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A Tale of Three Systems: Improving Three Emergency Communication Systems

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Abstract

This paper examines the current state of communications between the public, first responder

organizations, and hospitals during mass traumatic casualty events. While the current system that

exists nationwide, the National Incident Management System (NIMS), is an effective system,

there are several improvements that could be made on a community level. This paper looks at

national-level plans, such as the national emergency communications plan, NIMS, Hospital

Incident Command System (HICS), and national Incident Command System (ICS). This paper

sets forward several cost-sensitive recommendations to add to local emergency communication

plans and structures in order to make better use technology that already exists and to better serve

the community. These recommendations include the use of common language between first

responders and hospitals, effective recall system for hospital and first responder staff, and an area

combined information system for local hospitals. Overall, there is an effective communications

plan in place, but there are still areas that could be improved.

Keywords: Emergency Preparedness, First Responder, Hospital, Public, Mass Casualty
Event

A Tale of Three Systems: Improving Three Emergency Communication Systems

The world is not the same place that it was a hundred years ago during World War I. It is not even the same place that it was during the rise of terrorism during the nineteen nineties. The rate at which terrorist events happen has been on an increase since 2005 (Martin, 2015). This followed a fairly consistent decrease between the late nineties and early twenty-first century. With this increase in terrorist attacks, there was a corresponding increase in injuries and deaths. In addition to this, technology is much more advanced than twenty years ago. It makes no difference if two people are within the same town, the same country, or across the world from each other, they are able to communicate through technology at the same speed.

This change in communication ability has had both negative and positive impacts. The increase in technology has enabled law enforcement to communicate more effectively and reliably between themselves as well as other organizations (United States Department of Homeland Security [DHS], 2014). However, the increase in communication technology has also made untraceable interaction between people more accessible, through the aid of apps such as 'WhatsApp'. This app encrypts all messages sent through it by default. The creators of this app state that this privacy technique was implemented in order to protect its users against "…cybercriminals, hackers, and oppressive regimes" (Koum & Acton, 2016, second paragraph, second sentence). However, this kind of privacy protection has been used to further terrorist activity. It was used for communication and planning between terrorists prior to events such as the terrorist attack in London in March of 2017 (Rayner, 2017). The United States Department of Homeland Security (DHS, 2014) has noted the importance of adapting to technological advances in order to protect people in the most effective way that is possible.

In response, the DHS (2014) developed a "National Emergency Communications Plan" in order to "ensure law enforcement, fire, and emergency medical services personnel have access to reliable and interoperable communications at all times in order to save lives, protect property and the environment, stabilize communities, and meet basic human needs following an incident" (p. 1). This plan allows for communication between the first responders prior to, during, and after emergency situations. In addition to this, it allows for communication between first responders and other entities such as public health, medical organizations, and other critical infrastructure organizations. However, while this plan sets up the national communication system, it provides an adjustable framework for communities to tailor to their specific needs. This means that the local emergency response communication system is only as strong as the community stakeholders make it.

Connected to this first responder communication system is the emergency communication plan for the hospital, both internally and externally (DHS, 2014). This is the communication system between hospital departments that allows patients to flow from one area of the hospital to another, as well as being the system that allows hospitals to contact employees that are not scheduled in order to recall them to the hospitals during disasters. In addition to this, it is also the system that would be used to contact the family of patients who are admitted to the hospital.

Communication between emergency responders and the public is an important system that needs to be maintained and improved. A well-functioning system allows needed information to go from the Incident Command System in a disaster to the public in order to keep a community informed and safe (DHS, 2014). When this system is malfunctioning or underdeveloped in a region, public panic can endanger people in addition to property needlessly.

Purpose Statement

The purpose of this study was to review and compare plans within the current disaster response communications plans in a general metropolitan area. Included in this are communications within and between EMS and local hospitals/hospital systems as well as communication with public. Recommendations will be made to improve current plans for future disasters in order to facilitate easier and more efficient communication between first responders, hospitals, and the general public.

