CLASSIFICATION AND MINIMUM STANDARDS FOR FOREIGN MEDICAL TEAMS IN SUDDEN ONSET DISASTERS

HEALTH CLUSTER

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Foreword

Sudden onset disasters (SOD) occur with little or no warning and often cause excessive injuries far surpassing the national response capacities. These challenges can arise in both developing and developed countries. The demand for rapid trauma care is particularly critical in the aftermath of earthquakes.

Following SODs a large number of Foreign Medical Teams (FMTs) often arrive in-country to provide emergency care to patients with traumatic injuries and other life-threatening conditions. Experience has shown that in many cases the deployment of FMTs is not based on assessed needs and that there is wide variation in their capacities, competencies and adherence to professional ethics. Such teams are often unfamiliar with the international emergency response systems and standards, and may not integrate smoothly into the usual coordination mechanisms. These problems were especially evident following the Haiti earthquake and Pakistan floods of 2010. Recognition of these issues gave recently rise to discussions among relief experts about the need to ensure quality and standardisation of services provided by international surgical trauma teams.

As such, this first edition of a classification system and minimum standards for FMTs that provide trauma and surgical care in the first month following a SOD is a welcome and much-needed development. It provides benchmarks for international teams that they should meet when offering their services to affected countries. The standardisation of services allows countries requiring such support to better communicate their needs, while countries offering FMTs can clearly state the services and capacities that they are offering. This will lead to better coordination between aid providers and aid recipients.

Donors should be encouraged to fund teams that can demonstrate their ability to meet the minimum standards. Patients treated by FMTs will also be able to hold FMTs accountable for the quality of their services, based on the standards. This contribution to a more predictable, effective and coordinated response, together with increased accountability, is well aligned with the Inter-agency Standing Committee's (IASC) recent humanitarian reform initiative, the Transformative Agenda.

The process to develop this document has been highly consultative and led by the FMT Working Group of the Global Health Cluster (GHC). We are aware that there are stakeholder groups with whom we have not yet engaged sufficiently and we intend for this version to provide the basis for broader consultation. We plan to assist governments and partners to put this work into practice and welcome feedback

so we can improve on this edition. All comments and feedback should be sent to healthcluster@who.int.

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Executive Summary

The Foreign Medical Teams (FMT) Working Group under the auspices of the Global Health Cluster and the WHO commissioned this document. It introduces a simple classification, minimums standards and a registration form for FMTs that may provide surgical and trauma care arriving within the aftermath of a sudden onset disaster (SOD). These can serve as tools to improve the coordination of the foreign medical team response, and be the reference for registration on arrival as well as a possible global registration mechanism similar to what exists for urban search and rescue teams. The document explains the registration form that allows FMTs to declare their services and capacities, and an overview of the classification system, principles and standards. The definitions, process and technical details of the various requirements for teams to be registered are further elaborated. The classification and standards are designed for FMTs, but can also serve as guidance for developing domestic trauma response capacities.

The FMTs are divided into three distinct categories and are expected to declare which category they belong; 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. Furthermore they are expected to confirm that they are able and willing to meet the guiding principles and adhere to the minimum standards. The FMT can then, following consultation with the receiving country, provide services within a functioning national hospital or health centre, or offer to bring a field facility with them. This registration process will greatly clarify, to both service providers as well as recipients of the assistance, what type of assistance is offered and will facilitate the on-site coordination. The approach to registration will seek to be inclusive rather than exclusive, with self-declared information on capacities and commitment to adhere to the FMT principles and core standards. If an FMT declares its capability to offer a specific type and declares any additional services, it also is expected to comply with the technical standards of this document related to those services.

Selection from the FMT registry and authorization to enter or be allowed to work in a country affected by a SOD lies with that country. Global registration does not guarantee an invitation to be deployed, as this also depends on needs and context. The process of registration and declared commitment of registered FMTs to adhere to the principles, and comply with both core and technical standards, will assist countries affected by SOD to select professional FMTs from their region and globally. The common definitions of types, capacity and services will improve their communication with FMT providers to match offers with demand/need (even before arrival through the virtual On-site Operations Co-ordination Centre (OSOCC)), and

facilitate the national registration process, giving preference to those FMTs that are committed to reach these standards.

For FMTs, benefits for registration include: giving confidence to donors to fund registered FMTs; knowledge that registration will facilitate the invitation to be deployed and speed up the registration process on arrival, with the approval to operate in the disaster affected areas; enable registered FMTs to benefit from logistic support on-site and to receive guidance on where best to set up their units so they don't lose time in starting to work at a designated site.

Date: _____
Country/Agency: _____
Recent deployment experience: _____
Name and position of person reporting: _____
Contact details: _____
Agreement to comply with FMT guiding principles and standards: _____
FMT *Type*: Please see reversed side for services and standards in order to determine FMT type

FMT Type	Outpatient capacity	Inpatient capacity	Surgical capacity	Length of stay	No. of international/ local staff		Time to deploy	Estimated time to be operational	Logistics and support required	List services offered/ Field Hospital (Y/N)
1. Outpatient Emergency Care		Not applicable	Not applicable							
2. Inpatient Surgical Emergency Care										
3. Inpatient Referral Care										
Additional Specialised Care FMT		Embedded in FMT 2, 3 or local health service								

Explanatory note:
Comply to standards: Y/N. All FMTs that want to register must comply with a) FMT guiding principles and standards b) Minimal service standards
Outpatient Capacity: Maximum number of patients that may be seen per day
Inpatient Capacity: Maximum number of patients that can be hospitalised at one time (i.e. bed numbers)
Surgical capacity: Maximum number of major and minor surgical procedures per day
Length of stay: Maximum number of days that you may be deployed
No. of international/local staff: Number of all staff that will accompany the FMT and number of local staff required to run FMT (and their specialty)
Time to deploy: Indicates how long (hours) it will take you to be deployed from origin after disaster has occurred
Estimated time to be operational at site of disaster: Indicates how long (hour/weeks) you estimate from the disaster onset to provision of patient care: Choose either: < 72 hours, within 1 week or within 1 month
List services offered: Specify functions, capacities, services and that are available with FMT. Include also whether field facility is provided or not
Logistics and support required: List elements not supplied by FMT but required on site to be operational (e.g.: water, fuel, sanitation, transportation, security, etc.)

FMT Type	Definition	Services	Key Characteristics	Minimal Benchmark Indicators	Opening Hours
1. **Outpatient Emergency Care**	Outpatient initial emergency care of injuries and other significant health care needs	• Triage, assessment, first aid • Stabilisation + referral of severe trauma and non-trauma emergencies • Definitive care for minor trauma and non-trauma emergencies	• Light, portable and adaptable • Care adapted to context and scale • Staffed & equipped for emergency care for all ages	100 patients/ day	Day time services
2. **Inpatient Surgical Emergency Care**	Inpatient acute care, general and obstetric surgery for trauma and other major conditions	• Surgical triage, assessment and advanced life support • Definitive wound and basic fracture management • Damage control surgery • Emergency general and obstetric surgery • Inpatient care for non-trauma emergencies • Basic anaesthesia, X-ray, blood transfusion, lab and rehab services • Acceptance and referral services	• Use existing or deployable facility structures • Clean operating theatre environment • Care appropriate to context and changing burden of disease • Multidisciplinary team experienced to work in resource scarce settings	• 1 operating theatre with 1 operating room: 20 inpatient beds • 7 major or 15 minor operations/ day	Day and night services
3. **Inpatient Referral Care**	Complex inpatient referral surgical care including intensive care capacity	• Capacity to provide type 2 services • Complex reconstructive wound and orthopaedic care • Enhanced X-ray, blood transfusion, lab and rehab services • High level paediatric and adult anaesthesia • Intensive care beds with 24 h monitoring and ability to ventilate • Acceptance and referral services	• Use existing or deployable facility structures • Sterile operating theatre environment • Enhanced multidisciplinary teams providing advanced care • Care appropriate to support referrals from FMT1 + 2 and national health system	• 1 operating theatre with at least 2 operating rooms: 40 inpatient beds • 15 major or 30 minor operations per day • 4–6 intensive care beds	Day and night services
Additional Specialised Care FMT	Additional specialised care cells within type 2, 3 or a hospital	• Context specific specialist care supplementary to type 2 + 3 FMT services or local hospital • Specialised services may include: Burn care, Dialysis and care for crush syndrome, Maxillo-facial surgery, Orthoplastic surgery, Intensive rehabilitation, Maternal health*, Neonatal and Paediatric Transport and Retrieval* *= Units that may be self contained not embedded	• Responds to an expressed need for specialised services • Embedded in and operates from FMT 2 or 3, national hospital or health system • May for some services be self contained	Depending on capacity	On request

The principles outline the spirit in which registered FMTs agree to practice to ensure that the care provided is ethically acceptable and provided to all in need. The principles are based on internationally recognized documents and collaborative(s) including the Sphere standards, Humanitarian Accountability Partnership, the International Agency Standing Committee IASC transformative agenda 2012, and the International Disaster Response Law Program, amongst others (20, 22, 25, 34).

All FMTs, no matter what type and including specialised care teams, should comply with these principles. Guiding principles that govern the practice of the FMT and the individuals within it include:

a. The FMT provides safe, timely, effective, efficient, equitable and patient centred care

b. The FMT offer a “needs based” response (19, 25, 35) according to the context and type of SOD in the affected nation

c. The FMTs adopts a human rights based approach to their response and ensure they are accessible to all sections of the population affected by the SOD particularly the vulnerable. (34)

d. The FMT undertakes to treat patients in a medically ethical manner consistent with the World Medical Association Medical Ethics Manual (36). In particular the FMT undertakes to respect with confidentiality that patients will have the right to be informed about their medical condition and communication on prognosis and alternative treatments in a language and culturally appropriate fashion, and that all informed consent for medical procedures is obtained in such a manner unless obviously impossible.

e. All FMTs are accountable to the patients and communities they assist, the host government and MoH, their own organisation and donors.

f. FMTs commit to be integrated in a coordinated response under the national health emergency management authorities, and collaborate with the national health system, their fellow FMTs, the cluster and the international humanitarian response community.

All FMTs (Type 1, 2, 3 and specialized care teams), must comply with the core standards. Each FMT type must comply with the minimum technical standard for the service per type of care. The technical standards are considered the minimum acceptable, but all teams with the resources and experience to exceed these standards are encouraged to do so, while considering the effect this may have on existing health system. The following standards have been divided into core and technical, and should be read in conjunction.

Core Standards
a. Agree to register with the relevant national authority or lead international agency on arrival and collaborate with inter-agency response coordination mechanisms at global, national and sub-national levels, as well as with other FMTs and health systems.
b. Will undertake to report on arrival what type, capacity and services they can offer based on the international FMT classification system
c. Will undertake to report at regular intervals during response, and prior to departure, to the national authorities and the cluster, using national reporting formats, or if not available, the agreed international reporting format.
d. Will undertake to keep confidential records of interventions, clinical monitoring and possible complications.
e. Will undertake for the individual patient, to have record of treatment performed and referral for follow-up planned as needed.
f. Will undertake to be part of the wider health referral system, and depending on type, offer to accept or refer or both accept and refer patients to other FMTs, the national health system or, if approved, other countries.
g. FMTs will adhere to professional guidelines: all their staff must be registered to practice in their home country and have licence for the work they are assigned to by the agency
h. FMTs will ensure that all their staff are specialists in their field ,appropriately trained in either war or sudden onset disaster surgical injury management. The majority should have training and experience in global health, disaster medicine and providing care in austere environments. Acknowledging the need to train and provide experience to new staff, there may be scope for junior and inexperienced staff in the later phase of a disaster response and working under direct supervision of experienced colleagues.
i. FMTs will ensure that all pharmaceutical products and equipment they bring complies with international quality standards and drug donation guidelines. (37)
j. FMTs are self sufficient and not put demand on logistic support from the affected country, unless agreed otherwise before deployment.
k. FMT comply with minimal hygiene and sanitation standards, including adequate management of medical waste.
l. FMTs must ensure the team and individuals within it are covered by adequate medical malpractice insurance. FMTs must have mechanisms to deal with patient complaints and allegations of malpractice.
m. FMTs must have arrangements in place for the care of their team members health and safety including repatriation and exit strategies if required.

Background

The number of international medical teams being sent to low and middle-income countries (LMICs), affected by sudden onset disasters (SODs) to care for trauma victims has increased (1, 2). The number of teams providing surgical trauma services reached an all-time high following the 2010 Haiti earthquake, a total of 44 foreign field hospitals from more than 18 middle and high income different countries were identified. (1)

The increase of international teams is positive and a sign of significant global solidarity. It shows that disasters are the concern, not only of neighboring countries, but the rest of the world. It is acknowledged that the most timely and cost effective response to trauma is the one mobilized by the affected country itself, and the international community should support this approach for those countries that do not have such capacity. However, this capacity may have been affected by the disaster, or the magnitude and severity of the disaster can still lead to needs that exceed national capacity, even in high-income countries. The work by international medical teams following SODs has the potential to do life and limb saving work and positively affect the health status of the affected population. However, providing trauma care outside your country of origin in a disaster setting is very challenging. Rapid deployment of adequately equipped medical teams to assist disaster victims on the other side of the world requires good intentions, but also appropriate knowledge, experience and preparation.

Data on international medical team activities in different SOD is limited and has not yet attracted significant attention from the scientific community. Clinicians working within some teams have described surgical activities (3–8), but only a few studies and reports have attempted to critically assess the overall international response (1, 2, 9). From the Haiti earthquake, articles have questioned the relatively high number of amputations performed (10), while others examined some of the medical practices and concluded them to be a “medical shame” (11). Concerns regarding teams have been raised, especially regarding their arrival without invitation, the lack of coordination and communication between the different teams, the lack of professional standards of care, the data collection and accountability as well as unclear exit strategies (11–14). Studies have documented that international medical teams have mainly focused on trauma care and, to a large extent, neglect normal health care needs such as essential obstetrical care, and lack capacity to address common morbidities such as emergency communicable and non-communicable disease, and pediatric care. (15–17)

In 2003 the World Health Organization (WHO) and Pan American Health Organization (PAHO) produced the WHO/PAHO Guidelines for the use of foreign field hospitals

in the aftermath of sudden-impact disasters (18). However, adherence to these guidelines has been limited particularly concerning time to become fully operational within the recommended 24 hours. Research has documented that of the 77 foreign field hospitals (FFH) that arrived in five recent SODs, none were operational during this time period. In fact, only one was operational before day three (1, 2). Several initiatives have attempted to address some of the concerns with humanitarian relief operations following SOD, but the lack of a clear international legal framework has limited adherence to guidelines such as Sphere and the Humanitarian Accountability Project (19, 20).

