Pandemic and All-Hazards Preparedness Act

Public Law 109-417

Telehealth Report to Congress

January 2009

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Statement by The Secretary

America has seen significant progress in the use of new technologies to improve medical care and bring innovative approaches to America's healthcare system. New research and technology advances are rapidly changing the healthcare landscape through increased access to care, higher quality, and wider availability of specialized expertise. As we in the Department of Health and Human Services continue to work on improving the way we prepare for and respond to public health emergencies, it's time to investigate how a strategic, coordinated, and coherent use of Telehealth can facilitate our efforts.

In passing the Pandemic and All-Hazards Preparedness Act, Congress directed the United States Government to transform our approach to public health emergencies through improved coordination and a strengthened Federal role. By including a provision on Telehealth in the Act, Congress recognized Telehealth's potential to enhance our preparedness and response capabilities. This report fulfills a requirement in that provision to outline the state of, challenges to, and recommendations for Telehealth in the context of public health emergencies and disaster medical response.

Telehealth technologies such as remote consultations have been used in past disaster response efforts with anecdotally reported results of vastly improved outcomes. Other technologies such as electronic medical records and patient tracking are being tested, employed, and enhanced in responses to current emergencies, and coupled with emerging cutting-edge technologies, have the potential to revolutionize the Nation's entire approach to disaster care. Battlefield medicine and clinical care for veterans have been leading in the field of Telehealth technology applications, and the Nation has much to learn from those efforts, as well as from advances in health information technology networks and policy.

This report illustrates the need to harness the good and important work happening throughout the government and private industry with a cohesive strategy for fully employing Telehealth as an integral part of preparedness planning, response operations, and to speed recovery from natural and man-made events. The Department of Health and Human Services looks forward to continued work with our Federal, State, local, Tribal, and private sector partners and stakeholders on this vital effort.

Executive Summary

The Pandemic and All Hazards Preparedness Act (P.L. 109-417), of December 2006 established a requirement for the creation and reporting of an Inventory of Telehealth Initiatives that could be brought to bear to optimize the National Response Framework Emergency Support Function number 8 efforts in service to the public. The law required that the focus of such Initiatives be considered in preparation for and response to public health emergencies and disaster medical responses. An initial effort in 2007 attempted to address this accounting requirement and illustrated that while numerous exceptional efforts had been taken in creating some eHealth, electronic medical record, and Telemedicine programs, most were relegated to routine care, preventive medicine and more conventional pursuits. At that time, the unique environments of austere care, infrastructurally devastated landscapes, mass prophylaxis campaigns, mass casualty and the catastrophic care requirements associated with disaster medicine were still in the preliminary stages of development. This report provides an evaluation of the issues that apply to the proper utilization and creation of an Inventory for Telehealth in public health emergencies and disaster medical responses.

The initial efforts of such an accounting quickly revealed that an inventory, registry, or guild of the nature prescribed by law did not exist, nor were the assets and resources immediately available for quick categorization. The private programs that were discoverable as well as the Federally-based and administered programs are listed in Appendix A of this report. To assert that this is an inclusive or complete list of the hierarchy and breadth necessary for a proper understanding would be inappropriate. The initial reconnaissance of this effort indicated that a complex and variably mature system of programs, initiatives, and enterprises that could contribute to service in response to a disaster were in varying states of completion and operation. They are also dynamic and, for the most part, self-reported and variably categorized. Considering the other charges of the law:

- incorporation of the practices of the National Disaster Medical System (NDMS)
- recommendations for improved interagency practices and cooperation
- establishment and improvement of reimbursement of Telemedicine resources
- preparation and integration of the electronic medical record, and
- encouraging public-private collaboration to leverage existing networks, information technology and telephonic connectivity to enhance the applications to mass casualty events, public heath emergencies, and disaster medical responses

and in the absence of an existing or readily defined national inventory, a larger requirement of a strategy for the use of eHealth and Telehealth in disaster theaters emerged.

Utilizing the established policy process mechanisms of the Office of the Assistant Secretary for Preparedness and Response (ASPR) the questions of the proper utility of and the format for creation of the national inventory of Telehealth were posed. This included the creation of an HHS workgroup, the Enterprise Governance Board process, the Disaster Medicine Workgroup of the National Biodefense Science Board, and the Institute of Medicine Forum on Medical and Public Health Preparedness for Catastrophic Events Workshop on Dispensing Medical Countermeasures for Public Health. Common findings among these bodies included the idea that Telehealth and eHealth could apply existing clinical and technical practices, networks and technological capabilities for information transfer, and they could rapidly insert intellectual and

clinical consultation into remote and compromised environments during a response. It was also suggested that applying existing and uniform accounting and electronic asset and reimbursement strategies for materials and services would enhance the overall incident management, accurately represent the event, enhance the event review and lessons learned, and allow better accountability to speed recovery and establish reliable best practices for the future. It was envisioned that with proper application these tools could capture the "arc" of a patient's encounter with the system, course of care, and final disposition.

The challenges that still exist include: the proper integration of existing Telehealth and eHealth resources and programs, communication technology, establishing uniformity of information formats, consistent implementation throughout Federal, State, and local entities, and estimating what resources and roles the United States Government (USG) should take. In order to proceed with the involvement of proper stakeholders and to assure a proper balance and configuration of public-private collaboration, a Task Force to address the challenges and advise on a National Strategy for Telehealth and eHealth application to public health emergencies and disaster medical responses is recommended. It is anticipated that this task force would assist in considering the proper matching of public health emergency and disaster medical response tactics with twenty-first century technology. The NBSB has announced that it will charge its Disaster Medicine Working Group with convening such a Task Force so that the NBSB can advise the Secretary in the development of a strategy for the use of telehealth and its applications to enhance the care provided in a public health emergency and medical disaster setting.

Among the items that might be addressed by the strategy are:
- Creation of a Telehealth and eHealth Disaster Resource Initiative to consider interval of updating the strategy and the consideration of public health emergencies and disaster medical responses
- Evaluation of the unique portability requirements inherent to austere environments
- Integration of a Telemedicine Disaster Resources Network
- Evaluation of material and fiscal support and reimbursement requirements for proper utilization of Telehealth and eHealth initiatives for disaster related operations
- Creation and development of policy for access and utilization of resources
- Development of policy for information interoperability between evacuation, mass care, and health and medical support functions
- Development of policy for NDMS integration via the Disaster Medical Information Suite
- Means and methods to integrate mass prophylaxis campaigns
- Means and methods to integrate mass casualty and mass decedent event management
- Means and methods to integrate material and medical accountability practices
- Means and methods to integrate information capture to facilitate disaster epidemiology
- Means and methods to integrate patient accountability
- Means and methods to facilitate research and inform best practices
- Means and methods to develop innovative strategies for remote care
- Development of an Inventory of resources, personnel, and technology that may be brought to bear in a public health emergency and disaster medical response and incorporate the protocols policy and practice for its utilization
- Address the USG role in the creation maintenance and direction of the National Strategy

- Establish specific objectives with respect to strategies to reduce health disparities and specific plans for ensuring that populations with unique needs are appropriately addressed

It is appropriate to acknowledge the involvement and efforts of the following in the work done to date:

- Department of Commerce
- Department of Defense
    - Office of the Army Surgeon General
    - U.S. Air Force Medical Support Agency
    - U.S. Army Medical Research and Materiel Command/ Telemedicine and Advanced Technology Research Center
- Department of Health and Human Services
    - Agency for Healthcare Research and Quality
    - Centers for Disease Control and Prevention
    - Centers for Medicare and Medicaid Services
    - Health Resources and Services Administration
        - Office for the Advancement of Telehealth
    - Indian Health Service
    - Office of the General Counsel
    - Office of the Assistant Secretary for Preparedness and Response
        - National Disaster Medical System
    - Office of the National Coordinator for Health Information Technology
- Department of Veterans Affairs/ Veterans Health Administration
- Federal Communications Commission
- Institute of Medicine
- National Biodefense Science Board

Introduction

What is Telehealth?

