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What Occupational and Environmental Medicine providers need to know when responding to a disaster? Lessons learned from the response to the 2010 Haitian earthquake.

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The American College of Occupational and Environmental Medicine's (ACOEM) ten core competencies include a wide range of skills that many occupational medicine physicians use on a daily basis. One of the competencies, Disaster Preparedness and Emergency Management is often drilled and practiced but, in reality, rarely tested. As a result, it is critical to capture lessons learned from real life experiences such as the 2010 earthquake in Haiti.

On January 12, 2010, a 7.3 magnitude earthquake devastated Haiti, already the most underdeveloped and poorest nation in the Western hemisphere. An estimated 200,000 Haitians were killed immediately

and up to 1,000,000 residents were displaced. The human toll included many of Haiti's own health care providers—an entire class of nursing students were killed when their building collapsed in the late afternoon on January 12th.¹ Mortality numbers continue to rise as infectious diseases spread, post surgical complications develop and malnutrition worsens.

In the five months since the earthquake, thousands of volunteers from across the globe have traveled to Haiti to assist in the rescue, recovery and rebuilding efforts. Though noble in cause, many of the volunteers are not trained disaster responders and few have experience working in austere environments. Though the numbers of these volunteers trained in Occupational and Environmental Medicine is small, the role to be played by OEM providers is critical. Of the ten ACOEM core competencies, seven (environmental health, work fitness integration, hazard recognition/evaluation/control, health and productivity, public health/surveillance and disease prevention and OEM administration) are essential in disaster response operations such as those in Haiti.

What is the Occupational Medicine Physician's role?

As with most jobs, the Occupational Medicine Physician's (OMP) role and responsibilities depend on the context of the disaster or emergency (earthquake, terrorism attack, tsunami, pandemic, etc.), the organization or entity to which the OMP reports, the experience of the OMP, and most importantly, what the situation on the ground demands. This idea of the situation defining what volunteers do in the setting of a disaster or emergency seems like a mundane and simple concept. However, too often, inflexible mindsets and situational challenges limit the expert's (including physicians) ability to utilize highly valued skills sets. These challenges may be logistical, organizational, security threats, environmental threats, personal illness/injury and interpersonal professional conflicts/relationships. The key is mental, physical and emotional flexibility. Because of many OMP's unique and diverse training and experience in public health, leadership and administration, military service, public service, clinical medicine, there are a wide range of roles the OMP's may be asked to fill—Occupational Health and Preventive Medicine Specialist², Red Cross Team Leader, Military Liaison Officer, Clinical Physician—just to name a few possibilities. In all of these positions, the OMP's core competencies can serve as reference and guidance for daily operations.

What to do before you respond to a disaster?

Be prepared. Avoid being part of the problem, so that you can be part of the solution.

While prospective volunteers tend to focus on the work that they will be responsible for at the site of the disaster, planning and especially training are critical to individuals and group's performance in emergency response. There are several strategies to achieve success.

1. **Find a team.** An initial step that can greatly enable the planning and training goals is for health providers to join, register or affiliate with volunteer organizations. Most well-established organizations with expertise in disaster response and public health perform on-going needs assessments and have the foresight to assign volunteers to mission-based roles that are matched with the volunteer's training, expertise and goals. Affiliations with organizations can build capacity

locally as well. There are national programs such as those coordinated through the Department of Health and Human Services: the Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP, esarvhp@hhs.gov), the Medical Reserve Corps (MRC, www.medicalreservecorps.gov), and the National Disaster Medical System (NDMS, www.hhs.gov/aspr/oepo/ndms). The NDMS provides emergency and disaster response training and also coordinates response efforts by DMATs and sister teams such as IMSURTs (International Medical Surgical Response Teams) and DMORTs (Disaster Mortuary Operational Response Teams). There are numerous local, regional, and national nongovernmental organizations (NGOs), secular and non-secular, that are very active in disaster response efforts and depend upon volunteer healthcare professionals. Two sources for information about nongovernmental organizations are National Voluntary Organizations Active in Disaster (www.nvoad.org) and the World Health Organization (www.who.org).

