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Assessing the infection prevention components of home health emergency management plans

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Background: Home health emergency management plans are essential and must address infection prevention issues. Few home health planning documents exist, and many of those that have been developed do not address infection prevention issues, combine them with non-infection prevention issues, or are disease/event-specific. An all-encompassing home health infection prevention emergency management planning guide is needed.

Methods: A literature review and Internet search were conducted in the summer of 2010, and data from relevant sources were extracted. A spreadsheet was created delineating home health emergency management plan components related to infection prevention.

Results: Of the sources screened, 41 were deemed relevant. Ten domains were identified: (1) having a plan; (2) assessing agency readiness; (3) having infection prevention policies and procedures; (4) having occupational health policies and procedures; (5) conducting surveillance and triage; (6) reporting incidents, having a communication plan, and managing information; (7) addressing surge capacity issues; (8) having anti-infective therapy and/or vaccines; (9) providing infection prevention education; and (10) managing water and waste management issues.

Conclusion: Home health disaster planners or managers should use this article as an assessment tool for evaluating their agency's emergency management plan and for developing policies and procedures that will decrease the risk of infection transmission during a mass casualty event.

Key Words: Surge capacity; infection control; disaster; disaster plan.

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A home health emergency management plan is an essential component of home health agency preparedness for mass casualty events (MCEs). This plan needs to address all potential hazards, including such biological threats as bioterrorism, emerging infectious disease outbreaks, and pandemics. Studies examining home health disaster preparedness have found that the vast majority of home health agencies have a written disaster plan that covers natural disasters¹⁻³; however, studies assessing the existence of a plan that addresses biological events have reported either conflicting findings or reflect new developments in home health preparedness.⁴ For example, a 2008 study of

home health care workers found that only 5% of surveyed workers reported that their employer had a pandemic plan,⁴ whereas a 2010 study found that almost 90% of home care agencies had a disaster plan addressing pandemic preparedness.⁵ This latter figure most likely reflects increasing awareness of the need for pandemic preparedness by home health agencies following the 2009 H1N1 pandemic, but possibly could be related to differences in sampling between the 2 studies.

Plan development and assessment are essential to home health agency disaster preparedness.^{4,6} Home care disaster plans need to identify an external point of contact (eg, hospital- or state health department-based infection preventionist [IP] or health care epidemiologist) to ensure that infection prevention issues are addressed in the Plan and to serve as a consultant for answering questions during an MCE.⁷ For most home health agencies, the plan should consist of multiple components: the main body of the plan that addresses emergency management tasks/needs that are applicable to all MCEs, and a series of appendices or annexes that address specific incidents such as chemical, nuclear, or biological events. Examples of all-hazards components of the plan include addressing

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liability issues for home health personnel, providing mental health support for disaster victims and home health staff, and establishing funding to cover uncompensated costs during an MCE. Although these issues are very important to emergency management and may have an indirect impact on infection transmission during an MCE, ensuring that these topics are addressed in a plan does not fall within the scope of duties of a home health agency's IP point of contact. Most IPs will act as a consultant to the home health emergency management planning committee and will be responsible for assessing the plan in terms of preventing infection transmission during MCEs.⁷ IP involvement will be most important in developing and assessing the plan's biological annex.

MCE planning guides for home health agencies are available from national organizations, governmental agencies, and academic institutions.⁶⁻¹⁹ However, these documents either address non-infection prevention MCE planning issues^{11,12} or provide specific recommendations based on a singular disease, such as smallpox¹⁰ or pandemic influenza.^{6,7,14,16-19} An all-encompassing planning guide is needed to help home health agencies assess the infection prevention components of their emergency management plans. In this article we compile infection prevention recommendations from various planning agencies and researchers into a single planning guide, with the aim of aiding the assessment of home health emergency management plans for infection prevention issues.

This article addresses only home health emergency management plan development topics that have infection transmission implications. A plan needs to have an appendix or annex that addresses biological threats. In addition, certain infection prevention issues need to be addressed in the main body of the plan, such as having infection prevention policies and procedures in place during any type of MCE. This article addresses all components of the plan of interest to IPs who will be assessing home health agency emergency management plans, including the biological annex as well as the infection prevention issues that should be addressed in the main body of the plan. Home health agencies can use this article as a resource to guide the development or assessment of their emergency management plan for infection prevention issues. There is no perfect plan; the best plans are constantly under review and revision; thus, this article does not provide information on best practices related to all aspects of infection prevention during emergency management. In addition, procedures that work in one home health agency or region might not be applicable to all agencies. This article also can be consulted to identify gaps in emergency management plans. Guidance on how to implement specific interventions, such as developing a policy on sick leave during a disaster, or how to

allocate limited amounts of respiratory protection is provided elsewhere.^{20,21}

