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Implementing Basic Infection Control Practices in Disaster Situations

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Infections, troublesome in even optimal health care environments, can be a source of serious and persistent concern for the local population and health care workers during a disaster. Because disaster situations often involve power outages, shortages of water and food, and damage to critical infrastructure, cutting off access to communications and travel (eg, destruction of roads and interruption of communications networks), it is critical to have basic infection control practices in place in order to contain the spread of disease and improve conditions more immediately for those affected. Toole and Waldman\textsuperscript{1} define a disaster as “a relatively acute situation created by manmade, geophysical, weather-related, or biological events that adversely impacts on the health and economic well-being of a community to an extent that exceeds the local coping capacity.” Basic infection control, as opposed to a more comprehensive program, is essential in disaster management because the procedures can be implemented by both the provider and the recipient. Historically, the United States military has gained extensive knowledge about infection control through its experience managing diseases in different geographical areas and climates, while dealing with cultural and political scenarios that directly affect the delivery of health care.

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HISTORICAL PERSPECTIVES ON INFECTION CONTROL

A Second Century Approach to Disease Management

The Bible refers to a range of disasters from floods and locusts to epidemics. Persian, Egyptian, Greek, and Roman physicians focused principally on medicinal efforts for wound management. Many of the therapies involved cleansing wounds with everything from water, beer, donkey feces, and grease to various herbal concoctions.2 Galen of Pergamum wrote a large body of work on wound management related to Roman gladiators but erroneously identified pus as a positive factor, an assertion that impeded infection control practices for centuries.2

The Black Death of the Fourteenth Century

The Black Death plague that occurred in medieval Europe from 1347 to 1351 is an excellent example of both mismanagement and proper management of infection. Initially, populations were powerless against the onslaught of the epidemic. The Black Death, now thought to be an outbreak of the bubonic plague, killed one third of Europe’s population.3 Eventually, basic principles of isolation, improved sanitation, and vector control were used to limit the spread of the disease.

Disease Management in Nineteenth Century Military Operations

Over centuries, a systematic approach to infection control gradually developed based on knowledge gained from military operations. Military campaigns brought with them the need for wound and disease management.

As chief nurse for the military hospital in Scutari, Turkey, during the Crimean War (1854 to 1856), Florence Nightingale learned that “improved sanitary conditions in military hospitals and barracks could sharply cut the death rate and save thousands of lives”.4 Six months after arriving at a British hospital in Scutari, her efforts to improve the laundry, kitchen, and hygiene of staff and patients, and the way supplies were gathered contributed to reducing the mortality rate of wounded soldiers dying from disease from 42.7% to 2.2%.4

During the American Civil War (1861 to 1865), practices in disease management were further advanced, including the use of general anesthetics for surgery, delay of amputation to reduce shock, bromine to prevent gangrene, carbolic acid and sodium hypochlorite to treat gangrene, avoidance of surgery for penetrating abdominal wounds, and maggot therapy.2

During the Spanish-American War of 1898, yellow fever caused the deaths of thousands of soldiers resulting in the US Army sending a team to Cuba to investigate the epidemic. At that time, it was believed that yellow fever was spread on clothing of infected patients and from person-to-person contact. However, in 1900, a US Army physician, Major Walter Reed, discovered that mosquitoes were the carriers of the deadly fever.5 Using epidemiological principles for controlling mosquitoes, Major Reed ensured that their breeding grounds were drained and screens were placed on houses.

Soon after, interest peaked in controlling malaria as well as yellow fever so the US Army could build the Panama Canal to join the Caribbean Sea to the Pacific Ocean. In 1904, the Sanitary Department was formed with US Army Colonel William Crawford Gorgas as the first chief sanitary officer. Colonel Gorgas was an expert in construction sanitation, an important skill because mosquitoes also carried malaria.6 Dr Gorgas developed a program to (1) drain areas where mosquitoes were breeding, (2) add larvicidal oil to kill mosquito larvae in swamps that could not be drained, (3) cut brush and grass near homes to 1 foot high, (4) distribute the medication quinine to workers, and
Building the Panama Canal was a huge and difficult construction project. In addition, the project demonstrated how well diseases such as yellow fever and malaria could be controlled.

**The Twentieth Century Faces an Evolving Disease Threat**

In 1915, poison gas was used during attacks in World War I, adding a new dimension to disaster and disease management. Improved sanitation and vector control could not contain the harm inflicted by poisonous gas.

