

The National Disaster Medical System's Reliance on Civilian-Based Medical Response Teams in a Pandemic is Unsound

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INTRODUCTION

The world is threatened with a pandemic. Such an event, considered by many to be the greatest public health risk the world faces, has the potential to kill up to forty or fifty million people, sicken hundreds of millions, and significantly impact the global economy. Countries and health organizations throughout the world are monitoring the threat and developing strategic plans and systems to prepare for what many consider an inevitable and possibly imminent event.

The United States has made it a national priority to develop strategic plans to coordinate preparedness and response efforts at the federal, state, and local levels. A relatively small but critical aspect of these plans calls for the utilization of the National Disaster Medical System's (NDMS) civilian-based medical teams, to assist state and local governments in the event of a pandemic. Generally, past deployments of these federal assets have had positive results; however, the reliance on these civilian-based medical teams for response in a pandemic is problematic. The medical professionals who primarily comprise the team may be more reluctant to participate in a pandemic due to the increased health risks to themselves and their families. Moreover, the hospitals and medical systems that employ these civilian responders may be unwilling or unable to allow their participation in the federal response system. The federal government should reconsider its reliance on this civilian-based resource in the event of a pandemic, and focus instead on enhancing existing state and local public health and medical capabilities and resources.

Background

A pandemic occurs when a new influenza virus manifests itself, and is spread easily from human to human through coughing and sneezing. Because there is no immunity to this virus, the severity of the illness is significantly increased. While influenza pandemics are rare, occurring three times in the previous century (in 1918, 1957, and 1968), they have the potential to cause more death and illness than any other public health threat. According to the Congressional Budget Office (CBO), a 1918-scale pandemic would sicken approximately ninety million people and kill two million more in the U.S. alone.¹ "Almost ten million people could be hospitalized during the course of the pandemic, which may take more than a year to evolve."² Modeling based on the more conservative 1957 pandemic projects more than 200,000 deaths and over 800,000 hospitalizations within the United States.³

A pandemic is certain to occur, but when and how it will manifest is unknown. Currently, within the scientific and public health communities, there is particular concern with the virus H5N1. Commonly referred to as "avian" or "bird flu," H5N1 is a strain of influenza that has primarily infected wild and domestic birds in Asia and parts of Europe. As the birds migrate, the virus spreads to bird populations in other countries.

“Most cases of avian influenza infection in humans have resulted from direct or close contact with infected poultry or surfaces contaminated with secretions and excretions from infected birds.”⁴ According to the World Health Organization, as of May 7, 2007 there have been 291 confirmed cases with 172 deaths.⁵ “Of additional concern are the few instances where secondary transmission from person to person may have occurred. Given these events, we are currently in a Pandemic Alert Phase 3, defined by WHO as ‘human infections with a new subtype but no human-to-human spread or at most rare instances of spread to a close contact.’”⁶ The rapid global spread of the H5N1 virus, the potential human-to-human transmission, and the potentially devastating consequences have created a sense of urgency within the U.S. government to assess various response capabilities and develop effective preparedness measures. Unfortunately, the need to develop those measures quickly has caused the federal government to overlook or ignore the reality that existing NDMS resources are inadequate to meet the demands a pandemic would place on them.

FEDERAL RESPONSE STRATEGY

Over the past several years the federal government has instituted several strategic plans in preparation for the pandemic: the *National Response Plan* (specifically ESF #8 and the Biological Incident Index) in December 2004, the *National Strategy for Pandemic Influenza* and *HHS Pandemic Influenza Plan* in November 2005, and the *Implementation Plan for the National Strategy* in May 2006. These plans guide our national pandemic preparedness and response efforts, emphasize the importance of state, local, and individual preparedness, require all federal agencies and departments (including federal health care systems) to develop the necessary pandemic plans, and identify Health and Human Services as the lead federal agency for medical response in a pandemic.