Scenario

A scenario; a large festival is being held in the downtown area of a metropolitan city. Thousands of people are attending the festival. It is a weekend evening and an otherwise quiet night. During the event, several loud bangs like firecrackers were heard. Yells are heard throughout the crowd as people start to collapse and the sound is now recognizable as repeated gunshots. The shots are coming from an elevated level and continue for several minutes, only pausing during the reload. During the shooting, approximately fifty-eight people are killed and five hundred people are injured, with fifty of these injury cases being critical. Thankfully, several positive conditions happened to make this situation not be any worse than it was. Different phone operating systems sent people to different hospitals purely by chance. Medical first responders arrived within minutes and could start triage. This situation happened in an area that had an adequate and functional response system with a functional communication system between first responders, the hospitals, and the public. If the area had a good response system and the communication system was ill-prepared, this situation would have been even more catastrophic than it already was.

Literature Review

Hospital Communications

      National system. When the National Incident Response System was first introduced in 2004, it included a requirement for hospitals and other healthcare facilities to develop some plans to receive certain grants (Jones, 2014). One of these plans was a Hospital Incident Command System (HICS). This HICS functions as the incident command system that law enforcement and fire/EMS department's use and it allows for easier mobility and coordination of hospital resources during a large scale event (Mohammad, Golrokh, Lida, & Abbas, 2011). The HICS establishes a plan for the chain of command within the hospital during an incident as well as assigning certain other individuals to act as section chiefs specializing in the response of different areas, such as logistics and communications. This plan also sets in place the needed response outside of the hospital, such as the information exchange between EMS/law enforcement in response to bed and resource availability. In a national study, around eighty-five percent of hospitals had regional communications systems that were able to track the number of available emergency department beds (Niska & Shimizu, 2011). This system would be able to be accessed by the hospital and, in some areas, the local first responders. Other recommendations include the need for redundancy in communication capability in order to confirm that communications will still be available even if the original channel becomes unusable (Institute of Medicine, 2007).

      Like with internal healthcare system communications, another recommendation for communications is that there is a level of redundancy in communications ability between the hospitals and first responders. A common means of communications (i.e., common radio channels) between first responders and different organizations can reduce time for

communications between organizations and allow for a quicker response (American Hospital

Association [AHA], 2000). This also allows hospitals to notify many EMS departments and

other organizations at the same time about bed and resource availability. Because many people

will self-transport from a disaster to a local healthcare facility, first responders may

underestimate the number of people that a specific hospital has received and may transport more

people than a hospital can treat because of this miscommunication (Institute of Medicine, 2007).

The HICS also must establish how a hospital or healthcare system will address both the

public as a whole and the family of incident victims. The most recent edition of national

recommendations talked about the importance of addressing family questions during an incident,

if only to help control the hospital environment (Shooshtari, Tofighi, & Abbasi, (2007). It was

recommended that an off-site location is used for families and friends to contact for patient

information. Such calls, if not addressed this way, can further overload a hospitals

communications network departments (AHA, 2000). It is also recommended that a single person

or group is used for all communications for a disaster or incident. This can help to prevent

miscommunication and public confusion that can occur if different organizations use their own

separate public affairs departments (AHA, 2000).

First Responders Communications

National system. Since 2004, the National Incident Management System (NIMS) has

been the backbone to most disasters or emergencies in the United States. This ranges from

national disasters, like hurricane Katrina and super storm Sandy, to localized disasters, such as

hazardous spill on a state highway. NIMS functions to organize and facilitate cooperation and

coordination, not only within governmental layers (federal, state, and local), but also between

governmental structures and nongovernmental structures, such as public health and businesses

(Federal Emergency Management Agency [FEMA] 2004). Another main function of NIMS is

that the system is designed to be scalable, which means that it is functional for both incidences

that involve a few organizations or many organizations.

NIMS has emphasis on different areas of disaster response. These areas are preparedness,

communications, resource management, command, and maintenance (FEMA, 2004). Within its

response planning, it emphasizes interoperability within all levels. For the communications

response, this means that communications remain flexible enough to shift when necessary, but

stable enough to withstand the pressure of stressful situations. In addition to this, it emphasizes

the necessity of cooperation between government and public organizations. The communications

component to the NIMS system states that with the combination of a good communication flow

and accurate information, effective decision making can be achieved (FEMA, 2004).

