
Addressing the increasing burden of trauma in humanitarian settings in the Eastern Mediterranean Region

Executive summary

WHO's Eastern Mediterranean Region is subject to some of the most acute, large-scale and complex emergencies in the world. Nine of the Member States are classified as fragile or conflict-affected situations by the World Bank, while five of the 10 deadliest natural disasters worldwide between 2022 and 2023 occurred in the Region. Each of these crises has resulted in a heavy burden of trauma-related morbidity and mortality, including complex injuries and mass casualty incidents. In protracted humanitarian crises, this burden can remain at high levels for many years.

The effective management of trauma requires a functioning trauma care pathway embedded within a comprehensive system of emergency, critical and operative care services. However, in many humanitarian settings, already-fragile health systems have been severely weakened and damaged, restricting the capacity of health workers to provide essential health services, including trauma care. Operational constraints due to insecurity, access restrictions and bureaucratic impediments can further limit the delivery of essential health and trauma care. Moreover, there are few agencies with the mandate or capacity to provide trauma care in humanitarian settings, especially in protracted conflicts.

Building on successful experiences in Iraq and Palestine, WHO established the Regional Trauma Initiative in the Region in 2020 to help address gaps in trauma care in humanitarian settings. Through technical and operational assistance and capacity-building, the Initiative has supported the response to more than 200 mass casualty incidents across five conflict-affected settings with an estimated reach of 800 000 injured patients.

To further expand and improve trauma care in humanitarian settings across the Region, WHO has developed an operational framework for these unique and challenging contexts. Informed by resolution WHA76.2 adopted by the Seventy-sixth World Health Assembly in 2023, the framework is built around the emergency, critical and operative care services continuum. This includes community, primary and prehospital care, acute hospital care, pain management and palliative care, and rehabilitation services. The approach ensures that all opportunities to reduce morbidity and mortality for trauma patients are addressed and that a patient's transition between different services is as smooth as possible.

The framework is built on the SWIFT principle – namely that trauma interventions should be safe, workable, intuitive, fair and timely. Given the major resource constraints faced in most fragile or conflict-affected settings, technical guidance and support should be stratified according to the capacities of the local health system and the operational environment.

The objectives of the operational framework are to: strengthen the community response to trauma; build capacities at primary health care level for the initial management of trauma; improve the timeliness and quality of care during patient transport; strengthen emergency, critical and operative care services; develop protocols and systems for the early integration of rehabilitation services into trauma management; develop protocols and systems for pain management and palliative care throughout the trauma care pathway; develop and reinforce national rapid response and surge capacities, including emergency medical teams; strengthen information systems for emergency and trauma care; and establish a quality improvement programme for trauma care.

Introduction

1. Trauma is a major global public health concern. Nearly 5 million deaths each year occur as a result of injury, with a further 45 million sufferers acquiring subsequent disability (1, 2). This exceeds deaths caused by the combined effects of malaria, tuberculosis and HIV. The highest burden is seen in low- and lower middle-income countries (LICs and LMICs), many of which are faced with the cumulative and converging effects of conflict, recurrent disease outbreaks, natural disasters and fragile economies. The effective management of trauma requires a comprehensive and coordinated systems approach that spans the continuum from injury prevention to rehabilitation.

2. The WHO Eastern Mediterranean Region has a particularly heavy and distinct trauma burden, contributed to by multiple ongoing conflicts and recurrent natural disasters. Nine countries in the Region are classified by the World Bank as having fragile and conflict-affected situations (FCS) (3). With a population of 745 million, the Region is home to 9% of the world's population, of whom 107 million need humanitarian assistance, representing 36% of the global humanitarian burden (4). In April 2024, WHO was responding to 19 major emergencies across the Region. The direct and indirect effects of many of these emergencies have resulted in a high prevalence of traumatic injury, placing an ongoing strain on already weakened health systems.

3. Responding to traumatic injuries and other urgent medical needs in humanitarian settings poses multiple challenges. Health systems are often progressively degraded during conflict and may suffer acute damage and destruction following natural disasters. Insecurity, limited access to health care, loss of medical staff, disruption of supply lines, forced displacement, funding gaps and attacks on health care are just some of the factors that constrain health service delivery in humanitarian settings. Moreover, the complex injuries and mass casualty incidents associated with conflict and natural disasters place a particular strain on health systems, requiring resources and capacities that are frequently lacking in such contexts.

4. To address these gaps in the Region, WHO has developed an operational framework to address trauma more effectively and predictably in humanitarian settings. This paper summarizes the burden of trauma in the Region due to conflict and natural disasters, reviews the operational context and challenges, and proposes a strategic approach to limit trauma-related morbidity and mortality in humanitarian settings.