- 2. Get training.** A second step for prospective volunteers to take before jetting off as a disaster response volunteer is to develop basic competencies in disaster medicine by completing formal familiarization training. Briefly, disaster medicine is a multidisciplinary field that involves the delivery of care in austere, often harsh conditions, with limited resources. Disaster medicine training focuses individual acute care (including mental health) and public health (including environmental health) concerns in the context of the phases of disaster response—early response/recovery through reconstruction. Formal board certification is possible via the America Board of Disaster Medicine (<http://www.abpsus.org/disaster-medicine-eligibility>) and extensive formal courses of instruction are available through professional societies and the National Disaster Life Support Foundation (<http://www.ndlsf.org>). However, many providers will not have the availability or desire to pursue extensive training and short courses are available through multiple organizations such as the Federal Emergency Management Agency (www.fema.gov), the American Red Cross (www.redcross.org), and the American College of Surgeons Committee on Trauma (www.facs.org/trauma/disaster/dmep_course.html). Self-paced online training in the National Incident Management System (NIMS, <http://www.fema.gov/emergency/nims/>) and the Incident Command System (ICS, available at www.fema.gov) are essential training courses that provide the lexicon for organizational structure and function in emergency and disaster response efforts. As with any professional situation, subject matter expertise and knowledge that is contributed in a respectful, tactful manner will allow you to have a more significant impact to the team, will avail you to a more rewarding experience, and lastly, will build and preserve relationships that often last a lifetime.
- 3. Perform a self assessment.** Now that you are affiliated and trained, a necessary third step prior to departure is to perform prospective self-assessment, environmental threat and occupational hazard assessment. This begins with a self-assessment prior to departing. Ask yourself the following questions: Do I have the proper training for what I will be doing? Am I fit for duty?; Do I have the recommended vaccinations (Tetanus/Diphtheria, Typhoid, Meningitis, Hepatitis A, Rabies) and prophylactic medications (e.g. malaria, chloroquine-sensitive); Is my fitness level sufficient to perform the anticipated activity level?; Do I have ample supply of my personal medications?; Do I

have proper footwear to protect against injury?; Are my family and employer situations stable? What is the weather like at my destination? (the majority of the days in Haiti in January 2010 were humid and hot, with highs exceeding 95°F; What will be the working conditions?(DMAT and IMSURT members endured 105°F temperatures inside surgical tents and there were mild heat stress casualties).

4. **Be prepared.** Your protection is critical to the success of the primary mission of the relief effort. Consider travel medical insurance and medical evacuation insurance—both very reasonably priced and available through vendors such as International SOS (www.internationalsos.com). You should familiarize yourself with the disaster response site. Consider preparing a three ring binder or folder with a brief country overview that includes maps, information about currency, and basic civil society structure. The CDC (www.cdc.gov) and the CIA (<https://www.cia.gov/library/publications/the-world-factbook/>) provide excellent country profiles and CDC (wwwnc.cdc.gov/travel) and Shoreland, INC (www.tripprep.com/www.travax.com) are excellent travel medicine resources.

There are a few very important threats that are pertinent for Haiti and worth highlighting: mosquito-borne illness in addition to malaria (30-35% DEET or picardin \geq 20% to protect against dengue fever); poisonous snakes displaced to uncommon areas (such as around your tent or living space); violent crime; airborne and water borne toxicants; extremely high prevalence of tuberculosis and HIV; dust from rubble (many organizations recommended exclusion of volunteers with asthma). Another critical piece of advice that is well known to experienced travelers, backpackers and military service members—“always know where you are and where you are going and ensure that your body language and behavior gives the appearance that this is so”—a simple concept that pays dividends in prevention of opportunistic violence and getting lost. How will you know where you are? Orient yourself with a map before you go, make notes on the map of important locations (U.S. Embassy, Airport, hospitals, etc.) and then bring the map with you on your trip. Purchase a compass and learn how to use it to orient yourself and perform basic land navigation (even if you have a GPS—any piece of electronics has the potential to fail you at the most critical time).

What are the challenges that volunteers can expect upon arrival after a disaster has occurred?