In the event that the H5N1 virus mutates into a contagious human-to-human influenza this year, or a different pandemic strikes in ten years, the implementation of the *National Response Plan* (NRP) would be necessary:

[The NRP] provides a conceptual and operational framework to integrate the capabilities and resources of various governmental jurisdictions, incident management, and emergency response disciplines, nongovernmental organizations, and the private sector into a cohesive, coordinated, and seamless national framework for domestic incident management.⁷

The NRP breaks down the individual department and agency capabilities and responsibilities into Emergency Support Functions (ESF):

[Health and Human Services (HHS)] has the primary responsibility for implementing ESF #8 – Public Health and Medical Services – which provides the mechanism for coordinated federal government assistance to supplement state, local, and tribal resources in response to public health and medical care needs in the face of a potential or actual large-scale public health and medical emergency.⁸

According to the plan, HHS will confer with state and local medical officials to determine what type of medical or public health assistance is required. HHS will then coordinate internal response assets such as U.S. Public Health Service Commissioned Corps., medical reserve corps, and the NDMS to provide the required assistance:

Assets internal to HHS are deployed directly as part of the ESF #8 response. Public health and medical personnel and teams provided by ESF #8 organizations are requested by HHS and deployed by the respective organizations to provide appropriate public health and medical assistance.⁹

NDMS is a primary support agency to HHS during a pandemic. “NDMS was established to create a single, integrated national medical response capability that ensures that resources are available in the event of a major disaster or emergency.”¹⁰

The National Disaster Medical System (NDMS) is a section within the United States Department of Homeland Security (DHS), Federal Emergency Management Agency (FEMA), Response Division, Operations Branch, and is responsible for supporting Federal agencies in the management and coordination of the Federal medical response to major emergencies and federally declared disasters...It is the mission of the NDMS to design, develop, and maintain a national capability to deliver quality medical care to the victims of, and responders to, a domestic disaster. NDMS provides state of the art medical care under any conditions at a disaster site, in transit from the impacted area, and into participating definitive care facilities.¹¹

NDMS relies on various specialized medical response teams to meet this integrated national medical response capability.

The NDMS is made up of more than 9,000 health and medical personnel organized into approximately 107 response teams.¹² The medical response teams are civilian based, and are comprised primarily of medical professionals from the various disciplines necessary to meet the specific team’s mission. The medical professionals are required to maintain the necessary certifications and licensures within their discipline; as such, each member is typically affiliated with, or employed by, a medical center, health department, or disaster organization. Upon activation, the team members are re-classified as intermittent federal employees. The response teams and individual team members are then covered for worker’s compensation, liability, and medical malpractice.¹³

NDMS has a number of response teams, each designed with a specific area of expertise. In addition to the various medical teams, there are management support teams, veterinary assistance teams, and mortuary teams. Although these teams have the potential to be activated and utilized in a pandemic, the focus of this discussion will be the medical response teams, as they will be the primary response assets deployed by NDMS to assist state and local authorities in a pandemic. The following briefly describes each team:

Disaster Medical Assistance Team (DMAT) is a group of professional and para-professional medical personnel designed to provide medical care during a disaster or other event. Teams are composed of physicians, nurses, paramedics, emergency medical technicians, pharmacists, mental health specialists, dentists, therapists, laboratory and environmental health specialists, logisticians and administrative support. Each team has a sponsoring organization, such as a major medical center, public health or safety agency, non-profit, public or private organization that signs a Memorandum of Agreement (MOA) with the DHS. The DMAT sponsor organizes the team and recruits members, arranges training, and coordinates the dispatch of the team.¹⁴

The DMATs are designed to be a rapid response element, deployable in six to twelve hours, self sufficient for seventy-two hours, and remain on-site for up to fourteen days. “DMAT services remain on site for the duration of an extended response, operating on a rotating schedule of personnel and equipment.”¹⁵ They have a quasi-paramilitary structure, and although they can be utilized for various types of incidents, their training has traditionally focused on mass casualty and mass trauma events.¹⁶

The primary mission of the National Medical Response Team (NMRT) is to respond to WMD incidents. The team has multiple capabilities, including mass decontamination, medical treatment and care, and WMD detection and monitoring. There are a total of four NMRTs within the United States, three of which are civilian-based. The non-civilian based team is located in the Washington DC Metropolitan area, and is primarily comprised of professional fire fighters, paramedics, law enforcement officers, and hazardous materials specialists from the surrounding jurisdictions.

