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Disaster relief in post-earthquake Haiti: Unintended consequences of humanitarian volunteerism

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Summary This article provides an overview of US humanitarian relief efforts in Haiti following the earthquake on January 12, 2010. Humanitarian aid arrived rapidly from many sources and was largely provided by organized and skilled humanitarian volunteers. There are however multiple impacts on the existing health care systems, as well as the pharmaceutical and medical supply chain created by massive relief efforts involving personnel, medicines, supplies and equipment that should be considered even in the immediate post-disaster period. Additionally the consequences of short-term medical missions by secular and non-secular NGOs should be considered carefully both in the post-disaster period and as ongoing support to underserved populations.

On January 12, 2010 an earthquake of magnitude 7.0 struck Haiti, the epicenter was 25 km WSW of Port-Au-Prince (PAP) a city of 3 million. Pre-earthquake Haiti was recognized as the poorest nation in the Western hemisphere, a site of governmental instability, with a lax to non-existent regulatory environment and a minimal governmental oversight or taxation. At the time of the earthquake there were approximately 10,000 NGOs working in Haiti. At the time of the earthquake the following facts applied to Haiti:

- 54 percent of Haitians live on less than $1/day (UNDP HDR 2007) while illiteracy is estimated at 44 percent;
- Unemployment rate in the formal sector is between 70 and 80 percent;
- 46 percent of Haitians do not have sustainable access to potable water (UNDP HDR 2007);
- Haiti ranks 154 of 177 countries in the UN's Human Development Index.[1]

Haiti demographics

Population: 9,035,536
Age structure:
0–14 years: 38.1% (male 1735,91; female 1,704,383)
15–64 years: 58.5% (male 2,621,059; female 2,665,447)
65 years and over: 3.4% (male 120,040; female 188,690)
Median age: (2009 est.)
Total: 20.2 years

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Male: 19.8 years
Female: 20.7 years
Population growth rate: 1.838% (2009 est.)
Birth rate: 29.1 births/1000 population (2009 est.)
Death rate: 8.65 deaths/1000 population (July 2009 est.)
Net migration rate: −2.07 migrant(s)/1000 population (2009 est.)
Sex ratio:
At birth: 1.03 male(s)/female
Under 15 years: 1.02 male(s)/female
15−64 years: 0.98 male(s)/female
65 years and over: 0.64 male(s)/female
Total population: 0.98 male(s)/female (2009 est.)
Infant mortality rate:
Total: 59.69 deaths/1000 live births
Male: 66.18 deaths/1000 live births
Female: 53.13 deaths/1000 live births (2009 est.)
Life expectancy at birth:
Total population: 60.78 years
Male: 59.13 years Female: 62.48 years (2009 est.)
Total fertility rate: 3.81 children born/woman (2009 est.)
HIV/AIDS - adult prevalence rate: 2.2% (2007 est.)
Ethnic groups: Black 80−85%, Mulatto and White 15−20%
Religions: Roman Catholic 80%, Protestant 16% (Baptist 10%, Pentecostal4%, Adventist1%, other 1%), none 1%, other 3%
Languages: French (official), Haitian Creole (official), Spanish (non official)
Literacy: (2008 est.)[3] Definition: Age 15 and over that can read and write
Total population: 61.0%[2]

I participated in 2 distinctly different missions during the months following the earthquake. As a regional medical officer for the National Disaster Medical System (NDMS) I was a member of a command team involved in directing the Health Human Services (HHS) disaster response teams and communicating with other governmental and non-governmental organizations (NGOs). The second was a long-standing private humanitarian mission that I have participated in since 2000. That is a training mission of the Seattle-King County Disaster Team in which medical care is provided in a rural village in Western Haiti. The goal is to provide intermittent medical care to an underserved area and to train team personnel in providing care in the austere environment.