Trauma burden in humanitarian settings across the Region

5. The quantification of trauma-related mortality and morbidity in conflict is difficult due to operational, systems and resource constraints. Nonetheless, existing data indicates a heavy burden across the Region. In 2023, eight Member States each recorded over 1000 conflict-related deaths (range 1038–14 248), including seven Member States classified as FCS (5). The protracted nature of many conflicts means that this burden can be extended over many years. In Afghanistan, the United Nations documented over 1000 civilian trauma-related deaths (range 1052–1686) and over 1000 civilian injuries (range 1440–3600) every year between 2009 and 2021 (6).

6. The high-intensity conflicts that escalated in 2023 in Sudan and in Israel and Palestine have taken an especially heavy toll. In Sudan, 12 270 conflict-related deaths were reported between 15 April 2023 and 26 April 2024, although these figures are generally acknowledged to be an underestimate due to access constraints (5). According to the Palestinian Ministry of Health, between 27 October 2023 and 20 April 2024, the war in the Gaza Strip resulted in 34 049 fatalities and 76 901 injuries; 72% of deaths were among women and children (7).

7. Natural disasters also present a heavy trauma burden for the Region. Between 2022 and 2023, five of the 10 deadliest natural disasters globally were in the Region, including earthquakes (Afghanistan, Morocco, the Syrian Arab Republic), flooding following a tropical storm and dam burst (Libya), and monsoon-related flooding (Pakistan). Each crisis resulted in over 1000 deaths (range 1739–12 352), damage to or destruction of health facilities and disruption of health systems, thereby reducing access to health care at a time of acute need (8). Technological disasters such as the Beirut Port blast in 2020 can also have devastating effects; this single event destroyed multiple health care facilities (9) and injured more than 6500 people (10).

8. Globally, mortality due to trauma is nearly three times higher in LMICs than high income countries (1), with those in FCS being the most significantly affected. This is due to complex competing factors, such as the disproportionate burden of injury and lack of access to health care services (9).

9. Limited prehospital care is of particular concern in the Region. Previous analysis from WHO reveals that between 60–80% of all trauma deaths in low and middle-income countries across the Region occur before reaching the hospital, an outcome frequently referred to as being DOA (dead on arrival).¹ In Afghanistan, the proportion of such deaths reached 86%. Although there is a paucity of relevant data collected across the Region on trauma (11), surveys and focus group discussions conducted by WHO reveal that community volunteers and other frontline workers lack training and supplies for basic life-saving interventions, such as haemorrhage control and airway management. At least 27% of deaths could be avoided with the application of simple, immediate life-saving techniques (9).

10. Furthermore, evidence has demonstrated that children, the future of any society, and young adults, the most economically productive demographic, are disproportionately affected by trauma. Specifically, data from WHO reveals that in the Region, children under the age of 15 account for 40% of civilian trauma victims, and often die prematurely or acquire a long-term disability.² Traumatic injuries among children contribute to longer-term consequences, including disability, economic inactivity and chronic physical and mental health problems.³

Emergency care systems

11. Emergency care systems – the systems in which trauma care is provided – can be considered circular frameworks that link and optimize multiple aspects of the trauma care pathway, from prehospital triage protocols and predefined transport links to definitive care and rehabilitation services, to reintegration back into the community, with the overall aim of improving trauma patient outcomes. In an ideal setting, they are planned, comprehensive and coordinated region- or countrywide networks that include all facilities and sectors that have the capability to provide care for the injured, integrated within the public health care system (12, 13).

12. The American College of Surgeons has previously categorized the key components of an ideal trauma system into five areas: access to trauma services, prehospital care and transportation; acute hospital care; rehabilitation; prevention education; and research activities (13), with other organizations expanding beyond this to include disaster medical planning and trauma care evaluation and improvement (12). These key components remain crucial in dysfunctional health systems, but strategies for their implementation may not follow the same trajectory as those in stable systems.

13. Much of the development of emergency care systems in high-income settings has been driven by lessons learned during military conflicts, such as those in Afghanistan and Iraq, where interventions shown to have benefit in a military setting have been adapted and integrated into the civilian health care system (14).

14. Historically, there has been a reluctance to invest in emergency care systems due to a range of factors, including a perception of prohibitive costs and the complexity of the care processes, as well as the challenges of demonstrating clear morbidity and mortality outcomes when compared with interventions for single diseases such as malaria or HIV. In addition, interventions to improve care for trauma patients may have significant mortality benefits but bring with them the risk of an increasing burden of morbidity in survivors; fragile health systems may struggle to manage this level of morbidity (15). However, as the Lancet Commission on Global Surgery demonstrated, the public health benefit of investing in surgical services can be comparable to traditional vertical programmes (16).

15. Furthermore, WHO resources such as basic emergency care training combined with simple process tools have been found to dramatically reduce mortality and produce substantial cost savings for many emergency

¹ WHO Regional Office for the Eastern Mediterranean, unpublished survey data, 2022.

² WHO, unpublished survey data, 2022.

³ WHO, unpublished survey data, 2022.

conditions, including injury (17). Similarly, due to the multifaceted nature of the medical interventions required to manage trauma, there will be overlapping benefits for other non-trauma emergency conditions.