As World War I was ending, the first flu pandemic occurred from 1918 to 1919, killing 40 million people around the world. On December 28, 1918, the *Journal of the American Medical Association* printed the following:

*The 1918 has gone: a year momentous as the termination of the most cruel war in the annals of the human race: a year which marked, the end at least for a time, of man’s destruction of man; unfortunately a year in which developed a most fatal infectious disease causing the death of hundreds of thousands of human beings. Medical science for four and one-half years devoted itself to putting men on the firing line and keeping them there. Now it must turn with its whole might to combating the greatest enemy of all— infectious disease.*

Events from World War I and the 1918 influenza pandemic prompted scientists to develop new applications for germ theory, antiseptic surgical techniques, vaccines and sanitary measures to prevent and treat infectious diseases. Public health departments were also better able to distribute information about the spread of diseases and how to break the deadly chain of infection transmission.

It was not until 1980 that the Association for Practitioners in Infection Control, which later became the Association for Professionals in Infection Control and Epidemiology, developed standards in the following specific areas for infection control practice: epidemiology; microbiology; infectious diseases; sterilization, disinfection, and sanitation; patient care; education; management and communication; and employee health. This multifaceted approach is critically important to the success of infection control efforts during disasters. It offers providers a framework for attending to basic infection control measures, detecting problem areas early, and implementing countermeasures to control the spread of disease.

**Infection control and the threat of terror in the twenty-first century**

Today, infection control measures must take into account the threat of terrorism and the potential for a range of terror attacks—chemical, biological, and nuclear—and a range of materials from explosives to radiation. Biological attacks are particularly insidious as they may be hard to detect. Prompt reporting and surveillance practices are critical to detecting and containing a biological attack.

Recently, a biological scenario was used for a mass casualty simulation in a large US city. During the simulation, patients presented to various military and civilian hospitals in the area with nonspecific symptoms. The scenario played out over 4 days until a pattern was discovered, after which a biological alert was issued. The potential exposures from the time of the initial presentations until diagnosis and alert are indicative of the danger associated with a bioterrorism event. Clinically, the mitigating factor in diminishing the severity of such an attack depends on how well responders such as health care workers and hospital staff practice basic infection control policies. Biological warfare using an agent such as smallpox would “dwarf any previous infection control concern.”
PRACTICAL ISSUES IN DISASTER MANAGEMENT

Nothing is easy during disasters—from accessing the area and dealing with logistics to coming to the aid of a population in need of, or lacking in, basic amenities and services. For example, interruptions to power would not only create issues with visibility and food refrigeration but would disrupt communication because telephones, computers, radios, and televisions would be affected as well. There could also be issues with passable roads, running water, and safe places to live and work. Add to that possible threats to safety, and the challenges of effectively addressing infection control issues are monumental.

MANAGING DISASTERS IN TIMES OF FAMINE AND DISEASE

During the past 20 years, military planners have had much experience with disaster management. This experience has been rich in lessons learned, from both things that were done well and things that could have been done better. For instance, an incident in Somalia in the early 1990s illustrates the myriad of problems caregivers face in disaster management. The capital, Mogadishu, is a city of more than two million people, many of whom live without electricity or running water. Warring groups had destroyed the local agriculture, which led to mass starvation. When other countries responded by sending food to Somalia, local leaders intercepted the food to barter for weapons. This led to millions of displaced refugees, hundreds of thousands of casualties, as well as endemic disease resulting from malnutrition and lack of proper sanitation. In 1992, the United Nations began an operation to help the Somali people receive food; however, what began as a mission to bring food to starving Somali ended in military battle. During the fighting, military health care providers were routinely exposed to a multitude of contagious diseases including tuberculosis, chicken pox, and other illnesses that are contained in Western society.

Climate, Water, and Other Disease Management Considerations

Climate is another main consideration in controlling infections during disasters. Whereas temperatures range from 70°F to 90°F in Mogadishu, the Balkan countries experience a hot summer and a cold winter climate. For example, due to snow, mud, and cold weather, the military hospital established in Tuzla, Bosnia, in support of the Implementation Force from 1995 to 1996, had to be built on wooden platforms. This created challenges for maintaining basic cleanliness of the facility.

Another classic infection control issue involves disposing of human waste. To the left of the makeshift latrine shown in the center of Fig. 1 is a “burn pot”—a metal drum cut in half. When the metal drum was full, the contents had to be burned. To the right of the latrine is the hand-washing station—a bar of soap is hanging in a nylon stocking on the side of a 5-gallon container filled with water. During winter, temperatures were cold enough to freeze the water at the hand-washing station, making basic hygiene difficult.

