
Preparing The Public For Preparedness Against Terrorism:: FEMA's Central Role Falling Short

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Abstract

Study Objective:To evaluate the appropriateness and usefulness of publically offered FEMA terrorism preparedness information contained in principal FEMA disaster preparedness documents.

Results: The latest Are You Ready? Preparedness document offered by FEMA for public use is inadequate in providing actionable information the public can use to effectively determine a potential terrorist attack against them. This is particularly true for an attack employing weapons of mass casualty and destruction.

Conclusion: The FEMA document for terrorism preparedness intended for use by the public does not offer useful information the public can use to actively take steps in their own defense and protection against weapons agents that may confront them in an active terrorist attack. The public remains unprepared to act on their own behalf, and by the time official notice of an attack is determined and announced, many people may suffer injury or die for lack of realistic preparation.

“... don't wait until disaster strikes before you tell the people what to do. Your motto should be the same as the scouts. You want the people to BE PREPARED!” —Federal Emergency Management Agency ¹

INTRODUCTION

The 2005 hurricanes Katrina and Rita exposed the flaws not only in government disaster response, but more importantly, they exposed the complete and total unpreparedness of the general public for response to disaster themselves. The public has been cultivated to believe that government can care for them, defend them, assist them in virtually any phase of social and natural disasters and assaults that come their way. It should be painfully clear now that government cannot do so.

Michael S. Rozeff, Professor of Finance at the University of Buffalo asserts that the public have come to rely on government as the ultimate rescuer in times of calamity. ² They see disaster aid as a top down structure where the federal government will cover (nearly) all eventualities, provide every asset, anticipate every consequence. This belief leads many people to leave preparedness for disasters of any stripe in the “capable” hands of anonymous government officials who are themselves far removed from

the disaster both in time and space as well as knowledge of the region's political, economic, asset, and topological features.

If the public does not make effective preparations for events with which they are very familiar, how likely are they to prepare for protecting themselves from a terrorist attack or its consequences? FEMA has been in the forefront of natural disaster preparation education since its inception. In today's world of terrorism, FEMA has expanded its education scope to include terrorism. All state and local emergency management offices display terrorism response publications. The most likely authoritative and reader-friendly source of disaster preparedness information is FEMA. Yet the primary document advanced by FEMA does a poor job of educating the public on terrorism related preparedness. It is for these reasons that analysis of FEMA's approach to terrorism preparedness education of the public is addressed here.

MATERIALS AND METHODS

The federal agency source materials from FEMA and the CDC were primary references selected for analysis in this study. FEMA's Are You Ready documents, one prior to 2004 and the in-depth version dated August 2004 were the principal documents upon which this study stands. They

were examined section by section for useful terrorism response information allegedly designed for public use in response to a terrorist attack.

DISCUSSION

U.S. TERRORISM PREPARATION

Since the 9/11 and anthrax-in-the-mail attacks on the U.S. in 2001, we have expended considerable effort and poured tens of billions of dollars into preparedness of the U.S. for both preventing and responding to terrorist attacks of all types, including weapons of mass casualty or destruction (WMCD).³ Though 9/11 focused the U.S. on the urgency for preemptive action against future terrorist acts confronting our nation, the nucleus of those preparations began in 1996 with the fiscal year 1997 defense appropriation's bill and its Title XIV.⁴ Those legislative requirements called for preparing both federal and state agencies and in particular, the training of federal, state and local emergency personnel for recognizing, responding to, and minimizing the consequences of WMCD terrorist attack.⁵ The preparation includes mandated exercises such as DARK WINTER, and the TOPOFF (top officials) exercises 1, 2, and 3 (just concluded in April 2005). It is the public that is now in need of useful, do-able information for preparing and responding to a terrorist attack, especially WMCD.

There are many public and private organizations or agencies which offer terrorism and WMCD information.⁶ Several sources are quite good particularly the ones cited herein.⁷ But they tend toward the technical side of explanations. Several federal government websites (DOE, NIH, CDC, DOJ, FBI, etc.) offer considerable information on terrorism and WMCD.⁸ These sources also tend toward technicalities (NIH, DOE, CDC) or are not of sufficient useful detail understandable to the average citizen. The major problem confronting the average citizen is what site offers understandable and actionable information for them? Much of the information is technical and written more so for those with a technical need-to-know such as HAZMAT or medical officials. Some sources address the subject from the standpoint of domestic and international law. The same spectrum of coverage is largely true of trade and professional publications.⁹ The public has access to these and other sources in most cases, but the technicalities most likely are beyond them. What they generally must do is rely on a select few government sources, searching for information both understandable and useful to them. That is not an easy and certainly not an efficient task. What is needed is a single source of information written in a form

and at a level of technical depth designed for the general public in a single source document from a single federal agency.

There are nontechnical publications that convey the problems of a societal nature imposed upon a society by run-away disease such as the 1918 Spanish flu outbreak.¹⁰ Others may impress the consequences of lack of knowledge and know-how. This was the focus of the Canadian military's responses and methods of coping with chemical weapons in World War I.¹¹ These are nontechnical in nature and certainly offer no hands-on response information for a citizenry facing WMCD terrorist attacks. Another approach are those publications attempting to explain and justify to the public why we must implement and finance programs on biological terrorism.¹²

The need for a "layman's what and how-to" guide is justified by intelligence statements arising from public hearings in February 2005 held by the U.S. Senate Select Committee on Intelligence.¹³ The top of the U.S. intelligence community appeared before the committee, presenting sobering judgments, assessments and guarded concerns.

Addressing the foreign-based and origin of the threat to the U.S., Vice Admiral Lowell E. Jacoby, Director, Defense Intelligence Agency (DIA), commented on the current and projected national security threats confronting the U.S., stating:

"We judge terrorist groups, particularly al-Qaida, remain interested in Chemical, Biological, Radiological and Nuclear (CBRN) weapons. Al Qaida's stated intention to conduct an attack exceeding the destruction of 9/11 raises the possibility that planned attacks may involve unconventional weapons."¹⁴

Addressing al Qaida's capability to employ unconventional weapons, he opined,

"Because they are easier to employ, we believe terrorists are more likely to use biological agents such as ricin or botulinum toxin or toxic industrial chemicals to cause casualties and attack the psyche of the targeted populations."