16. More recently, WHO has elaborated the concept of emergency, critical and operative care (ECO) services as outlined in resolution WHA76.2 (18), adopted by the Seventy-sixth World Health Assembly in 2023. These services represent a continuum that includes community, primary and prehospital care, acute hospital care, pain management and palliative care, and rehabilitation services.

17. The ECO approach is informed by other World Health Assembly resolutions and decisions that highlight integrated service delivery and the centrality of emergency, critical and operative care services to reducing morbidity and mortality due to trauma and other acute conditions.

Operating environment challenges to delivering trauma care in humanitarian settings in the Region

18. The delivery of effective trauma care – and health care generally – in humanitarian settings is constrained by multiple factors (11). Insecurity and logistic challenges limit individuals' ability to access health care and the ability of local health workers, humanitarian agencies and national emergency medical teams (EMTs) to reach those in need. Populations that are forcibly displaced within their own country, or across borders as refugees, are frequently separated from essential services, including health care.

19. Across the Region, there are several Member States in which areas of the country are under the control of autonomous, semi-autonomous or rebel entities. In countries such as Iraq, Libya, Somalia, Sudan, the Syrian Arab Republic and Yemen, the internationally recognized government does not control all areas of the country. This poses challenges to establishing coherent health service delivery, including for trauma care, and can result in parallel, non-aligned health systems.

20. Bureaucratic constraints applied by government officials at national and subnational levels can also limit the access humanitarian agencies have to those in need. Denial or delays in issuing visas, travel permits, facilitation letters, landing permits and importation clearances are frequently encountered in countries impacted by conflict. The removal of surgical items and what is known as dual-use medical equipment from aid shipments have particularly affected the delivery of trauma care. Sanctions imposed on Member States of the Region by other States have also impacted the ability to import equipment and supplies essential for comprehensive trauma management.

21. Donor support for trauma care is usually limited, in the context of reducing humanitarian funding generally. Trauma care is often considered expensive and complex, requiring more sophisticated levels of care than the more favoured primary care and public health interventions. This is reflected, for example, in the Health Emergency Response project supported by the World Bank in Afghanistan that covers over 2000 health facilities but does not cover trauma care (19). Health agencies working in humanitarian settings must increasingly prioritize services as donor funds progressively decrease and trauma care is therefore harder to sustain. In 2023, only 43% of humanitarian response plans were funded overall – the lowest percentage for seven years (20).

Systems issues in delivering trauma care in humanitarian settings in the Region

22. Most FCS have poorly developed emergency and trauma care capacities. WHO analysis has demonstrated severe weaknesses across the continuum of trauma care in humanitarian settings. Moreover, there are few international organizations with the mandate and capacities to provide trauma care in the context of conflict.

23. As mentioned above, between 60–80% of all trauma-related deaths in LICs and LMICs in the Region occur prior to arrival at hospital.¹ First responders in such settings come from a wide variety of organizations; a significant proportion of first aid is given by untrained bystanders. In many humanitarian settings across the Region, and particularly in those countries affected by protracted conflict such as Afghanistan and Somalia,

¹ WHO Regional Office for the Eastern Mediterranean, unpublished survey data, 2022.

most patients with traumatic injuries are transferred to hospital by untrained lay rescuers. As well as being a barrier to effective prehospital care, this can result in avoidable delays in reaching definitive treatment (21, 22).

24. Trauma first aid is an important educational tool but needs to be contextualized. While practice from the military in the use of tourniquets has shown a strong mortality benefit in life-threatening haemorrhage in civilian populations (23, 24), bystander knowledge is highly variable. Practical experience suggests that using community members to respond to trauma can help to improve health system functioning during acute crises and improve the trust in the system in protracted or future emergencies.

25. Many communities across the Region, especially those in LICs and LMICs, are not covered by any formal prehospital care system. Studies in the Region have demonstrated mortality benefits when introducing low-cost prehospital care (25), while those health systems with a prehospital trauma system have a 25% decreased risk of death due to trauma (26). Evidence from around the world has demonstrated that the introduction of a memorable standardized emergency number improves both access to emergency services and the speed of response to emergencies (27, 28); however, challenges to the implementation of such numbers remain and are related to cost, societal expectations and support at Ministry of Health level.

26. Damaged health facilities and disrupted health systems during crises, including those disrupted by loss of staff, reduce the health sector's capacity to respond to health needs just as those needs are increasing. The functionality of hospitals and clinics in many FCS is often seriously degraded. Studies using the Health Resources and Services Availability Monitoring System (HeRAMS) have demonstrated that in the Syrian Arab Republic, only 49% of public hospitals, and in Yemen, only 55% of health facilities, were fully functional (29, 30). In the Gaza Strip, as of 20 April 2024, none of the 36 public hospitals were fully functional and only 31% were partially functional, struggling to meet needs with average bed occupancy rates at 254% (7). In Sudan in early 2024, 70% of hospitals in conflict-affected areas were reported to be non-functional (31).