The first assumption is that no matter how well organized you are before you leave and no matter how much you have trained individually or as a group, expect that the situation on the ground and the demands upon you will not entirely be what you expect. And, expect that the situation will change as soon as you adjust to the last change. There is an old saying, paraphrasing Clausewitz, no plan, regardless of its quality, survives its first encounter with the enemy. Be flexible, but stay focused. An illustrative example of the fluidity of planning and plans from the Haiti response and Dr. Parmet's May 2010 letter to the editor in JOEM: “The role of the occupational health provider at the level of the Disaster Medical Assistance Team (DMAT) has not been defined and has been a function of the individual teams...General information was briefed to the team before deployment. However, all information was cautionary, and the actual deployment assignments were not made until shortly before the teams left. The teams were not informed of their assignments until they arrived in Haiti.”³ And, your

job may change. Dr. Parmet described how three non-surgical physicians were reassigned from outpatient clinics and “strike teams” to fulfill roles as inpatient hospitalists.⁴

In the setting of disaster response, expect that the living conditions will be meager, if not dangerous. For example, in Haiti the threat of aftershocks was real and a reality—buildings that were left standing were not necessarily safe. Water may not be running and will likely not be potable (drinkable). Expect that there will be no electricity and you will need an ample supply of batteries to operate essential items such as a flashlight (see checklist at the end of the article). Personal security and the threat of violence may be the most important threat and challenge.⁵ Five thousand prisoners escaped from the National Penitentiary, which was in close proximity to the GHESKIO clinic and a refugee camp.⁶

Enjoy yourself, contribute, but try not to be the casualty.

This is disaster response and emergency preparedness lesson number one. It is impossible to take care of casualties or to lead a DMAT medical team if you are the casualty. In his JOEM letter, Dr. Parmet notes that 13 of the 14 gastroenteritis cases that required IV rehydration were from the IMSURT (surgical) team.⁷

There are several key rules of thumb. First, pre-travel training, planning and preparation greatly reduce the susceptibility to environmental threats (e.g. infectious diseases or heat stress). Second, an environmental threat assessment and an occupational hazards analysis upon arrival will re-affirm the pre-travel assessments and highlight key items that were not predicted. Third, ensure that there is an emergency action plan for yourself and the volunteers at your location—and, practice or drill this plan. Fourth, assemble a “comfort care” medical supply kit that contains items that may be used to treat common illnesses, symptoms and injuries that may occur en route during your travel from home to your volunteer destination. Some items to consider for your “comfort care” kit: over-the-counter and prescription medications, basic wound care materials, splinting materials and a barrier mask (for CPR). Finally, adherence to the principles of prevention is critical. You will hear many creative, sometimes desperate excuses for diverging from sound operational practices including, “it is too busy” or “this isn’t the U.S.” Your preventive maintenance strategy should be comprised of several tenants: stay hydrated, make sure that you eat adequate calories, wash your hands frequently, take anti-malarials without failure, wear protective clothing (sun and biting insect protection), wear sunscreen (SPF 15 or higher, water/sweat proof), debrief with colleagues (decompress stress), schedule time to sleep (or take brief naps), and maintain contact with family and friends at home. The OMP will be a key proponent and enforcer of preventive health and safety strategy.

Knowing who is who in the zoo – how to get along and what to do if you don’t.

Nongovernmental Organizations (NGOs)

At the time of the Haiti Earthquake, there were over 10,000 NGOs functioning in Haiti. Though some of these NGOs had been up and running for years in some cases, many were not accustomed to collaborating with each other or with the Haitian government.⁸ Unfortunately, many NGOs function without integration, collaboration and coordination. Often they work in parallel to government services

that may or may not be serving the Haitian citizenry well.⁹ It goes without saying that in Haiti, there is and was no federally or locally integrated system analogous to the U.S. NDMS or NIMS. Haiti is not unique in this regard. In developing countries across the globe, interrelationships and collaboration between NGOs is at varying degrees of sophistication.

