a search unit, rescue unit, medical unit, technical unit, and insurance unit. The directly commanded team consists of the staff group, technical group, and insurance group (Yang et al., 2018: 536).

In the Nepal 2015 earthquake rescue mission, 10 experienced medical officers (including nine doctors and a nurse) from PAP comprised the medical team of CISAR. The first **command meeting** with the team occurred on the airplane bound for Nepal, and involved the formulation of a rescue plan based on the most recent information from the disaster area (Yang et al., 2018: 536). After arriving at the disaster region, CISAR reported to the **Reception and Departure Centre (RDC) of the United Nations' On-Site Operations Coordination Centre (OSOCC)<sup>47</sup> and the Local Emergency Management Agency (LEMA)**. It then carried out the rescue operation in accordance with unified planning, abiding by the principle of "adjoining three sources and avoiding the hazardous" (adjacent to water, road, and mission site, and avoiding any hazardous materials) to settle the camp and select an appropriate place for the setup of a Mobile Hospital, followed by performing emergency medical rescue operations (Li et al., 2012: 25; Yang et al., 2018: 536). As the first international rescue team in the disaster area with heavy equipment, CISAR also **assisted the arriving follow-up rescue teams and incorporated CISAR's rescue work into the local disaster information**.

The OSOCC chaired a daily coordination briefing, which provides a good medical rescue information sharing and exchange platform. **CISAR's liaison officer attended this briefing** to determine the joint rescue works of the day (Yang et al., 2018: 537). After OSOCC declared the start of the reconstruction phase of the disaster area, the focus of the medical rescue team shifted to assist the reconstruction effort of local hospitals, re-establish the medical order, as well as provide training of medical, nursing, and emergency operations to local medical personnel (Li et al., 2012: 26).

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<sup>47</sup> Specifically in response to earthquakes, UNDAC teams set-up and manage the **OSOCC** to help coordinate ISAR teams responding to the disaster - essential if USAR assistance is to function effectively. **Assessment, coordination, and information management** are UNDAC's core mandates in an emergency response mission. The UNDAC system comprises of four components: experienced trained staff (especially managers); methodology for coordination structures; procedures (deployment within 12-48 hours of the request), and equipment/self-sufficiency. The team normally stays in the affected area for the initial response phase, which can be up to three or four weeks in a natural disaster. For further details see UNDAC (2018: 13). *UNDAC Strategy 2018-2021*. United Nations Disaster Assessment and Coordination.

<https://www.unocha.org/sites/unocha/files/UNDAC%20Strategy%202018-2021%20Final.pdf>

## Funding

The CEA (now part of the MEM) implements the **dual-governing system**, within the provincial and municipal Earthquake Administrations. It establishes the systems of management, planning, and finance.<sup>48</sup>

## 2. China Search and Rescue

China Search and Rescue is different from CISAR.

### Management structure

Unlike CISAR, **all** the China Search and Rescue's members are from the **MEM**. China Search and Rescue is China's sole agency dedicated to emergency response management. The team's duties include firefighting, disaster relief, geological disaster prevention, drought and flood control, and prairie fire control.

The newly-constituted **China Search and Rescue team** concluded its first overseas mission to Beira, one of Mozambique's largest cities, which was devastated by Cyclone Idai on 14-15 March 2019.<sup>49</sup> This was the first such team sent by China's MEM, which took over 13 mostly disaster-relief related responsibilities from other organisations. The 65-member Chinese team – consisting of medical specialists, SAR personnel, logistics personnel for supply and communications, and liaison officers – arrived in Mozambique on 24 March. The team had water rescuers, and brought rubber boats for the mission. Their major duties were medical treatment for victims, transportation of people and supplies from isolated places to city area or hospitals, sanitation, and decontamination.

## Funding

China Search and Rescue is government funded.

## Germany

### 1. ISAR Germany<sup>50</sup>

In the first few years after its foundation in 2003, **International Search and Rescue Germany (ISAR Germany)** specialised primarily in rescue and first aid for victims of severe disasters. ISAR Germany has been working under the umbrella of the United Nations since 2007, and was the world's first group to be verified and certified as a 'Medium' Team by the INSARAG.<sup>51</sup>

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<sup>48</sup> [http://english.www.gov.cn/state\\_council/2014/10/01/content\\_281474991089800.htm](http://english.www.gov.cn/state_council/2014/10/01/content_281474991089800.htm)

<sup>49</sup> <https://news.cgtn.com/news/3d3d414f3067444d34457a6333566d54/index.html>

<sup>50</sup> <https://isar-germany.de/das-sind-wir/humanitaere-hilfe/>

<sup>51</sup> [https://www.dlr.de/os/desktopdefault.aspx/tabid-12484/21765\\_read-49891/](https://www.dlr.de/os/desktopdefault.aspx/tabid-12484/21765_read-49891/)

## Personnel & Management structure

ISAR Germany gathers a team of SAR specialists soon after devastating accidents and catastrophes, which in most cases is deployed to the disaster affected area **within 12 hours**.

The assistance here ranges from medical care for famine affected women and children, to training for emergency services in the city of Tacloban in the Philippines. In recent years there have been **long-term** humanitarian aid projects by ISAR Germany in East Africa (Kenya), Libya, Haiti, or the Philippines. In order to carry out targeted long-term aid projects, the exact need is determined **directly after an aid mission**. This ensures that the aid projects from ISAR Germany always start exactly where help is needed.

## Funding

ISAR Germany is a voluntary NGO which is financed by donations and sponsoring. There is no governmental money from Germany.<sup>52</sup>

## 2. THW

**Technisches Hilfswerk (Federal Agency for Technical Relief, THW)** was founded in 1950, by the Federal Minister of the Interior. The main purpose of this federal authority was civil defence in the event of war. This has changed during the decades; today the THW helps in a wide spectrum of disasters, such as traffic accidents or industrial disasters.

Like ISAR Germany, THW has also been active in many disaster relief operations abroad, e.g. after the 2004 Indian Ocean earthquake (for both relief operations and medium-term rebuilding), Hurricane Katrina in 2005, the 2005 Kashmir earthquake, in 2010 during the flooding in Poland, and the 2011 Tōhoku earthquake and tsunami. It was IER re-classified as 'Heavy' in 2012.