Robert S. Mueller, Director, the Federal Bureau of Investigation (FBI), in addressing terrorism enumerated his primary concerns¹⁵ :

"[T]he threat from covert operatives who may be inside the U.S. who have the intention to facilitate or conduct an attack."

“Concern with the growing body of sensitive reporting that continues to show al-Qa'ida's clear intention to obtain and ultimately use some form of chemical, biological, radiological, nuclear or high-energy explosives (CBRNE) material in its attacks against America.”

Porter Goss, Director, Central Intelligence Agency (CIA) observes similar concerns as others, stating ¹⁶ :

“Al-Qa'ida is intent on finding ways to circumvent U.S. security enhancements to strike Americans and the Homeland.”

“It may be only a matter of time before al-Qa'ida or another group attempts to use chemical, biological, radiological, and nuclear weapons (CBRN).”

Goss also states, “[w]e know from experience that al-Qa'ida is a patient, persistent, imaginative, adaptive, and dangerous opponent” (emphasis added).

The assessments by U.S. intelligence officials are all the more alarming in light of alleged communications between bin Laden (whereabouts unknown) and Al-Zarqawi in which bin Laden encourages Al-Zarqawi to initiate attacks directly against the U.S. homeland. ¹⁷ Al-Zarqawi was reported killed in an air raid conducted by U.S. warplanes in Iraq on 8 June 2006. ¹⁸ Bin Laden's own words should serve as a sentinel warning to all Americans:

We do not differentiate between those dressed in military uniforms and civilian: they are all targets.” ¹⁹

The statements by the U.S. intelligence community make it all the more imperative that the efforts underway to prepare the nation to respond and recover from a future catastrophic terrorist attack, particularly employing a WMCD, must now be inclusive of a thorough, yet understandable treatment of the subject matter for the public than heretofore considered necessary. A recent presidential commission assessed the intelligence capabilities of the U.S. in a massive document which underscores the risks and threats to the U.S. posed by WMCD agents. ²⁰

NATURE OF THE THREAT

As dangerous as chemical, nuclear or radiological weapons clearly are, and certainly are on the table for use by terrorists, perhaps nothing offers a greater long-term hazard and threat on a more likely level of occurrence than bioterrorism in this age of rapidly advancing and spreading biotechnology. Modern medicine has armed us with tools that make epidemics and pandemics perhaps much less

likely today in dealing with the historical and natural pathogens. Yet, today's bioengineering capabilities present us with potentially newer, more resistant, and likely more lethal pathogens.

The bioengineering capability was amply demonstrated in a paper by Australian researchers published in the *Journal of Virology* in February 2001. ²¹ A mouse gene called Interleuken-4 (IL-4) was inserted into the mousepox virus and subsequent infection of resistant mice resulted in near 100% mortality. The authors of the work expressed surprise about the result, though one other researcher argues it shouldn't have been a surprise. ²² The paper raised concerns of terrorists employing human or other genes inserted into human-pathogenic viruses which could overcome vaccinations or other acquired or natural immunities.

Most notably, the former Soviet Union also demonstrated the capacity of modern biochemical and molecular biological techniques for altering very dangerous natural pathogens to super pathogens. Soviet defector Ken Alibek (Russian name: Kanatjan Alibekov) in his 1999 book *Biohazard* revealed his work and that of the overall Soviet bioweapons research program, principally under the former Soviet research organ Biopreparat. ²³ The menagerie of microbes they studied included the causative agents of plague, tularemia, smallpox, and a hemorrhagic fever (Ebola). Some of the preliminary work of Soviet bioweaponeers was published in the open literature as mentioned by Alibek in his book.

A 1997 published paper of Soviet research on viruses noted the insertion of an Ebola gene into that of vaccinia (the virus generally used to make smallpox vaccines). ²⁴ Later the same year, another team produced a genetically altered strain of *Bacillus anthracis* (the causative microbe of anthrax) that resists the anthrax vaccine. ²⁵ These abilities to alter the natural genes of serious pathogens harbor serious potential threats to the U.S. in particular and the world community in general. If the technical know-how, or the actual agent samples fall into the wrong hands (such as rogue states and/or through them, terrorists), our safety is seriously compromised by these “artificial” and virulent agents for which no human has any natural resistance and no medical practitioner has the means to fight.

Richard Preston, author of *Hot Zone*, ²⁶ and of *The Demon In The Freezer* ²⁷ notes an experiment conducted by the CIA at the U.S. Army's Dugway Proving Grounds in Utah. The experiment focused on a simple question: could someone

produce anthrax in a make-shift production plant consisting of inexpensive, off-the-shelf equipment? In January-February 2001, they got their answer— yes. ²⁸ Crude that the product may be, it can be done.

Even the natural smallpox virus if unleashed upon us by an accomplished terrorist attack could present us with many problems in containment given the problems faced by many not able to take the vaccine (the immuno-compromised, transplant recipients, very old, and very young).

News reports over the past decade since the fall of the USSR noting the lack of security of Russian nuclear weapons also carries over into concerns for the security of these heinous microbes stocks and technical know-how knowledge base in under- employed or unemployed former Soviet bioweaponeers. A December 2004 report to the U.S. Congress notes improvements, but delineates concerns about current Russian nuclear security. ²⁹ The reports states, “[w]e assess that undetected smuggling has occurred, and we are concerned about the total amount of material that could have been diverted or stolen in the last 13 years.” Ariel Cohen in a paper for the Heritage Foundation assessing Russian security of sensitive weapons wrote, “[t]here is a pervasive sense in the military and security services that nobody is responsible for anything and that justice, accountability, and responsibility are not a part of the bureaucratic culture.” ³⁰

Given the uncertainties of security of these WMCD agents in troubled regions of the former Soviet Union, a better educated public on operationally implementable elements of individual recognition of, defense against and response to terrorism and WMCD attacks also serves the greater community good. A better educated public, capable of reacting to a greater extent than simply amassing an emergency kit, or cowering in a closed-off room also reduces the likelihood of overwhelming mass casualties or panicked fear of infection which can easily overburden medical first responders and hospital facilities. Those education measures cannot be superficial or incomplete. Specificity as well as reasonable technical simplicity are the key elements to an effective public education on terrorism and WMCD.