In an attempt to systematically address the problems with International Medical Teams, focusing on FFH, PAHO and Karolinska Institute hosted a technical consultation in Cuba in 2010 (21). The aim was to provide technical, authoritative guidelines to external providers as well as national recipients of International Medical Teams; to enhance and broaden the WHO/PAHO 2003 guidelines on FFH, to contribute to the formulation of minimum standards for international medical teams; and to outline possible mechanisms for global registration/accreditation and national coordination of medical care teams or facilities (21). At this meeting the term FMT was coined as a term for International Medical Teams that accept certain rules and standards and were ready to register their capacities. During this meeting it was decided that a classification system should focus on services provided by the FMT rather than physical structure in which the services are provided. The consultations led to unanimous support for the formation of an FMT Working Group that included broad representation of FMT key stakeholders. The aim of the FMT Working Group was to start a process for increased coordination and accountability of FMTs including a registration system for FMTs.

The aim of the FMT Working Group fits well with other initiatives to improve emergency relief such as the International Disaster Response Laws, Rules and Principles (IDRL) program implemented by the International Federation of the Red Cross/Red Crescent Societies (IFRC) and other partners (22). It also complements WHO or PAHO supported publications of local versions of "Standard Operating Procedures for Crisis" including the Republic of Indonesia's "Technical Guidelines for Health Crisis Responses on Disaster" — *Guidelines for Health Workers that are involved in Health Crisis Response for disaster in Indonesia (23)*. In addition the FMT initiative aligns with the Health Resources Availability Mapping System (HeRAMS) that has been developed by the Global Health Cluster (GHC) to support good practice in mapping health resources and services available in emergencies (24).

The call for improved FMT response is also aligned and consistent with the WHO reform and the Inter-Agency Standing Committee (IASC) transformative agenda (25) which aims to improve leadership, planning, coordination and accountability of humanitarian emergency response. Both strive for better, timely and predictable responses. One of the pillars of the new WHO Emergency Response Framework (26), and a priority under the work plan of the GHC, is to manage surge mechanisms together with partners. The operational aspects of managing the virtual OSOCC and Reception/Departure Centre (RDC) deploying experts to establish FMT Coordination Cells under the OSOCC/RDC will be integrated in the WHO surge mechanisms as per the Emergency Response Framework.

Since the Cuba meeting the FMT working group and its aim have been endorsed by the GHC and two meetings have been hosted by the WHO with increasing participation of a wide representative base including providers, recipients and funders of FMTs as well as from the academic world. During the FMT working group meeting in December 2011 two documents were commissioned to form the backbone of the FMT registration process. The first document is intended to provide clear definitions, standards and a simple pre disaster registration sheet for FMTs ready to adhere to the standards developed, while the second describes the national registration process on arrival, and coordination and reporting required of FMTs responding to SOD. The registration is in accordance with an agreed classification system defining types, capacities and services of FMTs, will be of value for both funders and receivers of FMTs and is a step in the process of improving FMT response (27).

Aim

The aim of this document is to:

Develop a simple classification system and registration form to define type, capacities, services, and minimum deployment standards for FMTs that want to respond to the immediate aftermath of a sudden onset disaster. These variables are the reference for a global registration system.

The target audience is:

- Countries receiving FMTs after a sudden onset disaster, in particular their national (e.g. Ministry of Health, and National/Local Emergency Management Authorities) and international (e.g. GHC) coordination bodies supporting the medical response after a sudden onset disaster
- Intergovernmental organisations, Countries sending teams (including military), non-governmental and other organisations offering FMTs after a sudden onset disaster
- Donors funding the foreign medical response such as government and non-government agencies, foundations and the public.
- Individual and groups of health responders, the global medical community and the professional registering bodies of the country of origin of responding health personnel.
- In country agencies, governmental and non-governmental organisations that may respond to health crisis within their own country

Purpose

This document provides common terminology for classification and minimum standards for FMTs following SOD. This document is not written as a scientific paper, however scientific principles and the available evidence have guided its development. Complimentary scientific articles will be published in peer-reviewed journals providing supporting evidence to this document.

This document allows teams to register before any disaster event, stating their level and type of capability to respond and acknowledging their compliance with agreed standards of deployment. It is intended to form the basis of a more formal global registration system of teams. The document aims to be clear, concise and easy to use by a Ministry of Health (MoH) or deploying FMT during crisis. It may serve as a decision-making support document for countries receiving FMTs. It will also be useful for countries or organizations sending and financing FMTs.

- The development of a classification and registration system and setting of minimum deployment standards will provide host countries with information needed to assist in deciding what FMTs to call upon after a SOD.
- It will assure recipient countries that registered FMTs have declared to meet agreed international minimum standards.
- It is also intended to guide providers in preparing FMTs so they can better meet the healthcare needs after a SOD that cannot be met nationally, and to improve FMT accountability to the wider humanitarian response.
- It will create a common lexicon for expressing what is needed and what can be provided and a consistency of minimum standards.
- Develop greater understanding at all governmental and non-governmental levels, amongst those that send and receive FMTs, to improve response coordination and standards and thereby reduce morbidity and mortality from a particular SOD.
- Seek to enhance preparedness of both providers and recipients to facilitate rapid deployment to a SOD and a speedy on-site registration process upon arrival.
- Seek to enhance coordination of request, mobilization, entry and collaboration with host government response activities, and orderly exit upon completion of tasks.

Process and Methods

A staged process was used that acknowledged and incorporated, as appropriate, existing literature, existing classification systems in international health response and other parallel programs, and the considerable experience of individuals and organisations working in the field of international health response following disasters. This is outlined briefly below while a full description of the methods including search strategy, benchmarking analysis and consultation process will be published in a peer reviewed journal.

Stage 1 – Information Gathering

- Literature search of peer reviewed literature (e.g. Medline, EMbase,) and grey literature (e.g. websites, government documents)
- Benchmarking process against existing classification systems and included international health organisations (e.g. HeRAMS, ICRC, IFRC, MSF, EU, and AECID) and non-health based classification systems (INSARAG).
- Consultation process using discussion forums at a variety of national and international conferences, email surveys of FMT Working Group membership and their organisations.

Stage 2 – Development of Draft Classification System

- This mixture of published literature, secondary data reviews, benchmarking and expert panels was then used to develop a draft classification system. The focus was on the services provided by FMTs rather than on the infra structure they work in.
- The classification system proposed was a 3 tiered system that considered the lessons learned from INSARAG in particular and was able to link with existing classification systems (e.g. HeRAMS)
- Minimum standards for the organisational and technical specifics of an FMT were also proposed based on existing evidence and internationally recognised consensus documents.

Stage 3 – Review Process

- The draft document and classification system was then reviewed by the FMT Working Group in Madrid in November 2012, with feedback also provided by other stakeholders and reference groups.

Stage 4 – Revision of Document

- The document was revised according to this feedback and a final draft developed and endorsed by the GHC.

Definitions

For the purposes of this document and attempting to create a common lexicon regarding the FMT response, the following key terms are defined below. Definitions are aligned with PAHO and WHO recognized terms.

International Medical Team/Foreign Field Hospital

International Medical Team and Foreign Field Hospital are historical terms referring to healthcare initiatives to provide humanitarian assistance. This document outlines the process whereby International Medical Team and Foreign Field Hospital groups can achieve the Foreign Medical Team status. (21)

A field hospital

A mobile, self-contained, self-sufficient health care facility capable of rapid deployment and expansion or contraction to meet immediate emergency requirements for a specified period of time. A field hospital can be set up in an existing structure or in a structure, tent or similar that is brought with the FMT (18). It should be noted that this term refers to the facility only, and does not specify the team or the type or level of services provided.

Foreign Medical Team (FMT)

In this document the term FMT is exclusively used for those international medical teams that have registered and agreed to comply with the standards and principles outlined below.

It refers to groups of health professionals and supporting staff outside their country of origin, aiming to provide health care specifically to disaster affected populations. They include governmental (both civilian and military) and non-governmental teams.

A FMT has staff to provide basic and/or advanced healthcare based on international classification levels and minimum standards during a limited time period in existing or temporary structures, with or without field hospitals.

Any individuals or groups that do not fit within the definition and cannot comply with the standard should either consider joining a recognized organisation that provides FMT or not responding in the aftermath of a sudden onset disaster.

FMT Type 1: Outpatient Emergency Care

Outpatient initial emergency care of injuries and other significant health care needs

FMT Type 2: Inpatient Surgical Emergency Care

Inpatient acute care, general and obstetric surgery for trauma and other major conditions

FMT Type 3: Inpatient Referral Care

Complex inpatient referral surgical care including intensive care capacity

Additional specialised care teams

Additional specialised care cells within type 2, 3 or a local hospital

Classification of FMTs

FMTs have been grouped together by types in terms of level of care, size, capacity, and capabilities to deliver predefined services. Those groups of individuals that do not match a FMT type 1, 2 or 3 classification, may consider signing up within a registered FMT, or, when applicable, register as an Additional Specialised Care team (see above). Classification is not equal to being accredited, as FMTs register their teams under this classification system on the basis of self declared capacity and commitment to comply with the standards.

Registration

For the purposes of this document, registration refers to the act of documenting FMT's details based on the classification system after self-declaring its type, capacity and services provided. The act of registration implies that the FMT, its management and individuals, accept that they should comply with the principles and standards outlined in this document.

Authorization

This is defined as the authority to practice as an FMT in a disaster affected country and is part of the process of national registration upon arrival (28). This authority

comes from the host Government and their relevant ministry and is at their discretion. Registration as an FMT does not imply authorization, and authorization must be obtained for each new response.

Sudden Onset Disaster (SOD)

SODs are disasters that occur with little or no warning, meaning there is insufficient time for the complete evacuation of the at risk populations.

A disaster is defined by the United Nations Office for Disaster Risk Reduction as a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources. (29)

Immediate aftermath

Refers to response and early recovery generally within the first months after the disaster.

The timeframe considered is the initial response period in which care is focused on the injured and those directly affected by the disaster rather than the temporary replacement of local health services.

This period is not fixed and will be influenced by the size of the disaster, numbers of people affected, the level of imbalance between healthcare needs and resources, damage to infrastructure, geographic access to those affected and their health seeking behaviour and whether secondary events occur.

Emergency Care

Health care of all age groups, with injuries or acute health care requirements. It includes the initial assessment, resuscitation, operative (and anaesthetic) care, postoperative care and rehabilitation of the injured as well as emergency care of any associated co-morbidities or illness.

FMTs must be able to recognise emergent care requirements in the affected population, and if unable to treat them, must have a clear plan of referral to the national health system or other FMTs providing such care.

A 'qualified health worker'

A formally trained clinical provider, such as a physician, nurse, clinical officer or medical assistant (30) who has been recognized as such by a competent professional body. The term qualified, in this context, does not refer to their qualities to be part of a FMT. This is dealt with in training and experience on page 23.

Minimum Deployment Standards

Criteria, which foreign medical teams must adhere to. While many standards describe structure and performance during deployment these should be acknowledged and implemented prior to deployment. This allows the affected country to have confidence in the capabilities of the FMT and an opportunity to hold FMT accountable if they do not meet their stated capability.

A standard is an object or quality or measure serving as a basis for example or principle to which others conform or by which others conform or should conform or by which the accuracy or quality of others is judged. (25)

A needs based response

A response in which the assistance provided is both appropriate to the anticipated epidemiological profile of the disaster and health profile of the affected community as well as being consistent with the actual health care required by that community. (25)

Lessons from Existing and Parallel Programs

Existing classification systems for international response teams are used by agencies in Europe (European Civil Protection Modules, AECID), the Federated Red Cross/Red Crescent Movement (Emergency Response Units), the UN and several others (see Annex 1). In general three levels exist for each system, with escalating complexity and capacity for each level. No one model is applicable to all FMTs internationally; therefore a specific FMT classification using elements of several pre-existing systems has been generated.

The 2003 WHO/PAHO Guidelines for the use of foreign field hospitals in the aftermath of sudden-impact disaster (18) has been discussed in the background section. The new FMT classification and registration system as well as the minimum standards build on this document, but place the focus of classification and standards on the services provided by the medical personnel rather than the physical structure in which they work.

FMTs will be required to register and declare their own level of classification and capability, as well as their ability to provide a field hospital or not. It will be for the coordinating body and the affected country to decide which registered team and facilities they choose to accept.

The INSARAG model: potential lessons for FMTs

The International Search and Rescue Advisory Group (INSARAG) may serve as an example for FMT how guidelines can be set up, particularly in terms of classification, and technical reference guide. INSARAG was formed in 1991 as a cooperative effort by countries prone to disasters with risk of structural collapse, and countries sending Urban Search and Rescue (USAR) teams, along with the UN, IFRC and other international responders. The aim was better coordination and effectiveness of international USAR assistance (31–33). Key similarities exist between the formation of INSARAG and the developments occurring in the FMT area. These include the fact that both guidelines:

- Are directed at two different yet equally important groups, the responding countries seeking to send teams, and the affected countries receiving them.
- Seek to enhance preparedness of both providers and recipients to facilitate rapid deployment to a SOD.
- Seek to enhance coordination of request, mobilisation, entry and collaboration with government response activities, and orderly exit upon completion of tasks.

- Seek to clearly define classification based on type, capacity and range of services, and standards for responding entities (USAR use Light, Medium and Heavy).