In order to make this effective decision making possible, the DHS develops a series of

plans. In 2014, the DHS developed the second edition of the National Emergency

Communications Plan (DHS, 2014). Like most of these national plans, it is a more of a template

than a concrete plan. The plan addresses the need for not only emergency responders, but also

other organizations to improve their radio systems, integrate emerging technology, and promote

agreements that further the idea of interoperability.

In addition to first responder and government organizations, hospitals and other certain

other healthcare facilities also must integrate NIMS into their response plans. Because such areas

will be one of the first place that trauma patients are taken to in the event of a mass casualty,

these areas need to have a similar level of training to that of first responders. While police and

fire have their own command structures, NIMS emphasizes the importance of hospitals

command centers to coordinate connectivity abilities with those first responder incident

command systems (FEMA, 2004). Different code calling systems can make immediate decision

making difficult for both the hospital personnel and the first responder organizations. One

component of NIMS calls for the use of plain language during emergency response (FEMA,

2004).

Like many incident command systems, NIMS utilizes the Joint Information System (JIC)

to organize communications both within the response and outside of the response. The JIC

utilizes member from all participating jurisdictions and organizations that are involved in the

emergency response (FEMA, 2004). This includes members from fire, law enforcement, public

health, and others. The JIC is also responsible for communications that go out to the public. They

are the organization that conducts interviews with the press and monitors the press to evaluate if

the information was understood and comprehended (FEMA, 2004).

Public Communications

      National System. In recent years, the U.S. Federal Communications Commission (FCC,

2017) has worked to improve faults that were found in the system during past disasters. It was

found that while the systems may function well during normal time, disasters and large incidents

can put a strain on the localized system, which could lead to outages. These systems include call

processing from emergency channels, such as 911, and the emergency alert system, in addition to

traditional radio and television broadcasts. Improvements to these systems includes a better

ability of 911 personnel to identify a caller's area even if that person is unsure, whether they are

on a landline phone or on a cell phone (FCC, 2017)

      The national emergency alert system was also improved. While only a presidential order

can allow the system to be used in a national area, local systems can be utilized more easily. The

system is designed to ensure that even if one communications channel is down, others can be

utilized in its place (FCC, 2017). This is not only limited to television and radio alerts, but also

cell phone alerts. While mostly used for things such as Amber Alerts for missing children, it can

also be utilized for communicating with a large amount of people in a short amount of time

during disasters (FCC, 2017). For example, Ohio State University utilized such a system during

an incident event that happened on their campus in 2017 (Knight & Saker, 2016).

An increasingly high number of people do not use traditional news networks as their

primary source of information after large disasters. Instead, social media and online news

sources are being used. Social media has been used for real-time dissemination of information in

a way that allows for the possibility of interpersonal communications between the public and

authorities in addition to one member of the public to another (Xiao, Huang, & Wu, 2015). Not

only can social media be used by the public to receive information from authorities and other

sources, it can also be used by hospital networks and authorities to gain insight to the scope and

time of disasters. A study has shown that a tracing of tweets from the social media site Twitter

can be used to alert healthcare systems that an incident has occurred in their general area and

help the hospital to prepare for incoming patients (Callcut, Moore, Wakam, Hubbard, & Cohen,

2017).

Methods

This study is exempt from IRB evaluation, per 45 CFR part 46 of the Human Subjects

Regulations Decision (Appendix A). Reports and writings on the topic of communications

during mass casualty events were obtained from a variety of sources. These sources include

Wright State University (WSU) Library, Google Scholar, and the WSU Library website.

Through these sources, the National Communication Plan from the United States Department of

Homeland Security was obtained as well as the national ICS and HICS.

The sources mentioned were reviewed analyzed in comparison to each other to find similarities and differences between emergency communication interactions of hospital staff, first responders, and the public. In addition to this, these similarities and differences were compared to existing research recommendations in emergency communications to assess weaknesses in existing plans and to suggest improvements current hospital and first responder plans. The results from this study were aggregated into a series of tables in order to compare the national recommendations to the local system that is currently in place.

