Disaster Medicine and Public Health Preparedness

www.cambridge.org/dmp

Concepts in Disaster Medicine

Cite this article: Rymer T, Breyre AM, Lovett-Floom LA, *et al*. Rapid expansion and adaptability of California medical disaster teams. *Disaster Med Public Health Prep*. **17**(e375), 1–7. doi: https://doi.org/10.1017/dmp.2023.35.

Keywords:
COVID-19; disaster; emergency medical team

Abbreviations:
ACS, Alternative Care Site; CAL-MAT, California Medical Assistance Team; DHV, Disaster Healthcare Volunteer; DMAT, Disaster Medical Assistance Team; EMSA, Emergency Medical Services Authority; EMT, Emergency Medical Technician; ICS, Incident Command System; LVN, Licensed Vocational Nurse; RN, Registered Nurse; SNF, Skilled Nursing Facilities; WHO, World Health Organization

Corresponding author:
Thérèse Rymer,
Emails: thereserymer@mac.com, trymer@cal-mat.org.

SDMPH
SOCIETY FOR DISASTER MEDICINE & PUBLIC HEALTH

Rapid Expansion and Adaptability of California Medical Disaster Teams

Thérèse Rymer NP, MAS[1], Amelia M. Breyre MD[1], LeAnne Lovett-Floom RN, DNP[1], Asha Devereaux MD, MPH[1], Katherine Staats MD[2], Erin E. Noste MD[3] and Howard Backer MPH MD[1]

[1]CAL-MAT, Emergency Medical Services Authority, Rancho Cordova, CA, USA; [2]County of Imperial Public Health Department, EMS, El Centro, CA, USA and [3]Emergency Medicine, University of California San Diego, San Diego, CA, USA

Abstract

The California Medical Assistance Team (CAL-MAT) program is coordinated by the California Emergency Medical Services Authority (EMSA). The program was developed to deploy and support medical personnel for disaster medical response. During the coronavirus disease (COVID-19) pandemic, the program and missions grew rapidly in response to medical surge, programs for testing and vaccination, and other concurrent disasters. CAL-MAT enrollment increased 10-fold from approximately 200 members at the beginning of 2020, to an estimated 2200 members by June 2021. This article describes the flexible use of a state-managed disaster medical response program within California and some of the challenges associated with rapid expansion and varied demands during the COVID-19 surges of March 2020–March 2022. CAL-MAT may serve as a model for development of similar state-sponsored or other disaster medical response teams.

Emergency medical teams have been developed in many countries for mass casualty care and for acute disaster response, adapted to local, cultural, climate, and geographical conditions. In 2013, the World Health Organization (WHO) published minimum standards for emergency medical teams with the goal of supporting government and non-governmental organizations in building capacity and capability in coordination with domestic response.[1] Significant global variation exists in emergency medical team formation, responsiveness, financial support, and readiness. Despite that variation, Oldenburger et al. analyzed team qualities related to effective team functioning and showed common themes for success: (1) adaptability, flexibility, and improvisation; (2) creativity and innovation; (3) experience and training; and (4) leadership and command structure.[2]

Many international teams rely on armed forces, such as Canada's Disaster Assistance Response, staffed by a 200-member Canadian Armed Forces military organization. Israel similarly utilizes a model based on military personnel with civilian reservists.[3] Other emergency medical teams are government-sponsored and staffed by volunteers. For example, Japanese Disaster Medical Assistance Team uses small teams of 5, focusing on common natural disasters such as earthquakes.[4] The Korean Disaster Relief Team has responded to local disasters such as hospital fires,[5] in addition to humanitarian response related to hurricanes.[6] Australia and New Zealand teams have deployed locally and internationally.[7,8] By 2016, the WHO had verified the Emergency Medical Team from Japan.[9] Russia, China, Israel, and Australia also have verified teams.

In the United States of America, civilian Disaster Medical Assistance Teams (DMATs) are volunteer-based teams of medical and non-medical personnel under the National Disaster Medical System (NDMS). These federal teams are designed to deploy to disaster sites with sufficient supplies and equipment to sustain themselves until a resupply.[10] Members are deployed an average of 2 weeks for domestic and 21 days for international incidents. Prior to the COVID-19 pandemic, the majority of DMAT team deployments were in response to natural disasters, such as hurricanes and earthquakes.[11] States other than California have had experience with state-specific disaster teams, including Oregon, Connecticut, Texas, Hawaii, Florida, and Illinois. Some mirror the DMAT format and are included as part of state disaster medical plans.

California established its own disaster medical teams due to frequent large-scale disasters and the need to provide medical support following civilian evacuations due to wildfires, flooding, and earthquake. CAL-MAT was initially modeled after the federal DMAT program but subsequently tailored to local hazards and responses in California. Regional units were developed to provide medical teams and associated resources across the state, comprised of individuals interested in disaster response and those who had prior experience with DMAT.