In Haiti, the most prominent NGO is Partners in Health (PIH) and its Haitian branch, Zanmi Lasante (ZL), both founded by Dr. Paul Farmer in 1987. PIH/ZL has operated for decades using an approach called “accompaniment.” Accompaniment involves shared responsibility and participation in problem solving with the host nation leadership ideally taking the primary leadership role. Partnering with local assets is often critical to mission success. Pulitzer price winning author Tracy Kidder describes an excellent example of how one PIH team avoided a common pit-fall of NGOs independently bypassing Haitian authorities. With the help of an experienced PIH physician, a Haitian hospital director “was able to prevent some NGOs from doing just what they wanted. The good thing was that he could speak Creole.”¹⁰ Although it is not specified what this NGO was interesting in independently doing, the key message is to build relationships early with your host nation counterparts, try to understand and respect cultural nuances and practices, and recognize the value of working together, not in parallel.

Military

The United States military is now functions as the nation’s quick reaction force for disaster response. The expanding purview of the Department of Defense means that increasingly, the military will be the first group present in the aftermath of a disaster or humanitarian crisis. This policy has advantages and challenges. However, understanding the military’s mindset, operating procedures and assets can dramatically improve your teams overall response efforts.



The US military is unrivalled in its ability to provide heavy lift logistics, MEDEVAC, immediate supplies, security, communication infrastructure and organizational capacity. Soldiers from the 82nd Airborne (USA) were some of the first people on the ground in Haiti and the USNS Comfort provided a majority of the advanced surgical care in the weeks after the earthquake. The OMP should acknowledge this capacity and encourage cooperative action between the civilian groups and the military. Early actions should include contacting the US embassy, USAID, and on the ground command staff. Request a face to face meeting or offer to open your site for a facility tour. This builds trust and fosters a strong working relationship.

When discussing operations with military personnel, be direct, specific, and respectful. Most importantly, have a plan. They want to help, but may not be aware of local needs. For example, if you are working in a hastily formed tent hospital, you may need water, tents, supplies and security. In discussion with the military liaison, state your needs in terms of specific requirements and then provide local information about potential landing zones (LZ), road conditions, numbers of casualties/ staff, etc. The military is extremely good at planning, but they demand data. In Fond Parisien and Jimani,

members of one group had strong contacts with the air officer for the USNS Comfort and the ability to provide critical information such as LZ grid coordinates, an organized patient manifest and reliable lines of communication. As a result, this group was able to facilitate bidirectional patient flow and improve clinical operations.

One contentious issue relates to the presence of armed personnel in humanitarian areas. You should help to determine a specific policy for your facility (most have a general policy of no weapons) and then relay this information with respect. In Port au Prince, most of the US Army (USA) personnel who assisted with supplies and patient transport were unarmed. However, to the east, during a site assessment for a dignitary visit, the diplomatic security personnel were armed when they entered a rehabilitation facility. The site director, accosted the agents and demanded that they disarm or he would have them fired. This is not the way to react; you look unprofessional and jeopardize a potentially important ally. Diplomatic security personnel will always be armed, but they will usually be discrete. Explain your policy and they will generally work with you in a respectful manner.

A parting tip:

What is a “go bag”? This is a military term for a small bag that you keep within arm’s length of your person at all times. At the very least, your “go bag” should contain: your personal medications (including malarial prophylaxis), a waterproof jacket, food to sustain you for one day (cliff bars, nuts, etc.), a small first aid kit, a whistle (preferably hanging around your neck on a string; blow this very loudly if an animal or human attacks you), waterproof matches in a sealed container, a large heavy duty trash bag (multi-functional, can serve as a ground cloth, poncho, etc), small roll of duct tape (great for fixing things including a blistered heel or toe), copies of your passport and credit cards in a zip-lock bag, cash, flashlight (preferably a head lamp with extra batteries), water carrying container, iodine tablets (for purifying water). Extras for the “go bag” include an extra set of undergarments and socks; satellite phone (if cellular phone service is disrupted); flare.

So, in conclusion, be flexible, be prepared to lead and be led, and above all, be ready and willing to learn from others.

¹ (Lappi, 2010)

² (Parmet, 2010)

³ (Ibid)

⁴ (Ibid)

⁵ (Jean William Pape, 2010)

⁶ (Ibid)

⁷ (Parmet, 2010)

⁸ (Kidder, 2010)

⁹ (Ibid)

¹⁰ (Ibid)

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