Disaster relief usually involves a coalition of military, civilian, and United Nations groups. Even when these relief workers are able to occupy fixed facilities, problems may arise. For example, buildings such as warehouses are often used as makeshift hospitals. These buildings typically have major water and sewage problems, along with indigent arthropod, rodent, and bird infestations. Supplying water and electricity to fixed facilities is also problematic. The task is often more difficult for US-based relief groups, which, for instance, may have 110-volt power equipment instead of the 220-volt power equipment commonly used overseas.
An equally critical consideration in any relief contingency is the people, their culture, their health care beliefs, and how they live. A prior knowledge of the people who are affected can inform the planning of effective approaches for infection control.

THE ROLE OF SUBCONTRACTORS AND FOREIGN HEALTH RESPONDERS IN DISEASE CONTROL

In many parts of the world, infection control does not receive the attention it does in more developed countries. However, this thinking is not necessarily shared by care providers from countries where antibiotics are commonly used and water is treated. Foreign responders, by contrast, may have a large contingent of subcontractors who come from countries that do not have readily accessible treated water and antibiotics. These subcontractors add another component to infection control in that they may be poorly screened for health issues themselves, which may pose a significant risk to other health providers as well as the local population. Toole and Waldman\(^1\) found that “front line relief workers in complex emergencies are often volunteers recruited by Non-Government Relief Organizations who sometimes lack specific training and experience in emergency relief.” These workers may be working in food service, acting as interpreters for patients, or providing basic housekeeping activities. Failure to adequately screen these individuals may lead to unexpected outbreaks.

FEAR OF A GLOBAL DISEASE OUTBREAK

A new threat, H1N1, or swine flu, emerged quickly and unexpectedly in 2009. It was a new virus for which there were low levels of immunity in the younger population.\(^12\) In addition, the risk of transporting a virus, drug-resistant organism or an exotic disease from one country to another or from one disaster site to another is a serious matter. Moreover, the mobility of today’s populations can make the worldwide spread of an undetected disease possible very quickly.\(^13\) Reducing the threat of transporting

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Fig. 1. Makeshift latrine with “burn pot” on left. Hand-washing station consists of a bar of soap in a nylon hose, hanging on the side of a frozen 5-gallon water container (Bosnia, 1996).
a virus may be done by screening people on entry or exit of a destination or by initiating modified forms of decontamination.

On a global level, there is the potential for highly pathogenic avian influenza (HPAI) to exert a worldwide effect. The main strategy to combat HPAI is aimed at minimizing the threat at the source. However, the potential for an HPAI outbreak due to the mobility and migration patterns of birds presents health planners with a potentially lethal scenario. Planning for military deployments includes setting contingencies for such epidemics. This is especially true in settings such as Iraq and Afghanistan where the environment can include sandstorms, extreme heat and cold, working in tents, and questionable sanitation facilities. Responding to such an event would primarily center on providing a large facility or tent to house patients suspected of having avian flu. Unused buildings or tents with water and sanitation equipment could be quickly converted into isolation and treatment centers. Surveillance and reporting are critical factors in containing an outbreak, but this is often not possible in some countries.

The importance of infection control and prevention grows in both scale and scope when practiced outside the hospital setting. So-called basic principles are quite challenging to implement. Broader training in infection control practices is recommended for personnel responding to disaster situations. However, because disasters are unpredictable events, it is likely that personnel who would be involved in responding to the next disaster would lack this broader training. Even with the broad disaster response experience among military personnel, infection control knowledge is likely to vary among responders.

**A MACRO- VERSUS MICROLEVEL APPROACH TO INFECTION CONTROL**

Response to disasters may be analyzed by a two-fold approach—a macro or strategic approach, which is broad, and a more detailed micro or operational approach. It is important to understand the relationship between the macro- and microlevels of disaster planning. At the macrolevel, a strategic approach centers on the disaster management of infection control to include a complete analysis of all environmental conditions, the risk factors for that event and region—such as vector prevalence, and available resources. The micro or operational level is focused on executing what should be a well-prepared disaster response plan.