The National Pharmacy Response Team (NPRT) and the National Nurse Response Team (NNRT), formed in 2002, are located in each of the 10 Federal Emergency Management Agency regions. They provide assistance during events requiring chemoprophylaxis, mass vaccinations, patient education, and risk communications. NRPTs are sponsored by a working group of the Joint Commission of Pharmacists Practitioners in a cooperative undertaking with DHS.¹⁷

ISSUE

The NDMS is not prepared for a pandemic. It does not have a strategic influenza response plan; there is insufficient management staffing at headquarters, and inadequate training and personal protective equipment at the team level; and NDMS operates under the misguided assumption that its teams will be 100% available for a response in a pandemic.

Although the NDMS plays a central role in the nation’s response plans, it does not have its own strategic influenza response plan. Moreover, there is no specific information available on how these teams will be deployed and utilized in a pandemic. It is difficult to understand how an agency that has a primary medical mission in a pandemic does not have a strategic plan. The lack of a strategic plan does have one benefit: assets and resources are not bound by the operational restrictions within the plan. For example, during Hurricane Katrina, the NMRT-Central was deployed to Houston to provide showering facilities for the evacuated New Orleans’ citizens. NMRT-Central’s mass decontamination capabilities were designed for emergency WMD incidents but could be adapted to provide regular shower facilities. Given the uncertain demands and needs in emergency situations, NDMS teams must be prepared to perform a wide range of services if activated in a pandemic. In addition to providing medical care to the sick in a pandemic, they could potentially be utilized to provide mass vaccination or anti-viral medication, assist with hospital surge capacity, transportation of patients, triaging patients, and assisting with isolation and quarantine issues.

NDMS’s management staffing was drastically reduced from 144 to fifty-seven in the transition to DHS.¹⁸ Although improvements have occurred since the transition back to HHS, this reduction in staffing has compromised leadership’s ability to adequately manage its resources and advance preparedness efforts throughout the NDMS.

NDMS's broad mission is carried down to the team level. Although the various teams have specific missions, they are, first and foremost, medical assets and as such may be utilized for a variety of medical scenarios. This unspecified response mission makes it difficult for teams to adequately train and provide the necessary personal protective equipment (PPE). Appropriate training and PPE have been determined to be critical factors in studies conducted on the medical and public health workers' willingness to work in catastrophic events. "In evaluating the willingness of Israeli health care workers to report to work after an unconventional missile attack, they found that although 42% of the respondents were willing to report to work, the percentage would increase to 86% if personal safety measures were provided."¹⁹ Another study determined that preparedness training and education was the single most important construct.²⁰ It is impossible for NDMS to provide adequate training and PPE, if does not know which and how their teams will be utilized.

These NDMS teams have provided, and will continue to provide, important medical assistance in certain emergencies or events. However, the federal government's blanket reliance and promotion of these assets to the state and local governments as a resource in a pandemic could have tragic consequences. Indeed, there may not be sufficient medical personnel available to formulate and deploy these NDMS teams to the extent that they are being promoted. There are three primary reasons for this: 1) The fear and increased health risks associated with the pandemic may reduce the availability of team members; 2) The medical establishments, in which the team members are associated or employed, may not allow their participation in the NDMS system during a pandemic; and 3) Health care workers will likely be unavailable for extended periods of time.