METHODS

A literature review was conducted in July 2010 using the Cumulative Index to Nursing and Allied Health Literature, Healthstar, Psych Info, and MEDLINE databases for the years 1966-2010. The following terms were used as keyword searches: infection control, infection prevention, home health, readiness, disaster plan, mass casualties, bioterrorism, pandemic, and emergency management. Only English-language articles in peer-reviewed journals were considered. An Internet search was also conducted in July 2010 using the same search terms as above to identify existing book chapters, reports from response agencies, published standards and guidelines, and other relevant materials related to the development of home health emergency management plans to address biological MCEs that were outside the peer-reviewed literature. Inclusion criteria included articles, planning documents, and published reports that addressed infection prevention issues that need to be included in a plan. Articles that addressed hospital, community, public health, or personal preparedness were excluded. Also excluded were articles that only addressed non-infection prevention emergency management issues, such as developing policies and procedures for incorporating the incident command structure into the home health emergency management plan. Both US-based and non-US-based articles and documents/reports were included in the analysis.

A total of 323 journal articles were identified and reviewed for relevance; many were eliminated based on the title or the journal (not peer-reviewed or did not meet inclusion criteria) alone. A total of 154 references were screened by reading the abstract. A spreadsheet was created that delineated the infection prevention issues in home health agency emergency management plans identified by each source. Infection prevention recommendations were divided into themes/domains for simplification and clarity. We each conducted a literature review and Internet search independent of one another, and then collated all sources for the review process. We divided the article review and data extraction responsibilities among ourselves. Each of us reviewed 4 of the same articles and then compared data extraction results as a quality control process to ensure consistency in data collection. Discrepancies and unclear areas were discussed until consensus was reached. Once all data were collated, the primary author categorized the findings into themes and developed the written recommendations. All of us reviewed the final themes and recommendations.

RESULTS

Of the articles and planning documents/reports screened, 41 references were deemed relevant. These included 22 journal articles, 1 book chapter, and 18 published reports, regulatory standards, and/or planning documents. There was significant overlap among these sources when summarizing the infection prevention issues that should be addressed by a home health emergency management plan. Common infection prevention issues mentioned included having policies and procedures related to infection prevention, preparing for a surge in potentially contagious patients, screening patients for communicable diseases, and educating patients and family members on infection prevention practices. Differences identified by the sources tended to be related to the types of appropriate infection prevention interventions that should be implemented, such as instituting isolation in the home,^{6,8,10,15,17,22-27} screening staff for illness before each shift,^{6,17,28} or having home care staff deliver infection prevention supplies to patients.²⁹ No single document or article identified all of the infection prevention issues that should be addressed by a plan.

Table 1 presents the complete list of the infection prevention issues that should be addressed in a plan categorized by themes, or domains. Home health agency disaster planners can use this table as an assessment tool for evaluating their plans and developing policies and procedures aimed at decreasing the risk of infection transmission during an MCE. It is important to note that the information provided in this article consists of compiled published recommendations that are not considered mandates or regulations, except for the Joint Commission standards for accredited home health agencies.³⁰

Domain 1: Home health agency emergency management plan and biological annex

A home health agency emergency management plan needs to address all biological threats, including bioterrorism, outbreaks of emerging infectious diseases, and pandemics. The plan must be updated regularly based on lessons learned from disaster exercises, actual events, and published evidence of best practices. The plan needs to be coordinated with local, state, and federal plans, and contact names and information for key response agencies need to be included. Lists of contact names and information should be evaluated and updated regularly to ensure accuracy. The plan's biological annex needs to define how biological events are different from other types of MCEs, how interventions will be stratified by pandemic stage/phase or nature of the biological attack, and the epidemiologic clues of a potential biological event.

Domain 2: Assessing home health agency readiness for an MCE

Every home health agency must assess its readiness for an MCE, including a biological event. The home health agency emergency management plan should state how and when an agency assessment, such as a hazard vulnerability assessment, will be performed. The hazard vulnerability assessment should include aspects of agency readiness related to infection prevention, such as supply chain issues that could affect how much personal protective equipment (PPE) will be available during an event, how to teach and implement home isolation, and other issues. Disaster exercises that use a biological scenario should be carried out to assess for biological MCE readiness. Whenever possible, home health agencies should participate in community-wide exercises to ensure regional coordination for MCEs.