Along these lines of better preparation for the public, it may be worth dusting off a paper written by Edward H. Kaplan, William J. Bicknell and Lawrence M. Wein in August 2003 in which they argue for the advance but controlled availability of anti-WMCD prescription medications to the public. ³¹

The information on WMCD for the public must be thorough and should cover the three types of WMCD— chemical, biological and radiological. It must cover the characteristics of the agents, elements of detection, dissemination, decontamination, symptoms, self protection, including medicinal use if available in hand, etc. that is understandable to them and where appropriate, executable by them in responding defensively to a WMCD attack themselves, separate and apart from government assistance. This source must cover these elements in plain language. The logical source for such information specifically designed for the public is FEMA.

FEMA'S PUBLIC TERRORISM EDUCATION

Several years ago, FEMA offered an initial 108 page “Are You Ready? A Guide to Citizen Preparedness” that covered a broad range of natural and technological disasters. ³² Though a preliminary stopgap measure pending a more developed document, it was very good on the natural disaster material. It was fraught with brevity that bordered on uselessness for the technological material, especially the terrorism and WMCD. It also overlooked more commonly useful items for implementation of its recommendations for action, and in some cases offered potentially hazardous information if carried out by the public.

Though replaced in FEMA's own words by a more “In-Depth” guide, the follow-on guide, a 204 page tome of nearly the same title and following the same format essentially as the first, including more pictures, fares little better. ³³ The problem confronting some of the public now is that a guide (the first) is out there in citizen's hands and perhaps stored in emergency kits for future reference and use that may not be updated by the newer version, possessing some information (such as it is) that to them must be good since the feds put it out. A comparison of the two different versions reveals the overall inadequacies of the approach FEMA took, and retained in the latest version available to the public.

THE FIRST PRE-2004 GUIDE

The first guide devoted 14 pages (13%) of its 108 pages to terrorism and WMCD. A few examples of the lack of thinking-it-through appear in the first guide. They are questionable for the potential safety of those attempting to implement those suggestions.

The Shelter section advised making an emergency toilet if necessary. It suggested sprinkling a household disinfectant

such as household bleach into the container to reduce odor and germs. As anyone who has read the label of a bleach bottle (or an ammonia bottle) knows, the warning is quite specific and emphatic: DO NOT MIX BLEACH with AMMONIA. Human urine contains ammonia and will generate more on standing. The bleach added to ammonia-generating materials can produce any one or all of several poisonous chemicals (chlorine, nitrogen trichloride, or hydrazine) depending upon the proportions and concentrations of bleach and urine-based ammonia, mixture temperature and standing time.³⁴ The recommendation served to replace the obnoxious with the noxious. These poisonous by-products are potent respiratory irritants. This problem is increased by many people utilizing the same receptacle repeatedly over time in a presumably confined, unventilated space. The fumes can build up very quickly. Of course, one could buy some non-bleach, commercial portable camping toilet chemical to have on hand in the emergency kit for this purpose.

Since many bacteria do not perform well in acidic solutions (most pathogenic bacteria have adapted to the mildly alkaline body pH), very liberal doses of vinegar would minimize their growth and ammonia production in standing urine. The vinegar would neutralize any ammonia produced³⁵ without production of toxic by-products. The "In-Depth" guide removed this emergency toilet idea.

The In-Depth guide having removed the emergency toilet fabrication presents the residents with a problem. Under Water and Sewage Systems, the In-Depth guide advises not flushing toilets until you know the sewage pipes are intact.³⁶ In Appendix B, under Sanitation and Hygiene Supplies, the In-Depth guide lists heavy-duty plastic garbage bags for personal sanitation uses.³⁷ Is this a hint for an emergency toilet? How should it be constructed, and how to address disinfection of the contents? The In-Depth guide does not say. With the exception of a nuclear blast, terrorist attacks would have to target municipal water treatment facilities to render not only toilets, but other water-requiring services inoperative. This is a possibility, though it would not bring with it the immediate mass-casualties and deaths within minutes or hours sought by today's terrorists.

In treating water for potability, both guide documents suggest using an eye dropper to add 16 drops of bleach to one gallon of water.³⁸ If a dropper is not available, it provides short directions on using a strip of paper dipped in bleach in a spoon and allow the bleach to drip from the paper

strip into a gallon of water. Though workable, it too is impractical. A simpler instruction would be to use a teaspoon of bleach added to five gallons of water.³⁹ Teaspoons are more available than eye droppers. A five-gallon plastic "Jerry" can, can be bought at most any store selling camping related equipment. One is good to have for any disaster situation, natural or technological.

The same section of the initial guide also notes that water can be purified by distillation.⁴⁰ The means suggested—placing a cup under an inverted lid within a pot of boiling water—seems clumsy, probably hazardous to perform, but certainly inefficient, not to mention energy and time consuming for very meager returns. The last thing those in an emergency situation need is a second or third degree burn from distilling water. Distilling enough water this way for a few people to serve their minimum daily needs is doubtful. If you lose electricity or natural gas through the incident, you can't distill anyway.