Articles 19 and 23 of the Constitution of the Republic stipulate that the State has the absolute obligation to guarantee the right to health and the obligation to provide all citizens in all territorial divisions appropriate means to ensure protection, maintenance and restoration of their health.[3,4] The constitution does recognize the obligation to provide health care to Haitian citizens, however resources have never been available.

The term 'medical tourism' was used many years ago as a disparaging term referring to third world volunteerism on the part of medical practitioners. In the intervening years the term is used in reference to seeking medical care across international borders to minimize expense and sometimes to avoid regulatory restrictions.[5] Large disasters of all types attract well-meaning medical volunteers who are driven to respond regardless of their own personal preparedness or their association with an organization able to provide the necessary infrastructure for a thoughtful, safe and useful disaster response. Many questions arise regarding these endeavors and the benefits they provide for the impacted communities and to the volunteers themselves.[6] There is a paucity of literature on this subject of benefits of Short Term Medical Missions (STMM). Ver Beek investigated the attitudes of local Hondurans following the efforts of US home-building teams compared to local Honduran teams. The perception of the recipients of relief showed no difference in the efficacy of the foreign vs. local teams and commented that the foreign team would have been able to provide 12 more homes per team had they sent money instead of traveled to the area[6,7] Graves reviewed 41 public articles on STMM. She found no discussion of regional health improvement associated with the missions; 'positive outcomes' were described as the personal benefits to the volunteer participants.[6,8]

The media is mobile and well resourced and will always arrive to impacted areas prior to large organized relief operations. The horrific images provided by the media can inspire many to become involved in the relief efforts regardless of their individual skill in providing relief in the austere, resource poor setting with major disruption of the basic domestic and health care infrastructure that was inadequate prior to the disaster.

Immediate post-disaster response

The immediate post-disaster needs of the impacted involve re-establishment of essential services such as shelter, food and water distribution, sanitation, vector control and immunization. Contrary to the common wisdom, rapidly disposal of bodies from the disaster area is not a high priority. Although disturbing and unpleasant there is no evidence that cadavers pose an immediate public health risk. Rapid disposal of bodies can deprive families of the knowledge of their loved ones circumstance and cause long-term mental health problems for remaining family. Epidemics do occur in the post-disaster period, but are generally due to respiratory and gastrointestinal disease related to the post-disaster living conditions.[9] While in Leon on a private NGO mission two and a half months after the earthquake I cared for a woman from PAP who was one of the 640,000 internally displace person who had fled PAP for the countryside. She had no significant injuries, however related that she had been buried in the rubble for several days and was in and out of consciousness. She awakened in the back of a truck that was taking her and the bodies surrounding her to a mass grave. She was able to lift her arm to signal that she was still alive (Personal communication).

Volunteer qualifications

Many individual volunteers with minimal equipment, no pharmaceutical or supply cache, no mechanism for providing their personal food, water, shelter or security arrived in Port-Au-Prince offering their services. Medical workers appeared at existing NGOs to volunteer their services without any means of verifying their clinical capability or credentials for the organizations. These volunteers often

became a liability to an organization in the setting of an ongoing disaster and a resource poor environment as well as putting themselves at individual risk. Responsible NGOs have a duty to assess their capability to provide meaningful medical care in the disaster setting.

Volunteers must honestly assess their level of physical fitness and whether it is realistic for them to work in an austere environment characterized by heat, humidity, rugged terrain and limited resources. In the post-earthquake period volunteers of all types came to Haiti with underlying medical conditions that precluded them working effectively and safely. There were actually volunteers who required durable medical equipment (DME) such as CPAP in theater. The limited resources in that period of the disaster response make evacuation of unfit volunteers difficult and detrimental to the overall response.