There are several key differences between INSARAG and any FMT developments including:

- The wider mix of actors in a health context, particularly the medical NGOs, major international response agencies as well as medical Government and Military teams make FMT coordination more complex.
- While the duration of USAR response is confined to seven (medium teams) or ten (heavy teams) days, medical response may be required from FMTs for weeks to months. In addition, the pathology that requires surgery changes over time. This has impact on the response parameters, the preparedness of teams, rotation of staff and also on the coordination aspects of any coordination system for a health response.
- The scale of FMT response is far larger following major SODs. This scale is measured not only in numbers of beneficiaries, but also in numbers of potential actors with a health focus. FMTs should be integrated in the national health system. This should include appropriate pathways for patient referral and follow up.
- FMT qualified health personnel are already accustomed to strict regulation of their work in the home country, including registration/accreditation with medical authorities, and know that if they want to work abroad, that this requires registration in the disaster affected country.

Potential learning from INSARAG of relevance to FMTs includes:

- ***The regional approach to response.*** INSARAG regional groups meet annually and maintain strong regional focus on preparedness, local resilience and response mechanisms. FMT response may use existing regional groups to support each other quickly in times of health emergencies, using WHO regional structure e.g. PAHO as well as economic or political groups such as the Association of Southeast Asian Nations (ASEAN).
- ***USAR response is defined in its specific time frame.*** It is recognized by INSARAG that response beyond a particular time is futile. FMTs should take on this example for timely appropriate medical response based on assessed needs, as well as evidence of rapidly changing medical and surgical burden following SOD.

- ***Working-groups to develop specific policy and technical standards in various areas*** (e.g. search dogs, training, medical etc.). Creating working groups for disciplines such as Surgery, Rehabilitation, Renal, etc. could reproduce this.
- ***Robust deployment and coordination mechanisms*** are the key strength to the INSARAG and USAR process. The system of utilising a virtual coordination and information management system i.e. the virtual On-Site Operations Coordination Centre (OSOCC) and establishing a Reception and Departure Centre (RDC) create order in the chaos of a SOD with multiple national and international responders. FMT response should use this existing coordination mechanism for the first days or weeks, before the broader health sector emergency coordination is functioning, and/or the health clusters becomes operational.
- INSARAG uses an ***international external classification (IEC) system*** to peer review registered USARs teams that may be used as a model for any future FMT accreditation system. The progression of FMTs from a self-classifying and registering system to accreditation will be lengthy and complex, but lessons from the IEC may be useful, in particular the use of mentors from other teams and real time exercise testing are worthy of consideration.

The FMT Classification and Self Registration

The FMT classification and registration system proposed includes:

- FMT types
- FMT guiding principles,
- Standards (core and minimal technical)
- FMT self-registration form.

The process of achieving registration begins with the aspiring team classifying the medical services it can provide in the aftermath of a future SOD, according to the categories below. The next step is defining FMT principles that outline the spirit in which FMTs must operate as well as the core and technical standards according to FMT type. When registering their FMT types and capacities, FMTs will declare commitment to adhere to, or ability to meet the standards of what they register. The two page registration sheet (pages 5 and 6) includes all necessary information to register, which must then be sent to the global registration body (WHO). It should be noted that despite registration team deployment is still subject to acceptance by host government (28).

FMT types

FMTs have been grouped together by types in terms of level of care, size, capacity, and capabilities to deliver predefined services. This should not be confused with the concept of primary, secondary and tertiary healthcare facilities, and is designed only for use by FMT in SOD response. The core definition of each type below is followed by a specific descriptor. FMTs are encouraged to exceed the minimum standards at each category type. But only those FMTs that meet the minimum standards of an FMT type are considered of that type, while those that do not meet the minimum standards are classified at the preceding type with their extra services offered noted e.g. FMT type 2 with specialist renal services etc.

FMT Type 1: Outpatient Emergency Care

Provides outpatient initial emergency care of injuries and other significant health care needs.

A type 1 FMT must be capable of treating at least 100 outpatients per day and function during day-time. (rather than 24 hours)

Key Services:

- Triage, Assessment and First Aid
- Stabilisation and referral of severe trauma and non-trauma emergencies
- Definitive care for minor trauma and non-trauma emergencies

Type 1 FMTs can work from suitable existing structures, or supply their own fixed or mobile outpatient facilities, such as tents or special equipped vehicles. They should be available to arrive in the fastest possible time, ideally within 24–48 hours, and be considered light and portable. Their staff should be experienced in those elements of initial trauma care that relates to triage on a mass scale, wound and basic fracture management, basic emergency care of paediatric, obstetric, mental health and medical presentations.

Type 1 FMTs should be in a position to stay for at least 2–3 weeks, or even longer if they are specialised in ambulant follow up for long term wound care and rehabilitation.

FMT Type 2: Inpatient Surgical Emergency Care

Provide inpatient acute care, general and obstetric surgery for trauma and other major conditions.

A Type 2 FMT must be able to perform at least 7 major or 15 minor operations daily with at least 20 inpatient beds per one operating table and be able to function 24 hours per day, seven days per week (24/7) if required.

Key Services:

- Intake/Screening of new and referred patients, counter-referral
- Surgical triage and assessment
- Advanced life support
- Definitive wound and basic fracture management
- Damage control surgery
- Emergency general and obstetric surgery Note: Obstetrics can either be provided or arranged with a local partner or other FMT

- Inpatient care for non-trauma emergencies
- Basic anaesthesia, X-ray, sterilisation, laboratory and blood transfusion
- Rehabilitation services and patient follow up

The original provider of the type 2 FMT may bring each of these key services or the organization may declare themselves capable of receiving and integrating specialised care teams (see below) to work within their facility (e.g. burns and emergency obstetric care) to achieve all services.

Type 2 FMTs must be able to provide inpatient care, and have the ability to receive, screen and triage new and referred patients. Surgical capability must be at a minimum standard as articulated in the technical minimum standard sections below. Type 2 FMTs may either be offered within a suitable existing structure, or provide a temporary facility. This must be articulated in the offer of an FMT to the host country. Minimum standards apply to that structure and are available in the logistics technical standards below.

Type 2 services are considered most useful from day one but it is anticipated that time to operation in the field may be several days. Type 2 FMTs should be available for at least 3 weeks but ideally longer. Those FMTs deployed in the first seven days can expect to see a large mixed burden of disease, with orthopaedic and wound injuries predominating, but also the normal expected need for acute surgery, including Emergency Obstetric Care. The acute trauma surgery is expected to decline quickly, and be replaced by those with complications of their incompletely managed wounds and fractures, as well as the normal local burden of surgical and medical disease. Type 2 FMTs must have staff capable of managing this expected epidemiology, and should have a specific plan to manage the co-morbidity of normal disease patterns, and of other medical conditions with complications or severity that requires admission, incl. infectious disease, noncommunicable disease, obstetric and paediatric presentations expected.

FMT Type 3: Inpatient Referral Care

Provide complex inpatient referral surgical care including intensive care capacity.

Type 3 FMTs must have at least 2 operating tables in two separate rooms within the theatre area, at least 40 inpatient beds (20 per table) and have the capability to treat 15 major or 30 minor surgical cases a day.

Key Services:

- Intake/Screening of referred and new patients, surgical triage and assessment, plus counter-referral
- Capacity to provide type 2 services when needed
- Complex reconstructive wound and orthopaedic care, when required
- Enhanced, X-ray, sterilisation, laboratory and blood transfusion
- Rehabilitation services and patient follow up
- High level paediatric and adult anaesthesia
- Intensive care beds with 24/7 monitoring and ability to ventilate

Type 3 FMTs should be considered an option to provide a high-level referral service to those type 1 and 2 teams (both local and foreign) that cannot provide services of that standard. These must include 4–6 intensive care beds with the ability to ventilate patients and reconstructive wound and orthopaedic capability, but can also include other specific specialist groups and services (e.g. maxillo-facial, specialist paediatric, etc.). The original provider of the type 3 FMT may bring these or may declare themselves capable of receiving and integrating specialised care teams (see below) to work within their facility (e.g. an ortho-plastic reconstructive group of surgeons and operative nurses).

Type 3 FMTs should be offered immediately, and upon agreement, deploy without delay, but are unlikely to be operational in the field for at least 5–7 days. In view of their referral function and the complexity of the cases they are likely to manage, they should be considered a service that is only appropriate to deploy for at least 2 months. Teams may deploy into existing health facilities or offer their services within their own structures (field hospital).

Additional Specialised Care Teams

These teams may be as small as two or three senior specialists and provide additional specialised care embedded within type 2 or 3 FMTs or a national Hospital. They must bring appropriate equipment, maintenance and supplies adequate to their specialty area. Like others FMTs, Additional Specialised Care Teams must adhere to the FMT Guiding Principles and core standards, and follow current guidelines for the speciality represented and ensure care provided is appropriate to context and identified needs.

Specialised services may include:

- Burn Care
  - Specialist surgical +/– allied health teams with expertise in management of burns and burn complications
- Dialysis and care of crush syndrome
  - Specialist nephrology and renal care teams for the care of crush syndrome and expert advice on mass dialysis
- Maxillo-facial surgery
  - Specialist maxillo-facial surgical teams +/– operative teams with expertise in the management of complex facial trauma and facial reconstruction
- Orthoplastic surgery
  - Specialist orthopaedic and plastic teams, ideally with operative theatre and allied health and rehabilitation support to provide complex orthopaedic and wound surgical care and reconstruction.
- Intensive Rehabilitation
  - Specialist rehabilitation teams to provide support to FMTs and hospitals unable to provide rehabilitation services
- Maternal Health
  - Specialist providers of midwifery and obstetric surgical care able to provide this care within FMTs unable to do so.
- Neonatal and Paediatric
  - Provide specialist paediatric and neonatal care.
- Transport and Retrieval
  - Specialist teams for the transfer of critically ill patients in specific circumstances after consultation with the host ministry of health.
- Additional services may be provided by other agencies or the local health services

The Additional specialized care cells must only deploy if they have pre-agreement with the national health authorities that will assign them to operate in either an existing health facility or a FMT type 2 or 3 into which they will embed. It should

be noted that if they embed with a FMT that then leaves they must either make alternate arrangements with a local hospital or FMT or depart.

Overview of Minimum Technical Standards per type of FMT

These standards should be addressed according to type of FMT and are not addressed per individual team member but the team or group as a whole. They are available in a table overview below and described in detail for each type in Annex 2. Where possible, all international consensus statements from world bodies, international technical panels, academic institutions and professional organizations have been taken into account and referenced. The standards aim at being evidence based. This technical section of the document does not detail each item of equipment required to resource an FMT. Such operational details can be found with large and experienced, pre-existing FMTs and organizations. The aim of the technical standards section is to clearly define the minimum standards that must be ensured if an FMT is to declare themselves able to provide a particular service and technical capability to an affected country.

TABLE 1

Minimum technical standards per service per Type of care: Source: FMT Writing Group

	1	2	3
Initial assessment and triage	Initial and field triage	Surgical triage	Complex referral triage
Resuscitation	Basic first aid and life support	Advanced life support and airway management	Intensive care level management with assisted ventilation available
Patient stabilization and referral	Basic stabilization and referral	Acceptance of referral, advanced stabilization and referral	Acceptance of referral and up to intensive care level management
Wound care	Initial wound care	Full surgical wound care	Complex reconstructive wound care
Fracture management	Basic fracture management	Advanced fracture management	Definitive and complex orthopaedic care
Anaesthesia	General anaesthesia not provided	Basic general anaesthesia	Intermediate general anaesthesia, paediatric and adult gaseous anaesthetic
Surgery	Not provided	Emergency surgical care including emergency obstetric and gynaecological surgery	Reconstructive and specialist surgery
Intensive Care	Not provided	Not provided	Intensive care available
Communicable disease care	Basic outpatient care	Inpatient care	Intensive care and specialist referral
Emergency obstetric care	Basic emergency obstetric care (BEOC)	Comprehensive emergency obstetric care (CEOC)	CEOC and intensive care
Emergency Paediatric care	Basic outpatient paediatric care for injuries and endemic diseases	Basic inpatient paediatric care for injuries and endemic diseases	Management of critically ill children including intensive care
Emergency care of Chronic disease	Basic outpatient chronic disease care for minor exacerbations	Basic inpatient care for chronic disease acute exacerbations	Advanced/intensive care for chronic disease acute exacerbations
Rehabilitation	Outpatient or mobile services provided or referred	Out and inpatient services provided or referred	Out and inpatient services for complex cases
Laboratory and Blood transfusion	Basic rapid detection tests, no blood transfusion	Basic inpatient testing and safe blood transfusion capability (walking blood bank)	Advanced inpatient testing and safe blood transfusion
Pharmacy and Drug Supply	Outpatient drug supply to treat for the FMT's declared capacity for 2 weeks, WHO Essential medication list or equivalent, tetanus prophylaxis.	In and outpatient drug supply including surgical and anaesthetic drugs, enhanced essential drug list	Intensive care level drug pharmacopeia
Radiology	No diagnostic imaging	Basic X-ray	X-ray +/– Ultrasound

Minimum technical standards per service per Type of care: Source: FMT Writing Group (*Continued*)

	1	2	3
Sterilization	Basic steam autoclave or disposable equipment	Full surgical autoclave with traceability	Full surgical autoclave with traceability
Logistics	Self sufficient team +/– OPD facility self sufficient if provided	Self sufficient team +/– type 2 facility self sufficient if provided	Self sufficient team +/– Level 3 facility self sufficient if provided
FMT Size	Personnel: At least 3 doctors trained in emergency and primary care, with the remainder nurses, paramedics and logistic staff. (Ideally 1:3 Doctor: Nurse ratio). Staff must have skills in emergency and trauma care, maternal and child health and knowledge of endemic disease management.	Personnel: Including doctors skilled in emergency and general medical care (including paediatrics and maternal health), surgical and anaesthetic staff for theatre, and medical, nursing and logistic staff to manage inpatients. Ratios must reach or exceed; anaesthetic technician/anaesthetist ratio 1:1 with surgeons, 5 OR technical staff per OT table. Nursing ratio of at least 1 nurse: 8 ward beds (24 hours)	Personnel must comply with FMT 2 size and ratios plus; orthoplastic reconstruction surgeon(s). Nursing ratio 1:2 beds for Intensive care (24 hours). Logistics and allied health including rehabilitation to reflect the increased size and complexity.
FMT Capability	100+ OP consultations/day for 2 weeks	At least 20 inpatient beds. 7-major/15 minor surgery day for a minimum of 2 weeks.	At least 40 inpatient beds, 2 operating tables available 24 hours, 15 major or 30 minor surgeries daily for a minimum of 4 weeks
Facility Capacity (If provided by FMT)	If facility provided: Rapidly deployable temporary shelter to care for Outpatient capacity of that FMT, or mobile	If facility provided: At least 20 inpatient beds and one Operating theatre and 1 table.	If facility provided: wards, operating theatre (2+ tables), outpatient plus Intensive care bed area

For additional specialised teams the technical standards will vary according to type of experience and the services offered should be based on clearly identified needs speciality. However, they must be context adapted and the practitioners should have a broad

Conclusion

FMTs have an important role to play in the saving of life and alleviation of suffering post impact of a SOD. FMTs have historically responded with the best of intentions, but in some cases, without the coordination, experience or logistical support that is required. Organisations and Governments deploying FMTs and countries receiving them did not have a common lexicon to describe or classify them and those requesting urgent assistance had no way to judge one offer of assistance from another. For the beneficiary, there was no way of knowing whether the health person who cares for you had the right training, skills or safe medicines.