The California Emergency Medical Services Authority (EMSA) has the statutory mandate to "respond to any medical disaster by mobilizing and coordinating emergency medical services mutual aid resources to mitigate health problems" as well as to coordinate and assist with medical and hospital disaster preparedness.[12] These tasks are accomplished in coordination with the Governor's Office of Emergency Services (OES), which has the overall responsibility for management of disasters in California, and the California Department of Public Health, EMSA's partner in Public Health and Medical Emergency Support Function (ESF) 8. EMSA provides medical response using CAL-MAT.

CAL-MAT members are licensed or certified medical professionals or administrators who are rostered in advance in the Disaster Healthcare Volunteer (DHV) system that was developed as part of the federal Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP). The DHV system maintains professional credentials, references, work history, and verifies professional licenses. When activated, CAL-MAT members become temporary California State employees through emergency hire, which provides a stipend based on their role, liability coverage, and workers' compensation. The application process is comprehensive and follows the California State Personnel Board rules for emergency hires. When deployed, CAL-MAT personnel receive a salary equivalent to the state classification to which they are assigned. New members meeting eligibility requirements are associated with regional units, thus fostering team building, training opportunities, member support, and unit management. Volunteers accepted into CAL-MAT are expected to be familiar with the Incident Command System (ICS) structure and the EMSA Code of Conduct (Appendix A), while maintaining requirements for active certifications and licenses.

To determine availability of CAL-MAT members for rapid deployment, EMSA communicates with all members monthly to poll for deployment availability through the DHV system, sending additional urgent messages when necessary. Availability lists can be augmented through messaging to a single discipline for specific position needs. Availability for 14 days is preferred, but exceptions may be made for hard-to-fill roles such as physicians and advanced practice providers. Deployment extensions are voluntary, but shorter deployments are approved when needed for rapid deployment to initiate a mission or during staffing shortages. EMSA also provides employee safeguards for temporary employees when deployed. CAL-MAT members submit employer agreements, which inform employers about their employees' emergency hire status and information on Section 230.3 of the California Labor Code (Appendix B).

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic resulted in a dramatic increase in requests for disaster medical support involving an expanded spectrum of missions. This article describes the experience of CAL-MAT during a prolonged period of continuous disaster response to demonstrate the feasibility and operational characteristics of a dynamic statewide response organization that can address simultaneous multi-hazard events.

Discussion

CAL-MAT Mission Expansion During COVID-19 Medical Surge

In 2016, the first official CAL-MAT deployment was a single member sent to assess medical needs during the Tubbs Fire in Sonoma and Napa Counties. From its inception in 2016 through January 2020, medical support at wildfire base camps remained the predominant reason for the mobilization of CAL-MAT. The increase in frequency and severity of wildfires throughout California resulted in a slow but steady increase to approximately 200 CAL-MAT members by January 2020.[13,14]

This abruptly changed with the SARS-CoV-2 pandemic. In February 2020, a cruise ship with an outbreak of COVID-19 docked in Oakland, California. Passengers were initially assessed by DMAT teams and then triaged by other medical teams for transport to hospitals, ongoing transportation to home, or isolation and quarantine centers. EMSA utilized CAL-MAT to operate an alternative care site for quarantine and isolation in Pacific Grove, California, to care for 133 COVID-19-positive patients with mild illness. In the subsequent months, CAL-MAT rapidly expanded capabilities and membership to deploy teams of different sizes and composition on a variety of COVID-19 missions, including surge support within health care institutions, alternative care sites, mass testing and vaccination in communities, as well as logistical support for medical surge and biomedical equipment (Table 1). In response, throughout 2020–2021, CAL-MAT enrollment increased more than 10-fold to approximately 2200 members. Figure 1 illustrates a timeline of CAL-MAT operational and mission milestones.

Skilled Nursing Facility Support

When COVID-19 infections increased in the spring of 2020, prior to vaccine availability, CAL-MAT efforts were directed to support long-term care (LTC) and skilled nursing facilities (SNFs). Once infection was introduced into these facilities, it spread rapidly among patients and staff, creating a staffing crisis due to employee illness or fear of illness. CAL-MAT SNF Strike Teams were comprised of at least 5–7 members, including 1–2 Registered Nurses (RNs) and the remainder paramedics and emergency medical technicians (EMTs) who could deploy to a facility within 12–24 hours, with the following objectives:

1. Perform an assessment for infection control, safety, staffing, and resource needs (Appendix C).
2. Train staff on infection control practices, including reorganizing patient care areas within the facility to create separate zones for infected, exposed, and uninfected patients, and prevent staff from moving freely between them.
3. Supplement critical staff shortages.
4. Engage local and state agencies to coordinate ongoing resource requirements, mainly staffing and personal protective equipment (PPE).