In some emergencies, authorities may advise remaining indoors. Creating a single, sealed interior room may appear to be a sound approach, but it assumes that the airborne threat outside will not present an airborne hazard to the remaining interior space over the time of the emergency confinement, an assumed and projected five hour duration. Given the inherent porosity of buildings through exterior doors and windows (drafts, etc.), the potential for interior contamination exists. This is particularly true for incidents during cooler weather, when the heating is turned off as directed. (Significantly cooler weather is not a climatic condition ideally suited to use of WMCD agents.) As the warmer indoor air cools, outside (contaminated) air will seep in.⁴¹ On exiting from the sealed room, occupants may well have to contend with any contamination of the building interior as a whole, and particularly those surfaces around exterior doors and windows. The initial guide document does not address how or when to emerge from a sealed room, beyond any broadcasted instructions. Relying on a communications system that is easily subject to interruption as evidenced in hurricane Katrina is equally iffy. If the hazard is so great as to justify confinement to a sealed room, then the remainder of the dwelling is likely contaminated. If sealing the exterior doors and windows is deemed unnecessary, then why a safe room at all? It seems reasonable that the time it takes to implement sealing of an interior room could as easily and more effectively be devoted to sealing critical exterior door/doorframe spaces first, followed by windows on the ground floor, and then

second floor balcony doors and windows, if present.

The selection of an interior room (or central location following the guidelines for tornados and hurricanes) for a sealed safe-room with no windows or vents to the outside, most likely nominates a bathroom or walk-in closet for most unconnected, self-standing, single family, single-story residences. Such confined rooms are cluttered with furnishings and storage, which significantly reduces the space and the available air volume per person. Many apartments offer the more likely chance of an available windowless, large interior room. Both the initial and the "In-Depth" guides state that "ten square feet [2 feet by 5 feet] of floor space per person will provide sufficient air to prevent carbon dioxide build-up for up to five hours."⁴² This assumes, of course, that confinement would be required for only five hours, and FEMA offers no instructions for what to do in excess of five hours. The space allotment per person may hold up assuming that space is open space (no furnishings, fixtures, etc.) in the room selected, and thus 80 cubic feet of air are available per person for the five hours of isolation. Calculations suggest the figure also appears based upon a normal breathing rate of 15 breaths per minute per person.⁴³ Under the duress of a terrorist attack and forced confinement, anxiety will significantly increase the breathing rate, of particular concern in smaller rooms. The minimum air volume demand per person can increase as much as 30% beyond what the isolated room may be able to provide.⁴⁴

These isolated, sealed room suggestions also ignore the psychological problem some people may experience with confinement—claustrophobia or some other confinement anxiety disorder. Individuals may be unaware of these anxiety issues under otherwise normal conditions, but the disorder may well be triggered by the duress of an actual terrorist attack. And the manifestation of any latent confinement anxiety is independent of the room size according to one psychologist.⁴⁵ With this in mind, sealing the exterior doors and windows may be more practical to minimize the inherent dangers to all from a person terrorized more so by confinement than by the actual terrorist attack. The sealed room suggestion does not address how to accommodate those who are bed-bound or wheelchair bound.

THE IN-DEPTH AUGUST 2004 GUIDE

The In-Depth guide devotes 33 pages (16%) of its 204 pages to terrorism. The slight increase is deceptive. Four pages of

the Terrorism section (Part 4) are blank. Seven pages are full-page pictures. That's eleven pages of nothing useful. The In-Depth guide effectively only has 22 pages (11%) of any information of any kind on terrorism and WMCD. What's worse, of the entire 204 pages, 42 pages are either blank pages or full page pictures (20.6%). Essentially one-fifth of the entire In-Depth guide conveys nothing useful or informative. FEMA could have cut out the empty space, shortening the document to 162 pages and been as "effective." What does the In-Depth Guide present and what does it not?

In Section 1.4, Shelter of the In-Depth guide⁴⁶, the treatment of food cans for opening advises using a one to 10 dilution of bleach (one part bleach, nine parts water) as the disinfectant solution to decontaminate the can. However, as any chemist knows, reactions are concentration, temperature and time dependent for completion (even in reaching equilibrium) which no private citizen is expected to know or worry about, but authors of such advice should. What the directive omits is any question of time for the process to be effective. This is important considering that a simple series of studies on decontamination of nerve agent with various bleach solution concentrations demonstrates a time dependence at room temperature for decontamination. A minimum of 10 minutes is advisable with dilute bleach solutions in the case of such agents.⁴⁷ However, in many cases, the decontamination process of chemical agents with oxidizers such as bleach can produce similarly poisonous by-products which must be thoroughly rinsed from the can.⁴⁸ The FEMA document does not address these issues either.

Section 4.2, Explosions, offers very good advice, and in particular the directive to use a cloth to cover the nose and mouth to breathe through is sound.⁴⁹ The importance of this is that even if the explosion is not a dirty bomb (laden with radioactive materials), all explosions in or near a building likely will release building debris which can include asbestos fibers, plastics aerosols, etc. and these should not be inhaled. The graphic images following the collapse of the World Trade Center towers in NYC in the aftermath of the 9/11 attack amply demonstrated to all viewing the images, the extreme problems confronting those caught close to the tower debris, the difficulty in breathing confronted by the bystanders and emergency personnel.

Section 4.4, Chemical Threats, makes several useful suggestions on behavior after the attack.⁵⁰ The blotting of areas of the body is sound advice on the mechanics of any

decontamination procedure. Yet this caution is not emphasized with regards to the washing of the face. Blotting is the recommended means for cleansing the skin of any WMCD contaminant. What is meant by “gently wash” is not clear. Blotting avoids rubbing the contaminant into skin pores, or abrading the skin which may further increase skin penetration of the agent. Given the wealth of face skin capillaries, blotting is arguably more important about the face to remove the bulk of any chemical contaminant. Then a follow-up “gentle washing” is appropriate. The In-Depth Guide makes the same recommendations here as was done in the original Guide's National Security Emergencies section.⁵¹ Some useful materials to act as blotting absorbents include flour or Fuller's Earth (diatomaceous earth).⁵² What to use as an absorbent blotting material is not mentioned in the section.

