

Emergency medical teams in WHO's Western Pacific Region

Sean T Casey,^{a,b} Erin E Noste,^{a,c} Anthony T Cook,^{a,d} David Muscatello^b and David James Heslop^b

Correspondence to Sean T Casey (email: scasey@who.int)

This regional analysis aims to provide a comprehensive review of emergency medical team development and action in health emergency response in the Western Pacific Region from 2010 to 2024. It details national, subregional and regional efforts to strengthen health emergency preparedness, response and resilience; it notes challenges faced by the teams in these efforts; and it provides examples that could be adopted or adapted to strengthen their development and action around the world. Emergency medical teams are critical components of national, regional and global health emergency workforces, enabling rapid, high-quality and self-sufficient responses to health emergencies domestically or internationally. They comprise clinical, mental health, public health, logistics and water/sanitation/hygiene personnel who collaborate in providing critical services to affected populations during health emergencies. By the end of 2024, emergency medical teams had been established in nearly every country in the Western Pacific Region, with 16 classified for international deployments, and many national teams developed to strengthen response to domestic emergencies. This analysis is based on published peer-reviewed literature on emergency medical team development and action in health emergencies in the Western Pacific Region, as well as publicly available data on team collaboration and deployment for health emergency response. This analysis considers the global evolution of the World Health Organization Emergency Medical Team Initiative and describes its development in the Western Pacific Region, including how the teams have contributed to emergency response efforts, and the key enabling factors and challenges faced as they develop and respond to emergencies. The analysis concludes by highlighting opportunities for future development, collaboration, research and insights that may be applicable to the global development of emergency medical teams.

THE EMERGENCY MEDICAL TEAM INITIATIVE

The World Health Organization (WHO) Emergency Medical Team (EMT) Initiative aims to enhance the speed and quality of health emergency response provided by both national and international EMTs, which include deployable field clinics, hospitals and specialist medical teams in disasters, disease outbreaks and other emergencies with significant health consequences. The initiative was established following the January 2010 Haiti earthquake, which saw hundreds of nongovernmental organizations (NGOs), foreign medical teams (FMTs) and individual foreign clinicians deployed to the country.^{1–6} While not the first large-scale disaster with significant international medical engagement, the Haiti earthquake response highlighted significant gaps in coordination with national authorities and in the

quality of medical response provided. For instance, some individual clinicians and medical teams were deployed without basic equipment or medications to operate self-sufficiently, and some provided inadequate or inappropriate care.^{4–6} The Haiti response also highlighted significant gaps in quantitative and qualitative data on the responders and the clinical services provided, a lack of standards and accountability to patients and national authorities, and a lack of professionalism in some clinical response actions.^{4–6}

The Haiti earthquake response demonstrated the beneficial impact that FMTs can have during major sudden-onset disasters, with teams caring for thousands of patients and enabling a significant expansion of clinical services alongside a surge in complex presentations.^{4–6} However, it also highlighted the shortcomings of medical response actions in terms of quality of care, scope of practice, self-

^a World Health Organization Regional Office for the Western Pacific, Manila, Philippines.

^b School of Population Health, Faculty of Medicine and Health, University of New South Wales, Sydney, New South Wales, Australia.

^c Department of Emergency Medicine, University of California San Diego, San Diego, California, United States of America.

^d National Critical Care and Trauma Response Centre, Darwin, Northern Territory, Australia.

Published: 28 July 2025

doi: 10.5365/wpsar.2023.14.6.1184

Table 1. Emergency medical team typologies, based on the 2021 Blue Book²

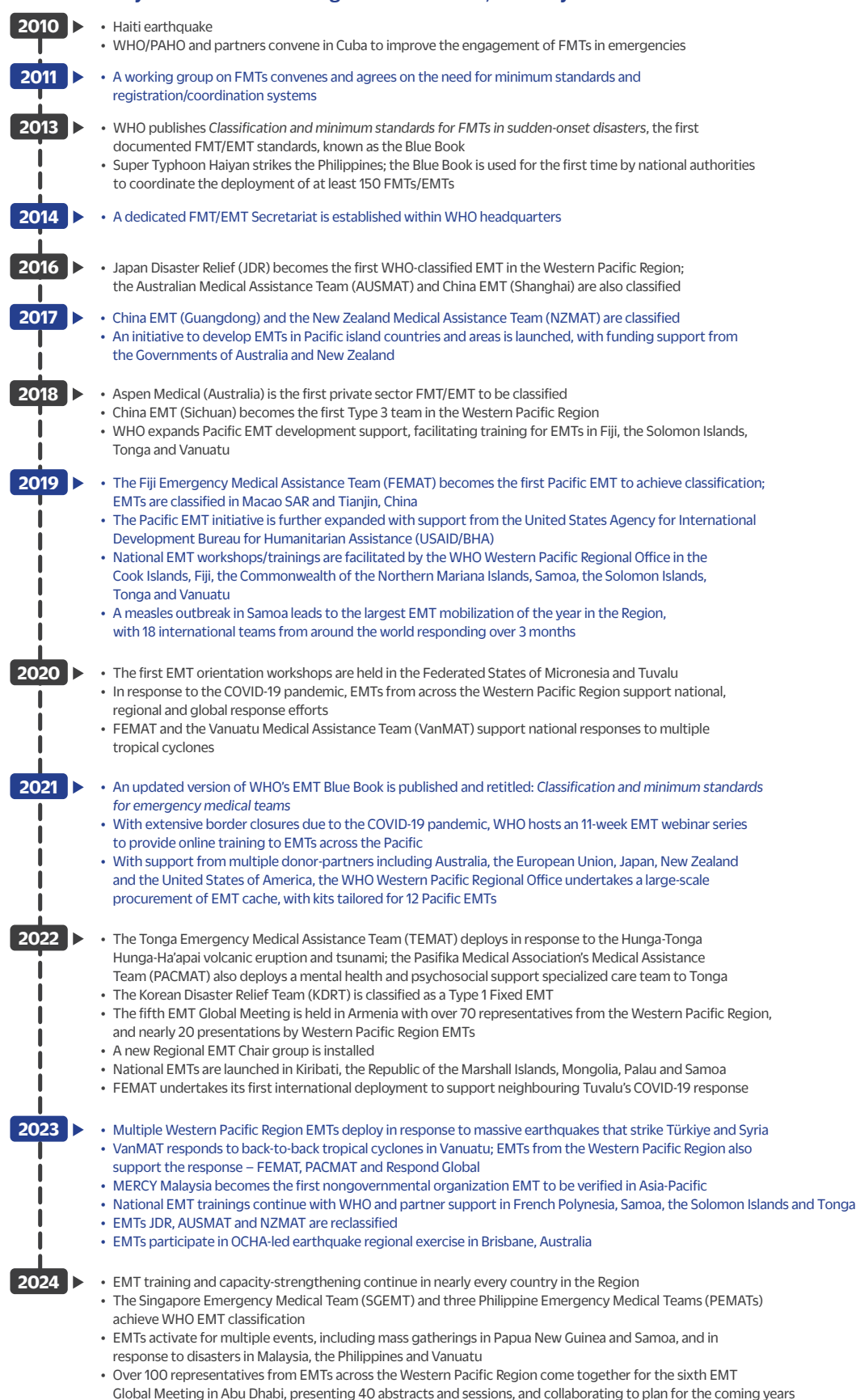
Type	Capability
Type 1 mobile	Provides daylight-hours care for acute trauma and non-trauma presentations, referrals and community-based care. Must be operational within 24 hours of arrival and be able to manage at least 50 outpatient and emergency cases per day for at least 14 days, working in multiple locations (including hard-to-reach populations) for at least 2 weeks. May perform minor procedures in an outpatient setting (e.g. wound debridement); no major surgical procedures.
Type 1 fixed	Provides daylight-hours care for acute trauma and non-trauma presentations, referrals and community-based care. Must be operational within 24 hours of arrival and be able to manage at least 100 outpatient and emergency cases per day in a fixed location for at least 14 days. May perform minor procedures in an outpatient setting (e.g. wound debridement); no major surgical procedures.
Type 2	Provides Type 1 services, plus general and obstetric surgery and inpatient care, operating 24 hours/day, 7 days/week. Must be operational within 24–36 hours of arrival and be able to manage at least 100 outpatients, one operating theatre and at least 20 inpatients, including at least 7 major or 15 minor surgical operations, per day for at least 3 weeks.
Type 3	Provides Type 2 services, plus complex surgical and intensive care capacity, operating 24 hours/day, 7 days/week. Must be operational within 36–48 hours of arrival and be able to manage at least 100 outpatients, two operating theatres/tables and at least 40 inpatients per day, including at least 15 major or 30 minor surgical operations per day. Must have at least four intensive care beds. Must be able to operate for at least 4 weeks.
Specialized care teams	Teams that can be embedded into local health-care facilities or with other emergency medical teams, or that can be self-sustained, and that can provide specialized care (e.g. rehabilitation, surgical, highly infectious diseases, etc.).