Domain 3: Infection prevention policies and procedures

The home health agency emergency management plan needs to outline infection prevention policies and procedures to be implemented during an MCE. These policies and procedures should encompass all aspects of patient care, occupational health practices, and aspects of the home environment that could contribute to the spread of infection. Examples of essential infection prevention policies include procedures for communicating PPE needs during patient transportation, isolation, cleaning and disinfecting patient care equipment, and hand hygiene practices. Home health agencies need to identify an infection prevention point of contact who can be consulted during an MCE. In addition to outlining routine infection prevention policies/procedures, the plan also needs to address crisis standards of care. Crisis standards of care are needed for events during which resources become limited or depleted. Infection prevention crisis standards of care include prioritization plans for allocating PPE, hand hygiene products, and anti-infective therapy or vaccines. Whenever possible, community ethics committees should be involved in the development of crisis standards of care.

Domain 4: Occupational health policies and procedures

The risk of occupational exposure to infectious diseases/agents increases during a biological event, such as bioterrorism or a pandemic, and thus the home health agency emergency management plan must address infection prevention-related occupational health issues. Examples include having a respiratory

Table 1. Infection prevention components of a home health emergency management plan

Home health agency emergency management plan	
Addresses all biological events, including bioterrorism, emerging infectious diseases, and pandemic influenza.	6,7,14-18,22,24-28,30,32-38
Identifies contact names and numbers for local and state health departments, state health association, and tribal health association.	6,10,14,16,18,19
Is coordinated with local, state, and federal emergency management plans.	2,6,7,10,15-17,22,24,25,27,28,30,32,33,37,38
Identifies the person(s) authorized to implement/activate the plan and the organizational structure that will be used, including the delegation of authority to carry out the plan 24/7.	4,6,17-19,30
Describes the responsibilities of key personnel and departments (and backups for key personnel) within the agency related to executing the plan.	4,6,17-19,30
Defines how biological events are different from other types of MCEs.	18,32,37,38
Has a planning committee focusing on biological events.	6,7,10,17,18
Stratifies implementation of specific actions on the basis of the World Health Organization pandemic phases, US government pandemic stages, and the pandemic severity index level worldwide, in the United States, and at the local level.	17,18,22
Stratifies implementation of specific actions for a bioterrorism attack on the basis of whether the attack is overt or covert, and on the basis of high-risk syndromes or suspected routes of disease transmission.	10
Describes the epidemiologic signs of a potential bioterrorism attack.	10,37
States how often the plan will be updated and by whom, including contact names/information, incorporating lessons learned from exercises/drills, and changes in recommendations related to managing biological events.	7
Assessing agency readiness for MCE	
States how and when an agency assessment will be performed that addresses infection prevention issues, such as location and amounts of hand hygiene products and PPE, how to implement home isolation, and so on.	6,11,39
Incorporates biological scenarios, such as pandemic influenza or bioterrorism, into a disaster exercise; whenever possible, this exercise should be community-wide.	6,15,17,22,25,28,33,37
Infection prevention policies and procedures	
Identifies an IP and/or hospital epidemiologist who will serve as the point of contact for questions or consultation related to infection prevention during an MCE.	4,6,7,10
Has a protocol for PPE use and hand hygiene.	4,6,7,11,14-19,24,26,27,29,32,34,37
Includes policies for modifying admission criteria on the basis of current agency capacity and disease status, including procedures for closing the agency to admissions of potentially infectious patients or noninfectious patients.	6,11,14,30
Has a protocol for monitoring staff compliance with infection prevention procedures, including PPE use, hand hygiene, and so on.	6,10,17,18,24,26,37
Has protocols for environmental decontamination during an MCE, including cleaning/disinfection/sterilization of patient care items and reprocessing of equipment when resources are limited.	15,25-27,29,30
Has a protocol for implementing quarantine that is coordinated with local public health officials, including plans for ensuring compliance and providing necessary supplies to maintain the quarantine.	10,22,32,37,40
Has prioritization plans/algorithms for allocating limited PPE, hand hygiene products, ventilators, anti-infective therapy or vaccination, and other supplies/products that affect infection transmission during a biological event.	4,6,7,11,16-19,32,40
Describes how a community ethics committee is involved in the development of crisis standards of care for the agency.	29
Infection prevention policies and procedures related to patient management	
Has a protocol for patient transport of potentially contagious patients, including coordination with local emergency medical services and 911 services.	11,12,39,39
Has a protocol for designating staff limited to work with potentially infected patients (ie, staff cohorting).	17,24,27
Has a protocol for instituting Standard and Transmission-Based Precautions, including home isolation, for all biological events (bioterrorism, outbreaks of emerging infectious diseases, and pandemics).	6,8,10,15,17,22-27
Has a procedure for identifying and managing vulnerable individuals/groups who may be at an increased risk of infection during a biological event.	4,10-12,29,30,39-41
Has a protocol for postmortem care procedures that limit infection transmission during a biological event.	6,7,17
Occupational health policies and procedures	
Has a program that offers and monitors compliance with the annual influenza vaccine for agency employees.	4,6,7,14,17-19,28,29
Has a respiratory protection program that fit-tests staff for respirators or provides and trains staff on the use of powered air-purifying respirators that do not require fit-testing.	4,6,10,17-19,27-29,32
Has a liberal/nonpunitive sick leave policy that addresses the needs of ill and symptomatic personnel during a biological event, including allowances and encouragement for sick employees to stay home until no longer contagious or furloughing exposed or infected staff.	4,6,7,14,16-18,22,24,29,42
Has a protocol for managing personnel who become ill during a biological event, including what to do when staff develop symptoms while at work and outlining how long staff must remain off-duty after becoming infected.	4,6,7,10,14,17-19,22,28-31
Has a protocol for identifying and managing staff who are at an increased risk for infection during a biological event (eg, pregnant women, immunocompromised workers, and employees aged ≥ 65 years), such as administrative leave, furlough, altering work assignment or location, and so on.	4,6,7,12,14,16-19,24,29,42
Has a protocol for tracking staff who have had contact with a potentially contagious patient or contaminated source (ie, an exposure) during a biological event, including offering postexposure prophylaxis when indicated.	4,6,7,10,14,17-19,22,28-31
Has a protocol that addresses if, how, and when long-term prophylaxis for employees will be provided during a pandemic, and to which staff this policy applies.	4,6,10,17-19,29,32,37
Includes a policy for the prevention of occupational injury and exposure to bloodborne pathogens during an MCE, including times when PPE or other resources are limited.	17

