

**Public Health and the Incident Command System:
A Shift From Disasters To Every Day Management**

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Abstract

The organizational structure of a public health agency can directly affect the success or failure of its programs. Currently within public health, quality improvement initiatives are being undertaken in order to improve the provision of services and response to the needs of the public. As a part of the identification of areas for improvement, the assessment of the organizational structure of the public health entity needs to become an integral part of that process. The current needs and challenges that public health entities confront are expanding and changing. The services, projects, and programs that local health departments are responsible for are varied and broad. Those entities need an organizational structure that allows for an efficient and effective response to those broad needs.

The Incident Command System (ICS) is an organizational structure that will facilitate the most effective and efficient response to everyday needs or issues that arise from a sudden disaster. The ICS is currently utilized mainly in response to disasters. The features detailed in this paper, along with case studies of ICS use, will support the proposal that the ICS is an effective organizational structure for every day management of a public health entity. The foundations and boundaries that the ICS establishes allows all types of organizations—hospitals, veterinary clinics, local health departments (LHD), etc.—to tailor the structure to meet the specific needs and mission of the organization. It allows for response to the broad range of needs that public health entities see daily. When a disaster does occur, the structure is already in place to respond and valuable time and resources are not lost in the transition.

Personnel education and training about the ICS is vital. To ensure effective management and operation within the structure, as well as support from involved personnel, education is incredibly important. Quality improvement initiatives have allowed for LHDs to improve

services and organizational function. The use of an ICS structure will complement and greatly facilitate CQI initiatives.

Introduction

The importance, or more accurately the general awareness, of the need for quality management and greater leadership at all levels within organizations has increased since 2009. Furthermore, the recent economic downturn has led to a more deliberate focus on the subject. Here in the United States, as well as around the world, banks, car manufacturers, and other organizations both big and small, government and private, have seen stronger days. Some are failing altogether, both financially and in quality. Certainly, a significant portion of the issues the global population is currently confronting are driven by economic conditions and cycles in the greater environment. However, there are a number of examples of organizations declining and/or failing due to internal issues, such as imprudent management—i.e. Enron, Tyco, Adelphia, and WorldCom.

The management structure of an organization can significantly affect both a manager's ability to lead and an employee's ability to work effectively. There is extensive literature currently available that discusses the idea of effective management or detailing the "proper" management style for a particular organization. When you search "management consulting" in an internet search engine such as Google, 47,600,000 pages are listed in the search results. There is an entire industry built around teaching other people what characteristics he or she needs to embody in order to lead an organization. However, it seems there is not as much published on quality management structures. Do not misunderstand, personal characteristics, traits or tools are very important to effective management. Ideas from writers, such as Stephen Covey and his mainstay 7 Habits series, are vital items for those in leadership roles to learn about and be aware of personally.¹ Managers should without question have an arsenal of leadership tools to be able to draw upon. However, the best trained leader is at an immediate disadvantage if the structure

¹ Covey, Stephen. *The Seven Habits of Highly Effective People*. New York: Simon and Schuster, 1989. Print.

he or she is operating within is disorganized or confusing. The structure that managers and employees operate within is incredibly important to the success of an organization fulfilling its mission.

This paper will focus on the Incident Command System (ICS) and its utilization within public health. The ICS is a management structure that has been predominantly employed in emergency management and disaster planning and response. Crisis situations require a comprehensible and succinct management structure that is easy to deploy in order to facilitate quick and efficient response. In addition, the bridge between crisis situations and day-to-day operations for a public health entity needs to be bridged. As public health matures and adapts to meet current needs, so should its management structure. A stated goal of public health is “to protect all Americans, their families and their communities from preventable, serious health threats and strive[s] to assure community-based health promotion and disease prevention activities and preventive health services are universally accessible in the United States.”² Recent trends in the application of continuous quality improvement (CQI) techniques in public health demonstrate a desire to adapt to meet current needs and emerging threats.³ Likewise, the goal of working to protect all Americans from preventable and serious health threats would be greatly facilitated by employing a management structure that is comprehensible and succinct and one that enables a quick and effective response to whatever those threats may be. Recent experiences, lessons learned, and strides that have been made in disaster planning and management in the United States provide a source of improvement and innovation in public health organizational design.

² American Public Health Association. “About Us: Overview.” APHA, March 2010. Web. 1 March 2010.

³ McLaughlin, Curtis and Kaluzny, Arnold. *Continuous Quality Improvement in Health Care*, 3rd. ed. Massachusetts: Jones and Bartlett, 2006. Print.

What is ICS?

During the fall of 1970, California dealt with a number of large scale fires that decimated the southern part of the state. In thirteen days, approximately 600,000 acres and 772 structures were destroyed. When the fires had finally subsided, millions of dollars in damage had been done and sixteen people had lost their lives. Because the locations of the fires were on federal, state, and local land, all three jurisdictions were involved in combating the fires. At one point, there were roughly 100 agencies, spanning jurisdictions, taking part in containing the fires.⁴ When the disaster response was over and officials had the opportunity to conduct after action reviews, the results were surprising to many. The failed efforts during the response were, in large part, not due to a lack of resources or incorrect tactics, but wholly inadequate management.⁵

The U.S. Forest Service was the agency that led a federally-mandated analysis of the response. The analysis identified six major problem areas that were contributors to the negative outcomes during the California event. First, there was a complete lack of common organization. There were a number of different organizational structures in operation and issues that seem relatively small, like terminology, became a hindrance during the response. There were no common names for items such as equipment, tactical actions, or personnel positions among all of the responding agencies. Second, there was poor on-scene and inter-agency communication. This was due in large part to the 1970 radio technology that consisted of largely single-frequency radios. Supervisors could not communicate in real time to crews on the ground and often messages were crossed in transmission and received by other crews. Obviously, technology has

⁴ Irwin, Robert L. "Chapter 7: The Incident Command System." *Disaster Response: Principles of Preparation and Coordination*. St. Louis: C.V. Mosby, 1989. Web. 1 March 2010.