27. Attacks on health systems are among the most disturbing aspects of today's conflicts and further limit access to health and trauma care. During 2022 and 2023, WHO documented 1190 attacks on health care across the Region, resulting in 754 deaths and 1200 injuries (32). Destruction of the health care system further drives an exodus of the health care workforce, particularly during prolonged conflicts, with the Region accounting for 20% of the global health care workforce shortage (33).

28. Natural disasters can also have a devastating impact on the structural integrity and functioning of health facilities, disrupting access to essential health services, including trauma care. The floods in Pakistan in 2002 damaged 13% of all health facilities across the country, with one fifth of affected facilities fully damaged (34). In Libya in 2023, Storm Daniel damaged 17% of health facilities in the affected area (35); following the earthquakes in Afghanistan in 2023, 86 health facilities were damaged and six totally destroyed (36).

29. As noted, the migration of skilled workers is a continual challenge in humanitarian and fragile settings, although arguably there is a lack of data from conflict zones (37). Health care workers may leave due to push factors, such as direct attacks or the inability to perform their roles in the setting, or pull factors, such as the promise of improved financial stability and security for their family. Clinical care in trauma requires a multidisciplinary approach, with specialities including paramedics, nurses, emergency physicians, surgeons, anaesthesiologists, intensivists and rehabilitation specialists. The deployment of international EMTs has helped to provide surge capacity in several countries through a well-established model, but sustainable improvements to trauma care require the training and retention of a skilled national workforce.

30. Across different countries, a variety of cadres of frontline workers provide trauma care. However, there is often a lack of dedicated training and teaching for the management of traumatic injuries, particularly for prehospital workers. Improving the provision of a well-trained workforce across all aspects of trauma care, but particularly in the prehospital setting, will increase the chances that patients survive to arrival at hospital to receive definitive care.

31. Health care standards are often designed for use in developed countries – these standards may not be practicable or feasible in fragile or conflict settings, where people are most in need of safe, timely and effective trauma care. Training should therefore be designed to be adapted and contextualized to the setting,

without compromising on aspirations for the standard of care. Training should include the appropriate management of common injuries seen in conflict such as bullet wounds, penetrating injuries, blast injuries, crush injuries and burns and the principles of damage control surgery.

32. Current evidence demonstrates the importance of early rehabilitation in traumatic injuries to improve functional outcomes (38, 39). However, 182 million people in the Region do not have access to the rehabilitation services they need, and these gaps are especially relevant in FCS (40). As survival from traumatic injuries improves, the need for comprehensive rehabilitation services to enable those injured to return to functional and economic productivity will continue to increase (41).

33. One of the significant challenges is that of the rehabilitation workforce, which faces challenges even in HICs with well-established trauma systems. Often, those rehabilitation services that do exist are provided by a range of actors, including the voluntary sector, with no strict definition of the rehabilitation workforce, which can include physicians, occupational therapists, physiotherapists, and speech and language therapists (42). Workforce shortages are common; the Region has fewer than 30 physiotherapists per 1 million population and fewer than one rehabilitation physician per million population (41).

34. Mass casualty events, such as those caused by conflicts, terrorist attacks and natural disasters, can overwhelm a health system's ability to provide care due to the number and density of patients that present. In 2022, more than 400 mass casualty incidents were documented in the Region, with the true number estimated to be twice this (9). Hospitals are rarely prepared to receive large numbers of casualties and can rapidly become overwhelmed. This has implications for those seeking emergency health care related to the immediate event, but also those with concurrently occurring health emergencies or long-term conditions.

35. Hospitals may not have mass casualty preparedness plans, or existing plans may not be embedded across the health system or implemented into routine training. A standardized approach to mass casualty management at the level of the emergency unit requires support at ministry level and practical drills should be part of routine preparedness in hospitals across the Region. Pre-prepared kits to support the activation of mass casualty management plans are essential for emergency unit preparedness, which includes non-clinical equipment such as high visibility vests, patient records, tracking forms and radio communication devices.

36. Gathering accurate data is essential to drive continual improvement in patient outcomes and to support evidence-based changes to policy. Lack of accurate data is a key challenge to the development of emergency and trauma care systems, particularly in FCS. The reasons for this are multifactorial, but include financial and administrative burdens, as well as inadequate human resources (43). Indeed, even those countries with robust systems to collect and analyse data may still face the effects of humanitarian crises, where the collection of data may become secondary to other demands on the health care system.

37. It is a paradox that those most in need of trauma care services are often the least able to access those services. Only a very small number of humanitarian agencies have developed capacity to provide trauma care in conflict settings to support a frequently overwhelmed national and local health system. Most humanitarian health agencies have not prioritized injury care in conflict because of mandate issues, security concerns and capacity and resource gaps; when non-specialized agencies do engage, it is too often uncoordinated and inconsistent with international standards. But the growing burden of trauma in current-day humanitarian emergencies can no longer be ignored. Indeed, in several recent major humanitarian operations, WHO has stepped in to lead and coordinate the trauma response.