The first 3 objectives were accomplished over 72 hours; staffing support could continue for another week or more depending on need and statewide priorities. Beyond that time, facilities were expected to obtain contract staffing or support from their local health department. The process provided a multi-dimensional approach for the short and long-term support of 65 nursing homes from May 2020 and into January 2021. The mean length of time at a facility was 5.6 days (1–3 days in 19 facilities; 4–6 days in 28 facilities; 7–19 days in 18 facilities). One important procedure prior to the arrival of the response team was to provide the facility administrators with a letter outlining the team requirements and capabilities and facility expectations. Only a small number of facilities failed to regain self-sufficiency. The few that required closure and patient evacuation had problems prior to COVID-19.

https://doi.org/10.1017/dmp.2023.35 Published online by Cambridge University Press

Table 1. Summary of CAL-MAT Missions (March 2020-March 2022–Some missions on-going)

Mission Type	Description	Number of Missions	Mission Dates for CAL-MAT Personnel	Patients/Clients Managed
ACS	First ACS was a quarantine/isolation facility for cruise ship passengers. Subsequent ACS were medical in-patient facilities to care for COVID-19 patients with moderate illness requiring hospitalization and oxygen.	6	February 2020 - April 23, 2021	1688
SNF support teams	Supported staff at SNFs impacted by COVID-19 outbreaks with infection control and patient care	65	May 1, 2020 - January 30, 2021	4981
Fire missions	Medical support for California wildfire incident base camp and shelter clinics for evacuees	30	July 6, 2020 - October 1, 2021	4766
Vaccination	Mobile and clinic-based COVID-19 vaccination support	123	January 28, 2021 - June 8, 2021	47,733
Monoclonal antibody Infusion clinic	Monoclonal antibody infusion clinic sites for mild-moderate COVID-19 patients. Initially infusion clinics were co-located at an ACS then free standing in latter months with care transferred to contract staff.	3 integrated with ACS, then 32 free-standing	February 1, 2021 - March 21, 2021	299
Medical Surge	Assemble 20x32 or 20x40 foot tents including HVAC and electrical for hospital surge, ACS, clinics, triage, vaccination, testing, and sheltering. Some sites had multiple tents in various configurations; tents were erected, dismantled, and moved as needed, resulting in more than 100 set-ups. Equip tents for required medical function Build out surge beds within 29 hospitals	30-40 missions	2020 and ongoing	N.A.
Logistical and warehouse support	Warehouse support: receiving, distribution, inventory biomedical equipment testing and maintenance, including 15,000 ventilators (under direction of biomedical technician)	continuous		N.A.
Shelters for EWI clients	Medical support for federal shelters serving migrant persons (clients). Services as COVID-19 testing, vaccination, quarantine, triage, first aid care, isolation, and low acuity medical care, and needed for clients. Staffing gradually transitioned to contract personnel.	4	May 3, 2021 – December 27, 2021	Federal data not available

Abbreviations:
ACS: Alternative Care Site.
EWI: Entry Without Inspection (Immigrants legally admitted to the United States from entry points along California-Mexico border transported to sites by Customs and Border Protection. EWI shelters are ongoing with federal collaborators and data for the number of clients managed is not available.
HVAC: Heating, Ventilation, and Air Conditioning.
SNF: Skilled Nursing Facility.
N.A: Not Available.

Alternative Care Sites

As medical surge increased and impacted local hospitals, CAL-MAT, in collaboration with local and federal partners, established and staffed 6 alternative care sites (ACSs) throughout California. The ACSs provided surge beds for low acuity patients from local hospitals, allowing acute care facilities to prioritize in-patient resources for higher acuity patients.[15] These ACSs treated patients with mild to moderate COVID-19 symptoms and oxygen requirements of up to 10-liters per minute, and provided isolation and convalescent care. Christensen et al. described details of the ACS operations and challenges encountered.[16]

ACSs drove further development of CAL-MAT due to the requirements of in-patient operations. ACS facilities operated 24 hours a day and were staffed by teams of physicians, advanced practice providers, RNs, paramedics, and EMTs. Physical therapists and registered respiratory therapists were new additions to CAL-MAT deployments. Pharmacists maintained the on-site formulary, filled orders, assisted with medication reconciliation, and advised on medication policy and procedures. Discharge planners from the local communities arranged post-discharge follow-up care and coordinated with staff for discharge needs. Mission Support Team (MST) personnel for ACSs commonly included an Incident Commander, Safety Officer, and section chiefs in the 4 areas consistent with the National Incident Management System (NIMS) ICS framework: operations, planning, finance/administration, and logistics. A Chief Medical Officer and Chief Nursing Officer were also assigned for medical oversight at each ACS.