Source: World Health Organization.²³

sufficiency and coordination with national authorities.^{1–6} With the aim of addressing these deficiencies, WHO and the Pan American Health Organization (PAHO) convened a meeting of disaster medicine experts, governmental health emergency focal points and NGO representatives to establish common principles and standards for medical teams deploying to emergencies with significant health consequences.³ This meeting, held in Havana, Cuba, from 7 to 9 December 2010, led to the development and publication in 2013 of the foundational document, *Classification and minimum standards for foreign medical teams in sudden onset disasters*, which became informally known as the FMT Blue Book.¹ This WHO publication formalized core principles and minimum standards for FMTs and led to the establishment of a global governance structure, with WHO hosting the FMT secretariat. It also established specific typologies for FMTs based on their scale, scope of practice and complexity of clinical services to be provided. The creation of this typology framework aimed to establish common terminology, understanding and predictability around FMT engagements, which was previously lacking (Table 1). It set out minimum staffing based on typology, expected deployment periods (generally at least 2–4 weeks), self-sufficiency requirements and daily reporting requirements.¹

In the years following the Haiti earthquake and subsequent meetings to establish FMT standards, teams deployed in response to numerous disasters and outbreaks around the world, including Typhoon Haiyan in the Philippines in 2013 – where the Blue Book was applied for the first time in international EMT coordination – the West Africa Ebola outbreak in 2014–2015, Tropical Cyclone Winston in Fiji in 2016, and many others (Fig. 1).^{7–17} During this period, alongside the development of additional formal medical teams by governments and NGOs, WHO established more robust global and regional secretariat functions, such as facilitating FMT development according to established standards and quality assurance of these teams through a process called EMT classification, and supporting nationally led coordination in emergencies. WHO did not set out to establish its own FMTs but worked to coordinate a global network of predictable and coordinated teams capable of providing high-quality care, even in challenging outbreaks or disaster conditions. More national medical teams also emerged in the years that followed the development of formal FMT standards, adopting and adapting the WHO Blue Book principles and standards, including predictable typology (Table 1).^{18,19}

Fig. 1. Timeline of key Western Pacific Region EMT events, January 2010–December 2024



EMT: emergency medical teams; FMT: foreign medical team; OCHA: Office for the Coordination of Humanitarian Affairs; PAHO: Pan American Health Organization; SAR: Special Administrative Region; WHO: World Health Organization.

Table 2. WHO-classified and reclassified^a EMTs in the Western Pacific Region in order of verification date, as of 31 December 2024²³

EMT	Base (city, country)	Type	Year classified (reclassified)
Japan Disaster Relief (JDR)	Tokyo, Japan	T1F/M, T2, SCT	2016 (2023)
China International EMT (Shanghai)	Shanghai, China	T2	2016
Australia Medical Assistance Team (AUSMAT)	Darwin, Australia	T2, T1F, T1M and SCT (surgical and outbreak)	2016 (2023)
China International EMT (Guangdong)	Guangzhou, China	T2	2017
New Zealand Medical Assistance Team (NZMAT)	Auckland, New Zealand	T1F	2017 (2023)
Aspen Medical	Australia	SCT	2018
China International EMT (Sichuan)	Chengdu, China	T3	2018
China International EMT (Macau)	Macao SAR, China	T1F	2019
Fiji Emergency Medical Assistance Team (FEMAT)	Suva, Fiji	T1F	2019
China International EMT (Tianjin)	Tianjin, China	T2	2019
Korea Disaster Relief Team (KDRT)	Seoul, Republic of Korea	T1F	2022
MERCY Malaysia	Kuala Lumpur, Malaysia	T1F	2023
Singapore Emergency Medical Team (SGEMT)	Singapore	T1F	2024
Philippines Emergency Medical Assistance Team (PEMAT), Visayas	Tacloban, Philippines	T1F	2024
PEMAT, Metro Manila	Metro Manila, Philippines	T1F	2024
PEMAT, Luzon	Pampanga, Philippines	T1F	2024

EMT: emergency medical team; SCT: specialized care team; SAR: Special Administration Region; T1F: Type 1 fixed; T1M: Type 1 mobile; T2: Type 2; T3: Type 3.

^a Classified EMTs should undergo reclassification – or additional peer review/quality assurance 5 years after initial classification.

Source: World Health Organization.²³

In 2015, the language of “foreign medical teams” evolved into “emergency medical teams,” recognizing that national actors are always the first to respond and that strengthening national clinical health emergency response capacity was essential.²⁰ This priority was reflected at the highest level through WHO Executive Board 146, Resolution 10 (2020), which called for “the development of effective and high-performing national, subnational, and regional Emergency Medical Teams, as appropriate, in line with WHO classification and minimum standards”.²¹ In 2021, WHO’s EMT secretariat, building on nearly a decade of FMT/EMT development, through extensive global consultation, and with the consent of the EMT Strategic Advisory Group (EMT SAG) comprising EMT representatives from the six WHO regions, published updated principles and standards in a new EMT Blue Book entitled, *Classification and minimum standards for emergency medical teams*.²

The EMT secretariat is based in WHO headquarters in Geneva, Switzerland. It oversees the global classification process of EMTs with each of WHO’s six regional offices in Africa, the Americas, the Eastern Mediterranean, Europe, South-East Asia and the Western Pacific.²² The secretariat focuses on EMT governance, standard-setting, coordination of EMT classification and emergency response coordination. Within WHO regional offices, EMT regional focal points engage in EMT development and training, participate in EMT classification, facilitate information management, and enable regional EMT networks and collaboration (Tables 2–4).²² Regional focal points also engage with ministries of health and WHO country offices, ensuring coordination across the three levels of the Organization. Financial and technical support from national, regional and international donor-partners enable EMT secretariat functions. These donor-partners sometimes fund and/or provide staffing to national EMT

Table 3. EMTs in the Western Pacific Region receiving direct support from the WHO Western Pacific Regional Office (national and international)

EMT	City, country	Type	Year established	Status/notes
Cambodia EMT (CAM-EMT)	Phnom Penh, Cambodia	T1F	2023	SOPs drafted. Cache on hand. Pursuing classification as of October 2024.
Cook Islands Medical Assistance Team (KukiMAT)	Rarotonga, Cook Islands	T1M (Pacific adaptation)	2019	SOPs established. Roster established with several team member trainings and exercises completed. Cache on hand.
French Polynesia EMT	Tahiti, French Polynesia	T1M	2023/2024	SOPs in development. EMT orientation workshop held in December 2023.
Kiribati Medical Assistance Team (KiriMAT)	South Tarawa, Kiribati	T1M (Pacific adaptation)	2022	SOPs established and under revision. Roster established with one team member training held (2022).
Lao People's Democratic Republic EMT	Vientiane, Lao People's Democratic Republic	T1F	2023	SOPs developed. Roster established with several team member trainings (2023, 2024). Cache on hand.
Marshall Islands Medical Assistance Team (MI-MAT)	Majuro, Republic of the Marshall Islands	T1M (Pacific adaptation)	2022	SOPs established. Roster established with two team member trainings held (2022, 2024).
Federated States of Micronesia EMT (FSM EMT)	Federated States of Micronesia	T1M (3)	2019	SOPs drafted. Rosters established in two States, with multiple team member trainings held (2023, 2024).
Mongolia Global Emergency Response EMT (M-GER EMT)	Ulaanbaatar, Mongolia	T1F	2022	SOPs in development. Specialized (winterized) cache on hand.
KLEMAT (Palau EMT)	Koror, Palau	T1M (Pacific adaptation)	2022	SOPs developed. Roster established with several team member trainings (2022, 2023, 2024). Cache on hand.
Papua New Guinea EMT (PNG EMT)	Port Moresby, Papua New Guinea	T1M	2023	SOPs developed. Roster established with several team member trainings (2023, 2024). Cache on hand.
Samoa Emergency Medical Assistance Team (SEMAT)	Apia, Samoa	T1M (Pacific adaptation)	2022	SOPs developed. Roster established with several team member trainings (2022, 2023, 2024). Cache on hand.
Solomon Islands Medical Assistance Team (SOLMAT)	Honiara, Solomon Islands	T1M (Pacific adaptation)	2018	SOPs developed. Roster established with several team member trainings. Cache on hand. Multiple national deployments completed.
Tonga Emergency Medical Assistance Team (TEMAT)	Nuku'alofa, Tonga	T1M (Pacific adaptation)	2018	SOPs developed. Roster established with several team member trainings (2018, 2019, 2023, 2024). Cache on hand. One national deployment completed.
Tuvalu EMT	Tuvalu	T1M (Pacific adaptation)	–	National EMT orientation workshop held in January 2020. Further progress limited.
Vanuatu Medical Assistance Team (VanMAT)	Port Vila, Vanuatu	T1M (Pacific adaptation)	2018	SOPs developed. Roster established. Cache on hand. Multiple team member trainings held, and multiple national deployments completed.
Viet Nam EMT	Hanoi, Viet Nam	T1F	2024	National EMT orientation workshop held in 2024.