## Organisational structure

As a federal authority, the THW is headed by the **president of the THW administration together with its board**. The THW comprises 668 THW local chapters (*Ortsverbände, OV*) all over Germany, 66 regional offices, 8 state associations, and the THW administration in Bonn, which is subject to the THW President and assists him in his daily official business. It consists of management staff, the commissioner of volunteers, and the Deployment Section.<sup>53</sup>

Some 80,000 people are active in this organisation, including approximately 15,000 young volunteers (members of the THW Youth). The majority of those are volunteers, while about 800 work full-time in its administration. Each local chapter maintains one or more *Technische Züge* (technical platoons), each consisting of one *Zugtrupp* (command squad), comprising four volunteers, two *Bergungsgruppen* (rescue units) comprising nine (first unit- i.e. deployed first) to twelve (second unit) volunteers, and one to three *Fachgruppen* (technical units), comprising four to eighteen volunteers.

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<sup>52</sup> The ISAR Germany finance reports from 2018/2019 will be published in due course (in German): <https://isar-germany.de/organisation/isar-germany-e-v/>

<sup>53</sup> See description of the nine THW units (in German): [https://www.thw.de/DE/Startseite/startseite\\_node.html](https://www.thw.de/DE/Startseite/startseite_node.html)

For relief overseas, there are four *Schnelleinsatzeinheiten Bergung Ausland* or *SEEBa* (Rapid Deployment Unit Search and Rescue Abroad) units, able to go airborne **within six hours**, and three *Schnelleinsatzeinheiten Wasserversorgung Ausland* or *SEEWa* (Rapid Deployment Unit Water Supply and Treatment Abroad) units.

## Funding

THW is funded by the government. However, further detail on management budgets is unavailable.

## Indonesia

The National Search and Rescue Agency of Indonesia, known as **Badan Nasional Pencarian dan Pertolongan** (formally *Badan SAR Nasional*, both abbreviated to Indonesian Search and Rescue team **INASAR BASARNAS**), is a **government agency** responsible for conducting SAR duties nationally in Indonesia.

### Personnel & management structure

According to presidential decree No. 99/2007 regarding the 'National Search and Rescue Agency Republic of Indonesia', BASARNAS' primary task is "to assist the president in the implementation of SAR activity in Indonesia." Therefore, BASARNAS may also be assisted in conducting SAR by the Indonesian National Armed Forces (TNI), Mobile Brigade Corps (Brimob) – a tactical unit of the Indonesian National Police - and local fire brigade units.

The 2014 operation of Air Asia QZ 5810 evacuation became one of the most successful large-scale operations BASARNAS has ever conducted, and highly applauded worldwide. Through coordination of skilfully trained divers and hundreds of volunteers, the agency discovered more than half of the victims and countless pieces of the plane wreckage.<sup>54</sup> This involved **both staff and technical units**.<sup>55</sup> The operation spent more than 80 days, IDR 570 million (USD 41,425),

When the 7.7 earthquake and tsunami hit Sulawesi Island in September 2018, mainly affecting the city of Palu and surrounding parts of Central and West Sulawesi, the Government of Indonesia immediately activated its disaster management mechanisms and resources to respond to the emergency (WHO, 2019: 14). The Government deployed 1,175 medical personnel working in 15 hospitals and 50 primary health care centres, **mobilised through national EMTs and volunteer health-care workers**. At least 25 international EMTs were on standby or deployed forward response teams, in full compliance with the coordination of the Government of Indonesia and eventual assessment of no gaps in response. This was after recent **workshops with the Indonesian Ministry of Health on coordination of EMTs**.

In November 2019, INASAR BASARNAS achieved IEC 'Medium' team classification.<sup>56</sup>

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<sup>54</sup> <https://www.marketwatch.com/press-release/indonesias-national-search-and-rescue-agency-basarnas-working-to-be-a-world-class-sar-agency-2015-06-09>

<sup>55</sup> The organisational structure from the Head and Secretariat, SAR staff, to the Inspectorate and Technical Units are explained in detail (in Indonesian): <http://www.basarnas.go.id/>

<sup>56</sup> <https://www.insarag.org/154-en/iec/iec/764-iec-medium-indonesia-rescue-team-inasar>

## Funding

The Government of Indonesia provides funding for BASARNAS. However, in 2013 it was reported in the media that BASARNAS was also receiving illegal funds from the Australian government with regard to the handling of refugees and asylum seekers from the Middle East.<sup>57</sup>

## Scandinavia

Although also acting in a regional collaborative capacity, the countries in Scandinavia have their own SAR teams which are managed separately due to their different skillsets (Table 1 shows their IEC classification variations):

Table 1: IEC/IER classification of Scandinavian SARs (2008-2015)

Country	SAR teams	IEC level (year of IEC)	IER level (year of IER)
Denmark	Danish Emergency Management Agency (DEMA)	Heavy (2010)	Heavy (2015)
Finland	FinnRescue (FRF)	Heavy (2012)	-
Iceland	The Icelandic Search and Rescue Team (ICE-SAR)	Medium (2009)	Medium (2014)
Norway	The Norwegian Search and Rescue Team (NORSAR)	Medium (2008)	-
Sweden	Swedish International Fast Response Team (SWIFT USAR)	Heavy (2008)	Heavy (2013)

Source: Author's own. Data taken from INSARAG (<https://www.insarag.org/ma>)

## National Personnel & Management Structures

### Denmark

SAR operators in Denmark are primarily air force (air force Squadron 722, navy air squadron); army (naval home guard), and navy (Danish Maritime Safety Administration).<sup>58</sup> They are coordinated by **Joint Rescue Coordination Centre (JRCC) Denmark**, operated by the navy and air force in the Danish Naval Commands facilities near Aarhus. Authority for the control of SAR is vested in the **Ministry of Defence** (MOD).

JRCC Denmark is manned 24 hours a day, seven days a week by one air force officer (usually with SAR background), one air force non-commissioned officer (usually with SAR background),

<sup>57</sup> <https://www.thejakartapost.com/news/2013/09/29/basarnas-accused-receiving-illegal-funding-australia.html>

<sup>58</sup> <https://www2.forsvaret.dk/eng/Organisation/Search-and-Rescue/Pages/SAR-Denmark.aspx>

one naval officer and one naval non-commissioned officer. Internationally, the Danish works mainly with Germany, Norway, and Sweden. Annual training exercises are conducted in Norway (Baltic SAREX) and Sweden (Scan-SAR).

## Finland

**Local rescue services** (i.e. fire departments) are responsible for land and inland water SAR, with the **Border Guard** responsible for maritime areas. These organisations alert and decide on the most suitable response for the location and situation. The country also has **several volunteer organisations** such as the volunteer fire department (VPK), the Finnish Lifeboat Institution (SMPS), and the Red Cross Finland (SPR).