ACS staffing needs were challenging due to the unpredictability of COVID-19 surge patterns and referrals from hospitals. It is notable that staffing for an ACS with less than 50 patients required as many as 45 medical and administrative staff, despite higher patient to staff ratios than standard hospital staffing (Table 2). Breyre et al. explained ACS staffing challenges, including difficulty finding available clinical providers with acute care or disaster experience.[17] To offset clinical resource shortages, composite teams were developed utilizing new RN and physician graduates, retirees, and those without experience working in non-traditional health care environments, requiring baseline and refresher training. The usual orientation and training with a regional CAL-MAT unit was not possible when onboarding so many new staff. Providers from the military and other agencies provided especially valuable support, because of their training for care in austere emergency environments and their team discipline.

With licensed vocational nurses (LVNs) and certified nursing assistant staff in scarce supply during the COVID-19 surges, EMTs and paramedics filled a variety of inpatient clinical roles alongside usual clinical staff. Under normal circumstances and in the absence of a statewide disaster response, California EMS

https://doi.org/10.1017/dmp.2023.35 Published online by Cambridge University Press

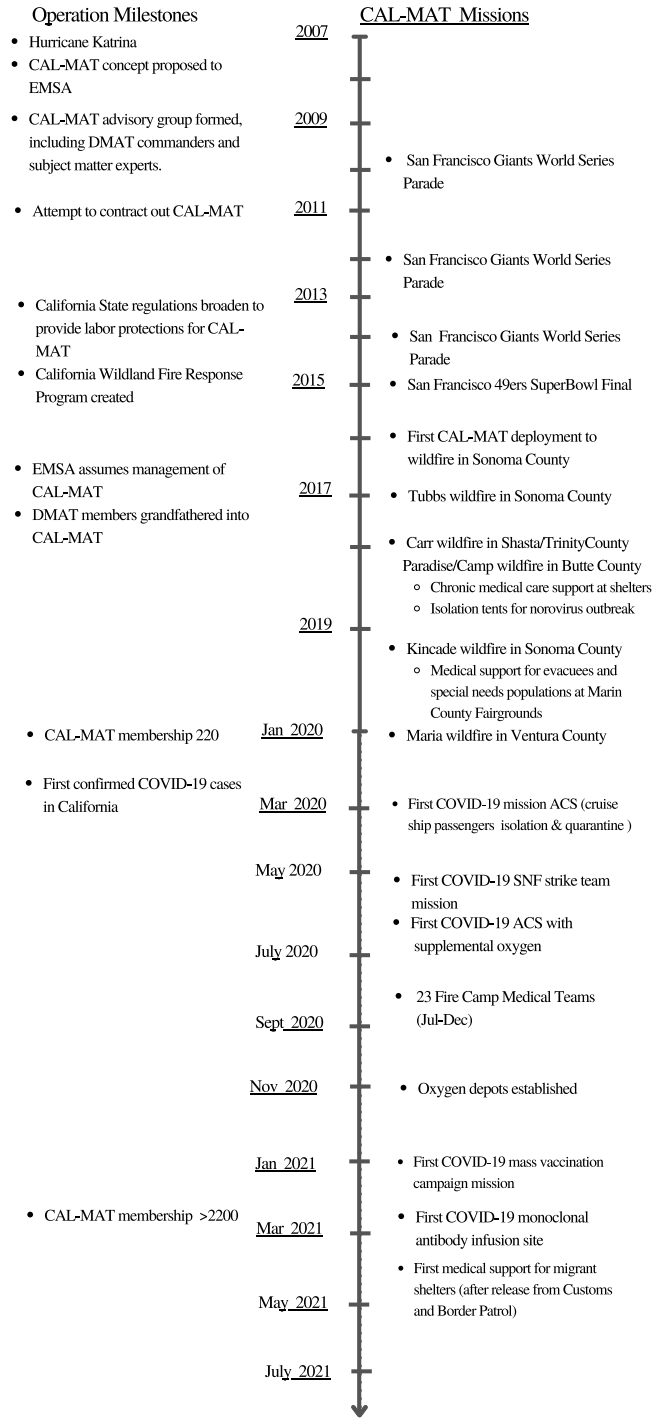

Figure 1. CAL-MAT timeline of operations and missions.

personnel may only provide care in emergency response and mobile settings. Under the state's emergency executive order, the local EMS Agency Medical Directors and California EMSA Director approved temporary changes that allowed EMTs and paramedics to work in fixed sites like ACS. In addition, scope of practice expansion under the emergency order allowed EMS personnel to staff other types of CAL-MAT missions alongside RNs and Advanced Practice Providers. In the spring of 2021, as mass COVID-19 vaccination campaigns began in California, trained EMTs and Paramedics provided staffing for vaccination sites and mobile vaccine outreach efforts that supported underserved communities and vulnerable homebound individuals. CAL-MAT teams were also deployed to COVID-19 testing sites.

The integration and alignment of personnel and the development and expansion of clinical protocols allowed for the best use of clinical skills and scope of practice for the care of patients. However, this often created role confusion surrounding staff member qualifications and practice. Providers and nurses who were not familiar with EMT and paramedic scope of practice in normal times were even less sure of their expanded practice parameters. For example, the administration of intramuscular benzodiazepine is within a paramedic's scope of practice in the prehospital setting; however, it would require a physician order before administering the medication to an actively seizing patient within an in-patient facility or an ACS.