Addressing the challenges of trauma care in the Region

38. WHO acts as a leader in trauma care (44). Its work to improve trauma care in the Region has been both complicated and enabled by the experience of military conflicts there. In a first-of-its-kind civilian trauma response, a multiorganizational approach coordinated by WHO in Mosul, Iraq, in 2017, demonstrated that coordination and frontline trauma care provision for civilians during conflict could improve outcomes, with the trauma pathway reportedly saving 1500–1800 lives (45). Similarly, in the Gaza Strip in 2018, WHO's response used existing infrastructure and staff to upscale the trauma pathway. It is estimated that the response

saved between 435–1227 lives over a period of one year and made sustained contributions to the local health system (46).

39. Building on the lessons from these experiences, the Regional Trauma Initiative (RTI) was founded in the Region in 2020 to directly support countries to reduce both mortality and disability caused by traumatic injuries in humanitarian settings, combining technical and operational advice alongside research and capacity-building. As of early 2024, the RTI has supported the response to more than 200 mass casualty incidents across five conflict-affected settings with an estimated reach of 800 000 injured patients.

40. As a new approach to working in humanitarian emergencies, at the heart of this initiative is a small, specialized Trauma Operational and Advisory Team. The mobile Team comprises experts working across countries in the Region and has been integral to providing operational support to WHO country offices. It provides teaching and training, as support for capacity-building and technical direction, alongside hands-on support. The Team has collaborated with nongovernmental organizations, academic partners and other institutions in the Region to establish shared learning, disseminate findings and inform policies related to trauma and emergency care.

41. Launched in 2013, the EMT initiative was established to strengthen health systems in times of emergency or disaster by deploying highly trained multidisciplinary teams to the areas in need (47). Traditionally focused on the management of traumatic and surgical injuries in the setting of natural disasters, EMTs have more recently supported responses to conflicts and outbreaks of communicable diseases, such as Ebola virus disease, cholera and coronavirus disease (COVID-19). In the Region, international EMTs have provided support for the response to the COVID-19 pandemic, the Beirut Port blast in Lebanon, earthquakes in Morocco and the Syrian Arab Republic, floods in Libya, a double car bombing in Somalia, and the conflict in Israel and Palestine. While EMTs are increasingly deployed during the acute stages of conflicts, they do not usually remain active in protracted situations. The EMT Red Book provides guidance for working in conflict zones and other insecure settings (48).

42. National and international EMTs support emergency responses at the subnational, national and international levels and form a key component for capacity-building and emergency preparedness (49). WHO acts as a coordinator based on the request of the affected countries to support the mobilization of teams during the response to emergencies, both national and international. Alongside its coordinating role, WHO centrally monitors and regulates standards for EMTs, so that those deploying deliver the required minimum standards of care.

43. Given the nature and frequency of mass casualty incidents across the Region, robust preparation at the hospital level is critical to improving survival from these devastating events. Many Member States exist in a near-constant state of heightened readiness for such incidents and may experience multiple events in short succession. To this end, there has been considerable work to deliver the WHO Mass Casualty Management training course across the Region, with a focus on priority countries with active conflict. A model of expert trainers delivering courses, followed by “training-of-trainers” courses, enables a sustainable approach by cascading the training within countries in a cost-effective manner. More than 200 hospitals have now been trained, with several working towards full national implementation including in the Islamic Republic of Iran and Lebanon. It is estimated that this training has supported the response to more than 400 mass casualty incidents across the Region. This training can be complemented with the new EMT modular approach to support the expansion of structures and services using a tiered approach.

An operational framework for trauma care in humanitarian settings in the Eastern Mediterranean Region

44. WHO has developed a dedicated approach to trauma care in humanitarian and fragile settings across the Region, focusing on sustainable investment across the entire emergency, critical and trauma care system, from the point of injury to rehabilitation. Given the operational challenges faced in humanitarian and fragile settings, particularly in the Region, the approach is grounded in process, rather than specific solutions, recognizing that goals and targets across different resource settings may differ. The concept of resource-stratified guidelines has been utilized in other settings, such as traumatic brain injury (50) and ECO care (18, 51). Resource stratification aims to maintain the aspirational objectives of reducing the gap in the

provision of trauma care to those most at need, while being pragmatic in designing systems that take into consideration the resource constraints and operational context frequently faced in humanitarian settings.

45. Trauma interventions should follow the principle of SWIFT: that they are safe, workable, intuitive, fair and timely:

- safe – interventions should be evidence-based and minimize further risk of morbidity and mortality
- workable – interventions should be context-appropriate and readily deliverable
- intuitive – interventions should make logical sense to those delivering them
- fair – interventions should not entrench existing biases or create new ones
- timely – the focus of all interventions must be on time-critical care.