**Finland's Search and Rescue Region (SRR)** extends beyond Finland's territorial waters into international waters bordering the SRR's of Sweden, Russia, and Estonia. Employees also participate in EU civilian crisis management operations.<sup>59</sup> Assistance can be provided in response to a call for assistance by the country facing the disaster; such a call may be sent through the **EU Civil Protection Mechanism, OCHA, or the NATO's Euro-Atlantic Disaster Response Coordination Centre (EADRCC)**. The 2011 *Finnish Rescue Services Act* contains information on dispatching assistance abroad, at the request of another state or an international organisation. **The Ministry of the Interior decides on international assistance.** When Finland decides to send experts abroad, the **Emergency Services Academy Finland (Pelastusopisto)**, formerly known as the Emergency Services College) assembles the team, and is in charge of logistics.<sup>60</sup> The Academy also partners many development projects aiming at improving not only Finnish but also European capacities in international civil protection.<sup>61</sup>

For international operations, the Finnish fire and rescue services use specially trained rescue personnel of the **Finn Rescue Force (FRF)**. Since 1994, FRF units have taken part in international rescue duties in nine disaster situations involving forest fires, flooding, explosion, earthquake, and toxic spillage.

## Iceland

The **Icelandic Association for Search and Rescue (ICE-SAR, or Slysavarnarfélagið Landsbjörg)**<sup>62</sup> is a national association of rescue units and accident prevention divisions. Its member organisations consist of 99 rescue units, 70 accident prevention and women's divisions, and 50 youth sections. Altogether, the association has approximately 10,000 volunteer members which are present in most towns.

The ICE-SAR team achieved classification as a 'Medium' USAR team by the UN and active members of UNDAC team in 2009. The team was IER re-classified as a 'Medium' team in June 2014. The team has extensive experience in rescue operations following serious earthquakes,

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<sup>59</sup> [https://www.raja.fi/functions/international\\_cooperation](https://www.raja.fi/functions/international_cooperation)

<sup>60</sup> Until 2019, The Crisis Management Centre (CMC) Finland was an operational actor within the Emergency Services Academy Finland, and responsible for training and recruitment of Finnish experts as well as material preparedness. Emergency Services Academy Finland employs approximately 120 persons - over half of which are instructors. From 2019 onwards, the training and recruitment of Finnish experts to international civil protection missions, as well as the material preparedness has been the responsibility of **Emergency Services Academy Finland**: <https://www.pelastusopisto.fi/en/civil-protection/>

<sup>61</sup> International civil protection is an immediate assistance provided by the Finnish government in natural or man-made disasters, or accidents all over the world.

<sup>62</sup> <http://www.icesar.com/search-and-rescue>



for example in Turkey and Morocco. The team was among the first to arrive in the disaster zone in Haiti (16:00 local time, 13 January 2010).<sup>63</sup> 37 volunteers were sent by the **Foreign Ministry** to help with the Haiti 2010 earthquake, specialising in searching for survivors in collapsed buildings.<sup>64</sup> The team was fully equipped and self-sufficient for up to seven days in the field, bringing with them 10 metric tonnes of their own tools and equipment, three tonnes of water, tents, advanced communication equipment, and water purifying capability. The Foreign Minister followed preparations closely, and visited the team's headquarters prior to deployment. The swift response from Iceland was enabled by Foreign Ministry officials **coordinating** with the Haitian authorities.

## Norway

The Norwegian Search and Rescue Service is a fully integrated set of services directed by a **joint coordinating organisation** responsible for all types of rescue operations (sea, land, and air). These services are performed through a cooperative effort involving government agencies, voluntary organisations, and private enterprise.<sup>65</sup>

The Norwegian SAR is organised under the **Ministry of Justice and Police**. Day-to-day responsibility is exercised by the Department of Civil Emergency, and Rescue Planning from its offices in the Government Administration Complex. Therefore, **coordination** between government agencies and private companies and organisations is important. The 2011 *Arctic Agreement* addresses how rescue operations will be carried out, procedures to obtain access to the territory of other countries, the exchange of information, and funding.<sup>66</sup>

## Sweden

The Swedish Maritime Administration (*Sjöfartsverket*) is responsible for maritime SAR in Swedish waters (Wang, 2006: 21). The Swedish Sea Rescue Society aims to save lives and recover property at sea, much the same as the Norwegian Society for Sea Rescue (Norsk Selskab til Skibbrudnes Redning). The society operates 68 SAR stations, and 185 ships manned by 2,100 volunteers; of those more than 300 are on call at any time, and can respond within 15 minutes. In 2011, the volunteers turned out to an emergency 3,274 times. The Swedish Sea Rescue Society is involved in 70% of the SAR missions in Swedish waters.

**SAR Management** has overall responsibility for the Swedish SAR-organisation. It also participates in international activities such as exercises, organises international co-operation, and is responsible for drawing up agreements, both national and international, involving SAR organisation. SAR Management also supervises the JRCC, and evaluates SAR-missions of interest.<sup>67</sup>

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<sup>63</sup> Iceland sends a search and rescue team to Haiti (2010): <https://reliefweb.int/report/haiti/iceland-sends-search-and-rescue-team-haiti>

<sup>64</sup> Björgunarsveitarmenn á leið til Haítí (2010, in Icelandic).  
[https://www.mbl.is/frettir/innlent/2010/01/13/bjorgunarsveitarmenn\\_a\\_leid\\_til\\_haiti/](https://www.mbl.is/frettir/innlent/2010/01/13/bjorgunarsveitarmenn_a_leid_til_haiti/)

<sup>65</sup> Norwegian SAR, p1, 2:  
[https://www.regjeringen.no/globalassets/upload/kilde/jd/bro/2003/0005/ddd/pdfv/183865-infohefte\\_engelsk.pdf](https://www.regjeringen.no/globalassets/upload/kilde/jd/bro/2003/0005/ddd/pdfv/183865-infohefte_engelsk.pdf)

<sup>66</sup> <https://www.barentswatch.no/en/articles/Search-and-rescue-in-the-Norwegian-area-of-responsibility/>

<sup>67</sup> <https://www.sjofartsverket.se/en/Maritime-services/Search-and-Rescue/>

## Overall organisational structure

The JRCCs in each country are linked to up to international satellite-based emergency communication and alerting systems. INMARSAT, an international satellite-based system for maritime communications, may also be used to transmit emergency communications and distress alerts. AMVER is an international maritime reporting system which SAR services may also make use of.<sup>68</sup>

SAR at sea, aircraft SAR, and accidents on offshore oil installations are led by just **one** of the JRCCs, particularly where operations involve international collaboration. However, air and sea SAR operations must follow **an extensive and complicated set of international procedures** established by the UN's International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) and international Aeronautical and Maritime Search and Rescue (IAMSAR) manuals.