Supporting the Logistics of EMSA Operations

CAL-MAT personnel were also used to support general operations at EMSA headquarters, including administrative functions within the EMSA Department Operations Center and logistical operations. Prior to COVID-19, EMSA maintained equipment caches for medical response in a small warehouse. To meet the needs of the COVID-19 medical surge, California purchased substantial amounts of biomedical equipment, including ventilators, oxygen administration equipment, monitors, surge tents, and beds. EMSA stored much of this equipment, which required a nearly10-fold increase in warehouse space and the development of modern logistical operations for inventory, maintenance, fulfillment, distribution, and the tracking of medical equipment. CAL-MAT personnel supported all these logistics functions. Additionally, CAL-MAT provided support in the field by staffing mission support teams.

Logistical Advance Teams staffed by CAL-MAT members erected surge tents at hospitals around the state and set up equipment for patient care either in the tents or in hospital space that had been converted for patient care. When oxygen became a scarce resource, CAL-MAT teams established oxygen depots, using industrial scale oxygen concentrators to support health care facilities. Devereaux et al. described the California response to oxygen shortages.[18] COVID-19 monoclonal antibody infusion centers across California were initially paired with ACSs for logistical and supply reasons and utilized CAL-MAT staffing support within the infusion centers. As these sites expanded to more than 30 around the state, contract staff were substituted, but CAL-MAT continued to provide logistical support.

Concurrent Disasters

Given the extended duration of response to COVID-19, concurrent disaster and emergency incidents were expected. Both 2020 and 2021 were severe and relentless fire seasons in California. Under contract with the California Department of Forestry and Fire Protection (CAL FIRE), CAL-MAT provided medical support to 23 fire incident base camps in 2020 and 7 during the summer and fall of 2021, including 2 of the largest fires in California history (Dixie and Caldor). In partnership with other organizations, CAL-MAT also provided critical medical resources for displaced residents evacuated to shelters. Backer et al. have detailed the wildfire medical support.[19,20]

In early 2021, EMSA was asked to assist with medical care to immigrants legally entering California through ports of entry and detention facilities at the Mexico border. In coordination with other state agencies and non-governmental organizations, 4

https://doi.org/10.1017/dmp.2023.35 Published online by Cambridge University Press

Table 2. Alternate Care Site Medical Staffing Matrix (sample)*

Type	EMSA	CAL-MAT	MIL	CSG	CTR	Total
Physician	0	1	0	0	0	**1**
Advanced Practice Provider (Nurse Practitioner/Physician Assistant)	0	1	0	0	0	**1**
Registered Nurse	0	2	1	1	0	**4**
Ancillary Clinical (EMT/Paramedics)	0	2	3	0	10	**15**
Pharmacist	0	1	0	0	0	**1**
Safety Team	0	2	0	0	0	**2**
Behavioral Health**	0	0	3	1	0	**4**
Clinical Administration	0	4	3	0	0	**7**
Mission Support Team (Org chart)	1	9	0	1	0	**11**
Total	1	17	10	3	10	**45**

Legend:
MIL (Reserve and Active-Duty Military, activated Nationally and Internationally, Federal Disaster Declaration).
CSG: California State Guard (activated for State of California responses by Governor).
CTR: Contracted staff members (contracted ambulance groups and clinical staff onsite).
* Staffing for a point in time for approximately 25-30 patients with 24-hour coverage. Other considerations for a safe and successful operation include additional services/contracted vendors for sanitation/hygiene, food, billeting, security, etc., and establishment of community partnerships.
** Behavioral Health dedicated to staff support.

testing, isolation, and quarantine shelters were staffed by CAL-MAT in 2 border counties. The first facility was established in tents, but all operations were subsequently moved to hotels. CAL-MAT provided health assessments, first aid, medical observation, and care to those with mild illness from COVID-19 or other health problems. COVID-19 vaccine and monoclonal antibody treatment was offered to all eligible adults and children.

Challenges to CAL-MAT Expanded Missions and Staffing

Initially, there were enough volunteers to staff CAL-MAT missions, since many elective medical services were canceled, resulting in health care workers being furloughed and few opportunities for new graduates. Over time, this trend reversed, and staffing became challenging. Additionally, prolonged deployments became a problem due to the state's employment restrictions limiting emergency appointments to 60 working days within 12 consecutive calendar months.[21] This regulation became a significant issue for CAL-MAT staffing resources, especially nursing, until it was waived by an Executive Order in March 2020[22]; however, a constitutional limit of 189 days per a 12-month period for temporary hires could not be waived, resulting in unanticipated demobilization of some EMSA and CAL-MAT personnel. California instituted several other changes in the strategy to address medical surge and shortages of health care workers that reduced the need for CAL-MAT personnel. Governor Newsom created Health Corps "to provide critically needed services during this public health crisis." These professionals were used to supplement staffing in health care facilities, mainly acute care and intensive care. Eventually, this program was transferred to EMSA and will be integrated with the CAL-MAT program but used for distinct purposes.[23]