The macrolevel concerns the overall response and implementation of a disaster plan. This is ongoing and conducted by professionals using all resources available. In the United States, the macrolevel assessment of disasters occurs at the federal level. The significance and coordination of efforts are accomplished through the National Response Plan. The highest level event is categorized as an Incident of National Significance; it falls under the purview of the National Response Plan. Such a response is coordinated under the National Incident Management System, which implements “federal, state, local, tribal, private sector, and non-governmental entities to save lives, minimize damage, and provide the basis for long-term community recovery and mitigation of activities.” Although avian flu and H1N1 are a real threat today, the rise of terrorism around the globe and the threat of a nuclear, chemical, biological, radiological, or high-yield explosive incident magnifies the importance of macrolevel planning.

At the microlevel, disaster response is coordinated by the state or local government depending on the severity of the event. The magnitude of the response is determined by parameters set by Homeland Security Presidential Directive/HSPS-5. The operational plan at the microlevel is formulated by bringing together all available assets in the area of operations. Preventive medicine, infection control, infectious disease,
veterinary and medical, and nursing personnel all play a part in developing a coherent plan to limit the spread of disease and protect the population. In many instances, coordination among available resources simply does not occur. For instance, many nongovernment relief organizations do not always coordinate their activities or experience with the larger operation. However, when these groups participate in the planning, they lend an invaluable source of expertise. This was the case in humanitarian efforts in Somalia and Bosnia, for example. It also is reportedly current practice in the Middle East.

Recent examples of microlevel planning include efforts to control disease at Tallil Air Base, Iraq. Characteristic of disaster events or deployments is the continuous influx and departure of personnel. The mobility of personnel increases the potential for missing critical signs of an impending infection control problem. The preventive medicine (PM) officer on the air base assessed the situation and realized that the task of protecting the personnel demanded a more focused approach. The first action was to determine who could assist. Assistance was found from personnel in other units and from coalition forces. For example, the PM officer implemented a program to protect the military personnel assigned to the area by bringing together the infection prevention and control nurse, a PM technician from another US military unit, the Veterinary Detachments, an Australian infectious disease physician, and a Romanian NBC (nuclear, biological, chemical) decontamination unit. These actions were highly effective. An outbreak of meningitis in the Iraqi Army camp was contained, a sexually transmitted disease problem was identified and eliminated, and a hospital interpreter was screened and treated for tuberculosis. In addition, the veterinarians dealt with an increasing intrusion of wild animals onto the base that could have posed a serious health issue for the base population.

SUCCESSFUL INFECTION MANAGEMENT

In the deployed military setting, there are three focal points for infection control and prevention: sanitary practices, disinfection and sterilization, and isolation. According to Roup and Kelley, “successful infection control programs usually have an active multidisciplinary infection control committee; proactive surveillance; effective methods for isolating patients and specimens that pose a risk to others; an occupational health program; policies regarding antibiotic use, aseptic technique, and facility sanitation; and access to at least basic microbiological laboratory support.” It is at this point in the disaster response that theory and planning transitions to practical application of basic infection control techniques. The success of an operation cannot be achieved simply by the implementation of an infection control program. A successful infection control program can only be accomplished by strict monitoring of the program basics. The use of a checklist, which focuses unit or operational level providers on the basics, is the key to successfully limiting the spread of infectious diseases in a disaster situation.

CHECKLISTS AND FOUR PRINCIPLES OF INFECTION CONTROL

Fig. 2 is a checklist that was developed by the US Army nurses of the 212th Mobile Army Surgical Hospital (MASH) in Bosnia in 1996 and has been improved upon through multiple deployments to the present. This checklist incorporates the four principles of infection control: (1) education, (2) monitoring, (3) surveillance, and (4) reporting, and provides for a mechanism to focus on the essentials.
Checklists, which focus on basic yet essential acts, have been effective in many areas for ensuring adherence to safety guidelines and are becoming an integral part of the health care environment. Hayes and colleagues recently completed a study using checklists to minimize errors in surgery and found that "a checklist-based program was associated with a significant decline in the rate of complications and death from surgery in a diverse group of institutions around the world ... Applied on a global basis, this checklist program has a potential to prevent large numbers of deaths and disabling complications."  

Checklists differ from infection control inspection lists, which are common in health care. Both types of lists allow providers to monitor and report data crucial to infection control practices. However, although thorough, an inspection list is not easily implemented in a disaster situation. Nor does it cover the contingencies associated with groups of responders with varying degrees of infection control knowledge.