Continued

Table I. Continued

Surveillance and triage	
Identifies the agency's role, if any, in a community syndromic surveillance program, with collection indicators (eg, syndrome-based, hospital admissions) identified in plan when applicable. ^{10,37}	
Identifies a process for surveillance to monitor for potentially contagious diseases during a MCE after it is identified, including screening of patients and staff, and identifies frequency of surveillance (eg, on admittance to service, before each shift). ^{6,7,10,17,28}	
Includes a protocol for tracking admissions and discharges of patients with potentially communicable diseases during an MCE. ^{3,17,28}	
Describes a written protocol for monitoring and reporting seasonal influenza-like illness among agency patients and staff. ^{6,14,17,24,27}	
Has a procedure for identifying, monitoring, and tracking health care–associated infection transmission among agency patients and staff, including health care–associated transmission of seasonal influenza. ¹⁷	
Reporting, communication plan, and information management	
Includes a protocol for notification of agency administrator(s) of a known or suspected biological event, including bioterrorism, outbreaks of emerging infectious diseases, and pandemics. ^{10,24,30}	
Includes a protocol for notifying local health officials and local law enforcement of a known or suspected biological event, including bioterrorism, outbreaks of emerging infectious diseases, and pandemics. ^{6,7,10,14,17,18,24,30}	
Identifies the name, title, and contact information of a primary and backup person assigned to communicate with agency staff regarding activation of the plan and the status and impact of the biological event during the incident. ^{3,4,6,7,10,14,16-18,19,22,37,43,44}	
Identifies the name, title, and contact information of the primary and backup persons assigned to communicate with public health authorities during a biological event. ^{3,4,6,7,10,14,16-18,19,22,37,43,44}	
Includes a list and contact information of other health care entities and key community response entities (ie, fire safety, law enforcement, emergency medical services, public health, local health care agencies, and governmental agencies) within the region with which it will be necessary to maintain real-time communication during a biological event. ^{6,10,14,16,18,19}	
Describes the process with which information about contagious diseases and need for and use of infection prevention measures (eg, social distancing practices, isolation, PPE) will be communicated within the agency during an MCE (such as through an intranet, hotline, etc). ^{4,17}	
Describes the process with which the agency has arranged mechanisms and content for interagency communication with other health care agencies in the region for safe patient placement during a biological event, including during admission and discharge procedures (includes information on PPE, isolation, and other infection prevention interventions). ^{6,7}	
Describes the process with which the agency has shared estimates regarding the quantities of essential patient care materials/equipment and PPE with local, regional, state, and tribal planning groups to better plan stockpiling agreements. ^{6,7}	
Describes procedures for obtaining and communicating infection prevention information when phone lines are not available. ^{34,36}	
Includes pre-event messages and materials about the most likely biological agents to be involved in an MCE that can be communicated to staff, patients, and patients' household members/families during an MCE. ⁶	
Surge capacity issues	
Has a plan for surge capacity to handle an influx of potentially contagious patients. ^{4,6,7,12,13,17,18,23,24,29-31,40}	
Estimates the quantities of essential patient care materials/equipment and PPE that would be needed for an 8-week period (ie, the estimated wave of a pandemic). Examples of patient care materials/equipment and PPE include intravenous pumps, ventilators, anti-infective therapy, vaccination, respiratory protection, gowns, gloves, eye protection, and hand hygiene products. ^{6,7,15,17}	
Estimates the current staff shortages and staffing levels during an MCE. ^{4,6,7,12,15,17,23}	
Has a protocol for assessing and finding/supplying essential patient care materials/equipment and PPE stocks during an MCE. ^{3,4,6,7,12,14,15,17-19,24,25,29,32,34,37,39,43,45}	
Includes protocols for health care worker surge capacity that acknowledges that staff may be less willing or able to work during a biological event (due to health care worker illness or quarantine, family obligations, or fear leading to reluctance or refusal to work) and that more staff will be needed due to worker fatigue from wearing PPE for extended periods and has contingency plans for these types of situations. ^{4,6,7,18,19,22,24,31,33}	
Includes a protocol for maximizing staff's ability and willingness to work during an MCE, such as offering worker incentives and encouraging staff to have a personal disaster plan. ^{4,6,17,28,29}	
Anti-infective therapy, chemoprophylaxis, and vaccination	
Outlines procedures for establishing and/or maintaining a medication and vaccine stockpile, when applicable, and includes a protocol for coordinating with regional health care facilities or vendors to obtain additional anti-infective therapy supplies during an MCE. ^{4,17,18,32}	
Includes a prioritization plan for staff and their family members regarding who would be the first priority for anti-infective therapy, chemoprophylaxis, and vaccine during times of limited resources. ^{4,6,7,16-19,32}	
Has a protocol for identifying the most current recommendations and guidance on the use of anti-infective therapy and chemoprophylaxis needed for a biological event. ^{6,7,17,28}	
Has a protocol for expediting administration of anti-infective therapy, chemoprophylaxis, or vaccine to patients, staff, and/or staff's family as recommended by public health officials. ^{4,6,7,14,16-19,22,29,30,32}	
Defines the role, if any, of the facility in a large-scale program to distribute anti-infective therapy, chemoprophylaxis, or vaccine to the general population, including patients' household members/families. ^{6,7,17,18,29,30}	
Includes a protocol for performing follow-up monitoring and treatment of staff, patients, and/or patients' household members/families who received anti-infective therapy, chemoprophylaxis, or vaccine. ^{17,29,30}	
Includes security procedures as needed for control and administration of anti-infective therapy, chemoprophylaxis, or vaccine during MCEs or part of maintaining a stockpile. ¹⁷	
Infection prevention education	
Has a designated person who creates, coordinates, and tracks standardized staff training on biological threats and emergency management. ^{6,7,10,16}	
Has a protocol that outlines the types of information that will be provided to staff related to biological threats and emergency management, how frequently this training will be provided, and how competence will be assessed. ^{7,10,17}	