The Chemical Threat section of the In-Depth Guide does not even mention the four types of lethal chemical weapons. It does not indicate the relative rapidity of action of one class to another. It does offer a string of signs or symptoms of lethal chemical weapons employment in a terrorist attack.⁵³ But the string of symptoms are generic, could be in some cases those of allergic responses, and suggests by its manner of presentation that they may all become present. There is no elaboration of any kind to offer agent class specificity. This is what is called an In-Depth guide. And the same cite makes the statement, while potentially lethal, chemical agents are difficult to deliver in lethal concentrations. This is an unjustified generalization that is disarmingly misleading and false. Both the original Guide⁵⁴ and the In-Depth Guide⁵⁵ state that chemical agents are difficult to produce. This is patently false. Chemical agents were originally made and used in WWI and they were made and used specifically because they were made from existing industrial chemical precursors, cheap to make and within handling safety considerations, easy to make and use.

Section 4.3, Biological Threats, offers general, but sound advice for biological threat concerns. Coverage of all the various kinds of biological agents of potential use would be impractical. However, certain generalities of specific severe, early onset of symptoms suggestive of urgent attention could be provided. The section refers the reader to the Centers for Disease Control and Prevention (CDC) website (www.cdc.gov) for specific information. The CDC site heading of biological agents covers some 30 plus different bioagents. Much of the available information is primarily for professionals rather than lay people and may be rather

technical for them. The problem with referring readers of the In-Depth guide (hardcopy) to a website is that many people may not have web access. The In-Depth guide should provide the critical information within its body. An example is that of anthrax.

Under the CDC site heading Emergency Preparedness and Response, Anthrax: Diagnosis/Evaluation (Signs and Symptoms) there are 11 subheadings, only two of which are earmarked for the public (Q&A: Diagnosis, Q&A: Signs and Symptoms). The Signs and Symptoms do attempt to make a distinction between cold and flu versus anthrax infection. A reference available through the CDC website under the anthrax signs and symptoms heading also offers a table of comparisons of inhalation anthrax and influenza symptoms.⁵⁶ Including the table of this citation and highlighting the entries of shortness of breath, chest discomfort, rhinorrhea, and nausea and vomiting, would perhaps offer the public a bit more specificity to assessing contraction of anthrax rather than the flu. Certainly the current In-Depth guide does not offer any information to help the public assess an ongoing anthrax infection. Similar concerns accrue for other biological agents.

The Nuclear Blast (Section 4.5)⁵⁷ and Radiological Dispersion Device (Section 4.6)⁵⁸ sections avoid useful information on the inverse square law for distance of separation and the 7-10 rule for time effects from ionizing radiation sources. Though these concepts may be viewed as complex, they really are not. They can be presented in tabular form for various distances or time frames to show the reader the diminished level of radiation received simply by increasing the distance or time between initial event and entering the area later. Of course the level of radiation received for a given distance or time frame depends upon the initial level. Giving examples of a table of the inverse square law or the 7-10 rule will offer the civilian a better “ruler” for judging their own safety better than the bland statements of section 4.5:

Distance- the more distance between you and the fallout particles, the better;

or

Time- fallout radiation loses its intensity fairly rapidly... Radioactive fallout poses the greatest threat to people during the first two weeks, by which time it has declined to about 1 percent of its initial radiation level.

DECONTAMINATION

In Section 4.4, Chemical Threats, FEMA's In-Depth guide states, “[d]econtamination is needed within minutes of exposure to minimize health consequences.” The guidelines given are for personnel and clothing contamination and revolve essentially about minimal personal decontamination.⁵⁹ The section does not address the larger issue of residential contamination for those in close proximity or certainly close down wind of the incident site. And though chemical agent contaminants down wind may well be much less than in close to the incident site, exposure to levels of chemical agent that may be sublethal to adults may well be lethal to children and pets as lethal dose is body weight dependent (LD50). This of necessity brings into play the need and concern for personal residences decontamination and especially surfaces outside that are frequented by all, especially children and pets. FEMA's In-Depth guide offers no advise on how to deal with this likely problem, much less how to undertake necessary hasty decontamination of residential exterior surfaces and what to use for doing so.

REDIRECTION

Technical papers often cite references and direct the reader to primary sources for elaboration on any number of points. A document designed for public information on a subject as vast and potentially technically complicated as WMCD terrorism, and claiming by its title to be an “In-Depth” guide, such redirection is not acceptable. The reader seeking definitively useful information for their own action in defense against these heinous threats should not be required to wade through other sources and websites such as the Centers for Disease Control and Prevention, the Departments of Energy, Agriculture, Justice, State, the FBI, the Nuclear Regulatory Commission, etc. where likely as not, the information is technical in nature. Such sites' information is designed for technical personnel, and where information is reduced in level for the “public” consumption, it often is sketchy, and incomplete in providing the spectrum of subject information needed by people to intelligently respond and act on their own behalf should they become caught in the area of a WMCD terrorist attack.

It is appropriate for those technical government agencies, offices, bureaus, etc., to contribute their expertise in a particular subject to a central issuing agency (as argued here-FEMA), but the basic document, the appropriate details, the breadth and depth of the material covered should and must be found in and issued solely through and by FEMA. That information must be technically correct, but not technically

overwhelming. The current FEMA In-Depth guide does avoid the technically overwhelming feature. It also avoids the completeness, the thoroughness, the robustness required of a document purported to be In-Depth to arm the private citizen with operationally useful and actionable information they can use to better prepare, protect and respond themselves to a terrorist attack, especially with WMCD. Some 208 pages, and it offers little by way of illumination of a subject of potential lethality to Americans. It does a great job for natural disastersB A+. It fails in terrorism and WMCD.

HOMELAND SECURITY ADVISORY SYSTEM

The current color code alert system is essentially incomprehensible to the public. It offers nothing substantive on which a citizen can intelligently know and base personal action upon the level designated. It needs revamping and much greater specificity.

EMERGENCY ALERT SYSTEM

During the post 9/11 anthrax in the mail scare, it was many weeks before any meaningful appearance of government officials on TV and radio occurred to provide information on anthrax. Mostly it was TV news and infomercial programs that paraded a number of “experts” before viewing and listening audiences. It was some six weeks after the first anthrax death before the U.S. Postal Service mailed out flyers informing the public how to handle “suspicious” mail and packages. The Cold War Emergency Broadcast System was never activated. What should federal officials have done then and do in the future?