EMT: emergency medical team; SOP: standard operating procedure; T1F: Type 1 fixed; T1M: Type 1 mobile; WHO: World Health Organization.

Table 4. EMTs in the Western Pacific Region pursuing WHO classification, as of 31 December 2024

EMT (host country/organization)	Base (city, country)	Type
Cambodia EMT	Phnom Penh, Cambodia	T1F
China International EMT (Hunan)	Changsha, China	T2
China International EMT (Zhejiang)	Hangzhou, China	T2
Fiji Emergency Medical Assistance Team (FEMAT)	Suva, Fiji	T1M
Humanitarian Medical Assistance (HuMA)	Tokyo, Japan	T1M
Mongolia EMT	Ulaanbaatar, Mongolia	T1F
Pasifika Medical Assistance Team (PACMAT/Pasifika Medical Association)	Auckland, New Zealand	T1M
Peace Winds (Japan)	Tokyo, Japan	T1M
Respond Global	Noosa, Australia	T1M/SCT
Tokushukai Medical Assistance Team (TMAT)	Tokyo, Japan	T1M

EMT: emergency medical team; SCT: specialized care team; T1F: Type 1 fixed; T1M: Type 1 mobile; T2: Type 2.

coordination structures in emergencies, support staffing for the WHO EMT secretariat, enable regional and global meetings, support EMT mentoring and classification, and enable work to develop national and subnational EMTs, particularly in low- and middle-income countries (LMICs) and areas.^{15,18,19}

The process to quality-assure EMTs for international deployments, known as EMT classification, began in earnest in 2015 with the first EMTs undergoing structured mentoring and external peer review, also known as EMT verification.^{1,2,23} This peer-review process, based on the principles and standards detailed in the EMT Blue Book, was established to ensure that EMTs provide high-quality clinical services to patients, are able to function with a high degree of self-sufficiency, and provide receiving countries and ministries of health with a high level of predictability when EMTs deploy.^{1,2} In 2016, the first year in which EMTs achieved classification, seven international teams were verified/classified, including Type 1, 2 and 3 teams in WHO's European and Western Pacific regions (Table 2).²³ The classification process included mentorship by peer EMTs, as well as multiple check-in points before verification, to ensure that teams were prepared for their final verification process. As of 2024, no EMT had failed verification. The same standards apply to all teams, regardless of the financial or human resources a government or NGO has available.^{1,2} Several teams have been in the mentorship phase for several years, for instance, due to operational and logistical challenges, financial and human resources constraints, and the impacts of the COVID-19 pandemic. To date, there are no published data regarding the number of

EMTs that have initiated but not completed the EMT classification process; this represents an opportunity for future analysis and research.

While continuing to mentor and undertake quality assurance of EMTs for international classification and deployments, the initiative also supports the development of national and subnational EMTs and strengthens the capacity of national health systems to lead the coordination and activation of the response in disasters, outbreaks and other emergencies.^{18,19} The EMT Initiative aims to support governments, NGOs and other health emergency responders to strengthen health emergency surge capacities and workforces, improving response to emergencies and strengthening global health security.^{1,2,23–28}

EMTs have become a critical part of national, regional and global health emergency workforces, enabling rapid, high-quality and self-sufficient response to health emergencies. EMTs comprise clinical, mental health and public health personnel, including physicians, nurses and allied health specialists, as well as experts in health logistics and emergency water, sanitation and hygiene (WASH).^{1,2} In recent years, more specialized care teams (SCTs) have developed, further expanding the scope and specialization of EMTs responding to health emergencies.^{2,23}

In 2023, the EMT SAG adopted the *Emergency Medical Teams 2030 strategy*, which recognizes the value of international surge capacity while stressing the importance of: developing and maintaining national

EMTs; ensuring accessible and quality health services in emergencies, partnerships and operational governance for the EMT network at global and regional levels; standardization and quality assurance at all levels; and strengthening information systems and evidence to continue to improve EMT development and action.²⁴ The strategy aligns with the International Health Regulations (IHR, 2005), World Health Assembly (WHA) Resolution 75.20 Strengthening the Global Architecture for Health Emergency Preparedness, Response and Resilience, WHO's Triple Billion targets, the United Nations Sustainable Development Goals, the Global Health Emergency Corps Framework, the Asia Pacific Health Security Action Framework, and the "Grand Bargain," all of which emphasize strengthening health systems and health emergency preparedness and response capacities.^{24–31}

EMT DEVELOPMENT IN THE WESTERN PACIFIC

The WHO Western Pacific Region comprises 37 countries and areas (until the addition of Indonesia in May 2025), with some of the world's largest and smallest countries by population, and with diverse economies and geographies, many of which face a wide range of hazards, including earthquakes, volcanoes, tsunamis, cyclones/typhoons, and a broad array of infectious hazards.³² Every year, millions of people in the Region face a wide array of health emergencies. Some countries in the Western Pacific Region have world-class national resources and capacities, some are emerging and rapidly developing economies, while others face significant and persistent financial, material and human resource constraints.^{15,18,19} Recognizing the unique risk profile of the Region and the importance of timely and quality response to health emergencies, many countries and areas across the Region have committed to applying the EMT methodology to save lives and relieve suffering in emergencies (Tables 2–4). At the same time, several countries/areas have adopted and adapted global standards to their specific contexts, recognizing unique country risk profiles, human resource pools and financial resources availability.^{18,19}

EMTs in the Western Pacific Region frequently engage in capacity development and health emergency response, contribute to the development of EMT standards, and engage in global and regional EMT governance. The Executive Director of Australia's National

Critical Care and Trauma Response Centre, which houses the Australian Medical Assistance Team (AUSMAT), served as the global EMT SAG Chair from 2021 to 2024, and AUSMAT was among the first EMTs to be classified for international response.^{23,33} EMTs from the Region contribute clinical and logistics mentors to support the development of other teams pursuing classification, and they support the development of emerging national teams in the Region and beyond.^{15,18,19} In addition, Japan's EMT, Japan Disaster Relief (JDR), through its secretariat in the Japan International Cooperation Agency (JICA), has worked as a key partner to collect, consolidate and analyse clinical data from EMT response actions, and led the development of the EMT Minimum Data Set (MDS).^{34–39} EMTs in the Region also contribute to EMT coordination training and are consistently represented in EMT technical working groups to expand and refine clinical and operational standards to strengthen EMT action in emergencies.^{40–42}

In the Western Pacific Region, EMTs have expanded in number, scope, capability and interoperability since the genesis of the EMT Initiative (Tables 2–4).^{18,19,23} The Region was home to 16 of the 52 classified international EMTs as of 31 December 2024, including: SCTs capable of providing specialized surge support in surgery, haemodialysis and outbreak response; mobile Type 1 teams that can reach remote islands and villages in a disaster or outbreak; fixed Type 1 teams that can replace or supplement damaged or destroyed health centres and provide emergency and outpatient care; and larger Type 2 and Type 3 EMTs capable of providing inpatient, surgical and specialized care in large-scale emergencies, including intensive/critical care.^{1,2,23} Ten EMTs in the Region are pursuing EMT classification (as of 31 December 2024) (Table 4). EMTs have been established in the largest and smallest countries, by governments and NGOs, and have responded to emergencies in the Region and around the world.^{15,16,18,19,23,43–63}

International EMTs often capture the spotlight in health emergency response, and they play a critical role, as demonstrated by EMTs from the Region responding to emergencies as far away as Liberia, Nepal, Sudan and Türkiye.^{9,10,12–14} At the same time, national EMTs across the Region have continuously demonstrated that investing in strong local health emergency response capacities has enabled local response when emergencies strike.^{15,18,19,43–50} Unfortunately, national EMT response

actions are rarely reported in the literature, limiting the ability to assess the impacts of their engagements.

By the end of 2024, nearly every country in the Western Pacific Region had established at least one EMT or engaged with the WHO EMT Initiative to establish national and/or international EMT capability.^{15,18,19,23} Larger, higher-income countries such as Australia, China and Japan have established sophisticated international EMTs with some of the most advanced capabilities, including complex surgical and intensive-care capacity.^{23,64–69} A number of these countries have also established networks of thousands of local clinical response teams, sometimes known as Disaster Medical Assistance Teams, designed specifically for response to domestic emergencies.^{69–71}

At the same time, LMICs, including some of the smallest Pacific island countries and areas (PICs), have also taken steps to establish international or national EMTs in recent years, often with financial and technical support from the WHO Western Pacific Regional Office and regional donor-partners.^{15,18,19,72–79} As of 1 November 2024, 14 PICs had already established EMTs or were in the process of doing so, training team members, sourcing equipment and supplies (known as “EMT cache” – many through bulk procurement by the Western Pacific Regional Office leveraging donor-partner financing), and developing standard operating procedures (SOPs) for emergency activations.^{18,19,76–78} Several countries within the Association of South-East Asian Nations (ASEAN) also took action to develop EMTs, with WHO-classified EMTs in Malaysia, the Philippines (3) and Singapore by the end of 2024.^{58–61,80–85} Several more are being developed, with at least one seeking international classification.