Continued

Table I. Continued

Has a protocol that outlines the types of information that will be provided to patients and patients' household members/families, who will provide this training, and when and how this education will be provided. ^{7,10,17}
Includes agent-specific information (eg, background on the agent/disease, epidemiology of the agent/disease, clinical features, incubation period, case definition, staff educational materials, quick reference materials for staff, and educational materials for patients and patients' household members/families) for the most likely agents to be used in a bioterrorism attack, or those that might occur during an outbreak of an emerging infectious disease or pandemic (eg, severe acute respiratory syndrome, avian influenza). ^{6,7,10,17,28,33,37}
Includes disease-specific patient management information (eg, criteria for detecting a possible case, screening form for the disease, medical treatment, vaccination, postexposure follow-up or treatment, route of transmission, isolation precautions and PPE needed, environmental decontamination procedures). ^{6,7,10,17,28,33,37}
Infection prevention related to water and waste management
Has a procedure for handling/managing increases in regular and regulated medical waste during MCEs, including times when regular waste management pickup is not possible due to the event. ^{8,25,29}
Has a protocol for assessing for water infiltration/environmental contamination after an MCE. ¹⁵
Has a procedure for obtaining additional water during an MCE for drinking, sanitation, and hand hygiene needs. ^{6,11,12,15,32}

protection program, having a nonpunitive sick leave policy that does not encourage staff to work while ill during a biological event, having procedures for monitoring and managing personnel who experience occupational exposures, and defining protocols during times of limited PPE supplies. The plan also should outline the agency's immunization policy, including how staff compliance will be monitored for annual influenza vaccination. Staff at high risk from infection (ie, pregnant or immunocompromised individuals) and those involved in high-risk procedures (eg, aerosolizing procedures during a biological MCE) should be identified. Protocols should be developed outlining the management of high-risk staff during a biological MCE, such as reassignment or furlough.