In the event of another bioattack, within 24 hours of the confirmation of a definite bioagent attack, the Centers for Disease Control and Prevention (CDC) and other medical associated federal agencies should activate the Emergency Alert System. Put two foremost experts on the air at prime time. One expert, a microbiologist who is expert in the pathogen, to address the do's and don'ts about handling suspicious materials, prophylaxes, etc. The second expert, a physician, who has actually treated the pathogen-specific infections, to inform the public about particular symptoms and physical evidence of infection by the pathogen. Educate the public quickly and concisely. Telling us it's like the flu on the eve of flu season is a recipe for instant, unnecessary panic and swamping emergency rooms.

PROTECTIVE MASKS: PRUDENCE OR

OVERREACTION

Many people bought “gas” (correct term: protective) masks as respiratory protection during the anthrax-mail attacks. The issue is not whether this was or wasn't “reasonable”. The issue is that many Americans have purchased masks of various kinds (military surplus and other) in the wake of the 9/11 anthrax attack which they believed would and will protect them. The typical American has no idea of how to assess the appropriateness or serviceability of the mask or the filter elements. FEMA's “In-Depth” guide does not address this. The use of surplus military masks should be emphatically discouraged for a number of reasons. Civilian alternatives are available, but educating the public in how to determine the mask's WMCD applicability is a necessary protection and preparedness subject. If the public is inclined to get them they should at least know what to look for in a mask, how to use it, and how to care for it and its all-important filter element(s). FEMA should include guidance on this subject as well. It is not a question of endorsing or disavowing protective mask possession and use. It is a question of informing the public on what to look for in a proper protective mask if they insist on getting one.

WHAT AN IN-DEPTH GUIDE ON TERRORISM SHOULD COVER

One can reasonably argue that too much information on the subject of WMCD terrorism likely may discourage the reader from going through it. Perhaps. It is always the reader's choice as to how deep and how far into a subject he may wish to go. That it is available, in one document claiming in-depthness is the point to be made here. If having a single document that may be 300 some pages long is the concern, then do the logical thing and split the natural from the technological disasters into two separate documents. As for WMCD terrorism, what should be covered?

Each WMCD offers its own unique issues as to form, effects, detection, and response. Essentially, the WMCD instructional material should cover the Awhat, when, where, why, and how@ of each agent. The content of a single, dedicated, comprehensive document (pamphlet form perhaps) on each of the WMCD triad should include, for each type of weapon:

1. WMCD type considered (biological, chemical, or nuclear/radiological); and for chemical agents, whether persistent or non persistent
2. Means of dispersal

3. Indications of use of a weapons agent
4. Symptoms (especially the four classes of lethal chemical agents) of exposure to extent possible
5. Personal protective measures and expedients
 - a. Respiratory
 - b. Over-clothing
 - c. Barrier materials
 - d. improvisations
7. Personal decontamination (low-level) means and expedients
 - a. Useful decontamination materials
 - a. Table of useful household cleaners and oxidizers (in addition to bleach) and applicable materials which are useful for cleaning/decontamination of a given agent or class, materials on which useful, and time-frame of contact for effectiveness
 - b. Common household cleaning agents
 - c. Useful household cleaning tools for use on WMCD agents
 - c. Examples of protective clothing to wear for decontamination
 - d. General instructions on how to decontaminate
 - a. Playsets, sandboxes
 - b. House siding, driveways, porches, exterior doors
 - c. Cars
 - f. Proper procedures for handling and disposal of contaminated clothing, etc.
 - g. Detailed personal decontamination procedures.

9. If a safe-room is used, what and how to do in emerging from it
10. How to use various medications specific to various WMCD exposure treatment

REALITY CHECK

Hurricane Katrina opened the eyes of many people, not the least of which should be those who firmly believed the federal cavalry would instantly ride to the rescue after any disaster. Despite many publications on preparedness for natural disasters urging the maintenance of at least three days of supplies, food and water, it was apparent that many in the regions of hurricane Katrina and even Rita did not prepare. Furthermore, even those who did stock supplies lost them along with their homes, cars, and other possessions.

The problem for the public is in individual preparedness. It is folly to depend on government at any level (local, state, federal) for the bare essentials for survival in the first three to five days after any major disaster. Individuals must assume responsibility for preparedness to endure the aftermath of any disaster. This is a point discussed by James Jay Carafano.⁶⁰ If people are better aware of the consequences of natural disasters and don't effectively prepare themselves and their families to ride it out until government can get its own act together, how much better and realistic are their preparations for a terrorist attack disaster going to be? If they are not given detailed, but understandable guidance in how and what to prepare, how can they prepare? One component of preparation seems clear at this juncture: even five days of supplies may not be enough.

Though natural versus terrorist inspired disease outbreaks are not related as to cause, the effects of natural outbreaks offers some valuable examples of the potential problems arising for any society confronted with the results of a bioterror attack. For the U.S. our best and gravest model for the problems facing us with a run-a-way disease let loose on the public is that of the 1918 influenza pandemic.⁶¹ Though the 1918 influenza outbreak was a natural occurrence, the consequences to everyday life in America confronting a disease for which the medical community has no defenses or prophylaxes is a sobering study. Once a bioagent is burning its way through a populous, it is irrelevant how it got there as far as the effect it has on the population. The anthrax-in-the-mail following the 9/11 attacks was a near-miss wake-up call.

U.S. education and training where available has focused, thus far, on first responders (medical emergency personnel, police, fire, etc.) ignoring the reality that the general public are the real targets and first responders to any terrorist attack. With few exceptions, civilians are part and parcel of any terrorist targets. The threat today is not just the terrorists themselves or their horrific deeds. It also is the public's lack of realistic knowledge of the hazards they face and practical, workable information for their personal self defense responses. They must know what to look for and what to do for themselves at the time of attack pending arrival of help.