Comparisons of Emergency Communications Plans

The National NIMS has been used by jurisdictions, including state, local, and other levels, in order to make a uniform response that is capable of handling emergencies from small to large. While NIMS does not provide step-by-step instructions on who is in the chain-of-command, which is the responsibility of the ICS, it does provide a template of how the to organize people and organizations in order to make a cohesive emergency plan.

In the event of the activation of the ICS structure that would be in place during an event, a designated person would be the overall incident commander. In a situation that would take the cooperation of many different government and non-government organizations, such as a mass traumatic casualty event, this designated incident commander could be one of a multitude of people including the health commissioner, fire/police chief, or the mayor.

While the NIMS structure works well within one organization, a slight alteration is needed when multiple organizations could claim jurisdiction or command. This can occur when an event will take a large amount of resources from different departments, such as the local public health department, fire department, and police department. Each organization would want to maintain their own internal ICS. NIMS sets out guidelines for the use of a unified area

command system where each organization retains command of their own department and the responsibilities therein, while still maintaining open communications between departments through the use of designated personnel that act as liaisons.

While each jurisdiction maintains their own command structure, it is essential that the liaisons function and communicate well in order to make uniform and consistent command decisions between departments and jurisdictions. Failure to due this would lead to confusion for the first responders and other organizations involved as well as the public as a whole. In addition to the liaisons, communication between the non-command members of the organizations is essential. It would waste limited time to communicate simple questions between non-command members of each organization, such as emergency medical transport informing hospital staff of an incoming patient.

Within each separate command structure, the NIMS structure holds steady. Most of the feature of both NIMS and ICS remain the same. Each department maintains their own chain-of-command, each maintains their own budget, and each maintains a reference of their own resources. In addition, each department would include positions such as the public information officer, to handle the press and public from their individual standpoint, as well as individual section command heads, such as the logistics and planning sections. The differences between a general incident command system and a unified command incident command system is in the communications, or lack thereof, between responding departments. A summary of the similarities and differences between emergency communications interactions of hospitals, first responders, and the public is found in Table 1.

Table 1

Similarities and Differences between Emergency Communications Systems

Similarities Between Communication Systems	• **Structured organization system (NIMS)** • **Hierarchical command system (ICS)** o **Clear who is in charge at any given time** • **Series of plans set in place in order to ensure communication ability while system is under stress** • **Hospitals and first responder organizations both have public information sectors**

Differences Between Communication Systems	• Ease of communication
	   o Between different police jurisdictions vs between hospital networks
	      ▪ Hospitals are profit centered
	• Scope of command
	   o Hospital ICS only works inside of hospitals; first responder ICS covers a larger area
	• Hospital system does not have same ability to deal with mass public communications
	• First responders rely more on electronic communications because of wider geographic area

In a mass traumatic casualty event, any miscommunication could have major dire consequences for the public as well as the staff of the different organizations, both public and private. Any improvement that could be made with the communications between command members of different organizations as well as non-command members could save resources and lives that would otherwise be lost. While the basic system that is in place across the United States functions well, there are several additions that could be made to the local system that could improve communications and save lives. A summary of the recommendations to improve the emergency communications between hospital, first responders, and the public is found in Table 2.

Table 2

Recommendations to Improve Emergency Communications Plans

Recommendations		
First Responders	**Hospitals**	**Public**
• Use of common language in order to reduce miscommunication	• Use of common language in order to reduce miscommunication	• Use of common language in order to reduce miscommunication
• Combined media communications with other jurisdictions	• Safe access paths to allow staff to get to duty site	• Push alerts on mobile phones and computers to notify public of terrorist event
• Safe access paths to allow staff to get to duty site	• Use of "information centers" to keep public up to date with current information	• Use of "information centers" to find information from different hospitals without directly calling
	• Inform public of the need to redirect non-emergency health problems	

Recommendations

Improving Emergency Communication between First Responders and the Hospitals

Common language. The use common language is necessary when there are communications between multiple agencies during a mass traumatic casualty event. While the use of codes exists in everyday communications between hospitals and first responders as a tool for increased effectiveness, common language should be used during such events as the normal personnel may not be available and miscommunications could have large effects (DHS, 2012). Different government and non-government agencies have different codes for the same thing and these codes may not be able to be understood outside of the individual agencies. This would need to be implemented in both the hospital and first responder communications plans. Clear, concise information should be used.