**Top level SAR managers** usually take the overall responsibility of establishing, staffing, equipping, and managing the SAR system, providing appropriate legal and funding support, establishing Rescue Coordination Centres (RCCs) and Rescue Sub-Centres (RSCs), providing or arranging for SAR facilities, coordinating SAR training, and developing SAR policies (Wang, 2006: 56).

When two or more SAR units are working together on the same mission, there is sometimes an advantage if **one person** is assigned to co-ordinate the activities of all participating units. The **SAR Mission Coordinator (SMC)** designates the **On-Scene Coordinator (OSC)**, who may be the person in charge of a SAR Unit, ship or aircraft participating in a search, or someone at another nearby facility in a position to handle the OSC duties. The person in charge of the first SAR facility to arrive at the scene will normally assume the function of OSC until the SMC directs that the person be relieved. The OSC may have to assume the SMC duties and actually plan the search if the OSC becomes aware of a distress situation directly, and communications cannot be established with a RCC or a RSC. The OSC should be the most capable person available, taking into consideration SAR training, communications capabilities, and the length of time that the unit where the OSC is aboard can stay in the search area.

## Overall Funding

Overall, through the **EU Civil Protection Mechanism**, the EU Commission supports cooperation between European rescue services with respect to prevention, preparedness, and assistance. The Commission also funds a range of projects through the Mechanism.

Denmark: Funding is the responsibility of the government (Military of Defence).<sup>69</sup> However there is no information on the amounts available for SARs.

Finland: Funding is the responsibility of the government. The Ministry of the Interior has allocations for expenditure on operations to provide or receive international assistance, as defined in the 2011 *Rescue Services Act*. Finland's participation in civilian crisis management is

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<sup>68</sup> See Norwegian SAR, pps8, 13, 19:

[https://www.regjeringen.no/globalassets/upload/kilde/jd/bro/2003/0005/ddd/pdfv/183865-infohefte\\_engelsk.pdf](https://www.regjeringen.no/globalassets/upload/kilde/jd/bro/2003/0005/ddd/pdfv/183865-infohefte_engelsk.pdf)

<sup>69</sup> <https://www2.forsvaret.dk/eng/Pages/English.aspx#>

funded principally from the main budget division of the Ministry for Foreign Affairs.<sup>70</sup> However, there is no information in English provided on actual funding amounts provided. Due to restrictions on transport capacity and funding, FRF has not been able to respond to all the requests for assistance, and the size of the units dispatched has had to be limited.

Iceland: Although the Iceland SAR team functions as a public service, they are not supported or paid for by the government. ICE-SAR teams count on donations to raise funds, e.g. fireworks sales, or by funding a seedling to be planted in a grove outside Þorlákshöfn.<sup>71 72</sup>

Norway: Through the Arctic Search and Rescue (ARCSAR) cooperation on search and rescue in the High North, Russia, the USA, New Zealand, Norway receives substantial funding from the EU.<sup>73</sup> The integrated coordination structure of SAR training and communication sharing provides a cost-effective highly efficient system, with little competition for resources.<sup>74</sup>

Sweden: Swedish Sea Rescue Society is involved in 80% of all sea rescues in Sweden, but receives no government funding. The Society is financed by membership fees, donations and voluntary work.

## USA

### Personnel & management structure: internal

In the United States there are **many organisations with SAR responsibilities at the national, state, and local level**. Most day-to-day SAR missions in the US are run by County Sheriffs, except in states like Alaska where the State Highway Patrol oversees SAR. They in turn, can request help from state and national resources, if they think they need them. A typical Sheriff's Office has a volunteer SAR team that matches the terrain and population of that county. SAR members are typically trained in the Incident Command System (ICS), first aid, and the outdoor skills needed in that terrain and climate.

The **National EMS Management Association (NEMSMA)**<sup>75</sup> is a professional association "dedicated to the discovery, development, and promotion of excellence in leadership and management in EMS systems, regardless of EMS system model, organisational structure, or agency affiliation." Their EMS Agenda for the Future helped to define and outline three levels of leadership: Supervising EMS Officer, the Managing EMS Officer, and the Executive EMS Officer.

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<sup>70</sup> Finish Security and Defence Policy 2012- SECTION III: INTERNATIONAL CRISIS MANAGEMENT: [https://www.defmin.fi/en/publications/finnish\\_security\\_and\\_defence\\_policy/2001/section\\_iii\\_international\\_crisis\\_management](https://www.defmin.fi/en/publications/finnish_security_and_defence_policy/2001/section_iii_international_crisis_management)

<sup>71</sup> Rakel Kristinsdóttir (Thesis- 2017, In Icelandic):

[https://skemman.is/bitstream/1946/27856/2/BS\\_ritger%c3%b0\\_Efnisyfirlit\\_heimildaskr%c3%a1.pdf](https://skemman.is/bitstream/1946/27856/2/BS_ritger%c3%b0_Efnisyfirlit_heimildaskr%c3%a1.pdf)

<sup>72</sup> <https://www.icelandreview.com/news/seedlings-instead-of-fireworks/>

<sup>73</sup> <https://www.highnorthnews.com/en/sar-network-goes-cruising-eu-funding>

<sup>74</sup> Norwegian SAR, pp5: [https://www.regjeringen.no/globalassets/upload/kilde/jd/bro/2003/0005/ddd/pdfv/183865-infohefte\\_engelsk.pdf](https://www.regjeringen.no/globalassets/upload/kilde/jd/bro/2003/0005/ddd/pdfv/183865-infohefte_engelsk.pdf)

<sup>75</sup> NEMSMA: <https://www.nemsma.org/page/TheSevenPillarsOfNationalEMSOfferCompetencies>

<sup>76</sup> These are explained in NEMSMA (2014: 5). *National EMS Officer Competencies*. National EMS Management Association.

[https://cdn.ymaws.com/www.nemsma.org/resource/resmgr/pdfs/credentialing/nemsma\\_seven\\_pillars\\_of\\_nati.pdf](https://cdn.ymaws.com/www.nemsma.org/resource/resmgr/pdfs/credentialing/nemsma_seven_pillars_of_nati.pdf)

In January 2008, the **United States Department of Homeland Security (DHS)** released the **National Response Framework**, which serves as the guiding document for a federal response during a national emergency. SAR is divided into four primary elements (structural collapse, waterborne, inland wilderness, and aeronautical); **a federal agency** is assigned a lead role for each of the 4 elements.

**SAR standards**, adopted by agencies having jurisdiction, are developed primarily by non-governmental organisations, e.g. National Fire Protection Association. These standards are adopted also by training and certification organisations, such as Mountain Rescue Association, and National Association for Search and Rescue, to develop training that will meet or exceed those standards.