In today's world of terrorism, the federal government has the responsibility to educate the public on how to prepare for response to the threats facing them. The American people understandably look to Washington for answers and effective guidance in responding to the grave threats posed by terrorism. The federal government can and should pull the necessary information together and present it in an understandable, meaningful and useful form. Its advance of such information stamps a legitimacy to it that no other source can claim. It should be available in a single, concise, comprehensive source. Only armed with complete, in-advance and workable information on WMCD attack characteristics and individual response will the public be prepared, and not in a position of having to play a losing game of catchup during an ongoing terrorist attack. Given the nature of those horrific weapons and the grave potential consequences of a WMCD terrorist attack, for the federal government to continue to ignore the public's need for operationally useful information is a grave failure in judgment. The public must be educated to respond, adapt and improvise. It would be a serious failure of government if the lack of such education resulted in catastrophe-- particularly if that catastrophe could have been lessened in severity if not prevented with simple, yet realistically informative information in concise form, in a single, authoritative document. After tens of billions of dollars spent on terrorism preparedness, with hundreds of expert chemists, biologists, physicists, and physicians on the government payroll, FEMA's In-Depth Guide is the best the federal government can offer the public? The public may face serious trouble ahead.

References

1. FEMA-Emergency Management Institute (EMI), The Emergency Program Manager, June 1998, Course IS-1, FEMA-EMI: Washington, pp 4-24
2. Rozeff, Michael S. Katrina and the Authorities. 3 September 2005, available at : <http://www.lewrockwell.com>
3. Weapons of Mass Destruction (WMD) is actually a

- misnomer. With the exception of actual nuclear detonation, the heart of WMD is chemical, biological and radiological agents which do not damage or destroy property or objects. These agents seriously injure or kill people and more correctly should be termed weapons of mass casualty. Including nuclear and conventional explosives, the destructive term enters and WMD has been in use. Some authors favor CBRNE (chemical, biological, radiological, nuclear, explosives), but WMD will be used consistently throughout here.
4. FY 1997 Defense Authorization Act, P.L. 104-201, Title XIV, 23 September 1996, Defense Against Weapons of Mass Destruction
 5. Taylor, Eric R. Are We Prepared For Terrorism Using Weapons of Mass Destruction? Government=s Half Measures. 27 November 2000, Policy Analysis No. 387, The Cato Institute: Washington, DC
 6. A few examples are: US Army Medical Research Institute of Infectious Diseases, US Food and Drug Administration, Armed Forces Radiology Institute, US Army Institute of Chemical Defense, US Department of Transportation, US Environmental Protection Agency, The Centers for Disease Control and Prevention, Federal Emergency Management Agency, US Department of Health and Human Services, American College of Radiology, American Academy of Family Physicians, American Academy of Pediatrics, American College of Physicians, American Society of Internal Medicine, American College of Surgeons. Association of Professionals in Infection Control and Epidemiology, Center for the Study of Bioterrorism and Emerging Infections, Johns Hopkins Center for Civilian Biodefense, the American Medical Association, UCLA Center for Public Health and Disasters
 7. A few good sites are the Johns Hopkins University site (jhsph.edu), and the new Center for Biosecurity (upmc-biosecurity.org). Washington State University offers a site on biological weapons: www.slic2.wsu.edu:82/hurlbert/micro101/pages/101biologic alweapons.html.
 8. doj.gov, dhs.gov, doe.gov, ed.gov, hhs.gov, state.gov, dod.gov, fbi.gov, fema.gov, cdc.gov, epa.gov, nrc.gov, cia.gov, ready.gov; bt-cdc.gov
 9. Ellison, D. Hank, Handbook of Chemical and Biological Warfare Agents. CRC Press, New York, 2000; Ellison, D. Hank, Emergency Action for Chemical and Biological Warfare Agents, CRC Press, New York, 2000; Mauroni, Albert J. Chemical-Biological Defense: U.S. Military Policies and Decisions in the Gulf War. Praeger, Westport, CT, 1998
 10. Crosby, Alfred W. America's Forgotten Pandemic: The Influenza of 1918. Cambridge University Press, Cambridge, UK, 1989
 11. Cook, Tim. No Place To Run: The Canadian Corps and Gas Warfare in the First World War. UBC Press, Vancouver, 1999
 12. Osterholm, Michael T, and John Schwartz. Living Terror: What America Needs to Know to Survive the Coming Bioterrorist Catastrophe. Delacorte Press, New York, 2000
 13. Senate Select Committee on Intelligence, U.S. Senate. Current and Projected National Security Threats to the United States. 16 February 2005, Washington, DC
 14. From Admiral Jacoby=s statement before U.S. Senate Select Committee on Intelligence, 16 February 2005, Washington, DC, p. 3
 15. From Director Mueller=s statement before U.S. Senate Select Committee on Intelligence, 16 February 2005, Washington, DC, p. 4
 16. From Director Goss=s statement before U.S. Senate Select Committee on Intelligence, 16 February 2005, Washington, DC, p. 2
 17. Jordan, Lara Jakes and Katherine Shrader. Bin Laden Enlisting Al-Zarqawi for Attacks, 1 March 2005, The Associated Press
 18. . Villelabeitia, Ibon. Abu Musab Al-Zarqawi Killed in Air Raid. Reuters, 8 June 2006
 19. Peter L. Bergen. Holly War Inc.: Inside the Secret World of Osama bin Laden. Weidenfeld & Nicolson, London, 2001, p. 115
 20. The Commission on the Intelligence Capabilities of the United States Regarding Weapons of Mass Destruction, 31 March 2005, Report to the President of the United States
 21. Jackson, Ronald J., Alistair J. Ramsay, Carina D. Christensen, Sandra Beaton, Diana F. Hall, and Ian A. Ramshaw. Expression of Mouse Interleukin-4 by a Recombinant Ectromelia Virus Suppresses Cytolytic Lymphocyte Responses and Overcomes Genetic Resistance to Mousepox. 2001, J. Virol. 75(3), 1205-1210
 22. Müllbacher, Arno and Mario Lobigs. Creation of Killer Poxvirus Could Have Been Predicted. 2001, J. Virol. 75(18), 8353-8355
 23. Alibek, Ken with Stephen Handelman, Biohazard, 1999, Random House, New York
 24. Alibek, p. 261: Chepurnov, A.A., Ternovoi, V.A., Dadaeva, A.A., Dmitriev, I.P., Sizikova, L. P., Volchkov, V.E., Kudoiarova, N.M., Rudzevich, T.N., Netesov, S.V. Immunobiological Properties of vp24 Protein of Ebola Virus Expressed by Recombinant Vaccinia Virus, 1997, Vopr. Virusol. 42(3), 115-120
 25. Alibek, p. 261: Pomerantsev, A.P, Staritsin, N.A., Moockov, YuV, and Marinin, L.I. Expression of Cereolysine AB Genes in Bacillus anthracis Vaccine Strain Ensures Protection Against Experimental Hemolytic Anthrax Infection. 1997, Vaccine 15(17-18), 1846-1850
 26. . Preston, Richard. The Hot Zone. Random House, New York, 1994
 27. . Preston, Richard. The Demon in the Freezer. Random House, New York, 2002
 28. Preston, Demon, p. 200
 29. AAnnual Report to Congress on the Safety and Security of Russian Nuclear Facilities and Military Forces@, December 2004, The National Intelligence Council, p.
 30. Cohen, Ariel, APreventing a Nightmare Scenario: Terrorist Attacks Using Russian Nuclear Weapons and Materials@, 20 May 2005, Background No. 1854, p.4
 31. Kaplan, Edward H., William J. Bicknell and Lawrence M. Wein, AThe Citizen as First Responder@, 13 August 2003, The Cato Institute, Washington, DC
 32. FEMA, AAre You Ready? A Guide to Citizen Preparedness@ (FEMA: Washington, DC) no date (ready.gov)
 33. FEMA, AAre You Ready? An In-depth Guide to Citizen Preparedness@ (FEMA: Washington, DC) no date (fema.gov)
 34. Chlorine properties: The Merck Index, 9th Ed. (Merck & Co., Inc., 1976) #2065, p. 265; Nitrogen trichloride properties: The Merck Index, 9th Ed. (Merck & Co., Inc. 1976) #6424, p. 858; Hydrazine: The Merck Index (Merck & Co., Inc., 1976) #4653, p. 627
 35. This is exactly the basis behind the use of acidic condiments served with sea foods. The acid of the condiment neutralizes the amines and ammonia produced by the breakdown of sea food proteins and amino acids through age, cooking and bacterial action. It makes for a more pleasant culinary experience.
 36. Are You Ready? In-Depth, p. 182