Domain 5: Surveillance and triage

Surveillance is a critical component of emergency management, especially for biological MCEs. The home health agency emergency management plan should outline the agency's role, if any, in participating in a syndromic surveillance program to identify a biological event. Surveillance protocols should be developed for rapidly identifying staff and patients who have potentially contagious diseases. The plan also should outline procedures for tracking admission and discharge of known or suspected contagious patients, monitoring staff absenteeism related to potentially communicable diseases/conditions, and calculating the rate of seasonal influenza-like illness among staff and patients. Some agencies also may choose to monitor patients' household/family members for potentially contagious diseases.

Domain 6: Reporting, communication plan, and information management

The home health agency emergency management plan needs to outline procedures for reporting known

or suspected biological MCEs both internally and externally. This includes internal communication with agency staff and administrators regarding activation of the plan and external communication with public health agencies, community health care facilities, and response agencies. It is critical that home health agencies identify or create pre-event messages; these materials can be provided or communicated to staff, patients, and patients' families during a biological MCE.⁶ These pre-event and postevent messages and educational materials need to use language that is appropriate for individuals with visual, learning, or other disabilities, as well as for non-English speakers.

Domain 7: Surge capacity issues

The home health emergency management plan must include protocols for handling an influx of potentially contagious patients. One aspect of surge capacity is assessing on-hand resources and calculating amounts that might be needed during an MCE. For biological MCEs, this could include the need for equipment and supplies that would last up to 8 weeks (the estimated wave of a pandemic). These estimates also should take into account that other health care agencies will be placing strains on the supply system during this period, and thus normal supply needs might not be met. Examples of resources that need to be assessed include anti-infective medications, vaccines, respiratory protection, gowns, gloves, eye protection, and hand hygiene products. The need for extra home health personnel will likely be greater during a biological MCE compared with other disasters, because staff may be less willing or able to work during a biological event.^{4,6,24,29,31,32} Factors that may influence health care workers' willingness and ability to work during a biological MCE include personal or family illness, family obligations, and fear of exposure or illness.²⁹ Whenever possible, home health agencies should provide incentives for staff to encourage them to work during an MCE; examples of incentives

include monetary, housing subsistence, health care access, child or adult family member care, and pet care.^{4,17,29} The plan should include protocols for stockpiling or obtaining additional staff and medical equipment/supplies.

Domain 8: Anti-infective therapy, chemoprophylaxis, and vaccination

Medications will be needed for all types of MCEs, but biological events will require a disproportionate need for anti-infective medication and vaccines. The home health emergency management plan should include calculations for determining the amounts that will be needed during a biological event. Home health agencies should be aware of community resources and specify procedures for accessing local, state, or federal stockpiles during an MCE.¹⁷ Agencies also should consider developing and maintaining a stockpile of anti-infective agents and vaccines. The plan also should define a prioritization plan for staff regarding who would be the first priority for anti-infective therapy, chemoprophylaxis, and vaccine during periods of limited resources. A procedure is needed for identifying the most current recommendations and guidance on the use of anti-infective therapy and chemoprophylaxis required for a biological event, given that these guidelines quickly become outdated.⁷ The home health agency emergency management plan should outline procedures for administering anti-infective therapy, chemoprophylaxis, or vaccine to staff, patients, and patients' household members/families, along with protocols for follow-up monitoring as needed.

Domain 9: Infection prevention education

The home health agency emergency management plan should designate a person responsible for creating, coordinating, and tracking staff training on emergency management and biological threats. In addition, the plan should outline the types of infection prevention training/information to be provided to staff, patients, and patients' household members/families. Suggested topics for staff education related to infection prevention during MCEs are outlined in [Table 2](#).

Domain 10: Infection prevention related to water and waste management

Water and waste management are important components of infection prevention during routine times as well as during MCEs. The home health agency emergency management plan should include protocols for safe water handling practices, such as advising patients to stockpile water for use during a disaster and

Table 2. Topics for staff education related to infection prevention during emergency management

Self-screening for illness
Screening/triaging of patients for communicable diseases/conditions
Internal and external reporting and communication procedures
Surveillance during MCEs
Planning of policies and procedures related to infection prevention
Disease transmission methods/routes
Isolation procedures
Respiratory hygiene
PPE use and reuse, including use of respiratory protection
Hand hygiene protocols
Social distancing
Environmental cleaning/disinfection
Disinfection and sterilization of medical equipment
Waste management procedures
Medical management of biological event victims, including identification and diagnosis of disease, and clinical care procedures (eg, treatment, isolation)
Postmortem care
Influenza vaccine
Impact of influenza

developing procedures for wound care and hand hygiene when water is limited or not available. Other important protocols include procedures for advising patients about the potential health risks associated with water infiltration/damage in the home environment, ensuring sewer/sanitation system functioning, and arranging for backup plans for medical waste storage or pickup when regular waste management services are not available during an MCE.