Responding at home and around the world: Western Pacific Region EMTs

EMTs have proven to be central to health emergency response in many countries across the Western Pacific Region.¹⁵ Even before the global EMT classification process, EMTs from the Region responded to large-scale disasters, such as Typhoon Haiyan (locally named Yolanda) in the Philippines in 2013, Tropical Cyclone (TC) Pam in 2015 in Vanuatu, and TC Winston in Fiji in 2016, among others (Table 5).^{7,8}

In 2019, the largest EMT activation in the Region was mounted in the South Pacific country of Samoa, where 18 international EMTs deployed in response to a measles outbreak that swept across the country.¹⁶ This response, led by Samoa’s Ministry of Health, integrated EMTs from around the world into Samoa’s hospitals and health centres and established standalone, spillover clinical areas, significantly expanding intensive, high-dependency and general bed capacity. EMTs also supported Samoa’s large-scale national vaccination campaign, helping to end the outbreak.¹⁶ While EMTs typically deploy for 2–4 weeks, several of them extended their deployments to Samoa by several months, requiring multiple team member rotations and resupply of medicines and consumables from their countries of origin. EMT composition, based on EMT Blue Book typology and standards, was partially designed for disaster response, and required adaptation to Samoa’s outbreak scenario (Table 1).¹⁶

Throughout the COVID-19 pandemic response, international EMTs deployed to provide technical and operational response support.^{45,50,64,68} Teams from Australia and New Zealand played particularly important roles in supporting national response efforts in the South Pacific, with multiple deployments reinforcing local capacities in case management, infection prevention and control, vaccination and health logistics in Cook Islands, Fiji, Niue and the Solomon Islands.^{50,86} China International EMT (Macao) deployed to Algeria and Sudan to support early COVID-19 response efforts.⁸⁷

In 2022, EMT activations in the Region highlighted the importance of this diversified portfolio of national and international teams of various sizes and capabilities. In January 2022, the Tonga Emergency Medical Assistance Team (TEMAT) deployed independently to the island kingdom’s Ha’apai island group following a volcanic eruption and tsunami that damaged infrastructure and led to several deaths.^{43,44} In 2023, the Vanuatu Medical Assistance Team (VanMAT) deployed in response to back-to-back tropical cyclones.⁶² Several EMTs from the Western Pacific Region deployed to Türkiye in response to multiple earthquakes, including EMTs from Japan, Mongolia and the Philippines.¹⁴ In 2024, EMTs deployed to multiple disasters in the Region, including the Philippine Emergency Medical Assistance Teams (PEMATs) in response to six typhoons in 1 month in the Philippines, MERCY Malaysia in response to flooding

Table 5. **EMT activations/deployments in/from the Western Pacific Region (January 2010–December 2024, non-exhaustive)**

Year	EMT	Location	Event
2010	AUSMAT, JDR	Pakistan	Flooding
	KDRT, MERCY Malaysia, TMAT	Haiti	Earthquake
	MERCY Malaysia	Malaysia	Flooding
	MERCY Malaysia, TMAT	Chile	Earthquake
	MERCY Malaysia	Indonesia	Earthquake and tsunami
	MERCY Malaysia	Pakistan	Flooding
2011	AUSMAT	New Zealand	Christchurch earthquake
	TMAT	Japan	Great East Japan Earthquake
	MERCY Malaysia	Malaysia	Flooding
	MERCY Malaysia	Libya	Conflict
	MERCY Malaysia	Somalia	Conflict
2012	MERCY Malaysia	Malaysia	Flooding
	MERCY Malaysia	Philippines (Cagayan de Oro)	Tropical storm
	MERCY Malaysia	Philippines (Davao)	Typhoon Bopa
2013	AUSMAT, China, JDR, KDRT, NZMAT, TMAT	Philippines	Typhoon Haiyan
	AUSMAT, NZMAT	Solomon Islands	Dengue fever outbreak
	AUSMAT	Australia (Manigrida, NT)	Trachoma outbreak
	MERCY Malaysia	Malaysia	Flooding, conflict
	MERCY Malaysia	Philippines (Leyte, Bohol)	Typhoon Haiyan, earthquake
2014	China	Liberia	West Africa Ebola outbreak
	NZMAT	Solomon Islands	Severe flooding
2015	AUSMAT, JDR, NZMAT, PACMAT	Vanuatu	Tropical Cyclone Pam
	AUSMAT, JDR, KDRT, MERCY Malaysia, TMAT	Nepal	Earthquake
2016	AUSMAT, NZMAT, PACMAT	Fiji	Tropical Cyclone Winston
	MERCY Malaysia	Indonesia (Aceh)	Earthquake
	TMAT	Japan	Kumamoto earthquake
	TMAT	Haiti	Hurricane Matthew
2017	MERCY Malaysia	Malaysia	Flooding
	MERCY Malaysia	Bangladesh	Flooding
	MERCY Malaysia	Sri Lanka	Flooding and landslides
2018	AUSMAT	Indonesia, Thailand, Papua New Guinea, Bangladesh	Earthquake, tsunami, cave rescue, diphtheria outbreak
	KDRT	Lao People's Democratic Republic (the)	Flooding
	AUSMAT, PACMAT	Tonga	Tropical Cyclone Gita
	MERCY Malaysia	Indonesia, Lao People's Democratic Republic (the), Malaysia	Flooding, earthquake, dam break/flooding

Year	EMT	Location	Event
2019	AUSMAT	New Zealand, Australia	White Island eruption, bushfires
	JDR	Mozambique	Tropical Cyclone Idai
	18 international EMTs	Samoa	Measles outbreak
	China International EMT	China	Earthquake, mudslide, water penetration
	FEMAT	Fiji	Measles outbreak, Cyclones Sarai and Tino
	SOLMAT	Solomon Islands	Rennel oil spill
2020	MERCY Malaysia	Malaysia (Johor)	Chemical spill
	China International EMT (several)	China, Italy, Algeria, Sudan	COVID-19
	PEMAT	Philippines	Taal volcanic eruption, Typhoon Ambo, COVID-19
	FEMAT	Fiji	COVID-19, Cyclones Harold and Yasa
	AUSMAT	Japan, China, Australia (various locations)	COVID-19
	SOLMAT	Solomon Islands	COVID-19
2021	MERCY Malaysia	Malaysia	COVID-19
	China International EMT (several)	China	Various earthquakes, social security incidents
	FEMAT	Fiji	COVID-19, Tropical Cyclone Ana
	AUSMAT, NZMAT	Fiji, Australia (various locations)	COVID-19
	PEMAT	Philippines	Typhoon Odette
	MERCY Malaysia	Malaysia	COVID-19
2022	NZMAT	Cook Islands	COVID-19
	PACMAT, TEMAT	Tonga	Hunga-Tonga eruption and tsunami
	China International EMT	China (Sichuan, Tibet)	Earthquakes, avalanche
	AUSMAT	Australia, multiple Pacific island countries (Kiribati, Solomon Islands, Vanuatu)	COVID-19
	PEMAT	Philippines (Northern Luzon)	Earthquake
	FEMAT, NZMAT, PACMAT	Niue, Fiji	COVID-19
2023	PACMAT	New Zealand	Tropical Cyclone Gabrielle
	JDR, Mongolia Military EMT, PEMAT, TMAT	Türkiye	Earthquake
	FEMAT, PACMAT, Respond Global, VanMAT	Vanuatu	Tropical Cyclones Judy and Kevin
	MERCY Malaysia, MIMAT	Pacific Islands, Malaysia	COVID-19
2024	Peace Winds Japan, TMAT	Japan	Earthquake
	PNG EMT	Papua New Guinea	Papal visit
	NZMAT, SEMAT	Samoa	Commonwealth Heads of Government meeting
	PEMAT	Philippines	Multiple typhoons
	MERCY Malaysia	Malaysia	Flood response
	AUSMAT, FEMAT, JICA, ^a NZMAT, PACMAT, Respond Global, VanMAT	Vanuatu	17 December 7.3 offshore earthquake

AUSMAT: Australian Medical Assistance Team; EMT: emergency medical team; FEMAT: Fiji Emergency Medical Assistance Team; JDR: Japan Disaster Relief; JICA: Japan International Cooperation Agency; KDRT: Korea Disaster Relief Team; MIMAT: Marshall Islands Medical Assistance Team; NT: Northern Territory of Australia; NZMAT: New Zealand Medical Assistance Team; PACMAT: Pasifika Medical Assistance Team; PEMAT: Philippine Emergency Medical Assistance Team; PNG EMT: Papua New Guinea Emergency Medical Team; SEMAT: Samoa Emergency Medical Assistance Team; SOLMAT: Solomon Islands Medical Assistance Team; TEMAT: Tonga Emergency Medical Assistance Team; TMAT: Tokushukai Medical Assistance Team; VanMAT: Vanuatu Medical Assistance Team.

^a Data/information management support.

in Malaysia, and multiple EMTs in response to the 7.3 magnitude offshore earthquake that struck the South Pacific nation of Vanuatu in mid-December 2024 (Table 5).