### **Personnel & management structure: international**

The **National Disaster Medical System (NDMS)**<sup>77</sup> is a federally coordinated system within the US Department of Health and Human Services that serves the Federal response by providing disaster medical care to the US, as well as responses to the world (including the 2003 Bam earthquake in Iran, and the 2010 earthquake in Haiti).

National standards and frameworks have been used internationally. Founded in 1996, the **National Disaster Search Dog Foundation (SDF)**<sup>78</sup> is a non-profit, non-governmental organisation which strengthens disaster response in America by partnering dogs with firefighters and other first responders, to find people buried alive in the wreckage of disasters. Two Search Dog Foundation federal taskforces have been deployable internationally: Virginia Task Force 1 (VA-TF1 or USA-1 outside of the US), and Los Angeles County Task Force 2 (known as CA-TF2, or USA-2). These task forces have the ability to deploy with a small group of 40-75 rescuers and six canines to assist foreign governments with SAR efforts, as well as humanitarian relief in the event of a disaster. Both task forces are completely self-sufficient when deployed. USA-1 and USA-2 were IEC classified as 'Heavy' in 2006 and 2007, respectively.<sup>79</sup> Different personnel and methods used in ISAR deployment situations are described below:

- Haiti 2010 earthquake: The Haitian government reached out to the **Office of US Foreign Disaster Assistance**, which is charged with deploying Federal Emergency Aid (FEMA) Task Forces to overseas disasters. Six SDF teams from USA-2 were deployed to search together as one group: with 21 additional SDF teams on standby. The 6 SDF teams resulted in a 72-member personnel.
- Japan 2011 earthquake and tsunami: Task force USA-2 was mobilised along with USA-1 by **USAID**, which dispatched a **Disaster Assistance Response Team (DART)** to help coordinate rescue efforts. Each Task Force was composed of approximately 72 personnel, including USAR canines, and 75 tons of rescue equipment.
- Nepal 2015 earthquake response: 128 members of **USAID's DART** reached hard-hit Bhaktapur, a city east of Kathmandu. There, the DART's USAR team worked closely with the Nepali army and members of the community to determine where people might be

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<sup>77</sup> NDMS Response Teams are DMATs, Disaster Mortuary Operational Response Teams (DMORT), International Medical Surgical Response Team (IMSURT), and National Veterinary Response Team (NVRT) (Arziman, 2015: 15). DMAT is a specific team which does not perform SAR, only medical treatment (Arziman, 2015: 12).

<sup>78</sup> <https://searchdogfoundation.org/>

<sup>79</sup> <https://www.insarag.org/ma>

trapped and to conduct searches. The DART team consisted of 15 **USAID disaster experts**, a 57-person USAR team from Los Angeles County (including six Canine Teams), and a 57-person USAR team from Fairfax, Virginia (which also included six Canine Teams).

## Funding

A USAR team costs between USD1.8 - USD2.2 million per year to maintain in the US (Alexander, 2011). According to the Congressional Research Service, the US USAR task force, as part of the Federal Emergency Network Response, was funded with USD28 million in FY 2011 and USD32.5 million in FY 2010. This was due mostly to the perceived successful efforts in Haiti in early 2010, and the growing support for a SAR team for both domestic and international crises.

## 4. Lessons learned

Valuable lessons on funding and management have been learned from evaluations of responses to disasters by EMTs and ISAR teams over the past two decades. These include the 2004 tsunami that affected 12 countries in the Indian Ocean; earthquakes (in Bam, Iran 2003; Kashmir, Pakistan 2005; Nepal 2015), and floods (Pakistan, 2010):

## Funding

### Changes in donor governments providing EMTs

Governments considered as humanitarian donors are traditionally 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 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 2011 Great East Japan earthquake and tsunami (IFRC & WHO, 2017: 12).

### Cost-effectiveness of rapid assessment

The cost of international relief and the belief that such deployment is cost-effective has been questioned by the international community. Unfortunately, there is still little informed debate and few detailed data are available. However, recent analysis shows that both EMT and ISAR team deployments are very expensive (Bartolucci et al., 2019: 419).

Before requesting the deployment of an international team, the host nation and international community should undertake **a rapid assessment and assess the specific need**. As Glassey (2013) suggests, after using a novel qualitative evaluation tool known as the Search Marking Adherence Score (SMAS), the cost of the deployment could save more lives if allocated pre-event to disaster risk reduction and mitigation programmes.

The comparative review by Bartolucci et al., (2019: 420) concludes that **increasing local adaptive and absorptive capacity** is perhaps the most cost-effective way for the affected government to meet their responsibility, supported by the regional and international systems

(Bartolucci et al., 2019: 420). For example, after the 2010 Haiti earthquake, at least five (11%) FFHs stayed for a very short time, three for just a single week, and the cost-effectiveness and medical value of such a short intervention is debatable.

Evaluations show that the international community often made mistakes and errors in management in their responses. Medical donations were not always appropriate, and the **costly destruction of inappropriate donations** was a recurrent problem (de Ville de Goyet, 2007: 17). In many cases, this was due to an under-estimation of the local capacity to respond (de Ville de Goyet et al., 2003). This error, with the accompanying disregard for the cost-effectiveness of the approach, contributes to making disaster relief one of the least cost-effective health activities (de Ville de Goyet et al., 2003).

## Management

### Result of national decision to request/ accept EMTs

In their evaluation, de Ville de Goyet et al. (2003: 1159) found that the decision to request the support of EMTs is a vital pre-requisite for the deployment of some (but not all) EMTs.

Before an EMT can travel to a disaster-affected country, **several time-consuming steps must take place**, both within the affected country, as well as with the provider of medical assistance. First, the affected country has to decide whether it needs and/or wants international assistance in the form of EMTs. Secondly, the deploying agencies must decide whether there is sufficient 'benefit' to deploying a team (IFRC & WHO, 2017: 21).

Civilian or military teams sent by foreign governments should always wait for **formal approval** and, in some cases, a specific request from the authorities of the affected country.<sup>80</sup> The actual departure of the team takes place only once formal approval is received. A formal decision from the affected state is also a pre-requisite for the deployment of non-governmental EMTs that are sponsored, transported, or funded by a donor government (IFRC & WHO, 2017: 21).

### Effect of team classification

Research shows that being classified or certified by internationally-recognised bodies, such as INSARAG and WHO,<sup>81</sup> has become a trend in the field of international disaster assistance (Okita & Shaw, 2018). **EMTs are more likely to be requested by an affected country** if they have demonstrated their quality in coordination efficiency following the onset of an emergency and been "classified" through the EMT classification process. However, **classification was not considered as criteria in receiving international USAR teams** in the 2011 Great East Japan Earthquake and the 2015 Nepal Earthquakes (Okita & Shaw, 2018). While the awareness of IEC

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<sup>80</sup> Security issues also played a role in the team being assigned a location and role before departure (IFRC & WHO: 2017: 63).