The fear and increased health risks associated with the pandemic will reduce the availability of NDMS team members during a pandemic. Although there are no studies conducted specifically on the NDMS system with regard to medical professional participation in a pandemic, several studies have focused on the general health care worker and the public health community. Analyzing this information is important, not only because these occupational areas will play a major role in a pandemic, but health care and public health workers make up a large portion of the NDMS teams. One could infer that the results of surveying NDMS team members would be consistent with the findings in these reports.

According to one report, *Health Care Workers' Ability and Willingness to Report to Duty During Catastrophic Disasters*, "the most frequently cited reasons for employees' unwillingness to report to duty during a disaster was fear and concern for the safety of their families and themselves."²¹ This fear would be exacerbated for the NDMS team member because of the potential extended deployment and the increased and intense patient contact involved in a pandemic response. Furthermore, the study showed that the willingness of health care workers to report to work during a catastrophic event were lowest for events "in which the employees are more likely to perceive the highest degree of risk to themselves or their family (smallpox, chemical, radiation, and SARS)."²²

In any catastrophic event, medical professionals must balance fear with their professional obligations and responsibilities. In 2004, I experienced this firsthand when I was deployed to Punta Gorda, Florida to assist with the Hurricane Charlie relief efforts. I was assigned to assist managing the local ESF #8 and was surprised to find upon my arrival that a large number of local medical and public health care workers had

evacuated the area. Moreover, that same year during Hurricane Francis, twenty-five nurses were fired or suspended for leaving early or not reporting to work.²³

The local public health community, if sufficiently staffed, will most likely be the backbone during a pandemic response. The HHS Pandemic Influenza Plan identifies the roles and responsibilities of the state and local public health agencies during a pandemic to include providing regular updates to public health providers, offering guidance on infection control, and investigating pandemic cases and particular situations.²⁴ These actions would require an immediate response by a significant number of local public health workers. A recent study suggests that these numbers will not be available in a pandemic, as nearly half of the local health department workers are likely not to report for duty.²⁵

A more significant problem requiring immediate federal attention is the insufficient staffing levels in the majority of public health departments. “The public health infrastructure has been cut to a point where most health agencies are barely staffed to operate during a normal workweek.”²⁶ The federal government cannot expect state and local public health officials to effectively plan and prepare for a pandemic when current staffing levels are inadequate.

To make matters worse, the hospitals, public health departments, or medical systems with which the medical professionals are affiliated may not allow their participation within NDMS system in the event of a pandemic. The primary reasons for that refusal would be the anticipated exponential increase in patients and the reduced health care workforce in their own communities. The impact on the hospital system will be enormous, particularly because most hospitals already operate at maximum capacity. The pandemic is expected to quickly fill the capacity and capabilities of most hospitals; in fact “most Americans would be unable to access the health care sector because demand will exceed supply by large factors that cannot be bridged by incremental, marginal increases in health care capacity.”²⁷ By allowing participation in NDMS, hospitals and managed care organizations would essentially be releasing their most valuable assets, thus reducing the hospitals’ ability to treat and care for patients.

The medical system must also anticipate that many of their health care workers will likely be unavailable for extended periods of time during the pandemic. Health care workers will be more susceptible to contracting the flu due to their contact with infected patients. This will have tremendous consequences on the overall medical system, as it will further reduce already deficient staffing levels and the capacity to treat flu and non-flu patients. Additionally, various personal issues will undoubtedly deplete the health care workforce as medical professionals remain home to care for sick family members, or refuse to come to work altogether for fear of becoming infected and thus potentially infecting family members. “During a catastrophic event, employers must recognize that their health care workers are likely to be as (or even more) concerned than the average citizen, because they might have a greater understanding of the associated risks.”²⁸

Every hospital operates on a budget, and the vast majority does not have a sufficient capital surplus to provide adequate training and supplies necessary for a pandemic. “One third of U.S. hospitals do not meet operating costs; among non-profit hospitals which are in the black, operating margins average 3%.”²⁹ In a pandemic, the financial pressures will drastically increase as the “money making” services within the hospitals are reduced or shut down to care for flu victims. Allowing their employees to participate in the NDMS will further exacerbate this issue.