International surge capacity remains essential when national capacities are overwhelmed, but strong national EMTs have proven important to rapid response that is adapted to a country's unique needs and operational contexts (Table 4).^{15,18,19,43–49} In recent years, national EMTs have responded more frequently and more independently to emergencies within their countries; unfortunately, these actions are not frequently documented through robust data collection and reporting, or in the academic literature.^{17,18} At the same time, international EMTs in the Western Pacific Region have expanded their technical and operational collaboration with these teams, focusing on capacity development and exchange.^{15,18} Collaborative efforts between national and international EMTs are essential to national, regional and global health security. Together, these capacities strengthen national health emergency response capacities, quickly identify when national capacities are overwhelmed, and enable rapid deployment of quality-assured and interoperable EMTs. Together, these comprise key components of what WHO is terming the Global Health Emergency Corps.²⁶

The application of EMT principles, standards and coordination mechanisms is now well established in many countries and areas, particularly in the Western Pacific Region. At the subregional level, ASEAN has adopted and applied the EMT coordination methodology through the *Standard operating procedure for regional standby arrangements and coordination of joint disaster relief and emergency response operations* (known as the SASOP).⁸³ National and international EMTs in the Region now ensure a high level of predictability and reliability in health emergency response, including in clinical quality, self-sufficiency, coordination mechanisms and reporting. However, some of these teams continue to rely heavily on donor-partner support and are not yet fully integrated into national emergency plans, systems and structures.^{15,18,19} Ensuring the sustainability of national EMT capacities remains challenging, as does objectively documenting their work and impacts.²⁴

Enabling EMT development and response action

The development of EMTs in the Western Pacific Region, particularly the development of national teams in LMICs, has been enabled through years of commitment and investment by countries and organizations developing their own EMTs, as well as several partners, including: the Government of Australia through its Department of Foreign Affairs and Trade; the European Union; the Health Bureau of the Government of Macao Special Administrative Region, China; the Government of Japan; the Government of New Zealand through its Ministry of Foreign Affairs and Trade; the Government of the United States through the United States Agency for International Development Bureau for Humanitarian Assistance (through to 20 January 2025); and the World Health Organization.^{15,18,19} This support, based on political will and diplomatic commitments, technical exchange and capacity-sharing, in-kind material support and funding, has enabled the network of EMTs across the Region to expand and develop. Some support has also been received through bilateral engagements between individual countries.

Additionally, donor-partners have funded WHO's Western Pacific Regional Office to support EMT development across the Region. Since 2016, through WHO and bilateral support, donor-partners have invested over US\$ 5 million in the development of EMTs across the Region and have played a key enabling role in the expansion of the EMT network.^{18,19} Their support has provided funding for EMT member training, facilitated procurement of appropriate cache for mobile EMTs, including centralized cache procurement for many teams by the Western Pacific Regional Office, and enabled shared learning and continuous improvement across teams.^{15,18,19,72–79} This investment supports the localization of health emergency capacities in line with the Grand Bargain localization commitments made at the 2016 World Humanitarian Summit.³¹

Challenges

While EMT development progress is evident across the Region (Tables 2–4), and EMT engagement in health

emergency response efforts is now occurring consistently, there remain challenges worth noting. National and international EMTs have developed relatively quickly in recent years (Tables 2–4) across the Region; however, some of these efforts have been heavily reliant on external support. National EMTs are yet to be fully institutionalized in laws, policies and budgets in several countries, and continued reliance on external financial support may compromise the sustainability of EMTs if such support were reduced or withdrawn.^{18,19}

Beyond financial concerns, many national EMTs – especially in smaller PICs – face logistical and operational hurdles. Some lack dedicated personnel to support team deployment readiness, dedicated warehousing to store EMT cache, and codified mechanisms to release funds for rapid deployment, sometimes leading to delayed deployments and risking damage or loss of critical supplies. EMT logistics remains a significantly under-researched area, and this reflects an opportunity for future consideration by EMTs and academics researching EMT actions.^{76–79}

Across the Region, EMTs have been active in health emergency response efforts for more than 14 years (Table 5). However, quantifiable data demonstrating the impacts of these deployments in terms of reduced population morbidity and mortality, improved access to quality health services delivery, and the speed of health system recovery remain limited. Efforts are underway to strengthen EMT information and data management, analysis and reporting/visualization, particularly with the support of partners such as JICA/JDR. However, this is an area ripe for additional efforts, investments and operational research to demonstrate quantifiable impacts and utility of EMTs.^{24,34–39,59}

While the EMT Blue Book, the EMT 2030 strategy and other key frameworks have highlighted the importance of coordinated and predictable EMT response based on medical needs, some variances from these approaches have been noted in recent response efforts. In some cases, international EMTs have anecdotally deployed based on requests at diplomatic rather than technical levels, with receiving ministries of health sometimes learning of EMT deployments after they have been initiated. Some EMTs have also deployed outside of the scope of their EMT classification, potentially compromising predictability, quality and patient safety. Since these matters may be

considered diplomatically or politically sensitive, there is little formal reporting or research on such actions. However, efforts should be made to apply EMT standards, including ensuring that teams work within their classified typology and deploy only when requested by appropriate and empowered health officials. This is another area that would benefit from future operational research.²⁴

DISCUSSION

Recent health emergencies, including the COVID-19 pandemic, other disease outbreaks, and disasters, have demonstrated the critical roles that national and international EMTs have played within the Western Pacific Region and around the world. At the same time, operational research on EMT deployments remains limited, with significant opportunities to better capture their impact on clinical outcomes and health systems in crisis, in line with the EMT 2030 strategy.²⁴

Looking forward, EMTs will remain essential to national, regional and global health emergency response, contributing to health security strengthening, limiting morbidity and mortality in major emergencies, easing pain and suffering, and strengthening the containment of outbreaks. The EMT network has grown significantly in recent years, with teams now established in nearly every country of the Region. Opportunities remain for teams to enhance collaboration and interoperability, to continue to learn and improve, to leverage their capabilities for diversified response, including in coordination with other rapid response/surge capacities, and to document their impact through data collection, analysis and publication.¹⁵

The Region has several EMTs already applying the EMT 2030 strategic goal of expanded interoperability. These include PEMAT in the Philippines, which had three EMTs classified within the same week in 2024, with common SOPs and team member training.⁶⁰ Federated States of Micronesia EMT (FSM EMT) applies a similar principle, with its national and state-level teams working together under a common structure and procedures. The national teams of Federated States of Micronesia are able to respond within their respective states but also to work together in case of a larger national or subregional emergency.⁵¹ While many Pacific EMTs have been developed primarily for national response, they have common WHO Western Pacific Regional Office-procured cache, their team members have been trained using a

common curriculum with Regional Office support, and their SOPs are based on a common template, facilitating future collaboration.^{18,19,72–78} Beyond reflecting the EMT 2030 objective, this interoperability, at both national and regional levels, can serve as a useful point of reference for other regions by simplifying EMT development through common goods, such as templated SOPs, facilitating access to EMT cache through bulk procurement for multiple teams, and enabling collaboration, with common training and operational approaches.

While expanding in number, EMTs in the Western Pacific Region also continue to expand in their scope of practice and depth of experience, building on response experience and further refining and expanding capabilities. These teams are largely designed for health emergency response, but they are also actively contributing to global EMT technical working groups, supporting learning and strengthening standards across the global EMT network, and resources for health emergency response more generally. At the EMT Global Meeting in November 2024, EMTs from across the Region reiterated their commitment to supporting one another and to strengthening health emergency response in the Region and around the world.

Limitations and future research

With progress made in EMT development and coordination, there remains significant scope for ongoing learning, improvement and strengthening the EMT evidence base. The Western Pacific Regional Office has contributed to this effort through the development of this EMT Special Edition of WHO's *Western Pacific Surveillance and Response* (WPSAR) journal, as well as by supporting the development of abstracts for oral and poster presentations at EMT global meetings and in other fora. However, many EMT development efforts, response actions and lessons from the field go undocumented, underscoring the need for continued efforts and investments in these areas, including collecting and publishing data on clinical presentations, patient outcomes, response times and health system recovery timelines following EMT deployments.

This regional analysis, the first to focus on EMT development and action in the Region, leverages published and publicly available information from EMTs to consolidate data and present the most comprehensive summary to date on the work that has been done, as

well as on the opportunities that remain. This article draws on extensive peer-reviewed and other official sources, although a systematic literature review was not undertaken. Further documentation of EMT development and response actions, and the sharing of learnings through these efforts, are reflected in strategic objective 4 of the EMT 2030 strategy and are critical for continued EMT improvements in the future.²⁴

Teams are already working together frequently, collaborating in training, development and deployments; however, opportunities to strengthen collaborations remain, at the subregional level (for example, ASEAN) and through bilateral collaborations, joint trainings and exercises, and through “twinning” arrangements. Continued investments in national and subnational EMT development can strengthen the speed and quality of national response efforts to emergencies, and potentially also reduce reliance on international EMTs and other responders. Evidence on these kinds of impacts is limited but should continue to be a subject for future research, based on more robust data collection and reporting by EMTs.²⁴

Several EMTs in the Region have developed or are now developing SCTs, and this effort can continue to be expanded and researched. SCTs, such as for mental health and psychosocial support, may contribute to future emergency response efforts. However, technical standards for several proposed SCTs do not yet exist or are in development, and research on their impacts, both positive and negative, is critical for understanding how to optimize their engagement in future health emergency response efforts.