A checklist could easily be adapted to include specific areas that comprise the response team’s responsibility. For example, a more detailed checklist could be

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**Fig. 2. Infection Control Monitoring Tool for Deployed Settings.**
adapted for surgical instrument processing and sterilization to guide stocking reusable supplies in a disaster scenario. Effort should be made to conform care processes in disaster conditions as closely as possible to those normally found in hospitals. This again involves careful preplanning. Great strides have been made in technology to replicate processes for unconventional hospital environments including everything from portable sterilizers to easily performed quality assurance tests. In addition, the introduction of new advances, especially in testing methods, such as the ability to test water quality and decontamination effectiveness, enables a unit-level manager to tailor infection control processes to the most basic operational level. The basic disaster infection control checklist is disseminated to all areas within the hospital so each area can add critical parameters to the list to make a more effective program.

Although it is easy to add parameters to a checklist to address specific issues, it is important to keep to the basics. The effectiveness of an infection control program is correlated with the number of parameters monitored. In disaster situations, health care workers are already operating under a high level of stress. Adhering to the basics helps workers focus on the priorities of the infection control program while still allowing them to perform their primary jobs. Having reliable reference material to refer to, teach from, and consult will help all staff to focus on the priority tasks.

Communication is the foundation for basic infection control. It is a mechanism to initiate action, whether it be reporting a finding or warning of a potential problem or shortfall. Breaks in communication equate to failure to take action. They lead to the possibility of a negative outcome such as propagating infections by misusing cleaning products, diluting chemical disinfectants incorrectly, failing to recognize symptoms of a contagious disease process, and deviating from standard infection control procedures.

Finally, what are the consequences of failing to implement and enforce adherence to basic infection control practices? Staff may merely fill out the checklist without due diligence. The point is not to fill out a checklist but to use it to remind and reinforce proper infection control and also to use as an evaluation tool to assess and reassess proper procedures. The bioterrorism example cited earlier illustrates the importance of having sound infection control procedures that are in place and that are observed.

**Educating Infection Control Personnel**

Education is vital to the effectiveness of deployed providers and the infection control program they help to carry out. Roup and Kelley\(^\text{10}\) concluded that “the underpinning of a successful [infection control] program is regular education and communication. Infection control must be given emphasis and responsible personnel to be successful.” **Fig. 2** lists two educational opportunities: staff in-services and the sharing of journal articles. Education can be focused on tailoring these activities to the specific situation. Emphasis should include a range of topics from basic hand washing to ensuring the providers have an understanding of the diseases prevalent in the area. Educational materials can be developed and distributed to all groups providing support.

An example from a military operation best illustrates a successful outcome in this area. The Public Health officer for the 28th Combat Support Hospital in Mosul, Iraq, routinely visited contractor facilities to educate and relay important infection control practices. Presentations about *Acinetobacter* were provided to reinforce information that many may have missed in briefings prior to deployment to Iraq. *Acinetobacter* is a bacterium commonly found in soil and water and has been problematic in the wounds of service members returning from the war zone.

For a disaster scenario, where the situation is not normal, education may also involve emphasizing to staff the importance of “doing the best you can for the most
people” because disaster situations may not allow responders to handle individual patients. Rather, following the practices that are best for the population as a whole can be the most effective way of containing infection. Identifying individuals who are responsible for the infection control program in their unique clinical area can be very helpful in making the program a success.

**The Use of Monitoring in Infection Control**

Monitoring, a key component of infection control, can be best understand through its engineering and clinical components (see Fig. 2) to make the process more manageable and intuitive. It may be easier to solve an engineering problem than a clinical one; personal health care practices are harder to change if not monitored closely. Critical practices of hand washing and disposal of hazardous waste, for example, may be neglected. In the chaos of a disaster, simple, routine practices can be forgotten. The checklist assists in monitoring by serving as reminders to health care workers of containment behaviors such as hand washing and the necessity of items such as trash bags, spill kits, eyewash stations, and water. For instance, the United Nations High Commissioner for Refugees recommends providing a minimum of 20 liters of potable water per person per day for domestic needs—cooking, drinking, and bathing.18 Not every disaster situation will involve refugees, but the concept of how much water is needed for basic needs can be elusive. Water needs are an essential consideration for personal hygiene and hand-washing practices. Additionally, water needed for cleaning and sterilizing surgical instruments and other equipment and the demand for water is increased.