⁵ Federal Emergency Management Agency. "Incident Command System Training: Review Material." FEMA Emergency Management Institute, May 2008. Web. 1 March 2010.

changed drastically since 1970; however the point is still the same. Even if radios now use more complex signals, interoperability is still a must. Third, there was inadequate joint planning. Different jurisdictions had varied strategic objectives and this allowed for inefficient response and posed some serious safety issues. Fourth, there was a lack of valid and timely intelligence. Much of the data that commanders were basing decisions from turned out to be hours old and not relevant. There was no single group tasked with gathering a comprehensive report of data on the various fires being combated. Fifth, during the response, there was inadequate resource management. Due in part to previously mentioned problems, crews and trucks were overstaffed at some sites, while severely understaffed at others. During the study, officials found more than one instance where fire crews from one agency heading to a site, passed a fire crew from another agency heading to a site that was in the direction the first crew was coming from. Lastly, there was limited prediction capability. Again, due in large part to previous problems discussed, there was no ability to forecast which direction the fire was going, who should be evacuated, and where those evacuees should go. The response effort was reactionary instead of proactively combating the fires.⁶

One of the significant results of the analysis was the establishment of the FIRESCOPE Program. The acronym stands for Fire Fighting Resources of Southern California Organized for Potential Emergencies. What is now known simply as the Incident Command System was a result of the FIRESCOPE program and the efforts in development, testing, and training.⁷ A goal of the review and subsequent developments was to mitigate another disaster resulting in such inefficient and inadequate response and subsequently, negative outcomes.

⁶ Irwin, Robert L. "Chapter 7: The Incident Command System." *Disaster Response: Principles of Preparation and Coordination*. St. Louis: C.V. Mosby, 1989. Web. 1 March 2010.

⁷ California Office of Emergency Services. Fire and Rescue Branch. "California Fire Service and Rescue Emergency Mutual Aid System: History and Organization." California OES, April 2002. Web. 1 March 2010.

Characteristics and Features of ICS

Please note: The following material is a significantly condensed version of several Federal Emergency Management Agency (FEMA) training courses. The specific training materials should be consulted for in-depth information. Online, refer to FEMA's Emergency Management Institute ICS resources.

One of the key characteristics of the ICS is the flexibility and opportunity for varied application. It is a standardized organizational management structure that can be utilized for short-term operations or long-term campaigns, both large and small, and all-hazards in nature. The ICS is found in all levels of government, domestic and internationally, and in the private sector and non-governmental organizations. The management structure is normally separated into five functional areas: 1.) Command, 2.) Operations, 3.) Planning, 4.) Logistics, and 5.) Finance and Administration.⁸ (Please refer to Appendix A for a sample ICS organizational chart.) Each section is responsible for a defined scope and related goals or objectives. Utilizing different sections ensures there is personnel focused solely on each specific area and need and that those needs are effectively met.

ICS functions not only as a structure to operate within during a response to an emergency or disaster, but also as an effective structure that aids in the planning process. It is not simply an organizational chart, but a full-scale management system. The principles of management embodied in this system contribute significantly to the overall efficiency and strength of the system. There are a number of ICS features that coalesce and enable the system to function so well.

⁸ Federal Emergency Management Agency. "Incident Command System Training: Review Material." FEMA Emergency Management Institute, May 2008. Web. 1 March 2010.

1. **Common Terminology:** A common terminology is used for job positions, for resources, and for functions that allow any responder or other personnel to communicate clearly and accurately in relation to the event.
2. **Modular Organization:** Again referencing Appendix A, the ICS chart showcases the modular organization of the structure that, depending on the type, size, or need of the event, can be adjusted to meet the needs accordingly. Stated another way, form follows function. Simply exercising the system during a drill allows for objectives and goals to be established in general terms and subsequently, during a response or event, those objectives are further fleshed out.
3. **Management by Objectives:** ICS utilizes management by objectives that allows for clear and stated goals from which all other functions, protocols, procedures, etc. are based upon.
4. **Incident Action Plans (IAP):** IAPs allow for the tasks and responsibilities of the objectives to be communicated clearly and succinctly to all parties involved and establish a time frame for the specific operational period in which these tasks should be established by specific positions. This assists in establishing accountability within the system.
5. **Chain of Command/Unity of Command:** Chain of command and unity of command allows for one, orderly dissemination of tasks down an established chain of command and two, apparent supervisory levels to report to and receive directives from back up the chain. This reduces the opportunity for contradictory messages from multiple different sources.