Hundreds of intelligent, clinically skilled and compassionate medical professionals poured into Haiti following the earthquake to provide care. Some were part of NDMS medical teams with surgical capability and were deployed to Port-Au-Prince shortly after the earthquake. The team physicians made difficult ethical decisions regarding appropriate use of resources. In one case a woman with bilateral crush injuries to her lower extremities developed sepsis. The decision was made to perform bilateral lower extremity amputations still with the expectation that she would be unlikely to survive. The woman did survive. She is now alive in a country with no disability, prosthetics or rehabilitation. After the initial massive relief response ebbed, medical teams left and there was no follow-up for patients such as this woman.

Some organizations (Medishare) with long-standing commitments to Haiti had begun in late February bringing prosthetic technicians and physical therapists to Haiti in order to manage long-term rehabilitation (Personnel communication). These ongoing, long-term efforts will need to be sustained for many years to assist in the full recovery of Haiti.

Medical volunteers are most effective in delivering medical care if they work as a member of an existing, organized system with a self-contained infrastructure.[9] Disaster Medical Assistance Teams and International Medical Surgical Teams consistent of volunteer physicians, nurses, medics and support personnel. Team members have been carefully vetted in the application process that includes applying to be an intermittent federal employee when called up for deployment. Teams members frequently participate in training exercises and at the time of deployment are usually quite familiar with one another. Teams generally deploy with a cache that allows them to fully function as a field hospital with surgical capability and be self-supporting for at least 72 h. Several teams were deployed in the immediate post-earthquake period and the DMAT component cared for thousands of patients. The IMSuRT performed over 200 surgeries and stabilized patient for transfer to the USNS Comfort. These teams are part of the NDMS that is housed in the HHS.[10]

Volunteers should avoid creating unrealistic expectations in the community in any post-disaster setting. With the arrival of so many resources from the US a rumor spread that anyone cared for by US volunteers or military would be sent to the US for care even though NDMS and other US resources were limited (personal communication). The process of identifying patients requiring critical care in the US changed over the course of the disaster. A medical review board consisting of representatives from DOD and HHS as well as Haitian physicians was formed in the immediate post-disaster period to evaluate appropriate transfers to the US. Clinical profiles of potential patients were sent to the medical review board from the field hospitals for review. Immediately after the earthquake the need for care in the US was straightforward. If the patient was likely to die without transfer they were transported when flights were available. As the post-disaster period went on it became more difficult to make decisions as patients with immediate life threat declared themselves in the first few weeks.

Sustainable long-term plans for Haiti

Medical care is important in the immediate post-disaster period however in large disasters such as the 2010 Haiti earthquake medical volunteers will continue to be needed but much more difficult to recruit once the post-disaster media attention fades. This was recognized by the highest level of those responding to the disaster as illustrated by this statement from Dr. Ron Waldman, U.S. Government Medical/Health Emergency Coordinator, Rear Admiral Alton 'Mike' Stocks, Joint Task Force Haiti Surgeon, and the Haitian Ministry of Health discussed the changing medical and public health needs in Haiti as a result of the January 12 earthquake:

"We are in the process of moving from a response that focused primarily on taking care of patients who were injured in the earthquake to one that prevents the widespread occurrence of communicable diseases, that provides people with decent living conditions, and that hopefully will be able to restore Haitians to a more normal social, economic, and political life," said Dr. Waldman. As part of this process, the U.S. remains fully committed to ensuring that Haitian health care facilities can build on the U.S. and international assistance provided over the last several weeks, and, with the support of NGOs, meet the medical needs of the population. "We do so with the full understanding that this will be a long process that will require the full cooperation and coordination of the international community but that, fundamentally, it must be led by the Haitian people and their government," Waldman said.

The donor nations met on March 31, 2010 and pledged $5.3 billion in aid would be available over the following 18 months. To date little of the money has been disbursed due to the complexity of managing resources in a country without a regulatory structure to insure accountability.[11]

Haiti has never had mental health resources. Haitians rely on themselves, their families and their community for support. Given the extent of this disaster many Haitians likely will have significant mental health issues. Culturally appropriate mental health resources should be part of the long-term recovery plan.