<sup>81</sup> A global list of all EMTs that meet the WHO EMT minimum standards for deployment to the affected populations is available. It serves as a coordination mechanism for all partners. It allows a country affected by a disaster or other emergency to call on teams that have been classified and quality assured. WHO's viewpoint is that international teams need to be deployed only in the case of an emergency of "overwhelming proportions".



is already high among these countries, in some countries, the sending agency and receiving agency is different, and thus IEC is not considered.<sup>82</sup>

### Effect of politics and friendship bonds

The political benefit of sending an EMT should not be under-estimated, and usually there are additional indirect drivers that trigger deployment (Gerdin et al., 2013). **Access to, and support from, the political level** has determined the success or failure in coordinating the external and domestic health response (de Ville de Goyet et al., 2003: 1159). Although sharing a political will is important, getting assistance from “friends” is preferred (Okita & Shaw, 2018). In this case “friends” are defined by UNDAC as “ones who have the local knowledge and personal relationship through the preparedness efforts for response.”<sup>83</sup>

### Preparedness

Often the decision to accept assistance comes without specific instruction or requirements regarding medical personnel and teams. In a relatively short time period, the already taxed local authorities could be faced with an overwhelming medical response of variable quality and effectiveness (IFRC & WHO, 2017: 18).

Therefore, the **synergy between preparedness and disaster response activities** should be recognised. Poor development practices increase vulnerability, whereas preparedness improves the attention to daily health challenges. Programmes narrowly focused on operational response have generally failed (de Ville de Goyet et al., 2003: 1159).

Those assisting countries should **prioritise investing** in preparedness (de Ville de Goyet, 2007: 17). For example, before the mission to Beira in Mozambique, the Chinese Ministry of Emergency Management (MEM) carried out two exercises in Laos and Indonesia to prepare the China SAR team for their response to Cyclone Idai.<sup>84</sup>

AUSMAT's efficient and timely deployment to Tacloban in The Philippines demonstrated the importance of preparedness and consistency (Coatsworth, 2014: 634). In an evaluation of this Australian response to Typhoon Haiyan in 2016, the clinical experience of many doctors and nurses in rural and remote settings meant that they were ideally suited to the demands of practice in an austere environment.

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<sup>82</sup> Although it is not mandatory to have an IEC certification in order to deploy international USAR teams, INSARAG and OCHA strongly request all the international USAR teams to go through the IEC process. At the same time, they recommend the governments of the affected countries to receive only IEC-classified teams. However, it is the decision of the affected country if they wish to prioritise IEC-classified teams. Between 2005 and 2010, 21 international teams were successfully classified. Now, more than 50 USAR teams have been classified in IEC, and more and more teams are waiting for their turns to be classified.

<sup>83</sup> Katoch A (2015). Initial response to the Nepal Quake. *Crisis Response Journal*, 10(4), 22-26.

<sup>84</sup> China Search and Rescue team completes first overseas mission (2019): <https://news.cgtn.com/news/3d3d414f3067444d34457a6333566d54/index.html>

## Personnel

### a. Personnel Models

**Combining military and civilian** EMT teams has been shown to work successfully in both Israel and Australia responses (Waxman et al., 2006). However, this strategic, flexible approach may be more difficult to implement in other countries (Arziman, 2015: 16).

In some countries (e.g. Spain), calling-up EMT volunteers from a roster and requesting their release from employers is all subject to receiving a formal request. Other provider governments may be willing to carry out these steps in advance of a decision from the affected country. The policy of **earmarking** medical personnel for potential emergencies before deployment is useful. This allowed the Indian Armed Forces Medical Services to deploy these personnel within 4 hours of receiving notification of the mission to Nepal (Chauhan & Chopra, 2017: 396).

### b. Organising field responsibilities

In the organisation of field response, deciding the **responsibilities of personnel and establishing job descriptions** are the initial steps to take. It should be very clear who will do what, when and how. For example, it should be very clear who the incident manager is, who will provide the security and traffic flow, who will be liaison and coordinate the units, and who will collect information, process and provide feedback (Arziman, 2015: 12). Once in the affected, country research shows that frequent changes of people in charge, e.g. on-scene coordinators (OSCs), should be avoided (Wang, 2006: 57).

The CISAR collaborative management structure used in Nepal is a good example of a coordinated response where specific roles were outlined (Li et al., 2012; Yang et al., 2018).

### c. Support and Training

A medical coordinator with technical responsibility for health outcomes, but no administrative authority over resources, will experience predictable organisational failures (Bradt et al., 2007: 368). A survey of Australian DMAT members revealed a need for more emphasis on education and training (Aitken et al., 2011). The importance of an **agreed consistency** in disaster training was less obvious, however (Coatsworth, 2014: 634). PAHO agrees that **basic training in disaster management** should be strengthened, with a need to develop **internal** training programmes and guidelines.<sup>85</sup> This is because well-designed disaster management training programmes will improve the management of daily medical emergencies and accidents as well (de Ville de Goyet et al., 2003: 1155).

The AUSMAT team member training course focuses on **safety and security, cultural awareness, team dynamics in the field, and familiarisation with equipment** (Coatsworth, 2014: 633). However, research shows that many other organisations/countries lack the capacity to train field personnel (especially in areas such as security, management, standardised programmes, field educational methods, and cultural sensitivity), while existing educational programmes need support (Waxman et al., 2006).

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<sup>85</sup> Griekspoor A, & Sondorp E (2001). Enhancing the quality of humanitarian assistance: Taking stock and future initiatives. *Prehosp Disaster Med*, 16, 209–215.

If mixed civil–military personnel models are used, then both **must train together before deployment**. While this may not produce agreement, it can help produce mutual understanding.