6. **Unified Command:** Unified command is a slight nuance on the previous terms. Refer back to the event in California that served as the catalyst for developing this system. There were multiple jurisdictions involved, all with legal or mandated authority, and slightly varied functions and abilities. Within unified command, each jurisdiction would shift into the ICS allowing each specific organization or jurisdiction to retain command and control of their personnel. The multiagency group would be able to work toward the established objectives without diminishing authority or responsibility. Certainly, there are different increased levels of authority and decision making as the chart gets closer to the top.
7. **Manageable Span of Control:** However, each position within the system should only have between three and seven subsequent positions that directly report to that individual. The incident commander is confronted with different challenges and decisions than a team leader within a specific section, but in order to ensure that individuals are able to efficiently manage their portion of the event, the numbers of direct reports are kept relatively low. This allow for a manageable span of control.
8. **Predesignated Incident Locations and Facilities:** Having predesignated incident locations and facilities is part of the overarching objectives that can be established during the planning or training processes.
9. **Resource Management:** Resource management establishes protocols and procedures for managing all necessary functions surrounding resources (personnel, equipment, supplies, etc.).

10. **Information and Intelligence Management:** Similar to the previous feature, the system participants are prompted during the planning stages to establish a system for information and intelligence management during an event. While it may be easier to have integrated communications technologically, it is still a necessary acknowledgement and step in the planning stages of disaster response.
11. **Transfer of Command:** Often, during an event, a transfer of command normally occurs as one agency has fulfilled its established objectives and a new operational period begins with new established objectives and a new agency in the lead. During many response efforts, there is a physical ICS organization chart present with names attached to positions. As the transfer happens, replacing one name with another also causes a moment of pause and offers a reminder to the outgoing commander to brief the incoming on the current status of the response.
12. **Accountability:** Accountability is a feature that has been inferred, but not stated out right. Having an action plan, clearly stated objectives, the ability to track all resources, and the fact that individuals have only one job function and one subsequent supervisor, enables individuals at all levels to be held accountable for meeting objectives.
13. **Mobilization:** The final feature of ICS is efficient mobilization. Because individuals have a defined scope of responsibility and a clear chain of command, it is an efficient process to request resources only when needed and to not have an over abundance or complete lack of available resources. Referring back to the California wildfire example again provides an explanation of this concept. There

were crews from one jurisdiction passing crews from another jurisdiction, heading to a fire in an area where the first had just been.⁹

Range of ICS Applications

As detailed in the previous section, the ICS details physical organizational structures, characteristics and features that allow for effective response efforts to a range of events that will vary, from a diverse group of potential responding agencies. The system establishes standards and boundaries to guide in the planning and response, regardless of the responding agency. FEMA currently is developing or has developed ICS trainings tailored to various stakeholders—i.e. hospitals, veterinary facilities/personnel, public works, etc.¹⁰

The standards remain the same, but the subject matter is adjusted to be relevant to the audience, such as hospitals.¹¹ Humans are the obvious focus of response efforts. However, there are animals—domestic pets and livestock—that also need to be dealt with. Madigan and Dacre pose the important fact in their 2009 paper, *Preparing for veterinary emergencies: disaster management and the ICS*.¹² Emergency medical services, law enforcement and public health are trained to deal with disaster response and there is an important need to ensure that veterinary personnel are trained as well. The American Veterinary Medical Foundation sponsors training for veterinarians in disaster response in order to ensure that those needs are met in a response.¹³ Pets are a significant part of a family's life and safe guarding those animals also assists in an effective response to the needs of the humans involved. Additionally, in situations such as

⁹ Federal Emergency Management Agency. "IS-200: ICS for Single Resources and Initial Action Incidents." FEMA Emergency Management Institute, 2 March 2006. Web. 1 March 2010.

¹⁰ Federal Emergency Management Agency. "Independent Study Programs: National Incident Management System." FEMA Emergency Management Institute, 7 March 2009. Web. 1 March 2010.

¹¹ Federal Emergency Management Agency. "Independent Study Programs: IS-100: HC Introduction to the Incident." FEMA Emergency Management Institute, 24 May 2007. Web. 1 March 2010.

¹² Madigan J, Dacre I. "Preparing for veterinary emergencies: disaster management and the Incident Command System." *Rev Sci Tech* 28.2 (2009): 627-33. PubMed PMID: 20128473.

¹³ American Veterinary Medical Foundation. "Disaster Preparedness and Relief." AVMF, 2007. Web. 1 March 2010.

Katrina, where animals are roaming free among people that are stranded, there is the increased potential for disease to be transmitted or for animal bites to occur. Likewise, the management of health issues related to animals clearly falls under the domain of public health.¹⁴

The standards established with ICS are transferable among different responding groups and allow for an all-hazards and efficient response. The foundations are established, but are flexible and allow for an effective response to a broad spectrum of potential situations.

Standards for Public Health Management

As discussed in the introduction, within many private sector organizations, there is an emphasis on management and related structures. This section will look at the emphasis or mandates from the federal, state and local, and educational institutions on public health management structures.

FEMA is the federal agency, in conjunction with the Department of Homeland Security (DHS), which manages the National Incident Management System (NIMS) and serves to support state and local entities during a disaster. FEMA's scope is focused solely on the ICS structure as it pertains to disasters, however. The management structure is reinforced by two national directives. Homeland Security Presidential Directive (HSPD) 5 establishes a national incident management system that covers prevention, preparedness, response, and recovery to events ranging from terrorist attacks to natural disasters.¹⁵ HSPD 8 and 8 Annex 1 requires a national all-hazards preparedness goal and mechanisms for delivery of resources from the federal level to the state and local levels.^{16 17} Additionally at the federal level, the U.S. Department of Health

¹⁴ Appleyby MC, Stokes T. "Why should we care about nonhuman animals during times of crisis?" *Journal of Applied Animal Welfare Science* 11.2 (2008): 90-97. *PubMed*. Web. 4 April 2010.