Finally, very few EMTs from the Region have engaged in response to conflicts, deliberate events, or other events related to chemical, radiological and/or nuclear hazards (Table 5). As EMTs continue to evolve, expanding capabilities in these areas will be essential. Future research should focus on developing technical standards, response protocols and training for these emerging challenges.

Conclusions

EMTs are now a well established and trusted component of health emergency response and form a core component of the global health emergency workforce.

This is evidenced by the extensive actions that EMTs have taken in health emergency response efforts, by the investments that governments, NGOs and donor-partners have made in EMT development and quality assurance, and by the active engagement of thousands of individual health workers, logisticians and other EMT members. This regional analysis highlights the achievements of the EMTs and their alignment with the global and regional priorities of Member States, reinforcing their critical role in health emergency preparedness and response.

Acknowledgements

The authors wish to acknowledge the commitment of the Member States, partners and NGOs of WHO's Western Pacific Region in developing robust national and international EMT capacity to respond to the wide range of hazards faced by populations across our Region and around the world. The authors also wish to acknowledge the commitment, the work and the bravery of EMT personnel, the front-liners of the health emergency workforce, who are often the first to respond to disasters and outbreaks, rushing into the most difficult circumstances in the most challenging times. Finally, the authors wish to thank the colleagues and partners who have supported the development of EMTs across the Western Pacific Region over the years.

Conflicts of interest

STC is an associate editor of the *Western Pacific Surveillance and Response* journal. He was not involved in the editorial decision to publish this article. The other authors have no conflicts of interest to declare.

Ethics statement

Ethical clearance was not required because this report used published and publicly available data. No personal identifying information was collected.

Funding

No funding was used in developing this manuscript. The Western Pacific EMT Initiative is supported by the WHO Western Pacific Regional Office with past or current funding from the Government of Australia, the European Union, the Government of Japan, the Government of New Zealand and the United States Agency for International Development (until 20 January 2025).

References

1. Norton I, von Schreeb J, Aitken P, Herard P, Lajolo C. Classification and minimum standards for foreign medical teams in sudden onset disasters. Geneva: World Health Organization; 2013. Available from: <https://www.who.int/docs/default-source/documents/publications/classification-and-minimum-standards-for-foreign-medical-teams-in-sudden-onset-disasters.pdf>, accessed 16 November 2024.
2. Classification and minimum standards for emergency medical teams. Geneva: World Health Organization; 2021. Available from: <https://iris.who.int/handle/10665/341857>, accessed 17 November 2024.
3. Pan American Health Organization and World Health Organization. Proceedings of the WHO/PAHO technical consultation on foreign medical teams (FMTs) post sudden onset disasters (SODs). Geneva: World Health Organization; 2010. Available from: <https://www.paho.org/en/documents/proceedings-whopaho-technical-consultation-foreign-medical-teams-fmts-post-sudden-onset>, accessed 16 November 2024.
4. Redmond AD, Mardel S, Taithe B, Calvot T, Gosney J, Duttine A, et al. A qualitative and quantitative study of the surgical and rehabilitation response to the earthquake in Haiti, January 2010. *Prehosp Disaster Med.* 2011;26(6):449–56. doi:10.1017/S1049023X12000088 pmid:22469020
5. Chu K, Stokes C, Trelles M, Ford N. Improving effective surgical delivery in humanitarian disasters: lessons from Haiti. *PLoS Med.* 2011;8(4):e1001025. doi:10.1371/journal.pmed.1001025 pmid:21541363
6. Van Hoving DJ, Wallis LA, Docrat F, De Vries S. Haiti disaster tourism—a medical shame. *Prehosp Disaster Med.* 2010;25(3):201–2. doi:10.1017/S1049023X00008001 pmid:20586008
7. Informal expert consultation on strengthening national and foreign medical teams in response to disasters, 21–23 September 2015, Manila, Philippines. Manila: WHO Regional Office for the Western Pacific; 2016. Available from: <https://iris.who.int/handle/10665/259123>, accessed 17 June 2025.
8. Peiris S, Buenaventura J, Zagaria N. Is registration of foreign medical teams needed for disaster response? Findings from the response to Typhoon Haiyan. *Western Pac Surveill Response J.* 2015;6(Suppl 1):29–33. doi:10.5365/wpsar.2015.6.2.HYN_014 pmid:26767132
9. Amat Camacho N, Karki K, Subedi S, von Schreeb J. International emergency medical teams in the aftermath of the 2015 Nepal earthquake. *Prehosp Disaster Med.* 2019;34(3):260–4. doi:10.1017/S1049023X19004291 pmid:31057142
10. Huang Y. China's Response to the 2014 Ebola outbreak in West Africa. *Glob Chall.* 2017;1(2):1600001. doi:10.1002/gch2.201600001 pmid:31565261
11. Koido Y, Kondo H, Wakai A, Ono T, Toyokuni Y. Introduction of Japan Disaster Medical Assistant Team as a national emergency medical team. *Prehosp Disaster Med.* 2022;37(S2):s81. doi:10.1017/S1049023X22001807
12. Read DJ, Holian A, Moller CC, Poutawera V. Surgical workload of a foreign medical team after Typhoon Haiyan. *ANZ J Surg.* 2016;86(5):361–5. doi:10.1111/ans.13175 pmid:25997691
13. Li Y, Wang H, Jin XR, Li X, Pender M, Song CP, et al. Experiences and challenges in the health protection of medical teams in the Chinese Ebola treatment center, Liberia: a qualitative study. *Infect Dis Poverty.* 2018;7(1):92. doi:10.1186/s40249-018-0468-6 pmid:30134982
14. Emergency medical team response to the Türkiye earthquake: lessons learned workshop report. Copenhagen: WHO Regional Office for Europe; 2024. Available from: <https://www.who.int/europe/publications/i/item/WHO-EURO-2024-9935-49707-74484>, accessed 17 November 2024.