For EMTs, **leadership training** has been considered as essential for DMAT commanders (Aitken et al., 2011). Programme managers also need training in **management skills**, such as project assessment and planning, finance and personnel management, quality assurance, and reporting.<sup>86</sup> Three key areas identified by the Swiss that warrant further training and development are **rapid assessment, flexibility in assistance, and rapid decision-making**.<sup>87</sup>

For SAR teams, the International Aeronautical and Maritime Search and Rescue Manual (IAMSAR) has been found to be very valuable training. However, although it is recommended it is not always used (Wang, 2006: 61). The *SAR Training—Team Leader Handbook*<sup>88</sup> touches on some important elements, including leadership, situation management, health and safety, as well as rescue law and duty of care. However, it cannot be ranked as a formal training guide (Wang, 2006: 6). The lack of an operationally focused training framework to guide EMC/EMT organisations has been highlighted as an essential gap. Therefore, the TEAMS (Training for Emergency Medical Teams and European Medical Corps)<sup>89</sup> project, funded by the European Union Humanitarian Aid and Civil Protection, aims to develop, pilot and assess a standardised, validated and cost-effective online training package. It will focus on operational team training for EMCs/EMTs, adaptable to different types of EMCs/EMTs, and be sustainable within low-income countries and resource-poor settings. In the Americas Region, an online platform<sup>90</sup> has already been developed for EMTs and stakeholders. Regional experiences, knowledge and material from workshops, courses and other events are shared there. A stand-alone e-learning course has been developed: *Introduction to the EMT Initiative*. Regular bilingual webinars are also held on topics requested by the regional group, such as pharmaceutical management for EMTs, and optimising clinical care in emergencies.

#### d. Prior management experience

The importance of prior experience in international disasters was highlighted by Australian DMAT members (Aitken et al., 2011: 41). The majority of respondents stated they had actual experience (58%, 34/59), either through military (41%, 24/49) or NGO (32%, 19/59) deployments. Although only 5% (3/59) stated they had experience in disaster management before their DMAT deployment, this actual experience was felt to be beneficial, and provided more help in preparing for deployment than did coursework or other forms of instruction. The value of **military, developing country, and remote medical experience** also was noted following the Australian Team Charlie deployment to the Maldives.<sup>91</sup> However, it was found that NGOs may recruit medical coordinators with less extensive field experience (Bradt et al., 2017: 365).

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<sup>86</sup> van Rooyen MJ, Hansch S, Curtis D, et al. (2001). Emerging issues and future needs in humanitarian assistance. *Prehosp Disaster Med*, 16, 216–222.

<sup>87</sup> Frisch T (2005). The international aid perspective. *Crisis Response J*, 1(2), 22–23.

<sup>88</sup> 2003-2005 SAR Training-ST-002-01V2.2

<sup>89</sup> [www.teams-project.eu](http://www.teams-project.eu)

<sup>90</sup> [www.emtamericas.org](http://www.emtamericas.org)

<sup>91</sup> Robertson AG, Dwyer DE, & Leclercq MG (2005). Operation South East Asia Tsunami Assist: An Australian team in the Maldives. *Med J Aust*, 182, 340–342.

In Nepal, all of the members of CISAR had previously participated in major disaster rescue missions, both domestic and overseas, and had rich experiences in disaster rescue (Yang et al., 2018: 537).

## Management Partnerships

### a. Defining government responsibilities

Some lessons for EMTs can be learned from established programmes and structures for disaster risk management. de Ville de Goyet et al. (2003: 1159) concluded that a **multi-hazard programme** covering the entire health sector is most effective. Assigning responsibility for coordination and management among different technical departments according to the type of hazard (chemical or natural, for instance) does not work. Risk management programmes should cut across departments of the Ministry of Health (medical care, epidemiology, water supply, sanitation, nutrition, etc.) and become **sector wide**.

### b. Within team workflow

Overseas rescue missions need a scientific, efficient, simple workflow for providing efficient emergency medical assistance (Li et al., 2012: 23). Evidence from the China Search and Rescue team found that coordinating all parts of the sub-organisations within the new Ministry of Emergency Management rather challenging.<sup>92</sup> However, CISAR had established a set of scientific, highly efficient, and coherent **workflow for medical rescue operations** which ensured the execution of the operations in an orderly and coherent fashion, laying a foundation for providing high quality and high-level medical services.<sup>93</sup>

### c. Public-public partnerships

The complex US operation after the 2010 Haiti earthquake illustrated the **collaboration between federal agencies** operating overseas: “In the health sector, the US 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 Defence and Department of State agencies.”<sup>94</sup>

### d. Public-private partnerships

The US provides another good example of public-private partnership work in their response to the December 2004 Indian Ocean tsunami, and the related Nias Island earthquake. More than 200 civilian volunteer physicians, nurses, and medical professionals were recruited, oriented, and

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<sup>92</sup> China Search and Rescue team completes first overseas mission (2019):

<https://news.cgtn.com/news/3d3d414f3067444d34457a6333566d54/index.html>

<sup>93</sup> Li, X.-H., Hou, S.-K., Peng, B.-B., Fan, H.-J., Wu, X.-J., & Zheng, J.-C. (2007). Preliminary study of workflow for overseas emergency medical rescue mission. *Chin J Crit Care Med*, 27, 611-614.

<sup>94</sup> PAHO / WHO (2011). p135.

logistically supported by international NGO Project HOPE, to serve aboard the hospital ship USNS Mercy off the coast of Banda Aceh, Indonesia. This endeavour required **careful interaction and collaboration** between 200 volunteer medical professionals, NGO technical staff and managers, and military personnel (Peake, 2006). The Navy ran, operated, and maintained the ship. However, Project HOPE representatives were allowed to participate in preliminary Navy planning sessions. To specify roles and responsibilities, memorandum of understanding (MOU) was drafted and signed a week before deployment. It covered such issues as credentialing of medical providers, security clearances of volunteers, and organisational leadership while aboard (Peake, 2006: 27-28). Project HOPE had a full-time manager, and their human resources staff reached out to many national organisations to recruit medical staff. The Project was led by Project HOPE planner, who – through operators on the ground- coordinated schedules and transportation with the naval command and a military senior medical officer.

### Organising timely medical care

In 2003, the WHO-PAHO published guidelines for the use of FFHs.<sup>95</sup> Three uses were identified, corresponding to the **timing of healthcare needs**: early emergency care, follow-up care, and acting as a temporary healthcare facility. However, after the 2010 Haiti earthquake, many FFH were deployed, but without coordination (Gerdin et al., 2013). Therefore, the following steps are important for countries offering to deliver emergency medical care:

#### a. Arrival time and effectiveness

The **effectiveness of both EMTs and ISAR teams is strongly dependent upon the time of arrival** (Bartolucci et al., 2019: 418; IFRC & WHO, 2017: 58). de Ville de Goyet (2007: 17) found that FFHs rarely arrived in time for immediate trauma care. EMTs rarely arrive within 48 hours, and by which time many patients will have already died from their injuries or been evacuated to other facilities. The published literature suggests three days to be the average time for an EMT to arrive and become operational into the affected country (Arziman, 2015: 16; Brolin et al., 2015: 5).

Most foreign ISARs teams arrive late when they travel over long distances, and their output in terms of people saved remains low. For example, the EU Ebola mission to Angola in 2016 occurred 4 months after the declaration of the outbreak (Haussig et al., 2017: 5). **Tasking SAR teams** is one area where INSARAG achieved some success, after years of efforts. Since 2014, UN OCHA and WHO have launched joint simulation exercises in order to increase coordination and synergy between USAR and medical teams (IFRC & WHO, 2017: 58).