¹⁵ United States of America. Department of Homeland Security. "Homeland Security Presidential Directive 5: Management of Domestic Incidents." DHS, 28 February 2003. Web. 1 March 2010.

¹⁶ United States of America. Department of Homeland Security. "Homeland Security Presidential Directive 8: National Preparedness." DHS, 17 December 2003. Web. 1 March 2010.

and Human Services (DHHS) has published resources and guidance regarding preparedness and response.¹⁸ However, there is no guidance for local health departments or other public health entities on the subject of recommended day-to-day management structures. The focus of HHS is on clinical treatment or scientific research guidance. As well, the Centers for Disease Control and Prevention (CDC) offer an abundance of guidance and recommendations on preparedness and response, as well as clinical resources regarding diseases, viruses, treatment, etc. While the CDC primarily offers the aforementioned resources, the organization does work to promote the National Public Health Performance Standards Program (NPHPSP). The NPHPSP is supported by a collaborative of national partners, several of which will be discussed later. The goals of the program are “to improve the quality of public health practice and the performance of public health systems” by: 1.) Providing performance standards for public health systems, 2.) Improving quality and accountability of public health practice, 3.) Conducting systematic collection and analysis of performance data, and 4.) Developing a science-base for public health practice improvement.¹⁹ The overarching focus is that of quality improvement surrounding processes, methods, and governance structures within local public health organizations. The CDC offers sources for assessment and tools for implementation in order to enhance performance, but it is completely voluntary for the local entities to engage.

One of the other organizations within the collaborative for the NPHPSP is the National Association of Local Boards of Health (NALBOH). The national organization has member chapters referred to as State Associations of Local Boards of Health (SALBOH). Each

¹⁷ United States of America. Department of Homeland Security. “Homeland Security Presidential Directive 8 Annex 1.” DHS, 17 December 2003. Web. 1 March 2010.

¹⁸ United States of America. Department of Health and Human Services. “Preparedness.” HHS, 2010. Web. 1 March 2010.

¹⁹ United States of America. Centers for Disease Control and Prevention. “Building Our Nation’s Public Health Systems: National Public Health Performance Standards Program.” CDC, November 2005. Web. 1 March 2010.

SALBOH “is an identified and recognized state organization representing local boards of health within a state. Their purpose is to provide education and advocacy for local boards of health who are advisory and/or governance bodies to the local public health agencies within their state.”²⁰ The state associations offer important opportunities for member local boards of health, for example, to network, to exchange best practices or ideas for improvement, and educational programs. The NALBOH believes that public health policy is most effectively changed in a grassroots manner, at the local level, and from the ground up. By allowing citizens to participate through one of their important democratic functions, leadership skills are further developed. By grouping local boards of health together by state, this allows for a more targeted focus on public health issues specific to the region.²¹ The NALBOH, in conjunction with the CDC, have also put together a Public Health Accreditation Board that will allow local boards of health the opportunity to increase credibility and effectiveness through reviewing current performance and offering improvement methods and an official stamp of approval.²² The focus of the Public Health Accreditation Board is to have health departments working towards accreditation in 2011.²³

While it is an important step for local public health organizations to be involved in associations or collaboratives that mutually encourage processes such as accreditation or engaging in regional collaboratives, these are relatively new ideas and standards that are solely voluntary. Of the seven partners, the NALBOH is the only one any significant focuses on governance and process improvement. While the issues of governance and accreditation should

²⁰ National Association of Local Boards of Health. “State Associations of Local Boards of Health.” NALBOH, 25 February 2010. Web. 1 March 2010.

²¹ National Association of Local Boards of Health. “Benefits of Forming a State Association.” NALBOH, 17 December 2009. Web. 1 March 2010.

²² National Association of Local Boards of Health. “FAQs: Boards of Health/Governing Entities.” NALBOH, January 2010. Web. 1 March 2010.

²³ National Association of Local Boards of Health. “Board Governance.” NALBOH, 26 February 2010. Web. 1 March 2010.

not in any way be diminished, there are currently only thirteen states with chapters.²⁴ This is only an indication that there is interest somewhere within that state and there is at least one group willing to sponsor the state association. North Carolina, for example, is listed as having an existing state association. However, not all of the county public health departments are involved with the association. Many of the organizations, such as the American Public Health Association, are largely policy advocates. The APHA has been around since 1872 and has a strong track record regarding policy advocacy. Even just within the seven national partners encouraging the NPHPSP, local public health entities have a variety of collaboratives and organizations that compete for support of their specific goals and missions—i.e. the CDC, APHA, NALBOH, Association of State and Territorial Health officials, National Association of County and City Health Officials, National Network of Public Health Institutes, and the Public Health Foundation. At the end of the day, local governance is vital. However, there is a finite amount of time and resources, financial or otherwise, that a public health entity will be able to allot to these external organizations while also attempting to fulfill their obligation to the local community.