46. This allows a focus on the processes to achieve improvement, and allows for variations in local, national and regional settings as well as in levels of clinical capacities and oversight. Consideration should be given to the end goals rather than making rigid proposals based on evidence from stable HICs which may not be achievable or appropriate in humanitarian crises. The framework is informed by an extensive review of the literature and the key lessons learned from the RTI.

47. Using the example of transporting patients to hospital, a contextualized and resource-stratified approach should focus on what processes are necessary to achieve the aim of the safe and timely transfer of injured patients to hospital. For some settings, this may involve a nationally coordinated emergency number and trained ambulance dispatch service. In other settings, this may involve local health workers, officials or community members transporting the patient to hospital using locally available means, e.g. ambulance, private vehicle or horse-drawn cart. Interventions may include the training of the general public or police, firefighters and other emergency service workers in trauma first aid and safe transfer of patients, or disseminating public health messages to reinforce the utilization of the correct emergency number. Rather than a focus on who is providing the transport, the aim should be to improve the time to definitive care and therefore reduce preventable prehospital deaths due to delays in access to care.

48. While a global approach to the strengthening of services in all areas is ideal for day-to-day systems development, this is extremely challenging in areas experiencing acute or protracted crises. Prioritization has been given to activities focused on emergency life- and limb-saving actions for injured patients. To achieve this effectively, and maintain other core life-saving services, the provision of trauma services should not be dissociated from the provision of emergency medical, surgical or obstetric care for non-trauma patients. The strategic objectives are oriented around these core evidence-based principles for trauma care:

- early recognition of life-threatening injuries and complications, including triage;
- robust and timely referral systems to access higher levels of care and more advanced services;
- capacity to perform appropriate resuscitation and surgical stabilization interventions through the availability of trained clinical staff with adequate supply and work environment;
- capacity to manage pathologies resulting from specific conflict-related injuries and day-to-day trauma emergencies such as road traffic accidents; and
- consideration of morbidity and mortality and of specific care needs associated with special populations such as children, older adults, victims of sexual and gender-based violence, and pregnant women.

Strategic objectives of the framework

49. The framework has nine strategic objectives, as described below. Table 1 outlines a number of specific objectives within them and a list of suggested actions or activities which may be adopted to achieve them.

50. The first strategic objective is to strengthen the community response to trauma. Communities should be empowered and encouraged to respond effectively in emergency situations and reduce avoidable deaths due to haemorrhage prior to transport to hospital with simple techniques such as direct compression or the use of tourniquets. Educational campaigns can be conducted through diverse media platforms, community

engagement programmes and partnerships to boost public knowledge and skills. This should include public health education and prevention messages specific to the local context, such as educating children on the dangers of unexploded ordnance, as has been done in Afghanistan.

51. The second strategic objective is to build capacities at primary health care level for the management of trauma. Primary care providers are often the first point of contact for injured patients within the formal health system. They should be trained in the early recognition, triage, resuscitation and rapid referral of seriously injured patients. Simple injuries and wounds should be managed at the primary care level; wound care for more serious injuries focuses on minimizing risks of complications, such as severe pain, infection and disability, prior to rapid transportation.

52. The third strategic objective is to improve the timeliness and quality of care during patient transport. Transportation systems should be established to ensure the timely and effective referral of patients to initial and referral care. Emergency transport may be basic, without patient monitoring or trained personnel, or may be advanced and include the provision of advanced life support, vital sign monitoring and highly trained paramedics and prehospital workers. Community-specific arrangements may be required, especially for remote and rural communities. Ambulance systems should be developed and strengthened over time to integrate standardized protocols, training, equipment, documentation and referral pathways. Wherever possible, standardized emergency numbers or hotlines for prompt access to emergency services should be established. Ideally, there should be a single, standardized national or subnational emergency number with centralized dispatch. However, priority should be given to a mechanism by which acutely injured or ill civilians can rapidly access emergency services, in whichever form they are provided.

53. The fourth strategic objective is to strengthen ECO care through (a) improving education and training on trauma management and (b) developing, institutionalizing and periodically updating comprehensive mass casualty management protocols and plans in hospitals and other health care facilities. This involves developing and harmonizing accredited national and regional curricula, courses and standards to equip a skilled workforce for high-quality trauma medical care throughout the entire trauma care pathway. Several WHO resources can be used for this purpose (see Table 1). Countries with a high proportion of prehospital deaths should recognize the need to train and upskill prehospital personnel, paramedics, health care workers and volunteer first responders. At the hospital level, specialized multidisciplinary trauma teams with the skills to manage complex injuries seen in conflict – such as penetrating injuries, gunshot wounds and burns – and natural disasters, such as crush injuries, should be established. Using WHO tools and the model developed by the Trauma Operational and Advisory Team to cascade training throughout countries, robust mass casualty protocols and preparedness plans can be rapidly taken to scale and can contribute to more resilient health systems. In addition to training and the development of hospital plans for mass casualty incidents, simulations and exercises should be undertaken on a regular basis to stress-test plans and build confidence in the team management of large-scale incidents. Training-of-trainers courses will develop local capacity to deliver the training, with support from WHO in the early phases of dissemination.