The compilation of these factors should be sufficient evidence that civil-based medical teams will not be the panacea the federal government portrays them as.

SOLUTIONS

The World Health Organization estimates that a significant percentage of the world population will require some form of medical care in the event of a pandemic. Regardless of the pandemic's severity, additional professional medical assistance will be needed at the state or local level. The federal government must decide if this is a resource it wants to continue to provide, and then determine the best way to provide it in an effective and reliable manner.

The reliance on civilian-based medical response teams in its current form is unworkable. The continued federal promotion of these civilian-based medical response teams to the state and local governments must stop. Federal strategic pandemic response plans must be modified to recognize that these teams will, most likely, not be available to state and local governments in a pandemic. There are indications that top-level officials within the government are aware of this limitation. In a recent telephone interview with a top-level NDMS official, I was informed that other top-level government officials in other agencies and departments were told that the NDMS teams will probably not be available in a pandemic or, at most, a group of teams would be combined to form one team. According to the interviewee, this did not sit well with government officials. This fact notwithstanding, the teams remain an identified asset within various federal pandemic plans.

The NDMS and U.S. public health officials must recognize and aggressively inform other federal agencies that these civilian-based medical response teams will not be available in a pandemic. The return to HHS is a more logical fit for the NDMS, and should provide a more effective venue to advocate the deficiencies in this asset, as HHS is responsible for the overall preparedness and response planning.

The NDMS needs to develop a strategic pandemic response plan, regardless. The Implementation Plan for the National Strategy for Pandemic Influenza requires that all federal agencies adopt and practice such a plan. As a primary supporting agency to HHS in a pandemic, it would seem only logical that this would be a priority for NDMS; however, one can only assume that the loss of management staffing, and the integration into DHS under the Federal Emergency Management Agency, has sidelined this initiative.

Although it is uncertain how many state and local governments actually have these federal response teams in their pandemic plans, it is safe to assume that, in a pandemic, most state and locals would require additional medical assistance. The projected number of patients requiring medical attention, the anticipated reduced medical workforce, and the insufficient national public health infrastructure are primary indicators that supplemental medical assistance will be necessary. If preparedness is the key, and the state and local governments have incorporated these teams within their preparedness plans, then truly how prepared are they?

If the federal government wants to continue to provide supplemental medical assistance teams that would respond to assist states and locals in a pandemic, then it must develop a national system of medical professionals who are dedicated full-time employees. The mission would center on domestic response for all medical and public

health matters throughout the United States, and the system would have a military or para-military structure. There would not be any question as to whether team members would participate in a pandemic; this would be an anticipated response, a professional responsibility and requirement similar to the commitments made by our military personnel. There would not be the issue of medical professionals receiving permission from their sponsoring medical facilities and hospitals, as the federal government would be the employer. Additionally, the team could be deployed for the extended periods of time projected in a pandemic. This system could be utilized for a variety of medical and public health responses throughout the United States: WMD incidents, epidemics, vaccination programs, large scale emergencies, and natural disasters. When not deployed, the system could focus on medical and public health preparedness efforts, operating as the primary conduit between state, local, and federal agencies. This system could be developed from scratch, or the U.S. Public Health system could be augmented to provide this capability.