North Carolina is one of a number of states around the country that are beginning a voluntary accreditation process for local health departments (LHD). This involves the writing of and gaining consensus around standards and the examination of LHDs against those standards. The standards here in North Carolina are based on several key documents: 1.) The Ten Essential Services of Public Health, and 2.) The Operational Definition of a Functional Local Public Health Agency from NACCHO. These documents address the essential services that public health entities should provide. In the NACCHO document dated November 2005, Essential

²⁴ National Association of Local Boards of Health. “State Associations of Local Boards of Health: Map of Existing Associations.” NALBOH, 22 April 2009. Web. 1 March 2010.

Service 2 discusses disaster response in accordance with the National Incident Management System (NIMS).²⁵ There is a self-assessment each LHD must complete as one of the initial steps in the accreditation process. The assessment focuses on ensuring key functions such as surveillance systems are in place, staff members are trained and current in licensure or on current issues for specific positions, etc.²⁶ The accreditation criterion are incredibly detailed and the key services and aspects of a LHD that are assessed during the accreditation are vital to the LHD being able to function and meet the needs of the community. Assessment and accreditation processes are important to ensure that public health is meeting the broad spectrum of needs in communities. In that spirit of improving services, assessing a LHDs management and organizational structure as a part of accreditation would allow for additional opportunities for improvement. Currently, the criterion does not include an assessment of specific organizational structure. Ultimately, this would further ensure that LHDs were functioning properly and able to meet the broad needs and provide essential services.

In the education realm, the APHA and the Association of Schools of Public Health (ASPH) sponsor the Council on Education for Public Health (CEPH). CEPH is the accrediting agency for graduate programs in public health and similar to other organizations discussed previously, can be voluntarily brought in by an institution. At this time, there is not a standing order for all schools of public health to be accredited. It is seen as a credible aspect, but is not required and does not carry an outright consequence per say. CEPH evaluates each school as the educational programs and outcomes relate to the specific school's mission statement.²⁷

Comparing the outcomes to the stated goals of the school is the only way to accurately evaluate

²⁵ North Carolina Institute for Public Health. "Local Health Department Accreditation Guidance Document." NCIPH, July 2008. Web. 1 April 2010.

²⁶ North Carolina Institute for Public Health. "Health Department Self-Assessment Instrument." NCIPH, July 2009. Web. 1 April 2010.

²⁷ Council on Education for Public Health. "Accreditation Criteria: Schools of Public Health." CEPH, June 2005. Web. 1 March 2010.

the program. However, the criterion does not include as part of the curriculum a requirement for leadership or management training. Health services administration is one of the core disciplines, but this includes more evaluation and analysis.²⁸ The standards set forth for schools of public health to embody have done well in developing competent public health professionals thus far. Educational and training programs are wonderful opportunities to further develop future public health practitioners into effective and competent professionals. With public health having to continually grow and adapt to meet new challenges, the management and leadership structures also have to be able to change and adapt to facilitate meeting those needs.

Shortell and Kaluzny are now in the fifth edition of their widely utilized text *Health Care Management: Organizational Design and Behavior*. They discuss organizational design and all related topics—theory, process and assessment, design, factors, etc. “Organization design refers to the way in which the building blocks of organization—authority, responsibility, accountability, information, and rewards—are arranged or rearranged to improve effectiveness and adaptive capacity...In fact, management texts refer to organization design as one of the management’s most critical functions.”²⁹ At the beginning of the section where the authors discuss three design options and then new or evolving designs, they state the following: “Specific design options available for health services managers depend on the environmental demands, the organization’s strategies, how activities can be grouped, and how decisions will be made.”³⁰ The needs to be met on a daily basis by LHDs are different depending on location and environment. Here in North Carolina, counties such as Carteret and Dare that are on the coast have to meet different needs and threats than counties such as Cherokee in the far west or

²⁸ Council on Education for Public Health. “Accreditation Criteria: Schools of Public Health.” CEPH, June 2005. Web. 1 March 2010.

²⁹ Shortell S and Kaluzny A. *Health Care Management: Organizational Design and Behavior 3rd ed.* Albany, New York: Delmar Publishers, 1994. 243-44. Print.

³⁰ Shortell S and Kaluzny A. *Health Care Management: Organizational Design and Behavior 3rd ed.* Albany, New York: Delmar Publishers, 1994. 252. Print.

Mecklenburg, a large urban county in the south. Through a set of common features that are adaptable to any environment and that remain constant regardless of the situation, the Incident Command Structure allows for continuity and efficiency as public health entities strive to fulfill the broad missions they are confronted with on a daily basis.

Case Studies

This section will look at three case studies—international, national, and local—focusing on the positive outcomes as well as items identified for improvement in after action reviews and how those outcomes relate to management structures and the ICS.

2004 Indian Ocean Tsunami

On 26 December 2004, the fourth largest earthquake since 1900 occurred in the Indian Ocean off the coast of Sumatra. The earthquake registered a 9.1 magnitude and triggered a massive tsunami that caused widespread devastation and loss of life in the region. In all of the nations affected, there were roughly 230,000 people killed and millions more displaced.^{31 32}

During the evaluation process, the areas identified for more planning and coordination centered on the need for infrastructure and capacity building related to response and communication.³³ The Indian and Thai governments had much better response processes in place and the damage and loss of life experienced in those nations was not nearly as significant as in others. Indonesia and Sri Lanka did not have much in the way of disaster response infrastructure or a governmental structure that allowed for an efficient or effective response. One of the results of the disaster was the Indian Ocean Tsunami Warning System (IOTWS). The U.S. Agency for International Development (USAID) has contributed to this project

³¹ United States of America. Department of the Interior. U.S. Geological Survey. “Magnitude 9.1 – Off the West Coast of Sumatra.” USGS, 1 March 2010. Web. 1 March 2010

³² NIMS Online. “The Aftermath of the 2004 Indian Ocean Tsunami: Tsunami Relief.” NIMS Online, 1 February 2010. Web. 1 March 2010.