Although international teams usually arrive too late to support resuscitative measures, they can respond to **specific requests for specialised 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

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<sup>95</sup>

WHO-PAHO (2003). Guidelines for the use of foreign field hospitals in the aftermath of sudden impact disasters. Washington, DC. World Health Organisation and Pan American Health Organization.  
<http://helid.digicollection.org/pdf/s8253e/s8253e.pdf>

routine day-to-day services while local staff continue to manage the disaster. The timing of this does not necessarily need to be immediate.<sup>96</sup>

#### **b. Sole mechanisms for priority alignment**

The Pan American Health Organisation (PAHO) and WHO conducted an evaluation in Haiti one year after the 2010 earthquake. Hundreds of NGOs and bi-lateral agencies offered support to the Government of Haiti – pouring human and material resources into the country. Ensuring the intentions of partners were appropriately aligned with the priorities of Haiti's Ministry of Health and Population (MSPP) was a key function of the PAHO/WHO Health Cluster in the initial weeks following the earthquake. **The Cluster was the sole mechanism by which priorities could be outlined with MSPP, and synchronised among implementing partners** (PAHO/WHO, 2011: 3). The cluster also ensured information and guidance was provided to member states, NGOs, and the donor community on their role and response needs in Haiti.

#### **c. Using surveillance and public information**

Occasionally, the risk of epidemics is grossly overestimated by agencies and the mass media. **Using surveillance and improved routine control programmes** works without resorting to costly, improvised immunisation campaigns of doubtless value (de Ville de Goyet, 2007: 17). OCHA (2007) has produced a user guide to help SAR teams do this. Public information detailing actions on the ground, norms, and guidelines can also be provided through the press and internet (PAHO/WHO, 2011: 3).

#### **d. Communication with national medical teams**

After the 2004 tsunami, many EMTs were sent to Banda Aceh from the trauma centres and major hospitals in Jakarta, Surabaya, and other metropolitan areas of Indonesia. However, there was no communication or cooperation between local teams and international EMTs. 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 (IFRC & WHO, 2017: 46).

#### **e. Knowing when to leave**

Producing appropriate care also means awareness of when to leave. In Banda Aceh, Indonesia, victims were eager to return to normality while external medical relief workers were still arriving in large numbers (de Ville de Goyet, 2007). This introduces a delicate ethical issue on the effectiveness of SARs: despite the high-cost of their deployment, every possible effort is taken to save life, and teams are requested to operate until the last person has been saved. Analysis by Macintyre et al. (2006) shows that the risk of abandoning a potential survivor deeply entrapped under rubble usually extends the activities of SAR many days after the last "save". One of the most valuable services provided by highly-qualified USAR teams is not necessarily finding survivors, but rather using the sophisticated structural assessment, advanced search capabilities, and specialised medical judgment to assist the local leaders in **limiting the period** that focuses primarily on the possibility of trapped survivors. The extension of this search phase has an impact on response priorities: SAR continues as long as the possibility of finding survivors exists,

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<sup>96</sup> Redmond AD, & Li J (2011). The UK medical response to the Sichuan earthquake. *Emerg Med J*, 28(6).



**even though this diverts efforts and resources away from the management of the disaster and other post-disaster issues** (Macintyre et al., 2006). This must be considered as part of the judgement required from some who suggest that international USAR teams are never needed since local personnel, using simple equipment, make the majority of earthquake rescues within the first 24 hours.<sup>97</sup>

## International guidelines

Existing international guidelines for the use of FFHs were often ignored, and their use was not promoted (de Ville de Goyet, 2007: 17). Typhoon Haiyan in the Philippines was the first occasion on which a host government was able to use the WHO guidelines to assess the contribution of foreign EMTs (Coatsworth, 2014: 632). Research has shown that WHO guidelines for donations were not always followed. INSARAG guidelines<sup>98</sup> seem to have the best response internationally.<sup>99</sup> Its published guidelines and standards, a peer review external classification of USAR teams (IEC), and frequently organised simulation exercises have been of particular value to the EMT initiative.

## Data and level of documentation

EMT evaluations are hindered by a lack of detailed clinical information being gathered and made available (de Ville de Goyet, 2007: 17; Bartolucci et al., 2019: 420). Studies have demonstrated the difficulties in evaluating a response due to the lack of reliable data, and the tendency of responding agencies to not share internal reports and records.

In the response to the 2004 tsunami in Indonesia and Sri Lanka, and the 2005 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 (IFRC & WHO, 2017: 47).

After the 2010 earthquake, little time was available for EMTs to prepare reports on daily activities for the Ministry of Health of Haiti 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 the IFRC & WHO report on Regulation and Management of EMTs has established, those reports were rarely shared with the health authorities or the health cluster (IFRC & WHO, 2017: 47).<sup>100</sup> It is disappointing to note that such a

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<sup>97</sup> de Ville de Goyet C (1999). Stop propagating disaster myths. *Aust J Emerg Manag*, 14(4), 26–28.

<sup>98</sup> **International Search and Rescue Advisory Group (INSARAG)** is a network of 90 disaster-prone and disaster-responding countries and organisations, dedicated to urban search and rescue (USAR) and operational field coordination. It was established in 1991 by the United Nations, following initiatives of international SAR teams that responded to the 1988 Armenia earthquake. It aims to establish **minimum international standards for USAR teams and methodology for international coordination** in earthquake response based on the INSARAG Guidelines 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*.

<sup>99</sup> <https://iffmag.mdmpublishing.com/the-united-nations-perspective-to-search-and-rescue/>

<sup>100</sup> However, 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.

massive medical response as that for the 2010 earthquake in Haiti, at immense cost, is wholly inadequately documented (Gerdin et al., 2013).

Data capturing by a paper-based system in Nepal after the 2015 earthquake was also found to be inadequate (Chauhan & Chopra, 2017: 397-398). In China, regular reporting by EMTs is routine, although no information on format and content was made available for the IFRC & WHO (2017: 47).

Level of documentation is also an issue: most existing data refers to a non-itemised total budget, and most literature provides the total number of people extracted from the rubble using the criteria “lives saved,” rather than a distinction between people saved by ISAR and those saved by locals (Bartolucci et al., 2019: 417). **Without basic outcome data, there can be neither accountability nor lessons learned.**

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## Key websites

Some key experiences to emergency responses have been documented:

- Asian Disaster Preparedness Center: <http://www.adpc.ait.ac.th>
- Reliefweb: <https://reliefweb.int/updates?source=329>

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