Effective recall system and safe access paths. An effective system needs to be in place to allow first responders and the medical system to recall off-duty staff in order to fulfill the increased demand of services during a mass traumatic causality event. This should be an automated service rather than a personnel-maned phone tree type organization. Such a system is cited by French Emergency Preparedness organizations as having improved medical response time during the November 2015 Paris attacks (Ghanchi, 2016). In the event of this type of situation, staff would be needed in the organization and treatment of patients rather than calling down a list of off-duty personnel. This recall system needs to be in effect for not only the medical staff, but also environmental services, janitorial services, as well as food services. These other services may take longer to become overwhelmed when compared to the medical staff, but they would become overwhelmed and non-effective nevertheless.

A recall system would also need to be initiated for first responders in the area. There would be an increased need for police in order to maintain order at the site of the event as well as throughout the area. In addition to this, there would also need to be additional EMS personnel. While the EMS would not necessarily be effective in the transport of injured from the site of the event to a medical facility, they could be of use at the site for organization of triage for injured that do not need to be first transported to hospitals (Lidal, Holte, & Vist, 2013). In addition to this, they could also be used to set up a secondary triage system outside of the hospital emergency departments in order to slow the barrage of injured within the hospital. This would mostly affect the communication systems individually so changes would need to be made in both the hospital and the first responder communication plans.

Along with the need for additional staff, safe access paths need to be in place for this additional staff to be able to get to their duty sites in a timely manner. Without these paths

already in place, nurses and doctors that are needed in the emergency departments of local

hospitals may get stuck behind barricades meant to help police organize traffic and keep order in

the area. Hospitals would need to have fast contact with police to inform them that they have

recalled staff and to allow/direct them to get to the hospital.

    Connected call system. A means for common communication is needed between the

medical systems and the first responders beyond direct contact. When an event is deemed to be

an emergency by the designated person requiring mass stress on multiple area agencies, a

communication path should be opened to help maintain interoperability between agencies and to

help reduce time-consuming redundancies (Bureau of Justice Assistance [BJA], 2009). Currently

the MARCs system exists that would allow multi-agency communications. However, this

equipment is self-maintained by individual agencies. Between this and improper use, there could

exist significant problems within the system. Routine training and equipment inspections is

needed to ensure proper use is available.

Improving Emergency Communication between First Responders and Public

    Combined media communications. It is possible that a mass traumatic casualty event

would involve not only different organizations within the same city, such as police, fire, and

public health departments, but also involve similar types of organizations covering different

cities, such as different jurisdictions of police departments. Each of these departments would

have their own incident management system in place and their own staff member assigned to be

the media contact. While this might work for incidents within the same jurisdiction or

organization, it becomes a problem when two jurisdictions want to release different information

for the public. This would affect the communication plans of first responder organizations.

The use of different public relations contacts can create confusion and panic for the

public and increases the number of calls that the police and other public safety organizations

receive (BJA, 2009). The public relies on media to present accurate information in a timely

manner, especially in large-scale community emergency events. If the information that the media

presents comes from different sources, there exists the opportunity for conflicting information to

be presented. When this occurs, the level of confidence that the public has for first responders

could be compromised. On the other hand, using a combined public relations contact for all

jurisdictions ensures that only information that was jointly approved by the different jurisdictions

is released to the media and therefore the public. This situation relies on the staff members

following orders not to talk to the press about the mass casualty event or, if they have to talk to

the press or other media, following a set of standard responses.

Push alerts on mobile phones and computers. An increasing number of people choose

not to receive news from traditional new sources, such as television news channels on local

stations. There is an increasing trend of people, majority from younger age groups, which do not

have access to these stations, instead choosing to use internet options, such as Netflix. This

means that the emergency news broadcasts that break into regular television stations are not

reaching the same demographics of people that they used to reach (Rainie, 2017). The same

could be said for local radio stations. Options available from other areas mean that emergency

broadcasts on these types of media are less effective than they would have been twenty years

ago. However, this does not mean that these types of broadcasts should be completely gotten rid

of.