³³ United Nations. International Strategy for Disaster Reduction. “The 2004 Indian Ocean Tsunami: One Year Later.” UNISDR, Issue 2 2006. Web. 1 March 2010.

significantly. The program not only funded the placement of an early warning system of buoys throughout the Pacific, but continue to offer training and consultation for countries affected in that region on preparedness and mitigation. Part of this training has been assisting in establishing a regionally relevant ICS structure, to plan and evaluate exercises of the warning system and simulated response.^{34 35} Earlier this year, in February, an earthquake off the coast of Chile triggered the early warning system and countries that could potentially be affected were given notice and time to mobilize response resources.

As discussed previously, a major part of the problem in response to the tsunami was due to the lack of disaster response infrastructure. There was further compounded by lack of a strong governmental management structure to begin with. One of the first steps is to train and put in place a system like ICS so that those nations can respond more effectively when the need arises. However, in the event of an incident or disaster, the government will have to shift from what the day-to-day management structure is and enact the ICS. This is opportunity for time and resources to be wasted in a situation where a quick and efficient response is needed. When seconds and minutes equate to death or injury, if the step of a shift from one structure to another is eliminated, the government and other response organizations are prepared and ready to respond at any time on any given day. This helps to mitigate massive loss of life, injury, and further reduces costs to the government and public health systems in dealing with, for example, large scale disease outbreaks for in addition to trying to respond to the disaster.

³⁴ United States of America. Agency for International Development. "Fact Sheet; Incident Command System." USAID, February 2007. Web. 1 March 2010.

³⁵ United States of America. Agency for International Development. "US Indian Ocean Tsunami Warning System." USAID, 2010. Web. 1 March 2010.

2005 Hurricane Katrina

From 23 August 2005 to 06:10AM on 29 August 2005, Hurricane Katrina increased in size and strength and ultimately made landfall as a powerful Category 3 storm. Winds were reported as high as 130 mph and swells of 27 feet. When the wind and rain subsided, approximately 1,300 people had lost their lives, 770,000 were displaced, and the total damage was in the order of \$96 billion.³⁶

While after action review and honest evaluation is needed, unfortunately the majority of the results and press given after the response was overwhelmingly negative. There were without a doubt failures and issues that need to be addressed, but there were in fact positive aspects of the response. From President Bush, discussing reconstruction in 2006, “But there are lessons learned that we don't need to change: the lesson of courage...the determination of our citizens...the compassion of our fellow citizens...the decency of men and women.”³⁷ In Appendix B of the federal report detailing the Hurricane Katrina response, there are facts, figures, and accounts detailing the contribution by federal, state, and local government agencies, public and private sector organizations, and non-governmental organizations and charities. According to the report, more assets and personnel were staged and deployed than any other storm response in history.³⁸

There were seventeen major issues identified in the federal report on the Katrina response. One of the largest shortfalls surrounded infrastructure, the National Response Plan (NRP), which includes the ICS. The NRP was relatively new and unfamiliar to many when Katrina hit. Positions that were supposed to have been developed and exercised at all levels of

³⁶ Townsend, F. “The Federal Response to Hurricane Katrina: Lessons Learned.” *The White House*. February 2006. Web. 1 March 2010.

³⁷ United States of America. The White House. “President Visits Mississippi, Discusses Gulf Coast Reconstruction,” WH, 12 January 2006. Web. 1 March 2010.

³⁸ Townsend, F. “The Federal Response to Hurricane Katrina: Lessons Learned, Annex B.” *The White House*. February 2006. Web. 1 March 2010.

government had not been completed. Additionally, much of the personnel across all levels of government and agencies had not been properly trained in a basic understanding of ICS. Without detailing every single major issue, the overarching theme was a complete lack of integration, coordination, and training on potential disasters for the region extending across all levels and organizations.³⁹

The issues arose when people were asked to work within a system they did not understand or know about. ICS offers a simple and clear system that facilitates more efficient and effective results. Looking at the characteristics and features discussed earlier in this paper, there are similarities between what the ICS offers and what were problem areas during the response. If all stakeholders are educated in as well as utilizing ICS, there can be a seamless interface between organizations. This interface, along with a clear chain of command and common terminology, allow for the established objectives and associated IAPs to be communicated clearly. Further, this fosters the accountability for specific tasks. Also, through the education of personnel about ICS, the planning and exercise process allows for predesignated facilities and resources to be identified and terminology to be practiced.

Similar to earlier points, there was a lack of education and training of personnel in the ICS. When personnel and agencies had to make the shift from the existing day-to-day management structure into ICS, confusion ensued. If an agency, such as a human services or public health entity, operates every day in the ICS, there is a daily familiarity with the general system and there is the benefit of clear communication and accountability for work. Regardless of whether the entity is responding to a disaster or managing a community outreach program, improved communication and accountability are part of improved outcomes.