The term Telehealth describes the process of employing applicable telecommunications and informatics technology to improve healthcare delivery and enhance service delivery models. The increasing use of telecommunications technology to improve individual health, health education, and administration and coordination of healthcare services,[1] has made significant contributions to the ongoing transformation of the United States healthcare system. The impact of Telehealth can be seen in health professional distance education, nursing call center operations, poison control, telemetry, procedural robotics, and services such as remote monitoring of a patient's vital signs or transmitting diagnostic images for interpretation by an expert hundreds of miles away.

The Federal role in Telehealth includes: funding of demonstration projects and evaluation, direct services provision, Medicare payment for Telehealth services, and regulation of remote devices and services. Some of the Federal Departments that play primary roles in Telehealth are the Department of Veterans Affairs (VA), Federal Communications Commission (FCC), Department of Defense (DoD), and the Department of Health and Human Services (HHS). Within HHS, the Office of the National Coordinator for Health Information Technology (ONC), Centers for Medicare and Medicaid Services (CMS), Health Resources and Services Administration (HRSA), Indian Health Service (IHS), Food and Drug Administration (FDA), and the Agency for Healthcare Research and Quality (AHRQ) have responsibility for Telehealth initiatives.

Fully supported and integrated Telehealth networks have the potential to bring significant health benefits to the Nation, including: providing healthcare in remote, underserved communities; facilitating electronic medical record (EMR) usage; increasing accessibility to expertise repositories available at academic, public, and private healthcare entities; connecting geographically-dispersed healthcare providers; and facilitating rapid, effective, and coordinated responses to emergencies. Existing and developmental Telehealth technologies could revolutionize the way the Nation prepares for and responds to public health emergencies and medical disasters.

Telehealth in the Pandemic and All-Hazards Preparedness Act

Recognizing the need to examine potential Telehealth applications during public health emergencies and disaster medical responses, Congress included Telehealth provisions in the December 2006 *Pandemic and All-Hazards Preparedness Act* (PAHPA), P.L. 109-417. PAHPA amended the Public Health Service Act (PHSA) to include additional information and enhancements for many of HHS' public health emergency and disaster medical response functions. PAHPA established the position, functions and duties of the Assistant Secretary for Preparedness and Response (ASPR), expanded the scope of the Assistant Secretary's predecessor office and established the HHS Secretary as the lead for public health emergencies and disaster medical responses covered by the National Response Framework.

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[1] For purposes of this report "healthcare" includes behavioral health.

> ***Definition of Situational Awareness** –*
>
> *A common operating picture of the situation requiring a response based on a threat and vulnerability assessment and resource availability and the process of making sense of the current state of affairs and projecting solution strategies into the future.*

[2]

PAHPA addresses Telehealth as a means to enhance situational awareness during such events. PAHPA and Homeland Security Presidential Directive (HSPD)-21 describe situational awareness as a concept that includes the ability to: actively, continuously and accurately assess status; inform decisions; strategically and operationally address a threat, potential threat, need, crisis, or event; and assign capabilities and resources to achieve the maximum positive outcome[3].

The common operating picture described previously is the context for crisis-decision-making to mitigate negative health impacts. A report prepared recently for HHS further describes this common operating picture as having "incorporated a threat and vulnerability assessment and resource availability and included the process of making sense of the current state of affairs and projecting into the future."[2] As such, the components of situational awareness are:
- Nature of the incident (e.g., agent or cause, response timeline, severity),
- Personnel (e.g., volunteers, paid staff),
- Non-personnel resources (e.g., medical material, facilities),
- Projections about future changes (e.g., severity, skill sets).

Situational awareness is enhanced and improved by the following items:
1. Infrastructure, technical and clinical requirements and administrative provisions of triage, diagnosis, consultation, treatment, support, compensation, administration, and education relating to Information Technology (IT) and Telemedicine objectives,
2. Bio-surveillance systems that might identify and facilitate investigation of a threat,
3. Logistical and dynamic operational need and asset requirements and support of an ongoing theater of activity.

Improved situational awareness also increases the effectiveness and efficiency of these activities and resources by allowing for better targeting of their use during an incident (i.e., cyclic quality improvement).

Section 319D(f) of the PHSA, as amended by PAHPA is titled "Telehealth Enhancements for Emergency Response" and requires HHS, in consultation with FCC and other agencies, to:
> "(A) conduct an inventory of telehealth initiatives in existence on the date of enactment of the Pandemic and All-Hazards Preparedness Act, including—

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[2] Parker, A., Nelson, C., Shelton, S., Dausey, D., Lewis, M., Pomeroy, A., Leuschner, K. Measuring Crisis Decision-Making for Public Health Emergencies, WR-577-DHHS, October 2008. Working Paper Prepared for the U.S. Department of Health and Human Services Office of the Assistant Secretary for Preparedness and Response.
[3] Homeland Security Presidential Directive/HSPD-21. Public health and medical preparedness. Washington, DC: The White House; October 18, 2007.

(i) the specific location of network components;
(ii) the medical, technological, and communications capabilities of such components;
(iii) the functionality of such components; and
(iv) the capacity and ability of such components to handle increased volume during the response to a public health emergency;

(B) identify methods to expand and interconnect the regional health information networks funded by the Secretary, the State and regional broadband networks funded through the rural health care support mechanism pilot program funded by the Federal Communications Commission, and other telehealth networks;

(C) evaluate ways to prepare for, monitor, respond rapidly to, or manage the events of, a public health emergency through the enhanced use of telehealth technologies, including mechanisms for payment or reimbursement for use of such technologies and personnel during public health emergencies;

(D) identify methods for reducing legal barriers that deter health care professionals from providing telemedicine services, such as by utilizing State emergency health care professional credentialing verification systems, encouraging States to establish and implement mechanisms to improve interstate medical licensure cooperation, facilitating the exchange of information among States regarding investigations and adverse actions, and encouraging States to waive the application of licensing requirements during a public health emergency;

(E) evaluate ways to integrate the practice of telemedicine within the National Disaster Medical System; and

(F) promote greater coordination among existing Federal interagency telemedicine and health information technology initiatives."

Purpose, Scope, and Methodology of the Telehealth Report to Congress

The purpose of this document is to report on HHS' fulfillment of the PHSA Section 319D(f), including recommendations. It reflects the most current information available despite the lack of a National, comprehensive repository of Telehealth information and comprehensive integration of programs, systems and infrastructure. There are many efforts to expand, adopt, evaluate outcomes of, and improve Telehealth capabilities; however, comprehensive and clear visibility on the entire breadth of work conducted is not available. This report is not a strategy or plan, but rather a point-in-time reflection of the current status of United States Telehealth asset implementation during public health emergencies and disaster medical responses.