The requirement for FMTs who are rapid and professional in their preparation and response, and can show good outcomes through the data they collect and share, will increase as SODs become more devastating. The international community, FMT providers, the IASC and the WHO/GHC, must ensure that it is these pre-agreed or registered FMTs that are preferentially deployed in response to a crisis while simultaneously assisting the affected nation in turning back those who will do more harm than good.

ANNEX 1: DIFFERENT CLASSIFICATION SYSTEMS

Different FMT Classification Systems. Data compiled from references (31, 38–44)

Classification		Brief Capability Overview	Capacity	Staffing
FMT Foreign Medical Team Classification	**Type 1: Outpatient Emergency Care**	Outpatient initial emergency care of injuries and other significant health care needs. Services include: triage, assessment, first aid, stabilisation + referral of severe trauma and non trauma emergencies, definite care for minor trauma and non trauma emergencies	100 outpatients/day for 2 weeks. If facility provided: rapidly deployable temporary shelter care for outpatient capacity of that FMT, or mobile. Day time services	At least 3 doctors trained in emergency and primary care, with the remainder nurses, paramedics and logistic staff. (Ideally doctor: nurse ratio = 1:3). Staff skilled in emergency and trauma care, maternal and child health, knowledge of endemic disease management
	Type 2: Inpatient Surgical Emergency Care	Inpatient acute care, general and obstetric surgery for trauma and other major conditions. Services provided include: Surgical triage, assessment and advanced life support, definitive wound and basic fracture management, damage control surgery, emergency general and obstetric surgery, inpatient care for non-trauma emergencies basic anaesthesia, X-ray, blood transfusion, lab and rehab services acceptance and referral services	1 operating theatre with 1 operating room: 20 inpatient beds; 7 major or 15 minor operations per day. If facility provided, at least 20 inpatient beds and 1 operating theatre and 1 table. Day and night services	Personnel: Including doctors skilled in emergency and general medical care (including paediatrics and maternal health), surgical and anaesthetic staff for theatre, and medical, nursing and logistic staff to manage inpatients. Ratios must reach or exceed; anaesthetic technician/anaesthetist ratio 1:1 with surgeons, 5 OR technical staff per OT table Nursing ratio of at least 1 nurse: 8 ward beds (24 hours)
	Type 3: Inpatient Referral Care	Complex inpatient referral surgical care including intensive care capacity. In addition to type 2 services, a type 3 FMT provides: complex reconstructive wound and orthopaedic care, enhanced, X-ray, blood transfusion, lab and rehab services, high level paediatric and adult anaesthesia, intensive care beds with 24 h monitoring and ability to ventilate ,acceptance and referral services	1 operating theatre with at least 2 operating rooms: 40 inpatient beds; 15 major or 30 minor operations per day, 4–6 intensive care beds If facility provided: wards, operating theatre (2+ tables), outpatient plus intensive care area, Day and night services	Personnel must comply with FMT 2 size and ratios plus; orthoplastic reconstruction surgeon(s). Nursing ratio 1:2 beds for Intensive care (24 hours). Logistics and allied health including rehabilitation to reflect the increased size and complexity.
	Additional Specialised Care FMT	Responds to an expressed need for specialised services. Provides context specific specialist care supplementary to type 2 + 3 FMT or local hospital. Specialist services include: Burn Care, Dialysis and care for crush syndrome, Maxillo-facial surgery, Orthoplastic surgery, Intensive rehabilitation, Maternal Health*, Neonatal and Paediatric, Transport and Retrieval*. * May be self contained	Embedded in and operate from type 2, 3 national hospital or health system. May for some services be self contained	

Different FMT Classification Systems. Data compiled from references (31, 38–44) (*Continued*)

Classification		Brief Capability Overview	Capacity	Staffing
IFRC Emergency Response Units (ERU)	Basic Healthcare	To provide immediate basic, essential curative, preventive and community health care in emergency situations according to WHO basic protocols, where local medical facilities are insufficient or have been destroyed. Preventive mother and child care disease and nutritional surveillance with formal reporting. Community health with PHC. Optional modules available, including surgical/nursing	200 people per day 10–20 beds for overnight observation Supplies to treat 30,000 pop. for a month	Per 12–14 hr shift: 1 Doctor, 1 Pharmacist/Nurse, 1 Curative/Community Health Nurse, 1 Midwife/ Nurse, 2 General Technicians
	Rapid Deployment Emergency Hospital	First level mobile hospital or field hospital, its services include an OT, intensive observation, anaesthesia, x-ray, laboratory, maternal-child health, pharmacy, sterilization, outpatient clinics. Provides safe medical and surgical interventions, while offering limited medical/surgical care	20–70 inpatient beds, essential medical and surgical care 300 people/day, 50–100 OPD/day	15–20 or 8–10 delegates? No specifics listed
	Referral Hospital	Referral level multidisciplinary care; covers the fields of surgery, limited Traumatology, anaesthesia, internal medicine, gynaecology, obstetrics and paediatrics.	Surgical and Medical care for 250.000 people, 120–150 inpatient beds	15–20 delegates: team leader, hosp admin, senior medical officer, doctors and nurses specialised in different fields, midwife, medical logistician/pharmacist, lad/x-ray/general technicians. Supplemented by approx 150 locally employed staff in the field, medical trained according to local standards and support
EU European Civil Protection Modules	Advanced Medical Post	Patient profiling (triage) on the site of disaster, stabilize the condition of and prepare the patient for transport to the most suitable health facility for final treatment	Triage at least 20 patients per hour, Stabilising 50 patients in 24 hours, Supplies to treat 100 patients with minor injuries per 24 hours	Medical team per 12 hour shift: triage: 1 nurse and or 1 doctor; intensive care: 1 doctor and 1 nurse; serious but not life threatening injuries: 1 doctor and 2 nurses; evacuation: 1 nurse; specialised support personnel: 4
	Advanced Medical Post with Surgery	Perform patient profiling (triage) on the site of the disaster, Perform damage control surgery, stabilise he condition of and prepare the patients for transport to the most suitable health facility for final treatment	triage at least 20 patients per hour, Surgical team capable of damage control surgery for 12 patients per 24 hours, working in 2 shifts, Supplies to treat 100 patients with minor injuries per 24 hours	Same as above + Surgery: 3 surgeons, 2 operating nurses, 1 anaesthetist, 1 anaesthetist nurse
	Field Hospital	Provide initial and/or follow-up trauma and medical care, taking into account acknowledged international guidelines for foreign field hospital use, such as World Health Organisation or Red Cross guidelines.	10 beds for heavy trauma patients, possibility to expand capacity	Medical team for: triage, intensive care, surgery, serious but not life threatening injuries, evacuation, specialist support personnel and at least covering the following: generalist, emergency doctors, orthopaedic, paediatrician, anaesthetist, obstetrician, health director, lab technician, x-ray technician.

Different FMT Classification Systems. Data compiled from references (31, 38–44) (*Continued*)

Classification		Brief Capability Overview	Capacity	Staffing
OAH AECID/ SEMHU	Basic Health Care Module	Patient classification – triage; assisted transport with EMTs, Coordination of assisted transport with Medical Transport Support Team when necessary, Care for Urgent pathology, Mother and child care (preventive services, IMCI11 y normal deliveries), Environmental health, Epidemiologic surveillance, Nutritional surveillance and care, Basic medical services, Attention to gender violence (including rape), Health Facility Waste Management	5 beds for stays no longer than 24 hours	1 medical coordinator, that will also deliver clinical care; 1 emergency physician, 2 nurses, 1 technical support person (nurse's aide or EMT), 2 logistic support technicians
	Advanced Care Module	Patient classification – triage, Advanced Life Support for Trauma, cardiac, obstetrics and paediatrics, Assisted transport with EMTs, Assisted transport with nurse/or Medical Transport Support Team when necessary12, Care for Urgent pathology, Emergency Surgery, Mother and child care (preventive services, IMCI13 and normal deliveries) Psychosocial support for post-traumatic stress, Portable X-ray, Basic Clinical Lab, Environmental health, Epidemiologic surveillance, Nutritional surveillance and care, Basic medical services, Attention to gender violence (including rape) Management of corpses, Health facility Waste Management	5 beds for stays no longer than 24 hours, 1 OT, 3 post surgery/ recovery beds, No less than 10 polyvalent boxes for observation and intensive care, permitting treatment and follow up of patients until discharge of transfer	Direction: 1 medical director, 1 operation director; Outpatient: 1 GP, 1 Paediatrician; Medical team per 12 hr shift: reception/admission/classification – 1 emergency nurse; resuscitation-covered by staff in polyvalent boxes; post-op/recovery observation- 1 emergency nurse; Pharmacy: 1 nurse aide; Polyvalent boxes for obs and intensive care: 1 emergency physician, 1 emergency nurse, 1 nurses aid; Lab and x-ray: 1 nurse and/ or technician; logistics: 4 specialised support personnel; Surgery: 1 general surgeon, 1 orthopaedic surgeon, 1 gynaecologist, 1 anaesthesiologist, 2 nurses (1 instrumentation, 1 surgical assist)
	Specialty Surgical Care Module	Initial and/or follow-up surgical, trauma and medical care, Surgical care according to service portfolio, Mid- and long-term hospitalization.	No less than 50 polyvalent boxes for observation and intensive care, permitting treatment and follow up of patients until discharge of transfer, 2 OT, 3 ICU beds, 3 post surgery/ recovery beds	Same as above +1 operations director, intensive care: 1 emergency nurse, observation: 1 emergency nurse, 2 general surgeons, 2 orthopaedic surgeons, 2 anaesthesiologists and 3 nurses (2 instrumentation and 1 for surgical assist)

Different FMT Classification Systems. Data compiled from references (31, 38–44) (*Continued*)

Classification		Brief Capability Overview	Capacity	Staffing
NATO	Role/Echelon 1	Medical support which is integral or allocated to life saving measures, and triage. Additionally it will guidance in prevention of disease, non battle of minor sick and injured personnel for immediate	a small unit and will include the capabilities for providing first aid, immediate contribute to the health and well being of the unit through provision of injuries and operational stress. Normally, routine sick call and the management return to duty are function of this level of care	
	Role/Echelon 2	Role 2 support is normally provided at larger forward, depending upon the operational Echelon 1 facilities, triage and resuscitation, evacuated, and emergency dental treatment. operations may require their augmentation with management. In this case, they will be often land forces' Role 2+, as a surgical team is war vessels and some larger logistics or support	unit level, usually of Brigade or larger size, though it may be provided farther requirements. In general, it will be prepared to provide evacuation from Role/ treatment and holding of patients until they can be returned to duty or Though normally this level will not include surgical capabilities, certain the capabilities to perform emergency surgery and essential post-operative referred to as Role 2+. In the maritime forces, Echelon 2 is equivalent to the integral to this echelon. Maritime echelon 2 support is normally found on major vessels, and at some Forward Logistics Sites (FLS).	
	Role/Echelon 3	Role/Echelon 3 support is normally provided at diagnostic resources, specialist surgical and operational stress management teams when sufficient to allow diagnosis, treatment, and duty within the evacuation policy laid down by field hospitals of various types. Maritime increased specialty capabilities. Echelon 3 is Hospitals, at some FLS, and at a few Advanced	Division level and above. It includes additional capabilities, including specialist medical capabilities, preventive medicine, food inspection, dentistry, and not provided at level 2. The holding capacity of a level 3 facility will be holding of those patients who can receive total treatment and be returned to the Force Surgeon for the theatre. Classically, this support will be provided by Echelon 3 is equivalent to land/air forces Role 3, though it will normally have normally found on some major amphibious ships, on hospital ships, at Fleet Logistics Support Sites (ALSS).	
	Role/Echelon 4	Role/Echelon 4 medical support provides definitive evacuation policy or for whom the capabilities specialist surgical and medical procedures, highly specialised, time consuming, and normally care may be established in a theatre of operations	care of patients for whom the treatment required is longer than the theatre usually found at role/echelon 3 are inadequate. This would normally comprise reconstruction, rehabilitation, and convalescence. This level of care is usually provided in the country of origin. Under unusual circumstances, this level of	
UNITED NATIONS	Basic level (first aid)	Compromises the basic immediate first aid provided to a casualty by the nearest person on site, at the point of injury. UN peacekeeper must have basic knowledge of and be trained in basic first aid, which must cover, at a minimum: cardio-pulmonary resuscitation, bleeding control, fracture immobilization, wound dressing and bandaging (include burns), casualty transport and evacuation, communication and reporting.	Treatment capacity: 2 casualties	Nil