54. The fifth strategic objective is to develop protocols and systems for the early integration of rehabilitation services into trauma management. Developing standardized protocols and training health care providers in early rehabilitation techniques will help to reduce longer-term morbidity. In resource poor settings, this will likely involve the upskilling of existing staff or volunteers, to ensure that early rehabilitation becomes part of acute trauma care. However, longer-term efforts should also be made to develop a cadre of rehabilitation specialists, such as prosthetists, physical therapists and occupational therapists, and to ensure the availability of the necessary equipment and facilities. EMTs are playing an increasing role in the provision of rehabilitation services and may also play a role in providing rehabilitation services during their deployments.

55. The sixth strategic objective is to develop protocols and systems for pain management and palliative care throughout the trauma pathway. Effective pain management and palliative care pose significant challenges in humanitarian and resource poor settings. Health care workers along the trauma pathway should be trained in basic fracture, wound and burn management to protect injuries, reduce pain and prevent infections. Access to adequate pain control is often limited, especially for controlled medicines. Supply chains should therefore be strengthened to ensure that analgesics are consistently available at the appropriate level

of care, informed by national essential medicine lists. Health workers should also be trained in palliative care, including for patients with non-survivable injuries; in addition to pain relief, this includes physical, psychological and spiritual care that optimizes comfort and dignity while also supporting family members.

56. The seventh strategic objective is to develop and reinforce national rapid response and surge capacities, including EMTs. The development and expansion of local rapid response teams and national EMTs will provide a dedicated surge system to deliver immediate, high-quality emergency care during disasters and conflicts. Applying the EMT methodology aims to ensure that deployed teams are well trained, well equipped and working according to national or international standards. It will also contribute to improved continuity of care through the integration and coordination of EMTs within the national health and emergency management system. As national capacity improves, there is the potential for EMTs to receive WHO classification that may permit international deployment to support emergency operations in other countries. Where humanitarian health clusters are active, cluster partners can also be engaged to support services along the trauma care pathway.

57. The eighth strategic objective is to strengthen information systems for emergency and trauma care. Dedicated efforts are required for the collection, analysis and sharing of emergency and trauma care data, to improve patient outcomes, support evidence-based policy-making and promote continuous improvement of ECO services across the Region. Data collection in complex settings may not be immediately solved by technology if basic infrastructure such as access to power or Internet connection is not available. Developments should focus on the application of practical solutions such as minimal data sets, standardized proformas and off-line data entry.

58. The ninth strategic objective is to establish a quality improvement programme for trauma care. Such a system will include the setting of national standards, monitoring outcomes and promoting best practices. Promoting quality is often challenging in the context of humanitarian settings, but the programme can be continuously developed over time, building on each step of the trauma care pathway from community care to rehabilitation services. Special emphasis will be given to the quality of care in health facilities, including ECO care.

Table 1. Trauma care in humanitarian settings: strategic objectives and proposed actions