While many issues addressed in this report are pertinent to Telehealth in general, the report's scope is limited to applications of Telehealth to public health emergencies and disaster medical responses. Considerations and evaluations of Telehealth usage, utility, and effectiveness during emergencies are a significant public health systems research challenge and many initiatives have been developed independent of an overarching strategy or common discourse. This report illustrates both capabilities and deficiencies and thus, might serve as context for creating a National strategy for Telehealth application to public health emergencies and disaster medical responses.

To research and develop the report, ASPR convened a Working Group to survey Federal agencies and develop a list of programs and formulate recommendations to this process and report. Subsequently, through combined Federal collaboration and stakeholder outreach, ASPR

formed a second Working Group comprised of United States Government (USG) representatives (Table 1). This Group was responsible for drafting the final report.

Table 1: Federal departments and agencies participating in Telehealth Working Group

Department of Health and Human Services	Office of the Secretary/Office of the Assistant Secretary for Preparedness and Response
	Agency for Healthcare Research and Quality
	Centers for Disease Control and Prevention
	Centers for Medicare and Medicaid Services
	Health Resources and Services Administration
	Indian Health Service
	Office of the General Counsel
	Office of the National Coordinator for Health Information Technology
Other Federal Departments and Agencies	Department of Commerce
	Department of Defense
	Department of Veterans Affairs
	Federal Communications Commission

On November 18, 2008, ASPR leadership addressed, briefed, and consulted with the National Biodefense Science Board (NBSB),[4] a Federal Advisory Committee established to provide advice and guidance to the Secretary of HHS. They sought discussion of two fundamental questions:

1. *Would an inventory or registry of Telehealth initiatives and networks that can provide resources for use in preparing for and responding to a public health emergency or disaster be valuable?*

2. *Should the NBSB maintain an ongoing Working Group or committee to address the greater strategic advisory considerations that would contribute to a National Strategy for Telehealth?*

The NBSB members were asked if they felt that an inventory would have value (Q1) – and if so, that the NBSB's Disaster Medicine Working Group (DMWG) consider the following questions:

a) *What is the optimal role of the USG in developing and/or housing a Telehealth inventory?*
b) *Should the Telehealth inventory reside within a Federal agency or program, a public-private partnership, a private organization, or some other entity?*
c) *If the Telehealth inventory resides outside the USG, should the USG have an administrative, oversight, programmatic, or other role in its ongoing maintenance?*

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[4] U.S. Department of Health and Human Services. (2008, March 4). *National Biodefense Science Board. Amended Charter*. Retrieved December 15, 2008 from http://www.hhs.gov/aspr/omsph/nbsb/nbsbamendedcharter.pdf

The NBSB discussed the establishment of a task force to investigate a strategy for its creation and application to public health emergencies and disaster medical responses.

Valuable information gleaned from two Institute of Medicine events was incorporated into this report. The first was a Workshop on Medical Countermeasures Dispensing[5] hosted by the IOM's Forum on Medical and Public Health Preparedness for Catastrophic Events in March 2008. The workshop was intended to engage the appropriate communities on the local and national levels, as well as across the public and private sectors, to identify and discuss the most promising near-term opportunities for improving the efficiency and effectiveness of frameworks designed for medical countermeasure dispensing. Because the medical model isn't feasible at many Points of Dispensing, telehealth capabilities were identified as an option for filling medical consult gaps. The second was the January 2009 meeting of the Forum on Medical and Public Health Preparedness for Catastrophic Events at which the need for a comprehensive National Strategy for the use of Telehealth during public health emergencies and disaster medical responses was independently identified. The forum discussed the importance of three key issues in the Strategy, namely EMR use, interoperability, and application and adaptation of existing technologies during a response. The valuable information was also included in this report.

The report has also been entered into the review process of the Public Health Emergency Medical Countermeasures (PHEMC) Enterprise Governance Board (referred to as the Enterprise Governance Board) who "coordinates the PHEMC Enterprise, including implementation of HSPD-18, the HHS *PHEMCE Strategy and Implementation Plan for Chemical, Biological, Radiological and Nuclear Threats*, the Strategic Plan for Countermeasure Research, Development, and Procurement required by the Pandemic and All-Hazards Preparedness Act, the National Pandemic Influenza Strategy, the *HHS Pandemic Influenza Plan,* Project BioShield, and any future strategic plan for medical countermeasures."

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[5] Institute of Medicine. (2008). Workshop *on Dispensing Medical Countermeasures.* Retrieved March 4, 2009, from. http://www.iom.edu/CMS/3740/42532/50909.aspx

Telehealth in Context: Definition, History, and Challenges

Telehealth Defined

The closely associated concepts of Telehealth and Telemedicine are dynamic and evolving. The American Telemedicine Association (ATA) offers that "Telemedicine and Telehealth both describe the use of medical information exchanged from one site to another via electronic communications to improve patients' health status. Although evolving, Telemedicine is sometimes associated with direct patient clinical services and Telehealth sometimes associated with a broader definition of remote healthcare and is sometimes also perceived to be more focused on other health related services."[6] Videoconferencing, transmission of still images, eHealth (including patient portals), and continuing medical education are components of Telemedicine and Telehealth. This report will use Telehealth as the encompassing term for electronic information[7], infrastructure considerations, clinical and administrative applications and communication technology applied to improving health and maximizing patient outcomes. In order to scope the task and be responsive to the directions of PAHPA, the report uses a definition of Telehealth that is limited to specific application to public health emergencies and disaster medical responses. This definition is appropriate as the intertwining of IT, telephonic, and informatics technologies is often difficult to functionally distinguish, and outside of the specifically described environment, has direction in a variety of departments and agencies.

> *Definition of Telehealth for Public Health Emergencies and Disaster Medical Responses –*
>
> *Electronic information, infrastructure considerations, clinical and administrative applications and communication technology applied to improving health and maximizing patient outcomes with specific application to public health emergencies and disaster medical responses*

The History and Evolution of Telehealth

Historically, the exchange of health related information by healthcare workers (e.g., dentists, doctors, psychologists, nurse practitioners) who are geographically distant from each other has been accomplished through existing communications technologies. Technology developments have improved information transfer and expanded these Telehealth capabilities. Similarly, EMR systems and online tool development have expanded Telemedicine capabilities, allowing for the provision of increasingly sophisticated care over large distances. From radio networks and telephones to video and facsimile, from pacemakers and defibrillators to virtual surgery instruments and robotics, the progression of Telehealth has paralleled the growth of technology and medicine.

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[6] American Telemedicine Association. *Telemedicine/Telehealth Terminology*. Retrieved March 13, 2009, from http://www.americantelemed.org/files/public/abouttelemedicine/Terminology.pdf

[7] Examples include individual patient data resource tracking and information sharing among response agencies during a public health emergency of disaster medical response.

The idea of using telecommunications in the healthcare industry was first postulated in the early 1900s. Radio Telecardiology was first attempted in the 1910s; telephone-mediated Telestethoscopy in the 1920s; and radiology image transfer and videophone experimentation in the early 1950s[8,9] In the late 1950s, Dr. Cecil Wittson used microwave technology to provide rural psychiatric consultations from Omaha, Nebraska and Dr. Albert Jutras used cable technology in his Montreal-based Teleradiology program. These individuals might be considered early adopters of the first generation of Telemedicine.