DISCUSSION

Home health agencies need to develop protocols for emergency management plans as they relate to infection transmission during MCEs. This article provides guidance on aspects of home health agency emergency management plans that have implications for the spread of infection in the home care environment. A home health agency can use this information to assess its plan and develop policies and procedures for emergency management that will decrease the risk of infection transmission. This assessment tool is designed to be used with home health agency all-hazards emergency management plans, with a special focus on the infection prevention issues that might arise during MCEs. Most notably, this article combines information from various national organizations and published articles into a tool that can be used to address all types of MCEs, including bioterrorism, emerging infectious disease outbreaks, and pandemics. Home health agency disaster planners should continue to monitor information from national organizations and regulatory agencies regarding recommended practices related to emergency management.

References

- Kirkpatrick DV, Bryan M. Hurricane emergency planning by home health providers serving the poor. *J Health Care Poor Underserv* 2007;18:299-314.
- Laditka SB, Laditka JN, Cornman CB, Davis CB, Chandlee MJ. Disaster preparedness for vulnerable persons receiving in-home, long-term care in South Carolina. *Prehosp Dis Med* 2008;23:133-42.
- Phreaner D, Jacoby I, Dreier S, McCoy N. Disaster preparedness of home health care agencies in San Diego County. *J Emerg Med* 1994;12:811-8.
- Gershon RR, Magda LA, Canton AN, Riley HE, Wiggins F, Young W, et al. Pandemic-related ability and willingness in home healthcare workers. *Am J Disaster Med* 2010;5:15-26.
- Rebmann T, Citarella BB, Subramaniam DS, Subramaniam DP. A home health agency's pandemic preparedness and experience with the 2009 H1N1 pandemic. *Am J Infect Control* 2011;39:725-31.
- Knebel A, Phillips SJ; Agency for Healthcare Research and Quality. Home health care during an influenza pandemic: issues and resources. Available from: http://www.oregon.gov/DHS/ph/preparedness/surge_capacity/homehc_panflu.pdf. Accessed November 2, 2008.
- Centers for Disease Control and Prevention. Home health care services pandemic influenza planning checklist. Available from: <http://www.flu.gov/professional/pdf/healthcarechecklist.pdf>. Accessed December 8, 2007.
- Agency for Healthcare Research and Quality. Mass medical care with scarce resources: the essentials. Chapter 4, prehospital care. Available from: <http://www.ahrq.gov/prep/mmcessentials/mcc4.htm>. Accessed August 22, 2010.
- Association for Home and Hospice Care of North Carolina. Emergency preparedness. Available from: <http://www.homeandhospicecare.org/disaster/handbook.pdf>. Accessed August 22, 2010.
- Centers for Disease Control and Prevention. Smallpox response plan and guidelines, version 3.0. Available from: <http://www.bt.cdc.gov/agent/smallpox/response-plan/index.asp>. Accessed January 30, 2010.
- Department of Homeland Security. Disaster planning guide for home health care providers. Available from: <http://www.dhs.gov/xlibrary/assets/oha-home-health-care-preparedness.pdf>. Accessed July 6, 2010.
- Department of Homeland Security. Preparedness planning for home health care providers. Available from: http://www.dhs.gov/files/programs/gc_1221055966370.shtm. Accessed April 13, 2010.
- Harper County Health Department. Harper County Home Health Agency bioterrorism and disaster response services. Available from: <http://www.harpercountyks.gov/index.aspx?NID=252>. Accessed April 13, 2010.
- Minnesota Department of Health. Home health care services pandemic influenza planning checklist. Available from: <http://www.ci.new-prague.mn.us/vertical/Sites/%7BAD7ECB62-2C5E-4BA0-8F19-1426026AFA3E%7D/uploads/%7B2BF5DD6-B747-49BC-ADCB-D73ED994325E%7D.PDF>. Accessed April 13, 2010.
- National Association of Homecare and Hospice. Emergency preparedness packet for home health agencies. Available from: http://www.nahc.org/regulatory/EP_Binder.pdf. Accessed November 12, 2008.
- New Jersey Department of Health and Human Services. Home health care services pandemic influenza planning checklist. Available from: http://www.state.nj.us/health/flu/documents/home_healthcare_svcs_pandemic_checklist.pdf. Accessed April 14, 2010.
- Occupational Safety and Health Administration. Pandemic influenza preparedness and response guidance for healthcare workers and healthcare employers. Available from: http://www.osha.gov/Publications/OSHA_pandemic_health.pdf. Accessed March 14, 2008.