CONCLUSION

There are few certainties in a pandemic; we do not know when the next pandemic will occur; we do not know the severity, or how long it will last. What we do know, however, is preparedness is the key. But effective preparedness requires a continuous evaluation that is critical and objective. An objective and critical evaluation of the use of the NDMS civilian-based response teams in a pandemic would discover an impractical and unreliable system. Already there is sufficient evidence that this system will not work and, as such, the continued federal promotion of this system borders on criminal negligence. The short term solution is simple: instruct state and local governments that these assets will not be available in a pandemic. This awareness will allow state and local governments to critically and objectively prepare for a pandemic. The continued federal reliance on the NDMS to support state and locals in a pandemic is unsound. The federal government should instead focus its preparedness efforts on enhancing the public health infrastructure, expanding company incentives for vaccine development, and developing and stockpiling vaccines and anti-viral medications. These preparedness efforts will have the greatest utility in a pandemic until a sufficiently staffed, funded, and trained federal workforce and system is established.

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¹Tara O'Toole, M.D. M.P.H., "Fighting Pandemic Flu From the Front Lines," House Committee on Homeland Security Subcommittee on Emergency Preparedness, Science and Technology, 109th Congress (February 8, 2006), 2.
http://homeland.house.gov/hearings/109_060201_PandemicFlu/Testimony%20OToole.doc.

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- ² U.S. Department of Health and Human Services (HHS), *HHS Pandemic Influenza Plan* (Washington, DC: Government Printing Office, November, 2005), 4.
- ³ Centers for Disease Control (CDC), CDC website http://www.bt.cdc.gov/coca/summaries/PandemicFluPreparedness%20Aug_8_2006.htm.
- ⁴ CDC website <http://www.cdc.gov/flu/avian/gen-info/qa.htm>.
- ⁵ World Health Organization. http://www.who.int/csr/disease/avian_influenza/country/cases_table_2007_04_11/en/index.html.
- ⁶ HHS, *HHS Pandemic Influenza Plan*.
- ⁷ *Ibid.*, Appendix 1.
- ⁸ *Ibid.*
- ⁹ Department of Homeland Security, *National Response Plan* (December 2004), 8-6.
- ¹⁰ National Disaster Medical System (NDMS), *Strengthening the Nation's Front Line* (nd). <http://www.ndms.dhhs.gov>.
- ¹¹ National Disaster Medical System (November 2006). <http://www.ndms.dhhs.gov>.
- ¹² NDMS, *Strengthening the Nation's Front Line*.
- ¹³ Department of Homeland Security, *FEMA/NDMS Administrative Officer's Handbook* (Washington, DC: Government Printing Office, April 2004), 16.
- ¹⁴ National Disaster Medical System.
- ¹⁵ NDMS, *Strengthening the Nation's Front Line*.
- ¹⁶ Lissa Westerman, R.N, interview by author, Arlington, VA. November 20, 2006.
- ¹⁷ National Disaster Medical System. <http://www.ndms.dhhs.gov>.
- ¹⁸ O'Toole, "Fighting Pandemic Flu From the Front Lines," 5.
- ¹⁹ K. Qureshi, et al, "Health Care Workers' Ability and Willingness to Report to Duty During Catastrophic Disasters," *Journal of Urban Health: Bulletin of the New York Academy of Medicine* 82, no. 3 (July 6, 2005): 386.
- ²⁰ Ron D. Balicer, et al, "Local Public Health Workers' Perceptions Toward Responding to an Influenza Pandemic," *BioMed Central Public Health* (April 18, 2006).
- ²¹ Qureshi, "Health Care Workers' Ability and Willingness," 386.
- ²² *Ibid.*, 385.
- ²³ *Ibid.*, 379
- ²⁴ Balicer, et al, "Local Public Health Workers' Perceptions," 1.
- ²⁵ *Ibid.*, 2.
- ²⁶ Denise Santiago and Anke Richter, "Assessment of Public Health Infrastructure to Determine Public Health Preparedness" *Homeland Security Affairs*, 2, no. 3 (October 2006): 1. <http://www.hsaj.org>.
- ²⁷ O'Toole, "Fighting Pandemic Flu From the Front Lines," 2.
- ²⁸ Qureshi, "Health Care Workers' Ability and Willingness," 386.
- ²⁹ O'Toole, "Fighting Pandemic Flu From the Front Lines," 3.