The second generation of Telemedicine had its genesis in the 1960s and 70s. In his 1975 book[10], Dr. Rashid Bashshur describes 15 projects that existed during this period. Three of the most notable were funded by National Aeronautics and Space Administration (NASA), the National Library of Medicine (NLM),[11] and Massachusetts General Hospital (MGH). In fact, NASA provided much of the technology and funding for early Telemedicine demonstrations, including the Space Technology Applied to Rural Papago Advanced Health Care, with additional contributions from the IHS. NASA's efforts in Telemedicine began in the early 1960s when humans began traveling in space. Physiological parameters were Telemetered from both the spacecraft and the space suits during missions. In 1967, MGH and Logan International Airport established a Telemedicine station to provide occupational health services to Logan airport employees and deliver emergency care and medical attention to travelers. In 1971, 26 sites in Alaska were chosen by the NLM's Lister Hill National Center for Biomedical Communication to see if reliable communication would improve village healthcare. These early efforts and the enhancement in communications satellites helped foster the development of Telemedicine and many of the medical devices in the delivery of healthcare today. Although all of these programs proved workable, they were hampered by limitations in technology at the time.

One of the first developments in the third generation of Telemedicine was the Texas Tech Mednet Project in western Texas in the late 1980s. This project used digital compression and transmission advances, allowing point-to-point interactive videoconferencing and improved imaging to and from anywhere with access to T1, fractional T1, or ISDN lines. This program was followed by the Telehealth Network Grant Program[12] and The Rural Utilities Service's Distance Learning and Medical Link Program, both of which provided opportunities to build up national rural Telehealth capabilities. As part of the Interagency High Performance Computing and Communications (HPCC) initiative in the early 1990s, NLM funded 19 telemedicine programs which evaluated the impact of telemedicine on cost, quality, and access to health care. It also funded a 1996 Institute of Medicine study "Telemedicine: A Guide to Assessing Telecommunications in Health Care" (ISBN-10:0-309-05531-8) and a 1997 National Research Council Study "For the Record: Protecting Electronic Health Information" (ISBN-10: 0-309-05697-7) to provide guidance for those conducting telemedicine projects. Since the mid-1990s, Telemedicine programs have become commonplace worldwide, impacting nearly every aspect of healthcare delivery.

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[8] Nancy Brown, A Brief History of Telemedicine, May 30, 1995, Retrieved December 15, 2008 from http://tie.telemed.org/articles/article.asp?path=articles&article=tmhistory_nb_tie95.xml

[9] California Telemedicine and eHealth Center, http://www.cteconline.org/telemedicine_history.html

[10] Bashshur R L, Armstrong P A, Youssef Z I. Telemedicine: Explorations in the use of telecommunications in health care. Springfield, IL: Charles C. Thomas, 1975.

[11] NLM is a component of HHS' National Institutes of Health (NIH)

[12] This program was known originally as The Rural Telemedicine Network Grant Program

In recent years, several factors have facilitated increased Telemedicine use:

- Lower cost and more widely available communications systems;
- Lower cost, higher performance computers;
- Greater public confidence in the use of computer technology;
- Greater acceptance of the technology by medical professionals; and
- Emerging global standards in communications, video conferencing, and medical disciplines.

Historically, Telehealth has been used in a limited fashion in preparedness, response, and recovery during public health emergencies and medical disasters. However, in order to fully realize the benefits of Telehealth to in these situations, it will be necessary to adjust tactics (based on a cohesive vision and dynamic strategy) to more effectively utilize current and emerging technologies.

Major Challenges Faced
Telehealth faces many challenges, any of which could serve as obstacles to the complete and optimal utilization of Telehealth concepts. While general obstacles to Telehealth affect practitioners and policymakers in all fields, this report addresses only those obstacles that are immediately relevant to the use of Telehealth in public health emergencies and disaster medical responses. Table 2 provides a full (though not necessarily exhaustive) list of the major challenges in the Telehealth arena, noting which are relevant for public health and disaster medical emergencies and are thus addressed in this report, and which are important but outside the scope of this report.

In general, there is a lack of optimal uniformity of strategy, informatics technology, and interoperability for "horizontal" (cross-agency) Federal emergency support functions involved in preparedness, rescue, response, recovery, and reorganization.

Table 2: Challenges to full and optimal use of Telehealth during public health emergencies and disaster medical responses

<u>Immediate challenges to the use of Telehealth for public health emergencies and disaster medical responses (within this report's scope)</u>

Challenges mentioned in PAHPA:
- Integration of existing Telehealth networks
- Mechanisms for payment and reimbursement of Telehealth technologies and personnel during an emergency
- Professional credentialing verification
- State-specific medical licensing requirements

Challenges, while not mentioned in PAHPA, relevant for public health emergencies and disaster medical responses:
- Interoperability
- Standardization
- Privacy and usability of EMRs
- Health care practitioner liability for patient outcomes during a disaster
- Hardware selection and interconnectivity – reliance on terrestrial fiber as a potential source of failure during an emergency
- Lack of evaluation data

<u>Systemic challenges to the optimal use of Telehealth (outside this report's scope)</u>
- Technology transfer - the difficulties faced by new technologies and ideas in making the leap from the field or a lab to a successful, sustainable program
- Proprietary interests of commercial vendors

Ideally, many of the challenges faced during the routine use of Telehealth could be overcome through use of a comprehensive vision and strategy. Hardware selection and interconnectivity are critical issues. Creating a "network of networks" will require increased telecommunications bandwidth and reliance on terrestrial fiber – a potential source of failure. Systems are not fool-proof and can be unreliable conduits for the transmittal of information, particularly if they are partially or entirely damaged during a public health emergency or medical disaster if they rely on common sources of power and/or other infrastructure. Failure to meet critical telecommunications needs could impact surveillance, situational awareness, and vital treatment decisions. Standardization is also a vital component of a comprehensive Telehealth strategy – setting administrative, clinical, and technical standards is critical for the success of Telehealth and Telemedicine.

Telehealth for Public Health Emergencies and Disaster Medical Responses

Advocates throughout the public health emergency and medical disaster response communities support the proposition that Telehealth/Telemedicine technologies can significantly enhance public health emergency and disaster medical preparedness and response activities. Empirical evidence supporting the use of Telehealth during public health emergencies and disaster medical responses is emerging, but it is not comprehensive enough to recommend at this time. However, anecdotal information does suggest that Telehealth can be efficacious during these events. Telehealth could potentially allow responders at the scene of a disaster to gain immediate access to expertise and resources, regardless of location or distance from the event. Additionally, Telehealth technologies are well suited for response and recovery efforts during radiological incidents or bioterror events, where just-in-time prevention, long-term support, rare specialties, and additional intellectual resources are required.

Rationale for the use of Telehealth during response and recovery efforts includes:
- Providing a more flexible response;
- Advancing consultation and medical expertise to more forward critically impacted areas;
- Protecting responders from unnecessary exposure to danger;
- Improving management, responders, and support entities of public health emergencies and medical disasters;
- Improving situational awareness;
- Reducing critical points of failure;
- Enhancing the interoperability and use of data and enhancing compensation mechanisms for providers;
- Offering specialist decision-making for triage and determination of appropriate investigation, treatment, or management;
- Providing increased accessibility to medical care for persons with disabilities and rural populations; and,
- Enhancing and strengthening patient and material accountability during patient rescue, transfer, and disposition.

The remainder of this section of the report offers insight into how Telehealth could be used to enhance public health emergency and disaster medical response operations. It does so by providing examples of successful applications, proposing methods in which reimbursement and payment mechanisms may facilitate the use of Telehealth, and suggesting ways that the National Disaster Medical System (NDMS) can better integrate Telemedicine and Telehealth principals into its practices.