Economic implications

There are local economic implications of the aid distribution as well. Haiti's economy is largely dependant on small entrepreneurs. The unemployment rate officially reported is 70%, yet almost all adults work extremely hard. Many sell water, food or other staples in markets or along the city sidewalks. The presence of free food and water was

essential in the immediate post-earthquake. However the persistent availability of free water negatively affected the many Haitians that had previously made their livings selling water and other goods. There have been US and IMF policies that have impacted the Haitian economy. Rice had been cultivated in Haiti for over 200 years and until the 1980's Haiti's was self-sufficient in domestic rice production. There were several contributors to the collapse of Haiti's domestic rice production. These include environmental degradation, trade liberalization, lowering of import tariffs making US rice ('Miami rice') cheaper than domestic rice.[12] These long and short-term economic policies have contributed to Haiti's ongoing dependence on foreign aid. Currently 60% of food in Haiti is imported. This has a devastating effect on the rural population whose livelihood is dependent upon agriculture.

Governmental response

The Haitian government has a history of not paying the salaries of government workers, including health care workers. The earthquake further crippled the Haitian medical community. Many physicians, nurses and technologists were lost in the earthquake. The collapse killed many of Haiti's future nurses. The General Hospital a building over was largely unscathed and was staffed with volunteer physicians from other nations (BBC news). The major nursing school in PAP was destroyed, killing hundreds of nursing students. The Ministry of Health collapsed and the minister lost 90% of his staff. The local health system was inadequate prior to the earthquake. The state medical college was decimated. Many universities were destroyed and the deaths related to the collapse of those institutions killed many of the future leaders of Haiti.

As personnel from the governmental and non-governmental agencies stepped in to staff the standing medical facilities and establish mobile field hospitals the unpaid Haitian workers had no incentive to work and staff those facilities. Early in the response the government presented a number of NGOs with a list of appropriate salaries for the governmental Haitian health care employees who would return and work with the NGOs (Personal communication).

Overwhelming the medical supply chain

Random and uncoordinated donations of medication and supplies can rapidly overwhelm local resources in any disaster setting. Haiti's national medication supply warehouse PROMESS (Program on Essential Medicine and Supplies) received 483,091 kg of pharmaceutical supplies and 4990 kg of medical supplies in a 2-week period following the earthquake. Following the quake PROMESS was the only supplier of medications in the country. The generosity of the donors overwhelmed PROMESS' ability to meet the markedly increased needs of remaining in-country health facilities and the many NGOs establishing field hospitals. PROMESS working in concert with the US Government pharmacists and logisticians and the WHO/PAHO personnel to organize and inventory incoming materials assisted in getting medications pushed out to the patient care arenas. However there were significant delays in pushing medications out to medical teams.[13]

Prior to the earthquake NGOs were entitled to free medications from PROMESS if they were registered with the Minister of Health. In the post-earthquake period there were self-proclaimed NGOs obtaining medications that were subsequently sold on the open market by opportunists. Subsequently the level of proof required to verify the registration of the NGO became more stringent (Personal communication).

Private medical missions-volunteers and NGOs

In general small and large NGOs can make significant contributions in the aftermath of major disasters. Large NGOs such as Medicins Sans Frontieres (Doctors Without Borders) and others have a long-standing reputation for mobilizing quickly with qualified health professionals in response to disasters.