15. Mamea N, Fatupaito AG, Samad A, Isa R, Uherbelau G, Muña E, et al. The emergency medical team initiative in the Western Pacific Region. *Western Pac Surveill Response J.* 2024;14(6 Spec edition):1–4. doi:10.5365/wpsar.2023.14.6.1161 pmid:39416873
16. Casey ST, Mamea-Maa NA, Nofoaiga M, Martin B, Henshall KA, Fidow M, et al. The roles of emergency medical teams in response to Samoa's 2019 measles outbreak. *Western Pac Surveill Response J.* 2024;14(6 Spec edition):1–7. doi:10.5365/wpsar.2023.14.6.1031 pmid:38745981
17. von Reding H, Rogers M, von Schreeb J, Bahattab A, Ragaazzoni L, Lajolo CP, et al. Emergency medical teams deployments since the 2010 Haiti Earthquake – a scoping review of publicly available literature. *Prehosp Disaster Med.* 2025;40(S1):s34. doi:10.1017/S1049023X25000998
18. Casey ST, Noste E, Cook AT, Larsen J-E, Cowie S, Ferguson MM, et al. Localizing health emergency preparedness and response: emergency medical team development and operations in Pacific island countries and areas. *Western Pac Surveill Response J.* 2023;14(6 Spec edition):1–4. doi:10.5365/wpsar.2023.14.6.1021 pmid:37969417
19. Casey S, Vatukela J, Bainivalu N, Ulufonua L, Leodoro B, Guyant P, et al. Strengthening national health emergency response: Pacific emergency medical teams (EMTs). *Wkly Epidemiol Rec.* 2021;96(special issue):iv–vii. Available from: <https://iris.who.int/handle/10665/345531>, accessed 17 November 2024.
20. Emergency medical teams global meeting: Panama, 1–3 December 2015. Washington, DC: Pan American Health Organization; 2015. Available from: <https://www.paho.org/sites/default/files/2020-10/EMT-global-meeting-2015-summary.pdf>, accessed 1 March 2025.
21. World Health Assembly, 73. Strengthening preparedness for health emergencies: implementation of the International Health Regulations (2005). Geneva: World Health Organization; 2020. Available from: https://apps.who.int/gb/ebwha/pdf_files/EB146/B146_R10-en.pdf, accessed 17 November 2024.
22. Emergency medical teams, global structure. Geneva: World Health Organization; 2024. Available from: <https://extranet.who.int/emt/content/global-structure>, accessed 17 November 2024.
23. EMT global classified teams. Geneva: World Health Organization; 2024. Available from: <https://www.who.int/emergencies/partners/emergency-medical-teams/emt-global-classified-teams>, accessed 17 November 2024.
24. Emergency medical teams 2030 strategy. Geneva: World Health Organization; 2023. Available from: <https://iris.who.int/handle/10665/372867>, accessed 17 November 2024.
25. Asia Pacific health security action framework. Manila: WHO Regional Office for the Western Pacific; 2024. Available from: <https://iris.who.int/handle/10665/377083>, accessed 17 November 2024.
26. Global health emergency corps framework. Geneva: World Health Organization; 2025. Available from: <https://iris.who.int/handle/10665/381484>, accessed 7 June 2025.
27. International health regulations (2005), 3rd ed. Geneva: World Health Organization; 2016. Available from: <https://iris.who.int/handle/10665/246107>, accessed 8 May 2024.
28. Strengthening health emergency prevention, preparedness, response and resilience. Geneva: World Health Organization; 2023. Available from: https://cdn.who.int/media/docs/default-source/emergency-preparedness/who_hepr_wha2023-21051248b.pdf?sfvrsn=a82abdf4_3&download=true, accessed 17 November 2024.
29. World Health Assembly, 71. Thirteenth general programme of work, 2019–2023. Geneva: World Health Organization; 2018. Available from: <https://iris.who.int/handle/10665/279451>, accessed 17 November 2024.
30. Transforming our world: the 2040 agenda for sustainable development. A/Res/70/1. New York (NY): United Nations; 2015. Available from: <https://sdgs.un.org/sites/default/files/publications/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>, accessed 13 March 2024.
31. The Grand Bargain (official website). Geneva: Inter-Agency Standing Committee; 2024. Available from: <https://interagencystandingcommittee.org/grand-bargain>, accessed 13 November 2024.
32. Caballero-Anthony M, Cook ADB, Chen C. Re-imagining the global humanitarian system: emerging dynamics in the Asia-Pacific. *Int J Disaster Risk Reduct.* 2021;56:102098. doi:10.1016/j.ijdr.2021.102098
33. Welcome the chair of the EMT strategic advisory group (SAG), Professor Leonard Notaras. Geneva: World Health Organization; 2021. Available from: <https://extranet.who.int/emt/content/welcome-chair-emt-strategic-advisory-group-sag-professor-leonard-notaras>, accessed 17 November 2024.
34. Benin-Goren O, Kubo T, Norton I. Emergency Medical Team Working Group for Minimum Data Set. *Prehosp Disaster Med.* 2017;32(S1):s96. doi:10.1017/S1049023X17002473
35. Kubo T, Chimed-Ochir O, Cossa M, Ussene I, Toyokuni Y, Yumiya Y, et al. First activation of the WHO Emergency Medical Team Minimum Data Set in the 2019 response to Tropical Cyclone Idai in Mozambique. *Prehosp Disaster Med.* 2022;37(6):727–34. doi:10.1017/S1049023X22001406 pmid:36325992
36. Kubo T, Yanasan A, Herbosa T, Buddh N, Fernando F, Kayano R. Health data collection before, during and after emergencies and disasters – the result of the Kobe expert meeting. *Int J Environ Res Public Health.* 2019;16(5):893. doi:10.3390/ijerph16050893 pmid:30871037
37. Igarashi Y, Kubo T, Toyokuni Y, Yokobori S, Koido Y. Predicting the demand for medical care in disaster-affected areas using the minimum data set and machine learning. *Prehosp Disaster Med.* 2022;37(S2):s108. doi:10.1017/S1049023X22002072
38. Oba J, Toyokuni Y, Koido Y, Kubo T. The role of information management and minimum data set in disaster response. *Prehosp Disaster Med.* 2025;40(S1):s36. doi:10.1017/S1049023X25001050
39. Kubo T, Odgerel C-O. Reviewing the implementation of the emergency medical team minimum data set. *Prehosp Disaster Med.* 2023;38(S1):s35. doi:10.1017/S1049023X23001292
40. National Critical Care and Trauma Response Centre. Republic of Indonesia Defence University (RIDU) multi-country training hub for health. Eaton (NT): Department of Health and Aged Care, Government of Australia; 2023. Available from: <https://nationaltraumacentre.gov.au/news/republic-of-indonesia-defence-university-ridu-multi-country-training-hub-for-health-emergency-operational-readiness/>, accessed 17 November 2024.
41. Hughes A, Almeland SK, Leclerc T, Ogura T, Hayashi M, Mills JA, et al. Recommendations for burns care in mass casualty incidents: WHO Emergency Medical Teams Technical Working Group on Burns (WHO TWGB) 2017–2020. *Burns.* 2021;47(2):349–70. doi:10.1016/j.burns.2020.07.001 pmid:33041154
42. Standards and recommendations for burns care in mass casualty incidents. Geneva: World Health Organization; 2024. Available from: <https://iris.who.int/handle/10665/379543>, accessed 17 November 2024.

43. Poloniati P, Akauola A, Fusi SK, Setoya Y, Tavo K, Casey ST. Tonga's national EMT response to the Hunga-Tonga Hunga-Ha'apai volcanic eruption and tsunami. *Prehosp Disaster Med.* 2022;37(S2):s80. doi:10.1017/S1049023X22001790
44. Sifa S, Fusi SKF, Casey ST, Poloniati P, Tavo K, Setoya Y, et al. Tonga national emergency medical team response to the 2022 Hunga Tonga–Hunga Ha'apai volcanic eruption and tsunami: the first deployment of the Tonga Emergency Medical Assistance Team (TEMAT). *Western Pac Surveill Response J.* 2023;14(6 Spec edition):1–6. doi:10.5365/wpsar.2023.14.6.1026 pmid:37969419
45. Vatukela JR, Waqasese I. Utilizing a medical ship in the COVID-19 response in Fiji. *Prehosp Disaster Med.* 2022;37(S2):s96. doi:10.1017/S1049023X22001959
46. Vatukela JR. Fiji Emergency Medical Assistance Team's (FEMAT) response to Tropical Cyclone Yasa, Fiji. *Prehosp Disaster Med.* 2022;37(S2):s94. doi:10.1017/S1049023X22001935
47. Mataika MB, Vatukela JR, Vatuvoka L, Leone LN, Nasila V. FEMAT response to leptospirosis outbreak in Navosa, Fiji. *Prehosp Disaster Med.* 2025;40(S1):s33. doi:10.1017/S1049023X25000986
48. Mataika MB, Vatukela JR, Vatuvoka L, Leone LN, Nasila V. A local EMT deployment in Fiji. *Prehosp Disaster Med.* 2025;40(S1):s33. doi:10.1017/S1049023X25000974
49. Mataika MB, Vatukela JR, Leone LN, Vatuvoka L, Nasila V. Emergency Medical Assistance Team (FEMAT) response to tropical cyclone (TC) Cody. *Prehosp Disaster Med.* 2025;40(S1):s31–2. doi:10.1017/S1049023X25000937
50. Mataika MB, Vatukela JR, Vatuvoka L, Nukutalai LL, Nasila V. Fiji Emergency Medical Assistance Team – Tuvalu COVID-19 surge support. *Prehosp Disaster Med.* 2025;40(S1):s32–3. doi:10.1017/S1049023X25000962
51. Casey ST, Pretrick ME, Johnson E, Sarofalpiy J, Fredrick M, Takeuchi M. Establishing a national emergency medical team (EMT) in the Federated States of Micronesia (FSM). *Prehosp Disaster Med.* 2022;37(S2):s107. doi:10.1017/S1049023X22002060
52. Casey ST, Cook AT, Ferguson MM, Noste E, Mweeka KT, Rekenibai TE, et al. Strengthening health emergency response capacity in Kiribati: establishing the Kiribati Medical Assistance Team (KIRIMAT). *Western Pac Surveill Response J.* 2023;14(6 Spec edition):1–3. doi:10.5365/wpsar.2023.14.6.1013 pmid:37197089
53. Muna EL, Villagomez WF, Casey ST. Resiliency of a US Pacific island territory with a Type 1 EMT. *Prehosp Disaster Med.* 2022;37(S2):s100. doi:10.1017/S1049023X22001996
54. Nou GG, Casey ST, Balasubramaniam BPLT. Establishing a national emergency medical team (EMT) in Papua New Guinea (PNG). *Prehosp Disaster Med.* 2022;37(S2):s59. doi:10.1017/S1049023X22001583
55. Oli U, Hosea R, Balasubramaniam BPLT, Timbi F, Nou G. Challenges of establishing an emergency medical team in Papua New Guinea. *Western Pac Surveill Response J.* 2023;14(6 Spec edition):1–6. doi:10.5365/wpsar.2023.14.6.1036 pmid:37969418
56. Ferguson MM, Casey ST, Omengkar W, Uherbelau GJ, Ngiraingas T, Eungel B. Developing and maintaining health emergency response capacity: Palau's national emergency medical team. *Western Pac Surveill Response J.* 2023;14(6 Spec edition):1–4. doi:10.5365/wpsar.2023.14.6.1039 pmid:38298250
57. Uherbelau GJ, Mekoll N, Omengkar W, Casey ST, Noste EE, Ferguson MM. Establishing a national emergency medical team in the Republic of Palau. *Prehosp Disaster Med.* 2022;37(S2):s85. doi:10.1017/S1049023X22001844
58. Calixtro JF. The Philippine Emergency Medical Assistance Team: what began as a domestic necessity has evolved into a global asset. *Prehosp Disaster Med.* 2025;40(S1):s28–9. doi:10.1017/S1049023X25000858
59. Rustia RGR, Capito EJD. PEMAT Information Systems (PIS): digitalizing health emergency and disaster response. *Prehosp Disaster Med.* 2025;40(S1):s40–1. doi:10.1017/S1049023X25001141
60. Joint news release. Philippine Emergency Medical Assistance Teams – ready for international deployment based on WHO standards. Geneva: World Health Organization; 2024. Available from: <https://www.who.int/philippines/news/detail/19-09-2024-three-philippine-emergency-medical-assistance-teams—ready-for-international-deployment-based-on-who-standards>, accessed 17 November 2024.
61. Cabrera GCD, Gamboa AP, Capito EJD, Famaran AVH. The Taal Volcano eruption and landfall of Super Typhoon Odette: a dilogy of disasters in the Philippines, an abstract on the response strategies of Dr. Jose N. Rodriguez Memorial Hospital and Sanitarium-Philippine Emergency Medical Assistance Team (DJNRMHS PEMAT) for the TAAL and DINAGAT missions in the years 2020 and 2021. *Prehosp Disaster Med.* 2022;37(S2):s92. doi:10.1017/S1049023X22001911
62. Obed J, Vile S, Moses S, Kemuel S, Guyana P. Emergency medical team deployment in response to cyclones Judy and Kevin in Vanuatu: coordination, challenges, and outcomes. *Prehosp Disaster Med.* 2025;40(S1):s32. doi:10.1017/S1049023X25000949
63. Nou GG. The Papua New Guinea Emergency Medical Team (PNG EMT): strengthening standardized emergency care while responding. *Prehosp Disaster Med.* 2025;40(S1):s14. doi:10.1017/S1049023X25000536
64. Bleakley E. Rehabilitation in EMTs: AUSMAT COVID-19 deployments. *Prehosp Disaster Med.* 2022;37(S2):s83. doi:10.1017/S1049023X22001820
65. Trewin A, Walsh N, Heywood A, Craig A. The characteristics of high-performance teams for infectious disease responses: an AUSMAT team leader's perspective. *Prehosp Disaster Med.* 2025;40(S1):s46. doi:10.1017/S1049023X2500127X
66. Trewin A, Grigg A, Wake R, Vajrathorn P, Fielding M. Innovative online toolbox for AUSMAT and EMTs: enhancing information sharing and operational transparency. *Prehosp Disaster Med.* 2025;40(S1):s22. doi:10.1017/S1049023X2500072X
67. Diverall M, Rogers W, McDermott K. Ready, set, deploy: AUSMAT's surgical cache gets a makeover. *Prehosp Disaster Med.* 2025;40(S1):s10–1. doi:10.1017/S1049023X25000457
68. Robinson A, Bleakley E. Building COVID-19 capacity with a simple tool – “POP-O-MOP” in the Pacific. *Prehosp Disaster Med.* 2022;37(S2):s60. doi:10.1017/S1049023X22001595
69. Koido Y, Kondo H, Wakai A, Ono T, Toyokuni Y. Introduction of Japan Disaster Medical Assistant Team as a national emergency medical team. *Prehosp Disaster Med.* 2022;37(S2):s81. doi:10.1017/S1049023X22001807
70. Kubo T, Taji A, Ogawa H, Shiroma N, Shiimoto T, Kato H, et al. Joint operation among EMT, FETP and PHRRRT during Noto Earthquake Japan 2024. *Prehosp Disaster Med.* 2025;40(S1):s48. doi:10.1017/S1049023X25001311
71. Toyokuni Y, Chishima K, Habano Y, Kotani S, Oba J, Wakai A, et al. Information management and action plan determination by nation EMT, Japan's DMAT: strategic approaches at the prefectural emergency operation center. *Prehosp Disaster Med.* 2025;40(S1):s37–8. doi:10.1017/S1049023X25001074