Past Examples of Telemedicine Use during a Public Health Emergency and Disaster Medical Response
Telehealth was used extensively following the December 1988 earthquake in Armenia that caused widespread destruction and ruined Armenia's healthcare delivery system. NASA, under the auspices of the U.S./U.S.S.R. Joint Working Group on Space Biology and Medicine, implemented a project called "Telemedicine Spacebridge to Armenia," in which American,

Armenian, and Russian medical professionals provided medical consultations via a satellite telecommunications network. During twelve weeks of operation, clinical sessions were held on burn management, sanitation, epidemiology, preventive medicine, reconstructive surgery, and rehabilitation medicine. Medical consultations provided via the Spacebridge resulted in an altered diagnosis for 26 percent of all cases. Participants judged that the quality of the technology was sufficient to allow success. These results suggest that interactive consultation by remote specialists can provide valuable assistance to onsite physicians and influence favorably clinical decisions in the aftermath of major disasters. These types of experiences can inform Telehealth utilization and potential effectiveness with respect to public health emergencies and disaster medical responses.

Telehealth has been used in recovery for behavioral health related issues offering many advantages for providers and affected community members. Events that require sheltering in place or quarantine, such as a pandemic, may restrict access to behavioral healthcare. Telehealth strategies can connect mass care providers with mental health or substance abuse treatment professionals when they identify individuals with pertinent needs. Emergencies that result in population displacement create anxiety and distress as people are separated from familiar support and information sources. Telehealth applications including hotlines and interactive web based programs were used extensively following the September 11th terrorist attacks on the Pentagon and the World Trade Center (2001), in Canada during the Severe Acute Respiratory Syndrome (SARS) outbreak (November 2002 – July 2003), and during recent hurricanes. The use of national hotlines has proved to be an effective way to provide large numbers of people spread out over great distances with information and guidance on how best to cope and recover.

Potential Benefit of Telehealth for Use during a Public Health Emergencies and Disaster Medical Response

If Telehealth is applied fully and optimally to public health emergency and disaster medical preparedness, response and recovery activities, the results could be profound. Current and emerging technologies could aid in every phase – from planning to detection to response to long-term rehabilitation to recovery and restoration. Telehealth networks would need to be linked with interoperable systems, clearly identified resources and effective communications for use by first responders. Some of the more common technologies in use today include:

- Patient tracking systems that assign unique identifiers to individuals, allowing monitoring of their progress through the care continuum (aggregate data from patient tracking systems can also be useful for patient records, patient safety, and surveillance);
- "Store and forward" imaging technologies that allow for information to be captured and sent to remote specialists for clinical evaluation -- a practice that is particularly widespread in dermatology, radiology, ophthalmology, and wound care;
- Videoconferencing, which is used to educate providers, provide mental health support services, especially in the recovery phase of a disaster;
- EMRs used by the NDMS to capture patient data during a disaster; and
- Entry of forward area specialty consultation to better triage patients and impact therapeutic management.

Examples of newer emerging technologies with applications for public health emergencies and disaster medical responses include field deployable sensors that detect chemical and biological

agents and Geographic Information Systems mapping that provides real-time status of location and availability of resources.

DoD, VA, and HHS/IHS are advancing development and use of Telehealth technologies for direct provision of care. Many of these technologies could be adapted for use in disasters. For example, the military has successfully implemented a remote critical care monitoring program in which critical care specialists use videoconferencing equipment and software to observe patients in intensive care from thousands of miles away, monitoring vital signs and instructing and assisting onsite healthcare workers. Furthermore, given the military's remote operations and the environmental constraints of combat, those Telemedicine programs that are successful on the battlefield are likely candidates for success in domestic emergencies. Telesurgical mentoring is one such effort under development. It allows for a specialist to remotely observe an operation and offer guidance to onsite physicians. Additionally, the Army Medical Department has robust Telehealth programs in Teleneurosurgery, Telebehavioral Health, Teledermatology, Teleechocardiology, Teleradiology, and online Teleconsultation (with 15 medical specialties).

One potential application CDC is exploring is the use of Telehealth for remote medical consultations for dispensing countermeasures at Points of Dispensing (PODs). This is especially applicable in the time constrained application described by the Cities Readiness Initiative. In this response paradigm, antibiotic prophylaxis must be dispensed or delivered to an entire population of a metropolitan statistical area within 48 hours of the decision to do so. Optimally this will be within 48 hours of exposure in order to prevent catastrophic numbers of ill and dead. Through implementation of measures established in the Homeland Security Presidential Directive 21, the United States Government strives to strengthen its National approach to healthcare during responses to catastrophic health events involving large populations, such as an influenza pandemic or large-scale, weapons of mass destruction attack. The efficient distribution of medical countermeasures to the public during such an event is a critical component of public health and medical preparedness. If such an event required a mass prophylaxis campaign, PODs would be the most common countermeasure dispensing option available to the health and medical community.

Creating or augmenting the medical screening capacity at PODs through Telehealth could potentially fill a significant gap in countermeasure dispensing operations. The Institute of Medicine found that one of the major challenges public health officials face when planning for mass prophylaxis campaigns is the lack of healthcare professionals available to support POD operations. This is because the supply of available healthcare professionals would be depleted to meet the medical needs of casualties. PODs are not established to treat the sick. However, in less urgent responses, the medical model for POD operations does include a medical screening, which could be conducted via Telehealth rather than relying on medical staff physically on-site.[13]

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[13] Institute of Medicine. (2008). *Workshop on Dispensing Medical Countermeasures.* Retrieved March 4, 2009, from. http://www.iom.edu/CMS/3740/42532/50909.aspx

Mechanisms for Payment and Reimbursement of Telemedicine and Telehealth during a Public Health Emergency or Disaster Medical Response

This section directly responds to Section 319D(f)(C) "to evaluate ways… to better manage an event through mechanisms for payment or payment for use of such technologies and personnel during public health emergencies." There are existing mechanisms to pay for Telemedicine that can be used as models during public health emergencies. Agency leads for this strategy and policy input would include Department of Commerce (DoC), CMS, HRSA and external private healthcare partners.

Medicare Payment for Telehealth Services

Under section 1834(m) of the Social Security Act (42 U.S.C. §1395(m)), Medicare pays both the distant site physician or practitioner and the originating site for eligible Telehealth services. The distant site physician or practitioner bills an eligible Telehealth service with the same procedure code used for a face-to-face-encounter. Distant site physicians or practitioners must indicate that the service was delivered via Telehealth and designate the Telehealth technology used to provide the service. Medicare pays the physician or practitioner the current Medicare Physician Fee Schedule amount and the usual Medicare beneficiary cost-sharing applies.

Medicare pays a fixed fee to a facility when it serves as an originating site and the usual Medicare beneficiary cost-sharing applies. The originating site facility fee is approximately $20 and it is updated annually by the percentage increase in the Medicare Economic Index.

It is conceivable that in concert with existing Midicare law and implementing regulations, and where appropriate, this payment schema could be used as a model mechanism for reimbursement for Telehealth services provided during a public health emergency or disaster medical response. The system would capture information regarding the condition and the practitioner to be paid and use existing infrastructure to collect statistics or possibly track a patient. For example, if a particular condition were occurring in excess of what one might expect for the type of emergency experienced it could signal that a population may have been exposed to an infectious disease or a chemical. The system could also capture information on secondary effects of a public health emergency and disaster medical response and the types of medical care for which additional resources need to be deployed from other localities, States, or the USG.