Different FMT Classification Systems. Data compiled from references (31, 38–44) (*Continued*)

Classification		Brief Capability Overview	Capacity	Staffing
UNITED NATIONS	**Level 1: Primary health and emergency care**	It is the first level of medical care that provides primary health care, and immediate lifesaving and resuscitation services. Normally included within basic level 1 capabilities are: routine sick call and the management of minor sick and injured personnel for immediate return to duty, as well as casualty collection from the point of injury/wounding and limited triage; stabilization of casualties; preparation of casualties for evacuation to the next level of medical capability or the appropriate level of medical facility depending on the type and gravity of the injuries; limited in-patient services; advice on disease prevention, medical risk assessment and force protection within the area of responsibility. A level 1 medical facility is the first level of medical care where a doctor/physician is available. Level 1+: Level 1 medical facility can be enhanced by the addition of supplementary capabilities: primary dental care, basic laboratory testing, preventive medicine, surgical capability (forward surgical module; only in exceptional situations), aero-medical evacuation team	Treatment of 20 OPD/day, holding capacity of 5 patients for up to 2 days, Medical supplies for 60 days	2 medical officers, 6 paramedic/nurses, 3 support staff
	Level 2: Basic field hospital	Level 2 is the first level where basic surgical expertise is available, and life support services and hospital and ancillary services are provided within mission area. It has the capabilities of a Level 1 plus emergency surgery, damage control surgery, post operative services and high dependency care, intensive care resuscitation, inpatient services, also basic imagistic services, laboratory, pharmaceutical, preventive medicine and dental services, patient record maintenance and tracking of evacuated patients. Level 2+: level 2 with additional capabilities like: orthopaedic, gynaecology, internal medicine, diagnostic imaging (CT scan)	3–4 operations per day, hospitalization of 10–20 sick/wounded for up to 7 days, 40 OPD per day, 1 OT, 1 or 2 ward with 10 bed each, 1–2 intensive care beds, consumables for 60 days	2 surgeons, 1 anaesthetist, 1 internist,1 general physician, 1 dentist, 1 hygiene officer, 1 pharmacist, 1 head nurse, 2 intensive care nurses, 2 OT assistants, 10 nurses/paramedics, 1 radiology assistant, 1 laboratory technician, 1 dental assistant, 2 ambulance drivers, 8 support staff

Different FMT Classification Systems. Data compiled from references (31, 38–44) (*Continued*)

Classification		Brief Capability Overview	Capacity	Staffing
	Level 3 : Advanced Field Hospital	It is the third and the highest level of medical care deployed within a mission area. At this level all capabilities of a level 1, 1+, 2 and 2+ medical facility are provided as are capabilities for multidisciplinary surgical services, specialist services and specialist diagnostic services, increased high dependency care capacity, extended intensive care services and specialist outpatient services.	Up to 10 surgeries per day, hospitalization of 50 patients at one time for up to 30 days, 50–60 OPD per day, 10 dental consultations per day, 20 X-rays and 40 laboratory tests per day, medical supplies for 60 days, 2 OT, 2 wards with 25 beds each, 1–4 ICU beds	4 surgeons (minimum 1 orthopaedic surgeon, also at least 1 with experience/training in craniotomies and 1 with experience/training in urology), 2 anaesthetists, 6 specialists, 4 physicians (preferably with knowledge in cardiology and tropical medicine), 1 dentist, 2 dental assistants, 1 hygiene officer, 1 pharmacist, 1 pharmacist assistant, 50 nursing staff, 1 head nurse, 2 intensive care nurses, 4 OT nurses, 43 nurses/paramedics, 2 radiology assistants, 2 laboratory technicians, 14 maintenance and support staff
USAR	**Light**	Assistance with surface search and rescue in the immediate aftermath of the disaster. Usually come from the affected or neighbouring countries. It deployment to international emergencies is normally not recommended		USAR medical support is designed to care for the team and individual entrapped persons they rescue.
	Medium	Technical search and rescue operations in structural collapse incidents, required to be able to search for entrapped persons. International teams must arrive in the affected country within 32 hours of posting the disaster on the VO	Adequately staffed to allow for 24 hour operation at 1 site up to 7 days	
	Heavy	Difficult and complex technical search and rescue operations. Required to be able to search for entrapped persons using both canine and technical systems, and are envisaged for international assistance in disasters resulting in the collapse of multiple structures, typically found in urban settings, when national response capacity is overwhelmed or does not have the technical capability. Team travelling internationally should arriving in affected country within 48 hours of posting of the disaster in the VO	Adequately staffed to allow for 24 hours operations at 2 separate sites for up to 10 days	

Different FMT Classification Systems. Data compiled from references (31, 38–44) (*Continued*)

Classification		Brief Capability Overview	Capacity	Staffing
Civil Protection Proposal, Region Marche, ANA, CRI, GCU	Advanced Medical Post (AMP)	Agile module delegate to stabilising the injured and critically ill patients, therefore its use is foreseen in disaster areas where hospitals can still accommodate patient and administer the necessary health care or where evacuation to other hospitals can be organized. Specialised medical module which treat the wounded and severely ill. This module has the following functional areas: triage, monitoring/ER, evacuation and logistics. It also has minimum diagnostics capacity with ultrasound	Medical supplies to treat 150 patients per 24 hours (50 Red/ Yellow tag and 100 Green as per the Medical Triage colour tags, START)	6 Doctors (2 surgeons, 2 emergency, 2 anaesthetist, 2 emergency medical first aid); 10 critical care nurses, 4 logisticians, 1 medical team leader and 1 deputy medical leader or nurse with proven experience and training
	Advanced Medical Post Surgery (AMP-S)	Agile module delegate to stabilising the injured and critically ill patients, therefore its use is foreseen in disaster areas where hospitals can still accommodate patient and administer the necessary health care or where evacuation to other hospitals can be organized. Specialised medical module which treat the wounded and severely ill In addition to the functional areas in the AMP module, the AMP-S has operating room and diagnosis area with ultrasound, radiography and clinical laboratory	Medical supplies to treat 150 patients per 24 hours (50 Red/ Yellow tag and 100 Green as per the Medical Triage colour tags, START)	12 doctors (6 surgeons, 4 anaesthetists, 2 emergency room), 14 nurses (10 critical care and 4 peri operative), 4 logisticians, 1 team leader, 1 deputy leader, 1 radiology technologist
	Light Field Hospital (LFH)	LFH is an agile unit that can be modulated before departure and upon arrival, depending on changing health needs. It has limited inpatient capacity and the same areas as AMP-S, as well as an intensive care area behind the operating room, that can also be used for reanimation. OBS: All 3 modules are agile to transport, which favours first medical emergency response	Medical supplies to treat 150 patients per 24 hours (50 Red/ Yellow tag and 100 Green as per the Medical Triage colour tags, START). Maximum 10 inpatient	12 doctors, 18 nurses (4 dedicated to intensive care unit), 4 logisticians, 1 team leader, 1 deputy leader, 1 radiology technologist

ANNEX 2
Specific Technical Standards

These standards should be addressed according to type of FMT. They are available in a table overview above and in the main text, and also individually per type in this annex. Where possible, all international consensus statements from world bodies, international technical panels, academic institutions and professional organizations have been taken into account and referenced. The standards aim at being up to date and evidence based. This technical section of the document does not detail each item of equipment required to resource an FMT. Such operational details can be found with large and experienced, pre-existing FMTs and organizations. The aim of the standards is rather to propose an overview of the technical standard required per escalating type of FMT.

Initial Assessment and Triage

This relates to a FMTs capacity to effectively manage large volumes of patients in short time periods and “do the most for the most”. There are several different triage systems. Each FMT should ensure that its members are well accustomed to the triage system that the FMT has chosen to use.

Type 1
Initial and Field Triage

Type 1 FMTs must train and equip to be able to manage the overwhelming numbers of patients encountered in a SOD such as an earthquake. They must have a recognized system of assessing injury severity, and identify those requiring life-saving first aid, urgent and non-urgent surgery and minor injury care, as well as other medical needs that depending on context may be expected. The use of the expectant category (45) should be in consultation with the local MoH if possible.

Type 2
Surgical Triage

Type 2 inpatient level resources should concentrate on surgical triage in particular, as well as identifying those with life threatening medical and obstetric presentations. The FMT should be able to triage appropriately 200 cases daily, with clear differentiation of those requiring in and outpatient treatment, and those requiring urgent, non-urgent and no surgery. The FMT must also have a plan for how to deal with a situation that is overwhelming and ensure that connections have been made with other FMTs and local hospitals for referral if necessary.

Type 3

Complex referral triage

Type 3 FMTs are considered places of referral for the complex or specialist cases not managed at other facilities. However, they should retain their ability to manage self-presentations in similar ways to Type 1 and 2 facilities, but will need to have a specific method of triaging referrals for specialist care. Triage at this complex and often time consuming level of care will need to be expertly managed or the Type 3 facility/service will quickly be over-run with cases that are either more appropriately managed at a Type 2 facility, or are so many or complex and beyond the capacity of even the Type 3 facility. In such case the Type 3 facility must ensure help from another facility until space becomes available.

Triage is intimately related to methods of communication, referral and transport of patients between Type 1, 2 and 3 FMTs and national health facilities.

Resuscitation

Resuscitation in terms of FMTs involved in SOD will be limited to life saving initial care at the incident site(s) to advanced trauma life support (ATLS)(46) type interventions to full intensive care.

Type 1

Basic first aid and Life support

Basic Airway management including oro-pharyngeal airways or similar, basic haemorrhage control, intravenous fluid management and specific wound and fracture care as outlined in other sections.

Type 2

Advanced life support and airway management

Advanced airway management up to and including endo-tracheal intubation, non-mechanical ventilation, thoracostomy or thoracic catheter insertion, advanced fluid management and the ability to transfuse whole blood (see technical specific for blood transfusions).

Type 3

Intensive Care level management with assisted ventilation available

Advanced resuscitation as outlined in Type 2 followed by the ability to ventilate and provide cardiovascular support in an intensive care setting as considered appropriate to context of the particular SOD. Such care should only be considered when sufficient resources are available and should be prioritised when other, simpler conditions need treatment.

Patient Stabilization and Referral

As per the FMT principles outlined in the main text, teams arriving in support of the national effort to provide health services to a population affected by an SOD must enhance, not duplicate, existing systems. Health systems worldwide operate by a process of management +/– referral of a patient at the community level, escalating to primary, secondary and tertiary levels of clinic or hospital care as required. Equally, all health systems use a process of referring "in reverse" once specialist care is over; patients are discharged from acute facilities to a lower level of care or to an outpatient model of healthcare with family or community support. FMTs that respond, as Type 1, 2 or 3 should be seen as augmentation to this underlying system for as long as the host MoH so requires, before withdrawing. Importantly a clear exit strategy must be defined as soon as possible, in consultation with the MoH. In particular this means that the FMT takes responsibility to ensure that the patients will continue to get treatment after departure. FMTs should understand their role and place in the wider referral system, and clearly articulate their capacity and capability, so that the MoH can appropriately task them within the system. It is advised that each FMT appoint one medical position that serves as the liaison for medical referrals. (47–51)

International referral was seen in the Haitian Earthquake response due to the scale and size of impact and local geographic and political factors. This was not seen in other recent disasters such as Bam (earthquake), Indonesia (Tsunami or earthquake), Sri-Lanka (Tsunami) or Pakistan (Earthquake or flood). The MoH and National Government hold primacy, as responders to their own SOD and national health referral systems outside of the SOD zone will usually form a major part in their national plans for response. International referrals must be decided in close collaboration with the MoH in the affected country.

Underlying principles in the process of stabilization and referral include the following:

- The patient should be stabilized according to the capabilities of the initial treating team, sufficient to have the best possible chance of survival prior to transport to another health care level or type of FMT.
- The receiving FMT or facility should be informed of the need for transfer if practicable and be asked to accept the patient.
- The accepting FMT or facility will not decline transfer if possible, unless an alternate disposition is preferable for the patient. Normal medical negotiation with the best interests of the patient at its core will inevitably follow
- Any transfer is the responsibility of the referring FMT, and the patient should be considered under that FMTs care until they have arrived at the next FMT.
- Patients should have some form of referral documentation that accompanies them to allow best possible treatment on arrival
- Referral of patients from Type 3 to 2 to 1 healthcare facilities or FMTs is appropriate, and normal practice in health care systems. Similar principles as above apply regarding communication, transfer, documentation and duty of care when transferring to lower acuity facilities from higher.

Type 1

Basic stabilization and referral

Type 1 FMTs should have the ability to manage patients that are appropriate to the outpatient setting and recognize patients that are beyond their ability to manage. They should have the equipment and skill to stabilize severely injured patients in a pre-hospital type setting, recognizing this may be at a basic or advanced trauma life support level depending on scale and resources. They should have effective communications equipment and contacts at agreed Type 2 or 3 FMTs or at local secondary or tertiary national health facilities with capacity to manage the patient.

Type 2

Acceptance of referral, advanced stabilization and referral to National centre tertiary facilities or Type 3 FMT

In a SOD setting, Type 2 FMTs will be seen as the main focus of initial stabilization, surgical care of general, orthopaedic and obstetric cases, and as inpatient facilities

for days-weeks of care as required. Type 2 FMTs should have the ability to stabilize severely injured patients, and transfer them urgently to their operating room (OR) if required. It is recognized that Type 2 FMTs may have as little as one OR and triage of this resource will be required. Transfer of those that require higher levels of care should occur only after initial stabilization and surgery if required. In general, transfer to Type 3 FMTs or national tertiary care facilities will be for specific specialist level care and reconstruction. Exceptions will be for those requiring specific intensive care, particularly in the obstetric and paediatric patient populations.

Type 2 FMTs should possess the communications equipment and pathways to contact FMTs that are both above and below them in echelon of care.

Type 3

Acceptance of referral and intensive care level management

Type 3 FMTs should have the capability to stabilize and manage those that present directly to them with critical and life threatening surgical and medical complaints as per Type 2. They should also have well prepared protocols to allow communication from Type 1 and 2 FMTs to refer patients at the appropriate senior level. This will allow clear and well-informed advice to be provided and consistent patient care pathways and plans established.