During 2020 through the COVID-19 surge in early 2022, there were 4500 individual CAL-MAT deployments and 476 Health Corps deployments. As the number and duration of health care missions continued to increase, California began using contract workers to staff operations and fulfill personnel resource requests from hospitals. In early 2022, staffing was transitioned to contract personnel for the immigrant testing, quarantine, and isolation sites since CAL-MAT was not designed for the indefinite time frame of these missions. From March 2020 to March 2022, this shift to contract personnel resulted in 61 000 out-of-state license approvals by EMSA, primarily RNs and LVNs but also physicians and advanced practice providers. Finally, the strategy for supporting medical surge in hospitals shifted from external sites to expanding care within facilities by adding equipped and staffed beds. Since all the support services were already available within the facility, care could be delivered more efficiently.

Qualities and Considerations for Medical Response Teams

Of the key team qualities outlined by Oldenburger et al.,[2] CAL-MAT demonstrated adaptability and creativity on many levels. As medical resource needs arose in communities throughout the large and diverse state of California, the CAL-MAT program expanded rapidly and deployed individual personnel and teams to support completely new and flexible missions.

The urgency and number of new unique missions continually challenged command and control as teams were rapidly formed and staff were rotated. The ICS command structure provided for rapid yet flexible growth, despite the recruitment of less experienced personnel. ICS is also designed to integrate different levels and types of organizations into a coordinated response. Each of the CAL-MAT missions relied on a combination of local, state, and federal resources for services, supplies, and site support. The California Military Department (Cal Guard) were especially valuable partners in the field. When in normal times, a mission might have been run by a single agency with limited support from others, the overwhelming demands on every agency and scale of operations created complex missions with multiple agencies participating.

Staffing demands also impacted availability of experienced leadership. Use of responders and providers with limited or no disaster response experience led to problems in medical decision making, team functioning, and personal behavior, all of which contributed to team dysfunction and interpersonal conflict. One compensation was to provide standardized processes for efficiency, consistency, and quality control. CAL-MAT standardized processes included staff applications and onboarding, orientation and training, formularies, occupational and safety procedures, such as fit testing for N-95 respirators, and clear procedures for donning and doffing. Moreover, medical practice protocols previously had not been implemented, leading to broad variability in

https://doi.org/10.1017/dmp.2023.35 Published online by Cambridge University Press

Table 3. Factors to Consider in the Development of a Medical Response Team Based on the experiences of CAL-MAT and the California Emergency Medical Service Authority, this list describes factors for consideration in the development of a medical response team

1. Establishing the need
2. Identification of the authority to create and manage program
3. Parameters of service
4. Interface or integration with other response agencies and authorities
5. Legal authority and scope for disaster response
6. Funding source(s)
7. Flexible response approach for all-hazard disasters
8. Program development planning team
9. Membership requirements and application processes
10. Membership database, technology platform(s)
11. Human resource management for license verification, timekeeping, and payroll
12. Membership support for worker safety and health, work related injury or illness
13. Behavioral health support
14. Unit structure, leadership, and support
15. Medical direction
16. Communication and information technology support
17. Orientation and training
18. Staffing strategies, polling for availability and workforce readiness to deploy
19. Development and implementation of policies and procedures with ongoing revisions
20. Scope of practice
21. Logistics support inclusive of storage, transportation, supply maintenance, and resupply
22. Biomedical support
23. Vendor arrangements
24. Demobilization process
25. Process for quality improvements and adaptations during missions
26. Program evaluation and modification
27. Continuity of program
29. Leadership support to maintain critical budget and political support

provider and caregiver staff approaches. Practice protocols became standardized through a process of sharing documents and practices across sites and the review and approval by clinical providers who met weekly under the leadership of the CAL-MAT Medical Director. These protocols were updated based on evidence-based data and resources.

Another need identified for the workforce was behavioral health support. While continuity of staff may benefit missions, it can also lead to stress and fatigue. Recognition of stress factors and the support of personnel in understanding and adherence to the expected job performance and Code of Conduct are keys to better mission and workforce wellness outcomes.[24–26] In addition, the CAL-MAT program has recognized the importance of behavioral health access for personnel in the field. With the expansion of telehealth, this can now be remote with an on-call provider.

Limitations

This report is based on observed experiences that capture only 1 part of the overall California response to the COVID-19 pandemic. There were many other actions and agencies involved with pandemic response that are not included in this review of CAL-MAT operations. The statistics of numbers of staff and missions were compiled from situation status reports and other documentation; while providing a realistic perspective, these may not be precise numbers. We cannot determine how unique our experience is, since this report was not compared to data from similar experiences in other state teams.