If this payment system were perfected for use during a public health emergency and disaster medical response, payment might be swifter, thus encouraging more practitioners to render services during an event. Because services provided by the on-site practitioners would be augmented by practitioners acting remotely, services could potentially be offered in an immediate and sustained fashion 24 hours a day. Deployment and travel time would not be as great an obstacle if practitioners were not required to be on-site.

Medicare Payment for Remote Physicians' Services Utilizing Telecommunications Technologies

In addition to coverage and payment for statutorily defined Medicare Telehealth services, Medicare covers and pays for certain other physicians' services remotely furnished utilizing telecommunications technology. These services do not require face-to-face, "hands-on" interactions between the physician and the beneficiary, and remote delivery does not affect the

physician's ability to furnish the service. In these situations, Medicare pays the same MPFS amount that would be paid if the service was furnished at the same location as the beneficiary. For example, the interpretation by a physician of an actual electrocardiogram or electroencephalogram reading that has been transmitted electronically is a covered Medicare service and is paid the same amount as an interpretation that is done at the same site as the patient. These services do not require a Telehealth modifier for billing purposes, and Medicare does not pay an originating site fee for these services.

Telemedicine Use by the NDMS

This section directly responds to Section 319D(f) (E) "to evaluate ways to integrate the practice of Telemedicine within the [NDMS]." The USG provides direct medical care during a disaster through the NDMS, HHS, DoD, VA and DHS in collaboration with State and local public and private practitioners to provide healthcare and other services to fulfill victims' needs.

The mission of NDMS is three-fold: 1) provide medical support to a disaster area in the form of teams, supplies, and equipment; 2) move patients from a disaster site to unaffected areas of the Nation; and 3) provide for definitive medical care at participating hospitals in unaffected areas.

NDMS has created a four-component approach – National Disaster Medical System Suite (NDMS Suite) - to improve its national public health emergency and disaster medical response capability and provision of medical services through Telehealth:

- EMR: Provides documentation of the care provided during Federal responses by HHS partners under Emergency Support Function (ESF)-8. Data transmitted from EMR can provide real-time data providing on-site information to assist in strategic decision processes.
- Health Information Repository (HIR): Provides an aggregate of the real-time data sent from the EMR. The data is distributed during a disaster response for health surveillance, resource planning, and management decision support.
- Joint Patient Assessment and Tracking System (JPATS): Provides a patient tracking capability through the continuum of medical care provided by ESF-8 through to the point of repatriation.
- *Hospital Available Beds for Emergencies and Disasters system (HAvBED)*: Provides a regularly updated national hospital-bed tracking system to address a surge of patients during a mass casualty event.*

    *NOTE: HAvBED is planned as a future addition to the existing NDMS Suite triad.

The EMR software was initially designed and built for the urgent/emergent-type of medical care provided by Disaster Medical Assistance Team (DMAT) providers. It was not designed for longitudinal-type patient care (e.g., long-term care and health maintenance issues). A typical Federal Medical Station (FMS) admits and treats patients for periods of time generally longer than 24 hours. In order to manage these special needs and chronic-care patients, the EMR demands robust inpatient-type laboratory, pharmacy, vital signs, physician and nursing notes, and assessment capabilities. NDMS is in the process of modifying EMR software to include a longitudinal record capability for use specifically at FMS.

Information entered into an EMR contains patient demographics, treatment site, initial triage and discharge status (e.g., non-urgent, urgent, emergent, deceased), injury codes, and medical supply status. Depending upon the configuration of the Base of Operations and condition of the local communication system infrastructure, data are transmitted via hard-wire, air card, or satellite connection to HIR.

Once the field information is sent, received, and stored in HIR, aggregate medical data may be used for surveillance and indicate a bioterror threat or emerging epidemiologic trend demanding immediate action. It can be used to generate quantitative statistical analyses and synthesize multivariate data for situational awareness, resource allocation, continuity of care, and reporting purposes.

JPATS is a modified application of the DoD's Joint Patient Tracking Application. It is used to track a patient's location and movement when NDMS requests help from the DoD, via air or ground transport, for medical transfer or evacuation. NDMS is currently working to develop the EMR application to interface directly with JPATS. Once EMR and JPATS are fully integrated, there will be the capability for bi-directional movement of patient information between the two applications.

The field application of these systems has faced many challenges, the most persistent of which have been technology issues - bandwidth requirements, difficulties with connectivity, and a current inability for EMR and JPATS to seamlessly interface. Using these systems effectively can be difficult during the turbulent conditions experienced during public health emergency and disaster medical response or recovery mission.

Reducing Legal Barriers

Large-scale public health emergencies and medical disasters that overwhelm local and State resources could require a response in which healthcare professionals from other states or countries provide services either directly or through telehealth. Because of the highly regulated nature of healthcare professions, in some cases there are significant perceived or actual legal barriers that might deter non-resident healthcare workers from providing Telemedicine services during a public health emergency and disaster medical response.

The response to Hurricane Katrina in 2005 revealed a lack of coordination and communication regarding existing laws that address large-scale emergencies. When responding to such an event, States can exercise their own emergency powers or may activate the Emergency Management Assistance Compact (EMAC), a mutual aid agreement among States. EMAC is Congressionally-approved and has been enacted by legislatures in all states in substantially identical form. When EMAC is triggered by a governor's declaration, it provides procedures and mechanisms for assistance requests and response and provisions for liability, licensing, and reimbursement of certain healthcare professionals. For example, EMAC states that a licensed person from a responding state is deemed licensed in the receiving state. During the response to Hurricane Katrina, problems apparently arose because the States' legal authorities were not exercised or understood fully and because there were no logistical mechanisms in place to quickly and efficiently verify licensure. Health professionals from states outside the affected Gulf Coast were in some cases substantially delayed or even prevented from rendering aid because they could not quickly and plainly obtain authorization to practice. The laws, mutual aid compacts, and ad hoc mechanisms that did exist were not comprehensive or well-communicated.

The elimination of legal barriers affecting the practice of Telemedicine during a disaster could significantly enhance a response. Clear and effective communication and unambiguous, comprehensive laws and regulations would ensure that Federal, State, and private healthcare practitioners acting as paid professionals or unpaid volunteers would understand their roles and have clear guidance from the command structure.

PAHPA specifically mandates that the Secretary address ways to reduce barriers affecting the use of Telehealth during emergencies and disasters. Four examples of potential actions include:
- utilizing State emergency healthcare professional credentialing verification systems;
- encouraging States to establish and implement mechanisms to improve interstate medical licensure cooperation;
- facilitating the exchange of information among States regarding investigations and adverse actions; and
- encouraging States to expedite and add flexibilities to the licensing requirements during public health emergencies and disaster medical responses.

This section of the report provides a description of legal barriers that exist and makes suggestions for remedying them, noting where the USG can take direct action versus where its role is to encourage remedy at the State level.

Licensing and Credentialing

Healthcare professionals are required to be licensed or credentialed in the state in which they practice. When there is a need for out-of-state or foreign healthcare professionals to assist during a public health emergency and disaster medical response, such professionals might not have the opportunity or be prevented from assisting in a response due to concerns regarding licensing reciprocity. An example would be a nurse practitioner from Connecticut that has volunteered to provide medical care in response to a medical disaster in Arkansas. That nurse practitioner is licensed to practice in Connecticut, not Arkansas; however, the healthcare system in Arkansas is overwhelmed and needs nurse practitioners from other jurisdictions to better manage the surge in patients. PAHPA suggests three ways the licensing issue might be addressed at the Federal level:

- utilizing State emergency healthcare professional credentialing verification systems such as the Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP);
- encouraging States to establish and implement mechanisms to improve interstate medical licensure cooperation; and
- encouraging States to waive the application of licensing requirements and fees during public health emergency and medical disaster responses.