Wound Care

Wound care during disasters should follow standards developed for the type of trauma that caused the injury in an SOD and the context of delayed access to initial care in an “austere” setting. Wound care should be as described by the ICRC (52) using similar but not the same lessons learned in complex and combat environments, and in guidelines from the CDC and WHO, as well as recent consensus papers. (53–56)

The key principles include not closing wounds primarily, providing excellent wound toilet, debridement and if appropriate, splinting, re-examination and delayed primary closure. Wound management by the three types of FMT care should be seen as a continuum, with wounds managed at the lowest acuity type of care possible. Key referral decisions to Type 2 concern those cases that require formal surgical debridement not possible in the outpatient setting of Type 1, under basic analgesia/or local anaesthetic. Similarly referral of those cases that require closure and reconstruction techniques not available at Type 2 will be referred to Type 3.

Type 1

Initial wound care

At the outpatient setting of Type 1 FMTs, initial wound care will concentrate on rapid assessment of wounds, decontamination using potable water or normal saline, simple dressing, tetanus prophylaxis and antibiotics as required. The wound must not be closed. If the Type 1 FMT has the ability to manage more complex wound management including debridement, this should only be with analgesia (57–59), which is considered a basic human right. Inadequate debridement or inappropriate closure of wounds will cause high rates of complication including delayed healing, and limb or life threatening sepsis.

Wounds that require surgical debridement unavailable at the Type 1 FMT should have gross contamination removed, wound cleansing as tolerated, dressing and splinting if required, and be referred to a Type 2 facility or FMT as quickly as possible.

Type 2

Full surgical wound care

Type 2 FMTs and facilities will be expected to have the surgical and anaesthetic facilities and experience to manage all contaminated wound care. This will likely be a major part of the workload encountered post earthquake based SOD in particular. Wounds may or may not be in the presence of fractures or suspected fractures. Fracture care is dealt with specifically in the next section, but the underlying principle to treat the wound first then the fracture, should be followed.

Wound care capability must include the ability to perform extensive debridement of devitalised tissue under regional or general anaesthetic. Inpatient care of those with extensive wounds, a formalized process of wound review, and delayed primary closure when appropriate are all required. Type 2 FMTs are expected to be able to perform simple closure techniques, including skin grafts, basic flaps and the management of burns. Complex cases requiring complex reconstructive surgery will be referred to Type 3 FMTs or facilities.

Type 3

Complex reconstructive wound care

Type 3 FMTs will have the capability to perform complex reconstruction of massive wound defects once adequate debridement and sepsis control has occurred either within their facility or at a Type 2 FMT. Referral pathways and communication

between surgical teams at FMT Type 2 and 3 are required. Examples of referrals may include complex paediatric cases, advanced plastics care, specific anatomical sites or patients with extensive burns.

Fracture Management

All FMTs that care for fractures must include a plan for continuation of that care for each patient, either by long-term delivery by that FMT, or a clear plan of referral and follow-up by another FMT or local health facility. The patient must understand this plan. This follow-up care may range from simple removal of a splint or cast, to removal of external fixation or rehabilitation and prosthetic fittings post amputation of a limb.

Type 1

Basic fracture management

Type 1 FMTs will be expected to manage basic fractures in an outpatient setting. Diagnosis with or without x-ray (not a minimum standard for Type 1) will be followed by the ability to apply basic splints and plaster of Paris (POP). Type 1 FMTs may also be required to accept referral back from Type 2 FMTs for ongoing or follow-up care of a fracture in the outpatient setting.

Type 2

Advanced fracture management

Type 2 FMTs will have surgical capability for both conservative and operative fracture management including traction, POP, external fixation and amputation. (52, 60–62)

For cases that may require amputation this will only be performed by a surgeon trained and accredited to perform the surgery in their country of practice, and will only be performed after taking into account all patient and context/environmental factors outlined in the papers referenced. Amputations will be performed to maximise limb length, wound healing and the fitting of prostheses. Guillotine amputations (61) are no longer an acceptable surgical procedure. They should to all means be avoided. The decision to amputate and the informed consent that was involved must be clearly documented, preferably using objective scoring systems that predict the likelihood of a limb to survive, such as the Mangled Extremity Scoring System (61). The reasons to amputate must be documented and surgical teams must have clear pre-planned procedures that involve more than one opinion, and explore and document all known factors, indications and options prior to the surgery. Amputation should not occur without adequate availability of anaesthesia and post-operative pain relief.

Rehabilitation services and psychological support ideally should be involved prior to or at the same time as the surgery, and will be required for life. Those teams that do not have the resources or the organisation to manage all these requirements in a disaster setting should not be performing amputations.

Type 3

Definitive and complex orthopaedic care

Level 3 FMTs may perform the fracture care described above, but will also have the capacity to provide complex orthoplastic reconstruction. This may involve bone grafting and internal fixation, but only in those facilities where minimum standards of positive pressure operating theatre and all requirements for complete sterility of instruments and consumables are guaranteed and traceable (see sterilization minimum standards).

Anaesthesia

The ability to provide safe anaesthesia is mandatory for an FMT Type 2 or 3. A Type 2 and Type 3 should use the World Federation of Anaesthesiologists International Standards for a Safe Practice of Anaesthesia (2010) as a basis for minimum standards. This body states that mandatory standards may not be met or may be difficult in urgent or emergency life saving procedures in some parts of the world. This is not applicable to FMTs, as these are offered from NGOs and Governments or world bodies that should either have the resources to reach these minimum standards, or should not offer a Type 2 or 3 FMT. Anaesthetics performed by an FMT must be by a trained professional licensed to perform anaesthetics in their country of origin. (57, 60, 63, 64)

Type 1

General anaesthesia is not provided at Type 1 FMTs. Pain management and the use of local anaesthesia to aid wound and fracture management in an outpatient setting is required.

Type 2

Basic general anaesthesia

Type 2 FMTs must be able to comply with all minimum standards of a basic anaesthetic service as defined by the international standards for a safe practice of anaesthesia (2010) (57) . In particular there should be drugs, equipment and trained staff to provide basic resuscitation in the event of an anaesthetic complication, and there must be the ability to provide supplemental oxygen via an oxygen tank or

oxygen concentrator, suction and basic monitoring of non-invasive blood pressure cuff and pulse oximeter. Basic airway adjuncts and self-inflating breathing bags in adult and paediatric sizes must be available. A full range of required drugs and equipment is outlined in the paper.

Type 3

Intermediate general anaesthesia

Type 3 FMTs must comply with the Intermediate level anaesthetic requirements outlined in the same paper. This is not reproduced in full here, but is available online through a creative commons attribution non-commercial license at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2957572/(57)

Of note, Type 3 services must be capable of safe paediatric and adult gaseous anaesthetics with all the equipment and drugs described in the international standard.

Surgery

Type 2 and Type 3 FMTs that offer a surgical capability must do so with the required resources and planning to provide the best possible outcome for beneficiaries. FMTs must be able to provide personal protective equipment to staff during all surgery of at least sterile gloves, gowns, mask and eye protection. The safe surgery checklist (65, 66) is a minimum standard, even if modified for the disaster setting and local context. All surgical procedures must be done with informed consent, even in the direst of SOD situations. This consent must be in keeping with local culture and context, and in the patient's own language and recorded in the patient's notes. All surgical procedures must be recorded in the patient's notes along with a brief description of the on-going treatment plan to inform other treating teams and the patient's future carers. (60–62, 64)

Type 2 and Type 3 must be capable of surgically managing all cases and procedures described in the corresponding Level sections of wound care, fracture care and obstetrics in this technical annex.

Type 1

Not applicable

Minor procedures carried out in an outpatient setting must be with adequate sterility and analgesia as would be expected in an emergency department setting or equivalent.

Type 2

Emergency surgical care

Surgical care in a Type 2 FMT setting will be focused primarily on emergency care related to the SOD and other emergency conditions requiring surgery. Type 2 surgical teams are expected to be proficient in general emergency care such as laparotomy, but must expect the bulk of their workload to be orthopaedic and soft tissue debridement surgery. They must be able to manage basic flaps and skin grafts to cover wound defects after debridement and wound care has been successful. Surgeons in these FMTs must be experienced enough to perform emergency caesarean section or have on call a colleague who can. They must be able to mange paediatric as well as adult surgical cases. Teams can also expect to see an increase in the number of other general emergency surgical cases e.g. appendicitis and incarcerated hernias, as well as other elective surgical cases. Discussion, surrounding performance by FMT of general emergency surgical cases, must occur with local surgeons and health services to avoid undermining or destabilising the viability of these systems.

Type 3

Reconstructive and specialist surgery

Type 3 FMTs must provide specialist surgical services and act as a referral centre for complex cases unmanageable in Type 2 FMTs. In addition to Type 2 services, Type 3 FMTs must provide specialised trauma and reconstructive surgical care, wound care and fracture management, and may offer complex paediatric cases, advanced plastics care, specific anatomical sites or patients with extensive burns.

Surgeons working in this type of FMT should expect support from good anaesthesia services, as well as intensive care level pre and post operative care and extensive rehabilitation services.

Surgical services technical table

To assist FMTs and MoH officials in recognizing the requirements of a functional surgical service at Type 2 and Type 3, the following table has been prepared. FMTs are instructed to further review all related texts and international standards quoted in the specific sections to ensure they are completely compliant with the minimum standard.

TABLE 3

Minimum Standards per OT according to type of FMT

	TYPE OF FMT Type 2	Type 3
PHYSICAL INFRA-STRUCTURE FOR OT	Dedicated area with access control	Type 2 PLUS:
	Recovery room	Air control (10 micron-filter G4)
	Hygiene management and protocol, hand washing facilities, washable floor and walls	Operating table adaptable to specific procedures performed
	Operating theatre management	Advanced sterilisation with traceability
	Operating table with pressure area control/protection	Enhance hygiene management protocols
	Lightning system powerful enough to visualize deep intra abdominal organs	
	Electrocautery	
	Suction	
	Operating theatre furniture (dressing trolley, instrument table)	
	Stretchers	
	Ability to climate and vector control	
ANAESTHESIA	Ability to provide regional anaesthesia	
	Ability to provide general anaesthesia with/without gas	Type 2 PLUS:
	Ability to resuscitate a patient with airway control and surgical airway	Advanced monitoring: cardiac monitoring +ETCO2
	Oxygen concentrator	Gas anaesthesia
	Basic monitoring, pulse oximeter, HR, manual BP	Ventilator
	Suction	Advanced resuscitation (defibrillator)
	Ability to give fluid resuscitation	Syringe pump
	Locked drug storage	Blood Warmer
	Recovery area with dedicated trained staff	Neural stimulator or ultrasound

TABLE 3

Minimum Standards per OT according to type of FMT

	TYPE OF FMT Type 2	Type 3
SURGERY including OBSTETRICS	Ability to provide general, orthopaedic and obstetric surgical care	Type 2 PLUS:
	Sets for at least amputation, external fixation, abdomen, C-section, D&C, thoracic drain, wound debridement, traction	Specialized sets according to profile
CONSUMABLE EQUIPMENT	Consumables, including medications, sufficient to perform at least 200 operations according the expected epidemiology of the SOD	As per Type 2
	Personal protective equipment for staff enough for 200 cases (gown, gloves, mask), capacity to change PPE between cases	
	Aseptic skin wash for staff and patient	
	Drapes	
	Sterilisation–autoclave	
	Laboratory (see section)	
	Clean Water (100 litres per patient x 200 patients)	
	Sterile saline for abdominal irrigation	
	Self sufficiency for power including redundancy (e.g.: autoclave, light, climate control & cautery)	
PROCESS	Safe Surgery Checklist	As per Level 2
	Comply to professional evidence based standards	
	Cold chain and drug control	

Intensive Care

Intensive care can be controversial in a SOD setting, and should be used in the context of social norms and pre-existing health contexts of the country an FMT is being asked to assist. FMTs should understand the context they are being deployed into, and should seek clarification from the national MoH if in doubt. Intensive care through FMT support will only be at Type 3.

Type 1

Not applicable

Type 2

Not applicable

Type 3

Intensive care will be at the level of a tertiary referral centre level, and should aim to reproduce the level of care available at the national tertiary hospitals. Specific requests from MoH for intensive care type interventions, for example renal dialysis for crush injury renal failure should be through a Type 3 facility. FMT Type 3 intensive care may be provided at a standing health facility where it augments staff, supplies and bed capacity of an existing Intensive Care Unit (ICU). When a Type 3 FMT has been set up in its own facility, it will be in replacement of, or adjacent to, a tertiary level care hospital. In such a case, it should act as a referral point for complex cases from Type 1 and 2 FMTs and national teams and hospitals. As such, it has the potential to quickly become overburdened, and must have clear and agreed protocols for acceptance and refusal of referrals, in consultation with the MoH. Intensive care providers within Type 3 FMTs must expect to face incredibly difficult ethical decisions in the midst of a SOD, and should have specific protocols for senior multi-disciplinary meetings on withholding of care, end of life decisions and difficult or controversial amputations.

Communicable Disease Care

It is recognized that some SODs may not be associated with increased rates of communicable disease within both the population injured directly, and those displaced. (13, 67–70) Preventative measures and good public health practices may be adequate in preventing any increase rates of communicable disease above normal background. However low and middle income countries (LMIC) have higher endemic rates of communicable disease pre-disaster, and any FMTs deploying into

such areas must have the knowledge and ability to treat such disease. FMTs of all types should use all available opportunity to contribute to good public health practice, particularly when serving displaced populations.

Type 1
Outpatient care

Type 1 FMTs will be able to provide basic outpatient care of communicable disease presentations using the WHO standard clinical diagnostic pathways and in particular any disaster specific disease early warning system or surveillance clinical tools. Treatment will be according to WHO recommended guidelines for the suspected cause using the WHO essential medicine lists. (71–77)

Type 2
Inpatient Care

Type 2 FMTs will have the ability to admit and care for cases of communicable disease that need to be hospitalised, recognizing that this may not be their primary focus in the initial aftermath of an SOD, particularly if they have a surgical case load that is using all available beds.