- South Central Public Health District. Home health care service pandemic influenza planning checklist. Available from: http://www.panflu.southidaho.org/docs/checklist_home-health.pdf. Accessed April 14, 2010.
- Tacoma Pierce County Health Department. Home health care service pandemic influenza planning checklist. Available from: <http://www.tpchd.org/files/library/347822c8ccf28a92.pdf>. Accessed April 15, 2010.
- Rebmann T. Emergency management. In: Carrico R, editor. *APIC text of infection control and epidemiology*. 3rd ed. Chap 27. Washington (DC): Association for Professionals in Infection Control and Epidemiology; 2009. p. 117.1-26.
- Rebmann T, Alexander S, Cain T, Citarella B, Cloughessy M, Coll B, et al. APIC position paper: extending the use and/or reusing respiratory protection in healthcare settings during disasters. Available from: <https://www.apic.org/>. Accessed November 20, 2009.
- Centers for Disease Control and Prevention. Interim pre-pandemic planning guidance: community strategy for pandemic influenza mitigation in the United States. Available from: http://www.pandemicflu.gov/plan/community/community_mitigation.pdf. Accessed January 3, 2008.
- Hogg W, Lemelin J, Huston P, Dahrouge S. Increasing epidemic surge capacity with home-based hospital care. *Can Fam Phys* 2006;52:563-4.
- Jan K. Avian flu: pandemic preparedness. *Home Healthcare Nurse* 2007;25:637-42.
- Martin S. Avian flu: should we worry in home healthcare? *Home Healthcare Nurse* 2006;24:38-45.
- Martin S. Infection control matters in home healthcare. *Home Healthcare Nurse* 2007;25:15-7.
- Yeung C. Home care. In: Carrico R, editor. *Infection Control and Epidemiology*. 3rd ed. Chap 51. Washington (DC): Association for Professionals in Infection Control and Epidemiology; 2009. p. 51.1-10.
- Gershon RR, Qureshi KA, Stone PW, Pogorzelska M, Silver A, Damsky MR, et al. Home health care challenges and avian influenza. *Home Health Care Manage Pract* 2007;20:58-69.
- Baron S, McPhaul K, Phillips S, Gershon R, Lipscomb J. Protecting home health care workers: a challenge to pandemic influenza preparedness planning. *Am J Public Health* 2009;99(Suppl 2):S301-7.
- Joint Commission Resources. 2010 standards for home health, personal care and support services, and hospice. Oakbrook Terrace (IL): The Joint Commission; 2010.
- McDonald MV. Pandemic influenza preparedness planning in the home care environment. *Home Healthcare Nurse* 2009;27:460-1.
- Shamian J, Petch T, Lilius F, Shainblum E, Talosi R. What's the plan? The unique challenges facing the home and community care sector in preparing for a pandemic. *HealthcarePapers* 2007;8:38-43.
- Harwell S, Rosselli R, Light P, Smith W. Bioterrorism and emergency preparedness among home care agencies in New York City and the north country of New York State. Available from: <http://www.albany.edu/sph/nephli/scholars/projects/Bioterrorism&EmergencyPreparedness.doc>. Accessed August 22, 2010.
- Martin SD. Code flu: common sense steps to the development of an agency pandemic flu plan for home care. *Home Healthcare Nurse* 2007;25:595-601.
- Rodriguez D, Long CO. Emergency. *Home Healthcare Nurse* 2006;24:20-7.
- Ross KL, Bing CM. Emergency management: expanding the disaster plan. *Home Healthcare Nurse* 2007;25:370-7.
- Sawyer PP. Bioterrorism: are we prepared? *Home Healthcare Nurse* 2003;21:220-3.
- Stys J. Improving home-based hospice understanding and use of the National Incident Management System for emergency and disaster preparation and response. *Home Healthcare Nurse* 2010;28:375-81.
- Duffy B. When disaster plans go up in smoke: 10 lessons learned from the Florida fires. *Home Healthcare Nurse Manage* 2006;3:16-8.
- Chen T, Lin M, Chou L, Hwang S. Hospice utilization during the SARS outbreak in Taiwan. *BMC Health Serv Res* 2006;6:1-9.
- Ireland P. Old man winter gets an icy grip on the heartland: emergency preparedness and management on the plains. *Home Healthcare Nurse* 2007;25:11-4.

42. Carson V. Walking our homebound patients through terror, grief and loss. *Home Healthcare Nurse* 2001;19:749.
43. Humphrey C. Home care and hospice united in crisis. *Home Healthcare Nurse*. 2001;19:670 [editorial].
44. Sienkiewisc J, Wilkinson G, Cubbage B. A patient classification system for emergency events in home care. *Home Healthcare Nurse* 2007;25:378-85.
45. McGonagle M. VNAA helps agencies prepare for the worst. *Home Healthcare Nurse* 2007;25:487.

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