This sub-section further describes licensing barriers and offers approaches to eliminating all three methods for reducing them as well as providing examples of ways Telehealth could be used to overcome such barriers.

States do have a variety of laws and regulations that may allow those professionals with licenses in one state to provide aid in another. However, it is not clear that an ideal mechanism exists nor that it could be implemented in a timely manner for all of the healthcare practitioners that may be needed during a public health emergency and disaster medical response. For example, the EMAC provides license reciprocity, but because of the language in the tort liability provision in EMAC that is limited to State "officers" and "employees", states may not be able to exchange private sector healthcare professionals through this compact if they do not have a mechanism to deem such private sector professionals to be State officers or employees. Though all State Governors have certain emergency powers when they declare a state of emergency, public health emergency or disaster, it differs from state to state as to whether the state will have the authority under those emergency powers or under state emergency statutes that apply during a declared emergency to recognize out-of-state licenses or other credentials. Some states have provisions to grant temporary licenses or credentials, but procedures vary and might have prohibitively long timelines. If adopted by all states, legislation such as the Uniform Emergency Volunteer Health Practitioners Act (UEVHPA) may be able to provide for recognition of public and private sector healthcare professionals' licenses and other credentials across State and National borders. Six states have enacted the UEVHPA.[14]

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[14] The Uniform Emergency Volunteer Health Practitioners Act (UEVHPA) was drafted by the National Conference of Commissioners of Uniform State Laws in 2007. Colorado, Indiana, Kentucky, New Mexico, Tennessee, and Utah have enacted the UEVHPA. For additional information about the Act, please see www.uevhpa.org.

The Licensure Portability Grant Program (LPGP) supports State professional licensing boards while developing and implementing State policies to reduce statutory and regulatory barriers to Telemedicine. LPGP efforts include:
- Thirteen State medical boards' development of model agreements to expedite the licensure process and eliminate redundancies associated with applying for licenses in multiple jurisdictions.
- The National Council of State Boards of Nursing's promotion of the Nurse Compact, a mutual recognition model under which nurses are allowed to be licensed in one state and to practice both in person and electronically in other states.

Through integrated approaches, programs might emerge as national models and implicate overcoming State statutory and regulatory licensure barriers to cross-state practice of Telemedicine.

Program and practice evaluation from these grants will not be available until December 2009, but preliminary results appear promising. Under the Federation of State Medical Boards (FSMB) grant, eight Boards have adopted the FSMB's Common Licensure Application Form and another nine are in the process of adopting it. As of February 4, 2009, seven boards have achieved improved licensure portability: Connecticut, Idaho, Iowa, Kansas, Maine, New Hampshire, Oregon and Rhode Island, either through endorsement or by requiring physicians to use the Federation Credentials Verification Service (FCVS). The FCVS is designed to lighten the workload of credentialing staff and reduce duplication of individual State board's and clinician's administrative burden by gathering, verifying and permanently storing a physician's, physician assistant's, and other health professional's credentials in a central repository maintained by the Federation. In addition, two States, Massachusetts and Wyoming, are implementing the laws necessary to allow licensure portability by endorsement.

Two additional states, utilizing the National Council of State Boards of Nursing grants, have joined the compact, for a total of 23 participating states. Six additional states have implemented requirements to complete fingerprint-based national criminal background checks conducted by the Federal Bureau of Investigation, for a total of 32 states performing such checks.

Federal healthcare professionals are generally required to be licensed in a state that may or may not be the place in which they perform their official duties. Case law supports the proposition that a state cannot require a Federal employee to procure a State license to perform official duties. As all states are not aware of this case law, it could slow public health emergency and disaster medical responses.

ESAR-VHP
Prior to a public health emergency or medical disaster, advance coordination and communication regarding the credentials and qualifications of healthcare personnel is critical. The ESAR-VHP will address this need by developing a national network of State-owned and operated systems that register volunteer health professionals (VHPs) who offer to fill capabilities during public health emergencies and disaster medical responses. States are responsible for verifying the identity, credentials, licenses, accreditations, certifications, hospital privileges, and relevant training of registered VHPs in advance of public health emergencies and disaster medical responses. When complete, ESAR-VHP will link these individual systems into a national

interoperable network of systems thus facilitating efficient use of health professional volunteers at all tiers of response (local, regional, State, and Federal). ASPR maintains this interoperable network of systems or verification network. Eventually, ESAR-VHP projections will include Medical Reserve Corps, NDMS professionals and other Federally-sponsored professionals in the verification network.

Each State's ESAR-VHP system is built to a common set of standards[15] designed to allow swift and simple engagement of health professionals with other States. If done correctly and expediently, more capabilities are likely to be filled and healthcare can be readily administered during declared public health emergencies and medical disasters. ESAR-VHP ensures that State, local, and Tribal health departments can access the verification network electronically and establishes and requires the application of and compliance with measures to ensure effective security of, integrity of, and access to the data in the network.

In practice, during public health emergencies or disaster medical responses, clinical privileges are granted by a requesting entity, such as a hospital, not by ESAR-VHP. The function of the ESAR-VHP system is to provide accurate and reliable credentials verification and other information to facilitate the granting of privileges. Many of the credentials verification organizations consult with the Joint Commission[16] and other National accrediting organizations. The information maintained in the ESAR-VHP system does not infer health professional volunteer competency to perform health services. The range of privileges given and the need for supervision remain under appropriate authority and control.[17]

The inclusion of a VHP in the ESAR-VHP program does not constitute appointment of that individual as a Federal employee. HHS has developed a protocol under which it can utilize certain emergency and temporary hiring authorities to hire VHPs on a temporary basis; however, those registered health professionals who are not Federal employees still face the same licensing and liability issues as other non-Federal professionals.[18]

In FY 2008, the program finalized its national compliance requirements and worked toward finalizing the third version of the ESAR-VHP Technical and Policy Guidelines, Standards, and Definitions: System Development Tools (Guidelines). The Guidelines provide the technical information that states need to develop systems capable of registering a wide range of health professional volunteers, verify their credentials and qualifications, and assign volunteers to one of four credential levels. Included are new and interim standards for twenty (20) healthcare

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[15] These include registration, classification of verified professional credentials, legal and regulatory issues.

[16] See http://www.jointcommission.org/

[17] *ESAR-VHP Interim Technical and Policy Guidelines, Standards, and Definitions,* U.S. Department of Health and Human Services, June 2005.

[18] That is, they may qualify for various tort liability protections through the EMAC, a state governor's executive order extending tort protections to out of state VHPs, various state statutory protections such as state emergency management statutes that apply when a governor has declared an emergency, Good Samaritan statutes, and general volunteer protection acts. In general, when providing health care in a state other than that in which they are licensed, non-Federal VHPs will need to obtain a license in that state unless they are responding through a mutual aid compact such as EMAC, the state has waived its licensing rules for emergency responders, or the state's laws provide licensing reciprocity for emergency responders.

professions. Currently, forty four (44) states have operational ESAR-VHP systems, and the remaining states are developing their systems.