Type 3
Intensive Care and specialist referral

Type 3 FMTs will have the ability to admit and care for complex cases of communicable disease requiring up to and including intensive care. They may act as a referral centre for such cases from Type 2 FMTs if resources allow.

Maternal Health

It is recognized that LMICs generally have high rates of pregnancy. All types of FMT deploying into a SOD must be capable of maternal health care, no matter what their primary mandate or focus. Standard guidelines are available. (24, 73, 78, 79)

Type 1
Basic Emergency Obstetric Care (BEOC)

As defined under the HeRAMS, MISP, and Sphere classification, Type 1 FMTs must be capable of safe uncomplicated delivery with mid-wife level care available, as

well as multiple births, breech delivery, management of infection, haemorrhage, eclampsia and complications of those who have undergone genital mutilation. They should have equipment for assisted vaginal delivery and neonatal resuscitation. Note: Type 1 FMTs will not have the surgical capability to perform dilatation and curettage as listed in the HeRAMS and MISP system.

Type 2

Comprehensive Emergency Obstetric Care (CEOC)

As defined by HeRAMS, MISP and Sphere classification, BEOC plus Caesarean section, management of complications and safe blood transfusion (see blood transfusion later). Type 2 FMTs must be able to perform dilatation and curettage for retained products of conception.

Type 3

CEOC and Intensive Care

Type 3 FMTS should ensure CEOC is available, as well as access to intensive care level treatment for patients that require it.

Child Health

As above, LMIC have far higher paediatric populations, close to half the population can be expected to be less than 15 years. FMTs must be capable of managing children, both those affected by trauma in an SOD, and those suffering from the five worst killers, namely pneumonia, malaria, diarrhoea, measles and malnutrition. (71, 73, 80–84)

Type 1

Basic outpatient paediatric care

Type 1 FMTs must be capable of managing basic outpatient paediatric care for injuries and diseases endemic to the region. Health professionals should be experienced in managing paediatrics but do not need to be a specialist paediatrician. Care should be available for the main LIC health problems that include respiratory tract infection, diarrheal disease and possible malaria. Level one teams should be capable of performing mass screening for malnutrition by using Mid-Upper Arm Circumference measures (MUAC) or similar, and managing or having appropriate referral for cases of moderate or severe malnutrition.

Type 2

Basic Inpatient Child Health care

Type 2 FMTs must be able to provide all services available at a Type 1 FMT as well as the ability to admit paediatric patients. Type 2 FMTs must have the required experience and equipment to manage paediatric surgical and non-surgical cases.

Type 3

Child Health Critical Care

Type 3 FMTs will be capable of providing Type 1 and 2 FMT care and in addition, the ability to manage children with intensive care when required. Type 3 teams should consider having specialist paediatricians and acting as a referral centre for complex paediatric cases.

Chronic disease emergency care

The Sphere guidelines place injury, reproductive health, mental health and chronic disease in one section under Non-Communicable Disease (NCDs). The first three headings are dealt with elsewhere in these technical minimum standards, and this standard will deal with chronic disease only. Disruption of normal health services, lack of access to regular medication and preventative medicine may exacerbate chronic disease states and increase the likelihood of emergency presentations of such problems. FMTs must be in a position to manage basic and emergency presentations of chronic disease as well as having an understanding of local context, normal treatment and prevalence of major chronic issues e.g. cancers, diabetes and renal disease. (71, 72, 85–91) Management of chronic disease caused by communicable infections (e.g. TB) may not be directly within the scope of an FMT, but an FMT of any type should liaise closely with the MoH to re-establish normal referral pathways, directly observed therapy programmes (DOTS) and help prevent the emergence of resistant strains of disease or relapses of chronic infection.

Type 1

Basic/outpatient chronic disease care

Type 1 FMTs must be capable of managing minor exacerbations of chronic diseases requiring emergent care as an outpatient.

Type 2

Basic Inpatient chronic disease Care

Type 2 FMTs must be capable of managing emergencies related to chronic diseases that may require admission as an inpatient.

Type 3

Intensive Care for chronic disease emergency presentations

Type 3 FMTs must be capable of offering intensive care management of emergency exacerbations of chronic disease as per the normal standard and context in the host country.

Mental Health

The IASC guidelines on mental health and psychological support in emergency settings state that minimum responses under health services (92) should include specific psychological and social considerations in the provision of general health care. FMTs have a modest role to play in mental health and psychosocial support (MHPSS) post SOD, due to the nature of short term, often surgical focused response and the fact that effective support will be a long-term process best delivered in a cultural and language format acceptable to the beneficiary. (93) Collaboration with and use of local staff, local health professionals and religious and social leaders, and the acknowledgement that FMTs must create a transition strategy and handover process for those identified as requiring MPHSS (73, 94, 95). FMTs should contribute to positive early social interventions including clear relevant information and decision sharing with the local community, assistance with contact tracing of the missing and engagement of families in the treatment of loved ones and in the ceremonial aspects of care for the deceased. All staff in an FMT should be trained in psychological first aid techniques for fellow staff members and for the beneficiaries. Those requiring lifesaving emergency medical care post SOD are at higher risk of needing psychological first aid than the uninjured population; FMTs should not engage in psychological debriefing or equivalent. (96–99)

Rehabilitation

Rehabilitation is one of the core functions of trauma care systems in regular healthcare and as such, FMTs should have specific plans for the provision of rehabilitation services to their patients post SOD. It may be that the FMT provider

chooses to set up separate units to provide long term post op and rehabilitation care. In SOD beds become rapidly filled up and it is difficult to discharge people due to loss of home and long distance referrals.

This is particularly useful in Type 2 and 3 surgical FMTs, where rehabilitation specialist support embedded within the team can offer triage and peri-operative advice as well as rehabilitation post surgery, and have been shown to reduce length of stay. Type 1 facilities (i.e. outpatient FMTs) should also consider having significant rehabilitation capability services, particularly if they are delivering mobile clinical services or arrive some time post an SOD with significant limb and spinal injuries e.g., major earthquake.

FMTs should be aware that cross cutting issues of disability and vulnerable population care is an important part of ethical SOD response, and teams should plan to specifically assist or refer those with disability that present for treatment. Studies quote increased odds ratios for death in those with pre-existing disability of up to 2.0. (100–102)

Of note, LMIC generally have poorly resourced rehabilitation services, which are quickly overwhelmed by victims of an SOD. Early rehabilitation can reduce the complication rate; inpatient stay and long-term health burden as well as improve the overall outcome of trauma victims post SOD. FMT rehabilitation experts are encouraged to provide rapid training to local staff and their teams to maximise the impact of consistent and continuous rehabilitation care. (103)

Type 1

Outpatient or mobile rehabilitation services.

This is not a minimum standard, but can be considered an additional service provided at the Type 1 FMT.

Type 2

Out and Inpatient rehabilitation service

As a minimum standard, Type 2 FMTs must provide some form of rehabilitation services to their patients who have been treated for fractures, amputations, traumatic brain injuries, spinal injuries or nerve damage. A rehabilitation specialist or physiotherapist experienced in post-trauma rehabilitation best delivers this. If this is not possible, nurses and doctors able to provide some basic advice about

rehabilitation and pre-deployment training in this area is encouraged. Rehabilitation must include the provision of basic aids for mobility and function such as splints and crutches, and a referral pathway for limb prosthesis if none is available locally.

Type 3

Out and Inpatient rehabilitation services

Type 3 FMTs are considered referral centres, and as such, must have rehabilitation services for the complex trauma patients they can expect to treat. This is ideally a rehabilitation physician plus a team including occupational and physical therapists and rehabilitation nurses. Type 3 FMTs who do not have specific rehabilitation services should accept appropriately credentialed rehabilitation staff to co-locate and provide specialist level rehabilitation services from within their facility. It was recommended in the PAHO Haiti report that spinal cord injury in particular should be referred preferentially to Type 3 FMTs or tertiary referral hospitals with specific orthopaedic and rehabilitation specialist services, and that those with this capability could have advertised their capability and position better.

Laboratory and Blood bank

FMTs deploying to a SOD will require varying diagnostic capability in view of their facility types and complexity of care. Some FMTs may choose to provide far higher diagnostic capability, even in an outpatient setting. As long as this is within the context of endemic disease surveillance and treatment, and for the rapid diagnosis and treatment of trauma cases, then it is encouraged. Reliable diagnostic systems and the ability to collate and report such data becomes a powerful tool for public health surveillance at the MoH and Health Cluster level, and contributes significantly to any disease early warning system. (74–76, 104)

Type 1

Basic Rapid detection tests, no blood transfusion

Basic tests within the outpatient clinic using a finger prick should include glucose and haemocue or similar and rapid detection for malaria. Type 1 should be able to provide a urine dipstick to estimate the presence of sugar, red cells and white cells.

Type 2

Basic inpatient testing and safe blood transfusion capability (walking blood bank)

All tests available at Type 1 plus an expanded Rapid detection test capability to include HIV. There should also be an ability to collect samples such as blood and microbiology specimens in appropriate containers and sample media to be transported to a laboratory elsewhere.

Type 2 facilities must have the capability to provide fresh whole blood or other forms of blood transfusion from volunteers and family. This must be in accordance with WHO guidelines for Communicable diseases control in emergencies (105), this includes but is not limited to the ability to check for ABO blood type and screening, HIV, Hep B and C and Syphilis rapid testing. WHO also recommends screening for other testable endemic diseases that may be transmitted via transfusion.

Type 3

Advanced inpatient testing and safe blood transfusion

As per Type 2 plus the ability to perform blood testing for electrolytes, Urea and Creatinine, full blood count and blood gas analysis. Type 3 facilities should also have capability to perform microbiology testing including basic culture and sensitivity and the ability to perform basic gram staining and microscopy.

Pharmacy and drug supply

FMTs must provide drugs for use during a response that comply with the WHO 2010 Guidelines for Drug donations. (37) This standard should be used not only for any drugs that are donated by an FMT on departure, but should also apply for all drugs while on mission with an FMT. In particular, drugs used during a response must be within date of expiry, relevant and appropriate for the disease pattern and level of care provided by that type of FMT, and are licensed for use in the country of origin. Use of drugs from the WHO essential medicine list (77) will mitigate risk of inappropriate prescribing and inappropriate donation on departure of any FMT drug supplies, and is strongly encouraged (23, 106). Bringing medicines in during an emergency phase requires planning in advance. It should not come as a surprise that some countries will not accept medicine brought in by an FMT without permission.

On departure, any donations of drugs must be with the knowledge and consent of the local MoH, and be at least one year from expiry or as defined by the national MoH. Drugs that are considered beyond the normal scope or practice of a local health service, and not part of a national essential drug list should not be donated.

FMTs must either; donate with consent, carry home or safely dispose of all drugs and pharmacy supplies on departure. Destruction of drugs and chemicals must be in a safe and ethical manner as outlined by Interagency Guidelines for the Safe Disposal of Unwanted Pharmaceuticals after Emergencies. (107)

Type 1

Outpatient drug supply

Type 1 FMTs should carry enough medication and supplies to treat at least 100 outpatients per day for two weeks. Drugs should ideally be from the WHO essential medication list, and must include adequate supplies of oral and parenteral analgesia, antibiotics and other drugs appropriate for treating the population affected by the type and scale of SOD in question. A Type 1 FMT must be able to supply tetanus prophylaxis to those requiring it according to WHO recommendations in the form of Tetanus toxoid or Tetanus and Diphtheria and Tetanus Immunoglobulin when indicated. (62, 108, 109)

Type 2

In and Outpatient drug supplies

Type 2 FMTs will supply those drugs expected for a Type 1 FMT as well as enhanced essential drug lists required for inpatient care and anaesthetic and surgical case loads in a Type 2 FMT. The drug supplies must be adequate to manage the expected capacity and workload of the particular FMT, but at a minimum, must be able to manage the patient load described in a Type 2 definition. Type 2 FMT pharmacies must have the capability to provide cold chain, and to treat emergency aspects of both communicable and non-communicable diseases of their inpatients.

Type 3

Intensive care level drug pharmacopeia

Type 3 FMTs will have drugs and pharmaceutical equipment for the defined minimum level of care in a Type 3 definition. In particular, the FMT will supply all drugs required for the intensive care provided, and for any speciality services offered by the FMT.

Radiology

Diagnostic imaging provided by an FMT maybe rudimentary, but must comply with minimum safe standards for both technician and patient. (110) In particular, the FMT

must undertake to comply with the standards of justified practice (i.e. the procedures benefit outweighs the risk, doses to staff and patient are minimized, and safety is maximized through use of shielding, and use of well maintained equipment, safe for use in the country of origin of the FMT). As with all standards described, an FMT may choose to provide additional facilities and equipment above the minimum standard, but they must at all times comply with the technical standard of that facility or service if offered.

Type 1
No diagnostic Imaging

Type 2
Basic X-ray

Plain x-ray capable of imaging limbs, Chest, Pelvis and Spine. X-rays may be displayed either digitally or via film.

Type 3
X-Ray and Ultrasound

Plain x-ray to be provided as per Type 2 FMT. Ultrasound must be provided as an additional level of diagnostic capability in a Type 3 FMT. This does not have to have capacity to print film or store images, but must provide images that are of adequate quality for use by clinicians for diagnostic purposes.

Sterilization

Any FMT that plans to reuse equipment for invasive procedures must have the ability to sterilize equipment. Failure to sterilize between cases will dramatically increase the incidence of post-operative wound infections rates as well as increase the rates of patient to patient cross infection with blood borne diseases such as Hepatitis B and C and HIV. (62, 64, 111, 112)

FMTs with surgical capacity must have a planned approach to sterilization that includes effective cleansing and then steam sterilization or autoclave. Other instruments and surgical equipment that requires sterilization by means other than steam or autoclave will be as per the WHO guidelines.