Conclusions

Throughout 2020 and 2021, California used the CAL-MAT program for medical response to the COVID-19 pandemic as well as other concurrent disasters. The program expanded rapidly and provided flexible deployment of individual personnel and teams to support completely new and adapted missions as medical resource needs arose throughout California. Table 3 lists considerations from the CAL-MAT experience for development of medical response teams. The ability to respond to significant local and statewide emergencies through this structured, yet flexible, approach to the use of temporary staff on medical assistance teams can serve as a template for other states seeking to build or expand medical disaster response frameworks.

Supplementary material. To view supplementary material for this article, please visit https://doi.org/10.1017/dmp.2023.35

Acknowledgments. We thank Kelly Coleman, Esam El-Morshedy, Susan Erbs, Michael Frenn, Heidi Hutchison, and Mitch Metzner for their contributions of information. The authors recognize the tremendous work, organization, and leadership by individuals at the California Emergency Medical Services Authority (EMSA) and CAL-MAT, as well as the countless volunteer responders who worked tirelessly throughout California during the COVID-19 pandemic and 2020 wildland fire responses.

Author contributions. All authors contributed to the development of the manuscript and provided content and edits for this article.

Conflict(s) of interest. None.

References

1. **Classification and Minimum Standards for Emergency Medical Teams**. World Health Organization. Published 2021. Accessed May 10, 2022. https://apps.who.int/iris/bitstream/handle/10665/341857/9789240029330-eng.pdf?sequence=1&isAllowed=y
2. **Oldenburger D, Baumann A, Banfield L.** Characteristics of medical teams in disaster. *Prehosp Disaster Med.* 2017;32(2):195-200. doi: 10.1017/S1049023X16001461
3. **Arziman I.** Field organization and Disaster Medical Assistance Teams. *Turk J Emerg Med.* 2016;15(Suppl 1):11-19.doi: 10.5505/1304.7361.2015.79923
4. **Fuse A, Yokota H.** An analysis of Japan Disaster Medical Assistance Team (J-DMAT) deployments in comparison with those of J-DMAT's counterpart in the United States (US-DMAT). *J Nippon Med Sch.* 2010;77(6):318-324. doi: 10.1272/jnms.77.318
5. **Jang JH, Cho JS, Lim YS, *et al.*** Disaster response to a mass casualty incident in a hospital fire by Regional Disaster Medical Assistance Team: characteristics of hospital fire. *Disaster Med Public Health Prep.* 2020;1-4. Published online August 26, 2020. doi: 10.1017/dmp.2020.164
6. **Kim H, Ahn ME, Lee KH, *et al.*** Disaster medical assistance in super typhoon Haiyan: collaboration with the local medical team that resulted in great synergy. *Ulus Travma Acil Cerrahi Derg.* 2015;21(2):143-148. doi: 10.5505/tjtes.2015.54770