72. Casey ST, Cook AT, Chandler DR, Larsen J-E, Cowie SR, Noste EE. Tailoring and implementing an emergency medical team (EMT) training package for Pacific island countries and areas (PICs). *Prehosp Disaster Med.* 2022;37(S2):s95. doi:10.1017/S1049023X22001947
73. Noste EE, Cook AT, Larsen J-E, Cowie S, Casey ST. Tailoring a national emergency medical team training package for Pacific island countries and areas. *Western Pac Surveill Response J.* 2023;14(6 Spec edition):1–6. doi:10.5365/wpsar.2023.14.6.1033 pmid:38298251
74. Cook AT, Devanath D, Noste EE, Beauchemin P-Y, Chandler DR, Casey ST. Adapting in-person national emergency medical teams (EMT) introductory training to a virtual, storytelling (Talanoa) format for Pacific island countries and areas (PICs). *Prehosp Disaster Med.* 2022;37(S2):s90. doi:10.1017/S1049023X22001893
75. Cook AT, Casey ST, Noste E. Modifying routine emergency medical team introductory training to a virtual storytelling (Talanoa) format for Pacific island countries and areas. *Western Pac Surveill Response J.* 2024;14(6 Spec edition):1–3. doi:10.5365/wpsar.2023.14.6.1037 pmid:38745982
76. Beauchemin P-Y, Noste EE, Larsen J-E, Casey ST. Equipping Pacific emergency medical teams for self-sufficient health emergency response in remote and resource-limited island settings. *Western Pac Surveill Response J.* 2025;14(6 Spec edition):1–11. doi:10.5365/wpsar.2023.14.6.1032 pmid:40519514
77. Beauchemin PY, Chandler DR, Noste EE, Larsen JE, Cook AT, Casey ST. Development and procurement of a national emergency medical team (EMT) cache for Pacific island countries. *Prehosp Disaster Med.* 2022;37(S2):s89. doi:10.1017/S1049023X22001881
78. Beauchemin P-Y, De Souza JBD, Noste E, Cook AT, Vile S, Nou GG, et al. EMT warehousing solutions in the Pacific island countries and areas: addressing system and infrastructure challenges to enable emergency deployments. *Prehosp Disaster Med.* 2025;40(S1):s36. doi:10.1017/S1049023X25001049
79. Dejidgunchin K, Khishigsaikhan B-O, Battugs K, Togmid O, Casey S, Larsen J-E, et al. Designing an EMT cache for extreme cold weather in Mongolia. *Prehosp Disaster Med.* 2025;40(S1):s22–3. doi:10.1017/S1049023X25000731
80. Rafiek R. A unified government-private sector strategy for streamlined Singapore EMT development. *Prehosp Disaster Med.* 2025;40(S1):s4. doi:10.1017/S1049023X25000329
81. Quah LJJ, Ho SF, Tan D, Faisal M, Ng KC. Setting up the World Health Organization (WHO) Singapore Emergency Medical Team (SGEMT) for a type 1 fixed facility deployment. *ASEAN J Disaster Health Manag.* 2025;1(1):117–39. doi:10.22146/ajdhm.v1i1.14345
82. Ho SF, Quah LJJ, Tan D, Muhammad Faisal FI, Ng K. Developing a hybrid training curriculum for the inaugural World Health Organization (WHO) Singapore Emergency Medical Team (SGEMT) using andragogical principles for adult training. *ASEAN J Disaster Health Manag.* 2025;1(1):65–81. doi:10.22146/ajdhm.v1i1.14344
83. Wuthisuthimethawee P, Yanasan A, Silapunt P, Ikeda S, Kita T. Institutionalization of EMT SOP as part of the ASEAN Regional Cooperation Mechanism on Disaster Management. *Prehosp Disaster Med.* 2022;37(S2):s64. doi:10.1017/S1049023X22001637
84. Yanasan A, Pongpamon N, Pattanarattanamole R, Rojsaengroeng R, Natsukawa T, Katsube T, et al. ARCH Project and the global initiatives of disaster health management. *Prehosp Disaster Med.* 2022;37(S1):s11–5. doi:10.1017/S1049023X22000048 pmid:35253637
85. Standard operating procedure for regional standby arrangements and coordination of joint disaster relief and emergency response operations (SASOP) – version 2.0. Jakarta: Association of South-East Nations Coordinating Centre for Humanitarian Assistance on Disaster Management; 2018. Available from: <https://ascend.ahacentre.org/wp-content/uploads/SASOP/2.-SASOP-Revision-V2.0-April2018.pdf>, accessed 17 November 2024.
86. NZMAT past deployments. Wellington: New Zealand Ministry of Health; 2024. Available from: <https://www.health.govt.nz/strategies-initiatives/programmes-and-initiatives/emergency-management/new-zealand-medical-assistance-team/past-deployments>, accessed 17 November 2024.
87. Staff reporter. Macau joins nation's medical team helping Algeria fight COVID-19. *The Macao News*; 2020. Available from: <https://macaonews.org/news/community/macau-joins-nations-medical-team-helping-algeria-fight-covid-19/>, accessed 17 June 2025.