Type 1
Basic Steam autoclave

Type 2

Full surgical autoclave with Traceability

Type 3

Full surgical autoclave with Traceability

Logistical support to FMTs

FMTs are expected to be self-sufficient to arrive at and operate within an SOD zone. For the purposes of FMT classification, this self-sufficiency must be scalable according to size and type of FMT, and flexible in its application. Specifically, FMTs that have robust local supply chains, pre-planned and with a positive rather than negative impact on local economy, should be permitted to manage their own affairs in a free market. This should be termed self-sufficiency, i.e. not requiring assistance from local government to function. FMTs that do not have such standard operating procedures and experience should be self-sufficient by bringing with them, what is required for care of all its members. Any FMT that is not capable of full self-sufficiency, or requires specific assistance from the host government to be operational, must articulate this at the time of offering to respond, so the Government knows exactly what it must supply if it is to engage that FMT, (examples include fuel, transportation or facilities to provide care within).

FMTs must be clear in articulating whether they are offering to work within a facility that they will provide, care for and manage, or they are a team without such a facility, and will work within the existing health system in support of the MoH efforts. The requirements and level of logistics involved in Type 2 and 3 FMTs supplying their own facilities should not be underestimated. In all health care response planning, self-sufficiency does not mean an isolated surgical service that does not accept nor refer patients with other FMTs or the local health system.

Medical, surgical and pharmaceutical resupply is an important consideration for FMTs, particularly those that will stay for an extended period of time. It is not acceptable for FMTs to comply with standards of care on arrival, but due to poor logistics management within their organization, allow attrition of standards during their mission. It is appreciated that some factors are beyond their control, but minimum standards must be met at all times, or the FMT should advise the host MoH or plan to withdraw.

The following list should be used in conjunction with reference to Sphere standards (19, 113), WHO technical notes on drinking-water, sanitation and hygiene in

emergencies (114), and should be used a guide to general team requirements and in and outpatient facility requirements.

FMTs should ensure that their team members have a safe environment in which to practice, as well as have a security risk management system in place. (25)

General requirements for FMT team members

Water

Water enough for all team members living requirements, including hand washing between cases and consultations. Guide volume 60–100 Litres per person daily. Drinking water must be potable to WHO standards. (114)

Power and Lighting

Enough to provide light and power to clinical patient areas, instruments and equipment requiring power and staff living quarters. It can be expected FMTs will not have access to a reliable power supply in the immediate aftermath of a SOD.

Food

Food enough for all staff members, either through imported food or local supply if assessments have ensured that this does not impact local food availability.

Shelter

Enough shelter and sleeping arrangements for staff, in an adequate area away from clinical work.

Medical and general waste disposal

General solid waste must be disposed of safely without negative impact on the community.

Medical waste from FMTs must not become a hazard to the local population. FMTs are responsible for the safe disposal of all medical waste from their facility or if working within a pre-existing national health facility, must encourage the safe disposal of such waste. Of particular relevance is the safe disposal of contaminated medical waste and waste fluids, sharps and discarded medications and chemicals.

Contaminated non-sharp waste and sharps must be separated from general waste into yellow-labelled receptacles of adequate design, and dealt with specifically. Technical aspects of dealing with all such material are outlined in WHO and OCHA guidelines. (113–115)

Sanitation

FMTs must ensure they have appropriate arrangements for management of their own sanitation and excreta, and in the case of all types of FMTs, culturally appropriate toileting arrangements for patients waiting for and undergoing care. Technical guidelines are available through the references above, and must be appropriate to local context and arranged with local negotiation.

Other logistical considerations;

Transport

FMTs must clearly state where they will arrive, and how they plan to travel to the SOD zone and their agreed area of work. Local transport arrangements of staff and equipment must either be arranged by the FMT or requested of the host Government on initial offer of assistance.

Communications

All types of FMTs must consider robust communication systems, with redundancy, as mandatory. Without communication systems, FMTs will continue to be outside of any Ministry of Health or GHC coordination framework. Technology used should be robust, appropriate for task and likely to still function in a SOD. FMTs must have more than one form of communication system (e.g. mobile and satellite phone). FMTs should consider telephone and data communication both to be priorities. FMTs should not focus purely on communication methods back to their countries of origin, instead ensuring they quickly establish means of communication with local MoH and emergency controllers, the cluster leads and through that cluster, local health facilities and FMTs to establish a functional health referral network. Reporting of activities to the MoH health cluster by e-mail, fax or other means is considered mandatory for FMTs.

Use of communications equipment for expert opinion from either other FMTs, national or international specialists should be encouraged. Telemedicine in

disaster response has the potential to develop further in the future to the benefit of beneficiaries.

FMT Type Specificities

All FMTs must ensure their staff are cared for through arrival with initial supplies, re-supply from another source external to the SOD zone, local ethical purchase or a combination of these means. In addition, FMTs supplying a facility rather than working within existing health care infrastructure, must ensure minimum standards of food, water, sanitation and shelter are met for in and outpatients attending their facility. This includes ensuring infection control and adequate public health measures are available to prevent cross contamination of patients. In this regard, the Sphere standards 2011(19) should be used for guidance (e.g. 1 toilet per 20 beds or 50 outpatients, and water supplies of 5 Litres per outpatient or 40–60 per inpatient). MSF recommends 100 Litres per surgical case, which is useful to guide water supplies for Type 2 and 3 facilities. (116)

Type 1

Outpatient facilities are expected to provide adequate shelter from the elements while waiting for and receiving care, and provide water and toilet facilities using Sphere standards. (117, 118)

Type 2

Type 2 FMTs providing inpatient facilities are expected to provide, in addition to the outpatient requirements above, enough shelter (appropriate to the local climate, not the climate of the FMTs home base), basic non-food items (bedding and appropriate garments to wear as an inpatient) and water/sanitation facilities to supply their stated bed capacity to at least Sphere standards. (117, 118) Adequate culturally appropriate food must be either supplied or be readily available locally.

Type 3

As per Type 2 FMTs, those supplying facilities rather than working within existing health infrastructure must supply all Water and Sanitation, shelter, non-food and food requirements to their inpatients.

FMT Capacities and Capabilities

Different types of FMTs will have varying minimum standards for personnel and skill sets. FMTs may offer facilities appropriate to their agreed level, or offer a host

government a team and medical supplies without a facility. It should be noted that the figures of FMT size, capability and capacity are a minimum to classify as a specific level. To be considered a particular level, all FMTs must supply personnel and supplies capable of reaching at least the target numbers of persons treated. The FMT will be invited to declare any higher capacity that it can attain (e.g. >100 outpatients daily in a type 1). Any additional modules available at the facility should be declared if it is not normally a part of that particular types minimum requirement. (E.g. Type 1 plus basic radiology). Finally, the Type 1–3 FMT should declare whether they will supply a facility (applicable to that type) or would supply the FMT personnel and equipment to work within an existing health facility.

Type 1

FMT size

Team including at least 3 doctors trained in emergency and primary care with the remainder nurses, paramedics and logistic staff. (Ideally 1:3 Doctor: Nurse ratio). Staff must have skills in emergency and trauma care, maternal and child health and knowledge of endemic disease management. Logistics staff must be additional to the overall number if an FMT is providing its own facility.

Capability

Outpatient care for at least 100 patients per day for two weeks including all medical and pharmaceuticals for the type and context of SOD.

+/– Facility Capacity

A rapidly deployable temporary shelter (e.g. tent or containers) or mobile that will serve as an outpatient facility large enough to see and treat a minimum of 100 patients daily.

Type 2

FMT size

Team including doctors skilled in emergency and general medical care (including paediatrics and maternal health), surgical and anaesthetic staff for theatre, and medical, nursing and logistic staff to manage inpatients. Ward staff of at least 1 nurse per 8 beds are required at all times (i.e. 3 nurses on shift at all times in a 20 bedded facility, Note: twenty four hour cover at least doubles this number as

a minimum standard of 12 hour shifts). Logistics staff plus allied health to provide radiology and rehabilitation services must be added to the total team number.

Type 2 FMTs must have at least two surgeons capable of general surgical procedures (emergency and trauma), surgical wound care, basic orthopaedic procedures and emergency obstetrics. If these skills are not available in surgeons, then specialist/s in these areas must be added to cover this entire skill set. There should be 5 Operating room technical staff (nurses or equivalent). There should be at least a ratio of 1:1 surgeon to anaesthetic technician or anaesthetist allowed to administer anaesthetic in the country of FMT origin.

Capability

Outpatient care must be available with a capability declared by the FMT, and inpatient equipment and consumables for 20 patients for two weeks must be supplied. Type 2 FMTs must have the capability to perform 7 major or 15 minor procedures daily for two weeks.

+/– Facility Capacity

If a facility is provided by the FMT, it must be capable of managing outpatients for surgical triage plus at least 20 inpatients and one operating theatre with one operating table. There must be at least 20 beds per additional operating table. Facilities must also have enough capacity for the required support areas to manage cleaning and autoclave, storage of pharmaceuticals, consumables, equipment and areas for x-ray.

Type 3

FMT size

This will include all the above staff for Type 2. It will also contain extra specialist/s in Ortho-plastic reconstruction to augment the general/orthopaedic surgeons described above. Operating room staff will be at least 5 per functioning operating table (nurses +/– technicians and support staff). Type 3 FMTs must have, at a minimum, at least one specialist anaesthetic doctor in addition to the 2 anaesthetic technicians (or doctors) described in Type 2 including recovery staff. It should also contain at least one obstetrician and one paediatric specialist, as well as two specialists in general/emergency or internal medicine, one of which must have training and experience in intensive care medicine. General ward beds will have

the same ratios of 1:8 nurses per bed; High dependency beds will have a ration of 1:2 as a minimum. This ratio must be maintained 24 hours with appropriate staff numbers according to the capacity and occupancy of the facility. Logistics staff numbers capable of managing a large operation must be added in cases of an FMT deploying with its own facilities. Allied health and support staff must also be added to all Type 3 FMT numbers, in particular to provide rehabilitation, x-ray and laboratory services and support.

Type 3 FMTs are in an ideal position to receive small speciality teams for example renal physicians, plastics or maxillo-facial surgeons or sub-speciality infectious disease or paediatric staff. Negotiation should ideally occur between such speciality groups and individuals and reputable FMT organizations to allow maximal benefit to the beneficiaries, of any such specialist deployments.

Capability

Type 3 FMTs must have the staff and consumables to manage at least 40 inpatients daily for two weeks. There must be at least 2 operating tables available for the Type 3 FMT 24 hours daily and be able to operate on at least 15 major or 30 minor cases daily. If the FMT chooses to provide more operating tables, then inpatient beds must increase by at least 20 per extra table. Increases in staff to manage extra beds must be cumulative.

+/– Facility Capacity

If the Type 3 FMT provides a facility, this must be substantial in size, encompassing all wards, operating and outpatient areas described above, including a dedicated intensive care area. Like Type 2, operating rooms must have an adjacent specific recovery area. As with Type 2 above, Type 3 facilities must have all the required space and storage for a fully functioning health facility at a referral level of care. Capacity must be at least 2 operating tables (with capability above) and at least 40 inpatient beds including at least a 4 bed Intensive care area. Any additional speciality areas specifically covered by the Type 3 FMT should include further beds, for example rehabilitation or care of spinal injured is best served by a dedicated ward area and speciality staff and support services. Additional OT tables will require extra 20-inpatient beds each, to ensure adequate post-operative capacity.

ANNEX 3
Acronyms List

AEICD	Agencia Española de Cooperación Internacional para el Desarrollo
ASEAN	Association of Southeast Asian Nations
ATLS	Advanced Trauma Life Support
AusAID	Australian Government Overseas Aid Program
AUSMAT	Australian Medical Assistance Team
B-Fast	Belgium First Aid and Support
BEOC	Basic Emergency Obstetric Care
BP	Blood Pressure
C-section	Cesarean Section
CDC	Centers for Disease Control and Prevention
CEOC	Comprehensive Emergency Obstetric Care
D & C	Dilation and Curettage
DOTS	Directly Observed Therapy Programs
ERF	Emergency Relief Framework
ECHO	Humanitarian Aid and Civil Protection Department of the European Commission
$ETCO_2$	End Tidal CO_2
EQ	Earthquake
FMT WG	Foreign Medical Team Working Group
FMT	Foreign Medical Team
GHC	Global Health Cluster
HCRI	Humanitarian Conflict Response Institute
Hep B	Hepatitis B
Hep C	Hepatitis C
HeRAMS	Health Resources Availability Mapping System
HIV	Human Immunodeficiency Virus
HR	Heart Rate
IASC	Inter Agency Standing Committee
ICRC	International Committee on the Red Cross
ICU	Intensive Care Unit
IDRL	International Disaster Response Laws, Rules and Principles
IEC	INSARAG External Classification
IFRC	International Federation of the Red Cross and Red Crescent Societies

INSARAG	International Search and Rescue Advisory Group
JICA	Japan International Cooperation Agency
LMIC	Low and Middle Income Countries
MHPSS	Mental Health and Psychosocial Support
MIMMS	Major Incident Medical Management and Support
MISP	Minimum Initial Service Package
MoH	Ministry of Health
MSF	Medècins Sans Frontières
MUAC	Mid-Upper Arm Circumference
NCCTRC	National Critical Care and Trauma Response Centre
NCD	Non Communicable Disease
NGO	Non-Governmental Organizations
OCHA	Office for the Coordination of Humanitarian Affairs
OPD	Outpatient
OR	Operating Room
OSOCC	Onsite Operations Coordination Centre
OT	Operating Theatre
PAHO	Pan American Health Organization
POP	Plaster of Paris
PP	Personal Protective Equipment
RDC	Reception Departure Centre
RDT	Rapid Detection Test
SDC	Swiss Agency for Development and Cooperation
SEMHU	Sociedade Española de Medicina Humanitaria
SHA	Swiss Humanitarian Aid Unit
SOD	Sudden Onset Disaster
TBs	Tuberculosis
ToR	Terms of Reference
UN	United Nations
USAR	Urban Search and Rescue
WASH	Water, Sanitation and Hygiene Promotion
WHO	World Health Organization

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