**Employing Surveillance in Disaster Control**

Not only must infection control practices be observed for patients in disaster scenarios, but healthcare providers must also know how to protect themselves. It is common for health care providers to ignore basic policies such as choosing not to eat at a co-located nongovernment relief organizations facility or declining food and drink given by a local worker. There is rarely a military operation where someone is not diagnosed with salmonella or another exotic disease acquired from disregarding standard policy. A good example of surveying at the worker level can also be found in Mosul. In 2007, a third-party subcontractor was admitted to the emergency room and eventually diagnosed with chicken pox. The workers he was housed with were quickly quarantined. Upon further investigation, it was discovered that a large group of these contractors were recently imported from another country in which chicken pox was prevalent during that season. This led to a review of the hiring practices along with health screening of workers prior to deployment from Kuwait.

**Reporting Infections in a Disaster**

Reporting is the last of the four major infection control basics. It includes accounting for everything from needle sticks and breaks in aseptic practice to exposure to tuberculosis. Any potential for disease spread must be identified early and addressed appropriately. Trained infection control professionals cannot be effective if they do not have necessary information. Seemingly insignificant matters may have far-reaching consequences.

Another aspect of reporting involves the Health Insurance Portability and Accountability Act (HIPAA). Many hospitals in the United States do not have the communications infrastructure to share necessary information between facilities with regard to medical records, patient privacy, and security issues, even in trauma situations.19 The situation can be even more complex when dealing with disasters outside the
United States. The ability to communicate patient information between hospitals and providers is crucial when dealing with matters of infection prevention and control.

CURRENT ADVANCES IN INFECTION CONTROL PRACTICES

Advances have been made in infection control practices and largely involve establishment of standards of care. These standards have been adopted by the US military. Rather than the latrine, burn pot, and improvised hand-washing station shown in Fig. 1, the military now deploys with commercial portable toilets equipped with waterless hand scrub dispensers attached to the wall. Procedures are also in place to routinely check hand scrub dispensers to make sure they are filled. This is a simple but important aspect of infection control. Another current infection control measure now part of standard practice in the military environments is the placement of multiple hand-washing stations at entrances to military dining facilities. A full-time attendant not only checks for supplies and cleanliness but also, and more importantly, ensures that everyone who enters washes their hands before joining the food line. Fig. 3 displays a sign for hand washing that transcends culture and language. The cardinal tenet of infection control practice is hand washing, and this practice must be brought down to the most rudimentary level for all to understand.

SUMMARY

Once a disaster has occurred, the possibility of an epidemic is prevalent. An emergency relief program that can be immediately put into practice is imperative and would involve (1) establishing surveillance processes; (2) developing standard case management protocol agreement on policies for prevention—including vaccination and prophylaxis—along with environmental management plans; (3) having reserve supplies of essential medical materials, including intravenous solutions and antibodies, and sources of relevant vaccines; (4) identifying treatment sites, triage systems, training needs, and expert assistance for epidemic investigation along with a laboratory to confirm index cases of epidemic disease; and (5) quick implementation of community education and evaluation programs. Implementing infection control practices involves a two-fold approach—a macro or strategic approach and a micro or operational approach. At the strategic level, overall planning and resource
management determine the effectiveness of the response. This includes compiling environmental analyses and stockpiling supplies including hand-washing supplies and equipment for laboratory testing. The success of rapidly mobilizing and deploying assorted relief groups depends on the effectiveness of coordinated efforts that have evolved from the strategic planning level.

The main objective of the infection control effort is accomplished at the microlevel using the principles of educating, implementing, surveying, monitoring, and reporting the infection control processes. These principles are enacted by establishing and monitoring individual infection control practices among providers and the population being helped. The principles are applied proactively through a combination of clinical, managerial, and logistical planning, all of which are being assessed at the strategic level.

Best practices from after-action reports of major disasters should be compiled, analyzed, and published so the information is disseminated to individuals entrusted with infection control management and disaster response at all levels. For instance, “the main lesson learned from the severe acute respiratory syndrome (SARS) outbreak (of 2003) was that it was contained through the conscientious application of enhanced infection control measures at the national and local levels... Control of an emerging infection requires swift action by health care providers and an adequate public health infrastructure.”

A successful infection control program in disaster situations requires enormous planning efforts; dedicated, detail-oriented health care workers; and helpful tools including checklists that emphasize the basics of education, monitoring, surveillance, and reporting. Understanding the successes and failures of past disasters, while rehearsing how to react in a crisis today, will allow ordinary people to accomplish extraordinary things in the area of infection control and prevention.

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