Strategic objectives	Suggested actions or activities
1 Community 1.1 Strengthen public awareness of and capacities for appropriate first aid interventions. 1.2 Improve activation and access to local prehospital system. 1.3 Improve early recognition, first aid and timely referral of injured patients via community engagement and organization.	<ul style="list-style-type: none"> • Design and disseminate simple, multimedia, first aid messages for the community on topics including injury prevention, basic first aid and awareness of referral pathways, ensuring that they are culturally sensitive and linguistically appropriate – <i>priority for communities experiencing high volumes of trauma.</i> • Support basic first aid training for community first responders, linked to the emergency system in collaboration with partners, e.g. Ministry of Health, Red Crescent/Red Cross, nongovernmental organizations. • Assist communities to establish a referral and transport mechanism where no formal prehospital care system or emergency access number currently exists (see strategic objective 3 on care during transport below).
2 Primary care 2.1 Improve early recognition, resuscitation and timely referral of injured patients from first contact locations. 2.1 Facilitate management of simple wounds or injuries at the community level where appropriate.	<ul style="list-style-type: none"> • Include basic emergency care training within primary care provider training, with a focus on the early recognition and resuscitation of severely injured patients. • Define clear referral and counter-referral pathways between primary care and hospitals. • Include the management of simple wounds and minor injuries in primary care training materials.
3 Care during transport 3.1 Develop, strengthen and integrate Ministry of Health-led prehospital emergency care systems.	<ul style="list-style-type: none"> • Establish a universal emergency access number and dispatch system for prompt access to emergency services. • Introduce standardized referral documentation, equipment lists and ambulance service protocols for basic and advanced care. • Include a focus on the early recognition and resuscitation of severely injured patients within ambulance provider training. • Define clear referral pathways at local, national and international levels, as required.
4 ECO care 4.1 Strengthen ECO services for individual and multiple trauma patients with integrated care pathways, protocols and evidence-based guidelines. 4.2 Strengthen supply chain in support of ECO and trauma services.	<ul style="list-style-type: none"> • Improve access to education and training to equip a skilled workforce for high-quality trauma emergency, critical and operative care throughout the entire trauma care pathway. • Utilize and cascade existing tools and support the development of new material as required, such as the WHO Emergency Care Toolkit, including the WHO Trauma Care Checklist, WHO mass casualty management education materials, WHO-ICRC Basic Emergency Care course and conflict-related injury modules, specific surgical skills training modules, advanced trauma skills modules and WHO Basic Critical Care course. • Build capacity for core surgical and trauma packages, including specific procedural competencies. • Strengthen supply chain management to ensure the availability of appropriate medicines, supplies and equipment at each step of the trauma care pathway. • Develop communities of best practice for ECO care at national and regional levels.
5 Rehabilitation 5.1 Integrate rehabilitation services within the trauma care pathway.	<ul style="list-style-type: none"> • Develop protocols for the integration of early rehabilitation services into standard trauma care. • Support recognition and training pathways for rehabilitation specialists and multidisciplinary teams.
6 Pain management and palliative care 6.1 Provide access to adequate pain management and palliative care services for all patients who need it, at each stage of the trauma pathway.	<ul style="list-style-type: none"> • Develop, as required, and disseminate protocols for palliative care, including the relief of pain and other distressing symptoms. • Strengthen supply chains to ensure the availability of pain analgesics at the appropriate level of care, informed by national essential medicine lists. • Advocate for the availability of palliative care medication.
7 Rapid response and surge capacity 7.1 Support the development of rapid response and surge capacities within country, in collaboration with the WHO EMT initiative.	<ul style="list-style-type: none"> • Develop, institutionalize and periodically update comprehensive mass casualty management protocols and plans in hospitals and other health care facilities. • Establish, develop and reinforce national EMTs and country surge capacities, in collaboration with the WHO EMT initiative. • Develop rapid response teams able to deliver surge capacity for trauma care at a subnational level. • Incorporate principles of trauma care, including mass casualty management, into national emergency preparedness.
8 Information systems 8.1 Establish robust data collection and analysis systems.	<ul style="list-style-type: none"> • Coordinate and standardize data collection, analysis, monitoring and evaluation practices at local and national levels, including trauma registries wherever possible. • Optimize the use of appropriate information technology to improve data quality and analysis, and information-sharing.
9 Quality improvement 9.1 Develop trauma quality improvement programmes.	<ul style="list-style-type: none"> • Establish, develop and reinforce trauma quality improvement programmes in health facilities that are inclusive of ECO care. • Provide opportunities for the sharing of best practice in trauma care systems development and delivery across the Region, through online, face-to-face and written platforms. • Support regional trauma research in a humanitarian context.

The way forward

59. Given the heavy and increasing burden of trauma in humanitarian settings across the Region, a dedicated approach to preventing trauma-related mortality and disability in these complex contexts is required. Operational constraints and weak health systems often limit capacities to provide effective trauma care in settings of conflict and natural disasters; nonetheless, WHO has demonstrated that with access to those in need and sufficient resources, effective trauma care systems can be established and adapted to the context, leading to improved outcomes.

60. Member States – especially those responding to or at risk of humanitarian emergencies – are therefore urged to strengthen and adapt capacities across the trauma care pathway, from prehospital to hospital and posthospital care; these capacities should be embedded within broader ECO care services. Details regarding priority actions and deliverables are outlined in Table 1, but include:

- strengthened community response to trauma, including through public messaging, educational campaigns and first aid training;
- expanded capacities at primary care level for the initial management of trauma and rapid referral;
- functional prehospital care services for the rapid stabilization and transportation of trauma and other emergency patients, including a universal emergency access number and dispatch wherever possible;
- strengthened ECO care services;
- rehabilitation services are integrated into the early management of trauma patients;
- protocols and systems in place for adequate access to pain management and palliative care services throughout the trauma care pathway;
- strengthened and expanded rapid response and surge capacities, including national EMTs;
- strengthened information systems for emergency and trauma care; and
- improved quality of care at each phase of the trauma care pathway, including the prehospital, hospital and posthospital phases.

61. WHO is requested to support Member States in these endeavours and will:

- provide technical and operational support on trauma care in humanitarian settings across all phases of the trauma care pathway;
- strengthen operational and academic partnerships across the Eastern Mediterranean Region to address trauma care more effectively;
- support Member States to undertake descriptive, operational and interventional research on trauma care in humanitarian settings; and
- use trauma care data in countries impacted by armed conflict and other situations of violence to advocate for the protection of civilians, protection of health care and resource mobilization.

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