³⁹ Townsend, F. "The Federal Response to Hurricane Katrina: Lessons Learned." *The White House*. February 2006. Web. 1 March 2010.

2009-2010 H1N1 pandemic response in a large, urban NC health department

Note: For the purpose of protecting the specific county and personnel, in this section the county will be referred to as “County A.”

Beginning in March and April 2009, reports began coming out of Mexico detailing an outbreak of respiratory illness and increased patients presenting with influenza-like illness (ILI).⁴⁰ Two of the first cases identified in the United States occurred in two children in the southern California area of San Diego County.⁴¹ Cases of H1N1 in the state of North Carolina were first reported by the NC Department of Health and Human Services in late April.⁴² H1N1 response in County A began with those first cases at the end of April. From April through September, Tamiflu was distributed to hospitals, private providers, and colleges in the county to treat ILI symptoms in patients. In addition, significant efforts were made to provide consistent recommendations to medical practices and other related organizations within the community regarding effective preventative measures and education on this “new” strain of influenza. In early October 2009, the first doses of H1N1 vaccine arrived at the County A Health Department. Beginning in October and continuing into 2010 through the end of traditional flu season, vaccination clinics were held in various locations throughout the county.

Early on in the pandemic, the health department in conjunction with other county agencies involved in response efforts opened an emergency operations center (EOC) and began operating within the ICS. This is a different usage of the ICS in comparison to the two previous examples. As stated earlier in the paper, the ICS originated as a structure to manage and

⁴⁰ United States of America. Centers for Disease Control and Prevention. Morbidity and Mortality Weekly Report. “Outbreak of Swine-Origin Influenza A (H1N1) Virus Infection---Mexico, March—April 2009.” CDC, 30 April 2009. Web. 1 March 2010.

⁴¹ United States of America. Centers for Disease Control and Prevention. Morbidity and Mortality Weekly Report. “Swine Influenza A (H1N1) Infection in Two Children---Southern California, March—April 2009.” CDC, 21 April 2009. Web. 1 March 2010.

⁴² State of North Carolina. Department of Health and Human Services. “Two Probable Cases of H1N1 Flu Virus Identified in NC.” NCDHHS, 30 April 2009. Web. 1 March 2010.

stabilize a disaster during a relatively short operational period. The operational time frame for this response to H1N1 was just shy of twelve months. Positively, the ICS allowed for a clear chain of command and common objectives that drove decision making and job tasking. It allowed for easy utilization of a variety of agencies and divisions to contribute with their specific assets. However, the challenges of the ICS in this case were similar to the challenges of the two previous cases. First, the several of the agencies participating in the EOC and operating within the ICS, were used to the “traditional” usage of the system—i.e. for a quick and intense response. They had not been educated properly on what an extended operational time frame was going to entail and support began to decrease significantly from those agencies. Second, mainly within the public health entity, personnel had not been extensively trained in the ICS and were unfamiliar with how to operate. Without the education and training, some of the public health entity personnel did not offer complete support. Both challenges led to a lack of solid communication that resulted sometimes in duplication of efforts and job duties or, in several cases, of tasks not being completed at all. The mobilization process was slow and had some growing pains because of the unfamiliarity. Intelligence/information management was difficult at the beginning, as well. Accountability was difficult to have because of all of the aforementioned issues. The process as a whole was able to serve as an education for personnel, but caused significant frustration at times. Again, similar to other cases, valuable response time and effectiveness was lost as a result of the unfamiliarity. If there had been proper education and buy in, as well as familiarity operating within the ICS, the switch of personnel focus from day-to-day tasks to the pandemic response would have been much easier. The stated objectives could have been adjusted and disseminated through the chain of command.

Lessons Learned

These case studies vary in the length and severity of event and as a result, the response and response durations vary as well. The application of the ICS structure ranges from days to months to years. What is highlighted in these case studies is the flexibility of design and broad range of applications. Referring back to the section of this paper that describes each of the features the ICS utilizes, those features allow for the flexible application of this structure in response to a natural disaster or pandemic, for a couple of days or for months on end. The ICS allows for a potentially effective response to a broad range of issues that could confront the public health entity. The flexibility of the ICS is further highlighted in the fact that it can be implemented on any number of levels—international, national, local—with varying levels of public and private partner organization involvement.

The ICS, when utilized well with proper stakeholder education and training, offers an effective organizational structure for a public health entity to be equipped to manage or respond to the broad range of issues confronting it on a daily basis.

Recommendations

The field of public health has seen significant change and development in recent years, especially since 1988 with the release of the landmark report, *The Future of Public Health*, which called for greater leadership in public health.⁴³ Even then, the Institute of Medicine recognized that “the emphasis in the field on technical competence and professionalism sometimes leads to a neglect of management as a skill in its own right...and that greater emphasis...should be placed on managerial and leadership skills.”⁴⁴

⁴³ Institute of Medicine, Division of Health Care Services, Committee for the Study of the Future of Public Health. *The Future of Public Health*. Washington, D.C.: National Academy Press, 1988. Print.