37. Are You Ready? In-Depth, p. 196
38. Are You Ready? In-Depth, p. 40
39. Data to calculate this measure was acquired from Stuart L. Meyer, AData Analysis for Scientists and Engineers@, John Wiley & Sons, New York, 1975. For the drops to milliliters p. 427 (1 fl. oz. = 29.6 ml), and for milliliters to teaspoon p. 428 (1tsp = 5 ml). The assumption was made that different droppers may deliver more or less than 20 drops per milliliter (low of 16, high of 25, average of about 20 drops).
40. Are You Ready? In-Depth Guide, p. 41
41. This is a consequence of the interplay between temperature, air (gas) volume, and pressure following the gas laws.
42. Are You Ready? Guide, p. 88; Are You Ready? In-Depth Guide, p. 131
43. 80 ft³ = 2265 L; average normal per breath intake of air is 0.5 L, at 15 breaths per minute, thus over 5 hours, volume of air inhaled equals 2250 L.
44. Under this scenario, the previously cited 2265 L per person rises to about 3000 L assuming a reasonable increase in breathing rate to 20 breaths per minute rather than 15 or 16 (25% increase) at the same 0.5 L volume per breath (likely greater under duress), this argues for at least a 32% increase in required air volume per person over the five hours.
45. In discussions with Dr. Irby Gaudet, Department of Psychology, University of Louisiana at Lafayette, claustrophobia is an expression of entrapment or confinement with no means of escape or control. It is not possible to necessarily predict who may have the response, or under what circumstances it may be triggered. The size of the room is less the problem, rather being a perception of entrapment and loss of control for escape. Elevators or the back seat of a car are examples of environments where this loss of control and entrapment can be perceived.. [Any misstatements here are those of the author and not of Dr. Gaudet.]
46. Are You Ready? In-Depth Guide, p. 42
47. Walters, Fred & Eric R. Taylor ACHEMICAL TERRORISM ATTACK DECONTAMINATIONB HOUSEHOLD OXIDIZERS: What Works@, 2003, J. Undergrad. Chem. Res. 3, 107-111
48. Costin, Christina, Alan Trahan, Fred Walters & Eric R. Taylor, ACHEMICAL TERRORISM ATTACK DECONTAMINATION IIB HOUSEHOLD OXIDIZERS: What Works@, 2005, J. Undergrad. Chem. Res. 1, 23-25
49. AAre You Ready? In-Depth Guide@, p. 153
50. AAre You ready? In-Depth Guide@, p. 161
51. AAre You Ready? Guide, p. 89
52. Levitin, Howard W., Henry J. Siegelson, Stanley Dickinson, Pinchas Halpern, Yoshikura Haraguchi, Anthony Nocera, and David Turineck, 2004, Prehospital and Disaster Medicine 18(3), 200-207, <http://pdm.medicine.wisc.edu>
53. AAre You Ready? In-Depth Guide, p. 160
54. AAre You Ready?@, Guide p. 87
55. AAre You Ready?@ In-Depth Guide, p.160
56. MMWR 50(44), 984-986 (9 Nov 2001)
57. AAre You Ready?@ In-Depth Guide, p. 164
58. AAre You Ready?@, In-Depth Guide, p. 170
59. Are You Ready? In-Depth Guide, p. 161
60. James Jay Carafano, Beyond Duct Tape: The Federal Government's Role in Public Preparedness, Heritage Foundation Executive Memorandum no. 971 (Washington, D.C.: Heritage Foundation, 3 June 2005).
61. Crosby, Alfred W., AAmerica=s Forgotten Pandemic: The Influenza of 1918", 1989, Cambridge University Press, New York

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