On March 30, 2010 I returned to Haiti to participate in a long-standing medical mission supported by the Seattle-King County Disaster Team (SKCDT). The mission has been ongoing since 1998 and I have participated since 2000. Volunteers from SKCDT, WA-1 DMAT, OR-2 DMAT, CA-4 DMAT and numerous other volunteers staff 2-week missions in February and June. It is a secular mission, though the infrastructure of the Catholic Church supports in-country logistics. The mission provides primary care, minor procedures and referral to the population of the Voldrog valley with the clinic located in Leon, Grand Anse. Leon is extremely remote located in far Western Haiti. The mission has evolved to include ultrasound capability and a laboratory both of which have increased the diagnostic capability of the mission. An advance team prior to each 2-week mission meets with local hospital representatives and representatives from local medical NGOs. The goal of these meetings is to align health care goals, to share epidemiologic data and to debrief the previous missions to define effectiveness and to plan for future missions. As part of this a detailed mission summary is an analysis of referrals, a lab summary and suggestions for subsequent missions.[14]

Smaller NGOs, whether secular or evangelical, should evaluate their ability to integrate with local governmental and non-governmental agencies. Short-term medical missions should be familiar with the broader public health messages that are determined by in-country public health officials and established in-country NGOs. Short-term medical missions should be aware of the in-country public health initiatives that are available from many sources. It is worthwhile for STMMs to familiarize selves with local health care resources and the priorities of other health care agencies (governmental and non-governmental) working in the same area as the STMM will work. Volunteers on STMM are well served by evaluating not only the personal benefit they derive from participating in the mission, but also the overall impact of the mission on local health care and public health priorities.[6]

The overarching Haitian public health efforts focused on the following:

- Maternal and infant care
- Childhood pneumonia
- Breastfeeding
- Skin care (management of scabies and cellulitis)

- Nutritional support (30% of Haitian children are malnourished)
- Containment of infectious diseases including:
  - HIV/AIDS
  - Malaria
  - Dengue
  - Cutaneous anthrax
  - Filiarisis
  - Typhoid
  - Tuberculosis
  - Syphilis
  - Polio (not yet eradicated in Haiti)
  - Tetanus

These public health goals are available for many countries and should be supported by any NGOs working in Haiti or elsewhere in the developing world.

Pharmaceuticals distributed by NGOs should be consistent with what is locally available. The WHO essential medication list[15,16] is an excellent resource. Random donations of medications that are not available locally are of limited value to ongoing medical care. There are examples appropriate for individual countries available on multiple sites. Treatment guidelines for the Seattle-King Co. Disaster Team Haiti Medical Mission are included in the appendix as an example of both treatment guidelines and an NGO on a short-term medical mission integrating with the local health agencies and resources.

The goal of volunteer medical providers is to provide the highest level of care and to closely mirror the standard of care in the US. Sometimes these are not only inappropriate but may be harmful. In rural Haiti diabetes mellitus (DM) and hypertension (HTN) are prevalent. Tight control of DM and HTN are goals of the governmental and non-governmental health care agencies in country, however there are obvious risks in a country with minimal medical care. One example the use of aspirin that is the standard of care for some patients at risk of stroke or coronary artery disease in the US, but may not be appropriate in rural Haiti. In the rural communities patients have significant risk of trauma due to the lack of traffic regulation, rugged terrain and lack of electricity after sunset. The mild though significant anti-coagulant effects of daily ASA may be inappropriate in the setting of rural Haiti. No studies have systematically looked at this question however. There is generally a paucity of research in the developing and under resourced world to answer clinical questions such as these and tremendous opportunity.

There are many valuable contributions to be made by governmental and private organizations willing to contribute to health care improvements in the developing world. It is however important to understand the overarching public health needs of the area, the existing infrastructure and the cultural context of health care interventions. Additionally establishing relationships with local health care agencies will strengthen the impact on any mission assure consistency in treatment guidelines, pharmaceutical use and health care messaging.

Conflict of Interest

I have worked as an intermittent federal employee as a volunteer for WA-1 DMAT, a team within the National Disaster Medical System. DMAT teams other than WA-1 DMAT responded to the post-earthquake medical relief efforts. I was deployed to Port-Au-Prince as part of a command team serving NDMS and the DHHS (Department of Health and Human Services). I receive minimal compensation for these activities, representing less than $<1\%$ of my annual salary. I am also an unpaid volunteer with the Seattle-King Co. Disaster Team (SKCDT).

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