7. **Australian Medical Assistance Teams (AUSMAT)**. Australian Government. Department of Foreign Affairs and Trade. Published December 20, 2022. Accessed July 1, 2021. https://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/public+health/disaster+management/australian+medical+assistance+team/australian+medical+assistance+team#:~:text=The%20Australian%20Medical%20Assistance%20Team,intentionally%20when%20services%20are%20overwhelmed
8. **NZMAT Background**. Ministry of Health. New Zealand Government. Published April 12, 2022. Accessed July 1, 2021. https://www.health.govt.nz/our-work/emergency-management/new-zealand-medical-assistance-team/about-new-zealand-medical-assistance-team/nzmat-background
9. **Emergency Disaster Relief Taking Back as Many Smiles as Possible**. JICA Annual Report 2019. Accessed May 20, 2022. https://www.jica.go.jp/english/publications/reports/annual/2019/c8h0vm0000f7nzvn-att/2019_24.pdf
10. **Sklar DP, Richards M, Shah M, Roth P.** Responding to disasters: academic medical centers' responsibilities and opportunities. *Acad Med.* 2007;82(8):797-800. doi: 10.1097/ACM.0b013e3180d0986e
11. **Mace SE, Jones JT, Bern AI.** An analysis of Disaster Medical Assistance Team (DMAT) deployments in the United States. *Prehosp Emerg Care.* 2007;11(1):30-35. doi: 10.1080/10903120601023396
12. **CA Health and Safety Code §1797.150 HEALTH AND SAFETY CODE – HSC, DIVISION 2.5**. EMERGENCY MEDICAL SERVICES [1797-1863] (Division 2.5 added by Stats. 1980, Ch. 1260.) CHAPTER 3. State Administration [1797.100-1797.197a] (Chapter 3 added by Stats. 1980, Ch. 1260. ARTICLE 4. Medical Disasters [1797.150-1797.153] (Article 4 added by Stats. 1980, Ch. 1260.) (Amended by Stats. 2013, Ch. 352, Sec. 334. (AB 1317) Effective September 26, 2013. Operative July 1, 2013, by Sec. 543 of Ch. 352.). Accessed July 17, 2022. https://leginfo.legislature.ca.gov/faces/codesTOCSelected.xhtml?tocCode=hsc
13. **Masri S, Scaduto E, Jin Y, Wu J.** Disproportionate impacts of wildfires among elderly and low-income communities in California from 2000–2020. *Int J Environ Res Public Health.* 2021;18(8):3921. doi: 10.3390/ijerph18083921
14. **Li S, Banerjee T.** Spatial and temporal pattern of wildfires in California from 2000 to 2019. *Sci Rep.* 2021;11(1):8779. doi: 10.1038/s41598-021-88131-9
15. **California Public Health and Medical Emergency Operations Manual**. California Public Health and Medical Emergency Operations Manual Workgroup. EMSA. Published 2011. Accessed May 17, 2021. https://emsa.ca.gov/wp-content/uploads/sites/71/2017/07/EOM712011_DMS.pdf
16. **Christensen K, Metzner M, Lovett-Floom L, *et al.*** Utilization of alternate care sites during COVID-19 surge and mass care: California 2020–2021. *Disaster Med Public Health Prep*. 2022;1-19. Published online April 1, 2022. doi: 10.1017/dmp.2022.93
17. **Breyre AM, Sloane B, Herring C, *et al.*** Establishment of an alternate care site (ACS) in Imperial County during COVID-19. *West J Emerg Med.* 2021;22(3):608-613. doi: 10.5811/westjem.2020.12.49237
18. **Devereaux AV, Backer H, Salami A, *et al.*** Oxygen and ventilator logistics during California's COVID-19 surge: when oxygen becomes a scarce resource. *Disaster Med Public Health Prep*. 2021;1-7. Published online August 16, 2021. doi: 10.1017/dmp.2021.267
19. **Backer HD, Wright C, Dong J, *et al.*** Medical care at California wildfire incident base camps. *Disaster Med Public Health Prep*. 2021;1-8. Published online November 23, 2021. doi: 10.1017/dmp.2021.321
20. **Backer H, Duncan D, Christensen K, *et al.*** Medical support for California wildfire response. *Disaster Med Public Health Prep*. 2021;1-8. Published online December 22, 2021. doi: 10.1017/dmp.2021.347
21. **California Code of Regulations: Authority Cited: Section 18701, Government Code**. Reference: Section 19888.1, Government Code. 303. Duration of Employment. 2CA ADC § 303 BARCLAYS OFFICIAL CALIFORNIA CODE OF REGULATIONS. Thomson Reuters Westlaw. This database current through 17 March 2023. Accessed September 12, 2021. https://govt.westlaw.com/calregs/Document/I02D021535A0A11EC8227000D3A7C4BC3?contextData=%28sc. Default%29&transitionType=Default&bhcp=1
22. **Newsom G.** Executive Order N-25-20. Executive Department State of California. Published March 12, 2020. Accessed September 12, 2021. https://www.gov.ca.gov/wp-content/uploads/2020/03/3.12.20-EO-N-25-20-COVID-19.pdf
23. **Disaster Medical Response Programs**. California Emergency Medical Services Authority (EMSA). Updated June 30, 2022. Accessed July 18, 2022. https://emsa.ca.gov/disaster-medical-response-programs/
24. **Arpacioglu S, Gurler M, Cakiroglu S.** Secondary traumatization outcomes and associated factors among the health care workers exposed to the COVID-19. *Int J Soc Psychiatry.* 2021;67(1):84-89. doi: 10.1177/0020764020940742
25. **Buselli R, Corsi M, Veltri A, *et al.*** Mental health of health care workers (HCWs): a review of organizational interventions put in place by local institutions to cope with new psychosocial challenges resulting from COVID-19. *Psychiatry Res.* 2021;299:113847. doi: 10.1016/j.psychres.2021.113847
26. **Position Statement: Moral Distress in Times of Crisis**. American Association of Critical-Care Nurses (AACN). Published March 2020. Accessed September 30, 2021. https://www.aacn.org/~/media/aacn-website/policy-and-advocacy/stat-20_position-statement_moral-distress.pdf?la=en

APPENDICES:

Appendix A: CAL-MAT Code of Conduct. Accessed October18, 2021 Code of Conduct 09-15-20 (ca.gov)

https://emsa.ca.gov/wp-content/uploads/sites/71/2020/11/Code-of-Conduct-09-15-20.pdf

Appendix B: Employers and Employees Employment Protections for Persons Engaged in CAL-MAT Activation EMSA. Accessed October18, 2021 Information-for-Employers.pdf (ca.gov)

https://emsa.ca.gov/wp-content/uploads/sites/71/2020/03/Employers-Authorization.pdf

https://doi.org/10.1017/dmp.2023.35 Published online by Cambridge University Press