An alternative option, to be used in addition to the more traditional emergency alerts,

should be in use. Approximately ninety percent of Americans own a cell phone by the beginning

of 2018 (Pew Research Center, 2018). In recent years, there has been an increase in the different

types of push emergency notifications that can be sent out. A push notification for a cell phone or

computer is an alert that is sent out through service providers and appears on all devices that

utilize that service provider. Such a system was used during an active shooter event at Ohio State

University and helped to warn students in a fast and effective manner (Knight & Saker, 2016).

Common types of push notifications include inclement weather-type advisories, such as tornado

or hurricane alerts, in addition to alerts such as Amber Alerts. While these types of notifications

have been in use for certain events for years, they are not commonly utilized for large-scale local

emergency communications. Push notifications to cell phones or to computers could help to

notify the community of a public safety concern in a logical and cost-effective manner. These

changes would be implemented in first responder emergency communications plans.

Improving Emergency Communications between Hospital and Public

      Information centers. During a mass traumatic casualty event, or even a minor event, the

closest hospitals generally get overwhelmed by the number of patients that are brought to them.

This surge of patients pushes hospital resources, including physical resources like beds and

supplies as well as personnel, to the limit (Adini, Peleg, Cohan, & Laor, 2010). Compounding

the problem is the presence of questions from friends and family. Because of the high likelihood

of cell towers being overwhelmed and cell services being unreliable, many family members and

friends of people that may be injured contact the hospital for information about their loved ones.

This quickly inundates hospital communications with the public and can hinder the ability of the

hospital to respond to such events in the necessary manner (Adini et al., 2010).

      While these calls can be a hindrance when channeled through the main hospital

communications lines, they can provide valuable information about unidentified patients within

the hospital. It is the fact that they are going through the main communications channels. The

creation of an information center separate from, yet still connected to, the hospital can help to

maintain order with loved ones and to help to obtain and disseminate information. It provides a

single source of information for the public which would help to limit the phone calls that the

hospital has to deal with as well as to help limit the amount of non-injured people that turn up at

the emergency departments (Adini et al., 2010).

Because these information centers are potentially dealing with multiple different hospitals

and, possibly, different hospital systems, it is important that a level of cooperation exists between

such organization. It is possible that family members are taken to different hospitals due to

medical need or bed availability. Cooperation between hospital systems helps to ensure that these

individuals maintain awareness of their loved one location. Each hospital or medical system

should have at least one representative in the information center to maintain the flow of

information from each individual location.

While these information centers are useful during mass traumatic casualty event, it does

not make financial sense to maintain such a center for the long term. The personnel from each

hospital that is sent to staff such a center should be from non-essential non-medical departments,

such as the social work department. Such people would have the level of compassion and

training necessary in dealing with people whose emotions are running high. There should be

multiple designated people in each department, at minimum three staff members, that receive

any needed additional training about new procedures or new technology that they may not be

familiar with.

In order to assist with identification of large number of patients, a uniform identification

method that can use used in any hospital system is necessary. If such a method can be used and

input into a common system, the information center can take in information from worried family and friends and try to match up unidentified patients. Combining the description obtained from the loved ones and the description obtained from the hospitals and using a computer algorithm to match physical descriptions, such as eye and hair color, as well as other physical descriptions such as tattoos and birthmarks. These changes would mostly affect the local hospital emergency communication plans and the interactions between different hospitals.

Redirecting non-emergencies. While many of the hospital emergency department resources that are normally available during normal time will be in use during a mass traumatic casualty event, this does not stop patients with other emergencies and non-emergencies from presenting at the hospital for care. This further congests the hospital, increases wait times, and decreases the level of care for all. Hospitals should make it known to the hospital, through use of television as well as other communication methods such as radio or social media that non-emergent cases should attempt to go to local Urgent Care Centers (French, Sloan, Fletcher, & Lehman-Huskamp, 2017). While this would not halt all of the visits that would not necessarily need emergency department care to treat, it would help to slow the flow and allow hospitals to treat patients with trauma from the disaster while still providing care to other local residents. This would affect the local area hospital system emergency communications plans.