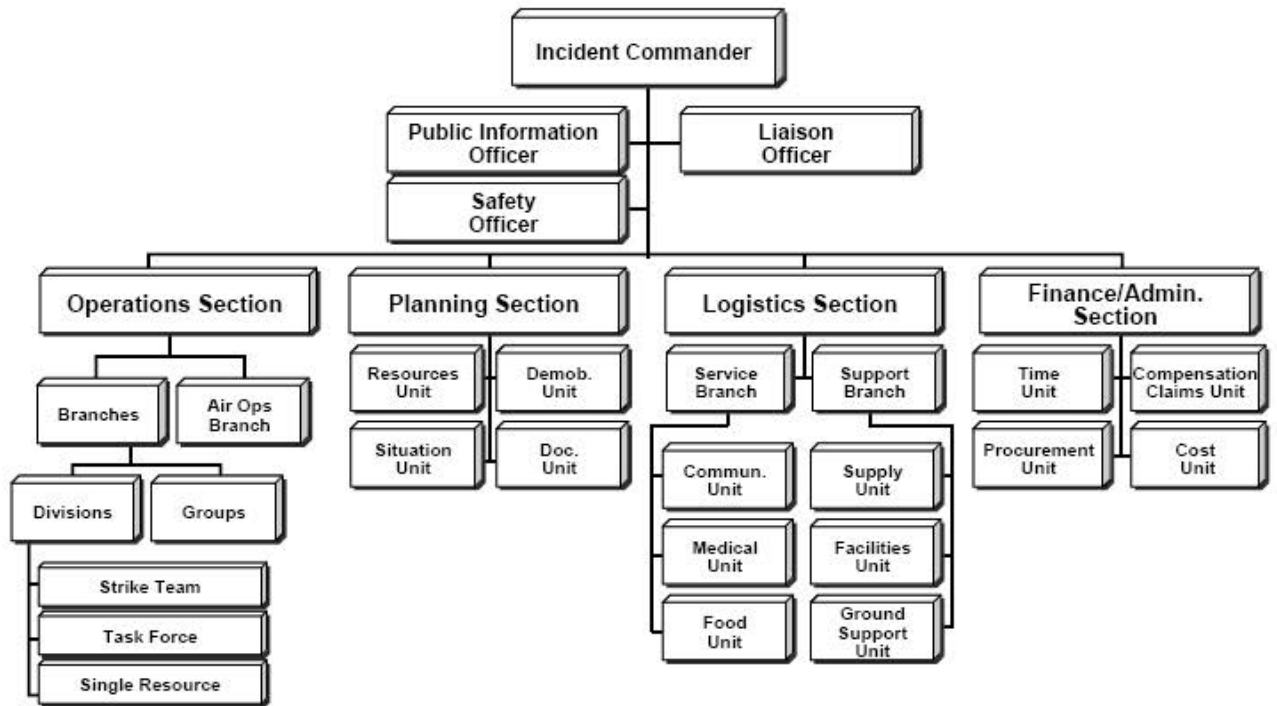
⁴⁴ Institute of Medicine, Division of Health Care Services, Committee for the Study of the Future of Public Health. *The Future of Public Health*. Washington, D.C.: National Academy Press, 1988. 155. Print.

In that spirit, today public health is continuing to meet new challenges of new threats to the health of populations head on, and in doing so is exhibiting greater leadership, including a greater knowledge of organizational design and a firm commitment to continuous improvement. Whether it is response to an emergency or disaster or an outbreak of disease, public health entities need to respond quickly, efficiently, and effectively to meet the needs of the population. Preparedness has typically been associated only with disaster situations. Public health now has the opportunity to proactively monitor the population, current trends, and respond to issues before they become full-scale events or disasters. A significant way for public health to address the needs identified in *The Future of Public Health* and to ensure proper management and preparation is to utilize an organizational structure that facilitates a response to a broad spectrum of issues, but in an efficient and effective manner. Having the foundation of the ICS as an organizational structure allows for the LHD to move seamlessly between every-day management and disasters, as they arise. Valuable time and resources are not lost in the transition of personnel to a new and, possibly, unfamiliar system.

One of the barriers to a fully effective response, as detailed in the case study section, surrounded personnel education. The ICS does allow for “just-in-time” or on the spot training for positions, but the senior management and decision makers need to be very familiar with the structure. Staff support of the structure is also vital to its success. Support only comes through the knowledge and understanding of what the system is, how it works, and why it is needed. In an environment where many staff fill several roles and are pulled in as many different directions, carving out a common time for extensive training is a challenge. However, it is challenge that needs to be confronted because of the considerable impact an organizational structure can have on the success or failure of a program or project.

The role of public health is expanding to meet the challenge of new disease outbreaks, to confront new issues related to disasters, and all in an ever changing landscape due to changes in laws and statutes. In the midst of this, public health has realized the need for improvement of services and the way in which those services are provided. Initiatives such as continuous quality improvement (CQI) and LHD accreditation are evidence of this focus within public health. It is important that organizational structure become a part of the improvement criteria and review process. Improvement of services is an important aspect. So is an effective response during disasters. However, referring back to the statement in the introduction of this paper, an ineffective organizational management structure can very quickly cause an effort to fail or at the very least, cripple the effort significantly. When the health and well-being of a population is ultimately at stake, it is of great importance to have basic structures in place that allow for the broad spectrum of projects, programs and response efforts to occur efficiently and effectively. The Incident Command System can give public health entities the foundational structure that facilitates a response to a broad possibility of issues as they arise.

Appendix A⁴⁵



⁴⁵ Federal Emergency Management Agency. "ICS Organization Chart." FEMA Emergency Management Institute, May 2008. Web. 1 March 2010.