Limitations

There are several limitations that exist in this study. Local emergency communications plans were not able to be obtained for the local counties first responders and local hospital systems. This limits the amount of direct recommendation that could be made in order to improve the plans. Instead, recommendations to improve the individual emergency communications plans were made based of successful implementation in other areas. In addition

to this, there is limited number of events where these types of emergency plans could be tested for field efficacy.

Conclusion

The world is not the same place that it was a hundred years ago during World War I. Technology has growth to impact nearly every aspect of our lives. Because of this growth, responses to disasters cannot stay stagnant or they will become obsolete in a manner of a few years. Change is necessary in order for plans to stay relevant and useful in today's environment. Overall, the current systems that are in place through plans such and National Incident Management System and Incident Command Systems works well as an outline for emergency situations. However, systems can always be improved, and plans should be evaluated regularly to maintain relevance.

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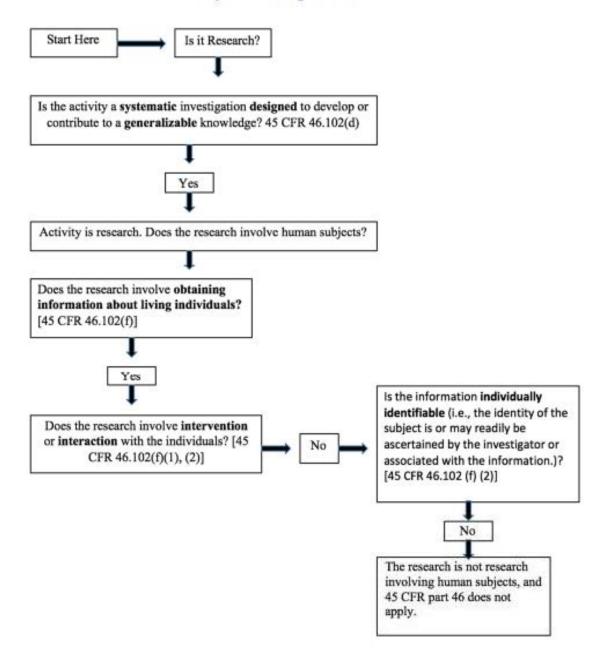U.S. Federal Communications Commission (FCC). (2017). Emergency Communications. Retrieved from https://www.fcc.gov/consumers/guides/emergency-communications

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Appendix A – Human Subject Regulations Decision Chart

Is an Activity Research Involving Human Subjects Covered by 45 CFR part 46?

Start Here → Is it Research?

Is the activity a **systematic** investigation **designed** to develop or contribute to a **generalizable** knowledge? 45 CFR 46.102(d)

Yes

Activity is research. Does the research involve human subjects?

Does the research involve **obtaining information about living individuals?** [45 CFR 46.102(f)]

Yes

Does the research involve **intervention** or **interaction** with the individuals? [45 CFR 46.102(f)(1), (2)]

No

Is the information **individually identifiable** (i.e., the identity of the subject is or may readily be ascertained by the investigator or associated with the information.)? [45 CFR 46.102 (f) (2)]

No

The research is not research involving human subjects, and 45 CFR part 46 does not apply.

Appendix B – List of Competencies Met in CE

Wright State Program Public Health Competencies Checklist

Assess and utilize quantitative and qualitative data.
Describe how policies, systems, and environment affect the health of populations.
Communicate public health information to lay and/or professional audiences with linguistic and cultural sensitivity.
Make evidence-informed decisions in public health practice.
Evaluate and interpret evidence, including strengths, limitations, and practical implications.
Explain public health as part of a larger inter-related system of organizations that influence the health of populations at local, national, and global levels.

Concentration Specific Competencies Checklist

Population Health Concentration
Explain a population health approach to improving health status
Use evidence-based problem solving in the context of a particular population health challenge.
Demonstrate the ability to contextualize and integrate knowledge of a specific population health issue.
Evaluate population health programs or policies that are designed to improve the health of the population, reduce disparities, or increase equity.