Information Exchange among States Regarding Adverse Actions

The National Practitioner Data Bank (NPDB) is primarily an alert or flagging system intended to facilitate a comprehensive review of healthcare practitioners' professional credentials. The NPDB collects and disseminates to eligible entities reports of the following:

- Medical malpractice payments (physicians and other licensed healthcare practitioners);
- Adverse licensure actions (physicians / dentists);
- Adverse clinical privileging actions (physicians / dentists);
- Adverse professional society membership actions (physicians / dentists); and
- Exclusions from Medicare/Medicaid (physicians and other licensed healthcare practitioners).

The NPDB was established through Title IV of Public Law 99-660, the Health Care Quality Improvement Act of 1986. Responsibility for NPDB implementation resides in the Bureau of Health Professions, HRSA.

Information reported to the NPDB is confidential and cannot be disclosed except as specified in the statute. To be eligible to query the NPDB, a querier must be one of the following:

- Board of Medical Examiners or other State licensing board;
- Hospital;
- Healthcare entity that provides healthcare services and engages in formal peer review activity through a formal peer review process; or
- Professional society that engages in professional review activity through a formal peer review process.

Eligible entities prepare and submit queries using the Integrated Querying and Reporting Service[19]. Eligible entities must register for a Data Bank Identification Number, User ID, and a unique password to be used by the eligible entities and their authorized agents to retrieve query responses on the World Wide Web. Internet access with a Web browser is required for querying.

Querying of NPDB during a public health emergency and disaster medical response is possible in accordance with the statutory provisions. During a public health emergency and disaster medical response, there could be a need to quickly credential and check the backgrounds of volunteer healthcare professionals. There is no exception in the law for querying the NPDB in these types of situations. However, to the extent that the entity looking to query is included in the list above (HHS itself could be considered a healthcare entity that provides healthcare services and engages in a formal peer review process), or is an agent of the entity, and the entity is checking the background of the provider who would be providing care on behalf of that entity, the entity would be permitted to query the NPDB.

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[19] National Practitioner Data Bank / Healthcare Integrity and Protection Data Bank available at
http://www.npdb-hipdb.com/queryrpt.html

Other resources exist as well, including the HHS Office of Inspector General Exclusion List[20], which also includes information regarding persons who are excluded from employment by a Medicare or Medicaid certified provider based on convictions for program-related fraud and patient abuse, licensing board actions and default on Health Education Assistance Loans.

Liability

Out-of-state healthcare professionals may also have liability concerns when assisting during a public health emergency and disaster medical response. States vary in the degree to which liability protections are offered and enforced. EMAC may provide tort liability protections for State officers and employees rendering aid. Several states have broadened liability protection under EMAC by enacting provisions that would classify volunteers as State employees under certain conditions.[21] The emergency powers granted to State governors when they have declared an emergency, public health emergency, or disaster, may authorize them to extend tort liability protections to healthcare professionals providing aid. Some states have Good Samaritan statutes and volunteer protection acts that provide some legal protection to healthcare workers who render immediate emergency aid. The Federal Volunteer Protection Act may provide some tort liability protection to volunteer healthcare professionals of nonprofit organizations or governmental entities. For some responses, liability immunity may be available under the Public Readiness and Emergency Preparedness (PREP) Act for the United States, manufacturers, distributors, program planners (including State, local, Tribal, and private sector entities) and qualified persons (including healthcare providers and others identified by the HHS Secretary) for distribution, dispensing, administration, and use of certain medical countermeasures, such as through a POD in response to an emergency involving an attack with a chemical, biological radiological, or nuclear agent. Finally, for Federal healthcare practitioners performing official duties, and certain other providers as provided by law, the Federal Tort Claims Act (FTCA) is the exclusive remedy for negligence claims, unless the PREP Act applies to the activity.

Given the variability and differing Federal and state laws, it is not always clear what liability protections exist in a given situation for a particular healthcare worker. Factors such as the person's employer and paid/unpaid status or the site of the public health emergency or medical disaster might determine what, if any, protection is relevant. Legislation could clarify liability protections for domestic and foreign healthcare professionals, whether they are volunteers or paid employees working outside their regular employment duties. Furthermore, some existing liability protections provide immunity, though not indemnification from civil action. Claims can be prevented from going forward, but the healthcare professional may be held responsible for any legal costs associated with asserting an immunity defense. This lack of protection could serve as a potential barrier to engaging healthcare practitioners to assist during public health emergency or disaster medical responses. Future legislation could ensure that liability protections indemnify healthcare professionals and not merely provide them immunity from negligent actions.

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[20] http://oig.hhs.gov/fraud/exclusions.asp
[21] For example, Iowa and Indiana have enacted such provisions, and Maine is contemplating similar legislation. It is our understanding that Ohio and Washington addressed the issue by entering into memoranda of understanding with volunteers.

Privacy and Security of Information

Another potential legal barrier to public health emergencies and disaster medical responses relates to the uncertainty in some states surrounding individual jurisdiction privacy laws that affect the sharing of personally identifiable health information in EMRs during the event. Individual states have laws that seek to protect personally identifiable health information. Respective states also have Freedom of Information Acts (FOIA) and open/public records laws that require, in some cases, that State and local governments provide public access to their records. Thus, if an interstate request is made to share personally identifiable health information, the state receiving the request needs to ensure that it has legal authority to disclose the information. To date, as this circumstance has been analyzed by State attorneys on a case-by case basis, the usual process is:

- The state providing the information must first determine that it has statutory authority to share the information if it is deemed necessary to protect public health, and if the petitioning state assures that privacy/confidentiality will be maintained.
- The state receiving the information must then determine that it can provide assurance that the information is exempt from the disclosure requirements of the state's FOIA/public records/open records law.

In addition, one other issue that may arise is the matter of data ownership, particularly once the health information is transferred or transmitted and data, called "metadata," is developed from the information. State and local laws and Federal laws may treat the ownership of metadata and the underlying information differently, and those legal analyses will have implications for both the sending and receiving entities. In order to be fully prepared to share private health information during a public health emergency and disaster medical response, states could perform the aforementioned legal analysis. At the Federal level, it may be advisable to develop protocols for sharing a minimal set of personal health data during a public health emergency and disaster medical response.

There are a number of Federal statutes that address privacy of health information, such as the Health Insurance Portability and Accountability Act of 1996 (HIPAA), P.L. 1 04- 19 1, and implementing regulations establish minimum Federal standards for safeguarding the privacy of individually identifiable health information used by "covered entities" and indirectly, their "business associates." Covered entities are: (i) health plans; (ii) health care clearinghouses; and (iii) health care providers who transmit health information in electronic form in connection with transactions such as benefit eligibility requests and referral authorizations. A business associate is a person or entity who, on behalf of a covered entity, performs or assists in the performance of an activity involving the use or disclosure of individually identifiable health information. The Privacy Act, 5 U.S.C. 552a, also provides protections for certain records containing individually-identifiable information that are maintained by Federal agencies.

Both HIPAA and the Privacy Act allow for disclosure of health information with the patient's authorization or consent. Each also allows for disclosure of information without the patient's authorization or consent in certain circumstances. For example, under HIPAA, subject to certain conditions, covered entities may disclose individuals' identifiable health information without individual authorization for the following purposes, among others:

- to provide treatment;

- to seek payment;
- to identify, locate and notify family members, guardians or anyone else responsible for the individual's care. of the individual's location, general condition or death;
- to inform anyone reasonably able to prevent or lessen a serious and imminent threat to the health and safety of a person or the public;
- to inform a public health authority acting as authorized by law during a public health emergency and disaster medical response; and
- as required by law.

The Privacy Act allows disclosure without consent to, for example Federal officers who have a need for the record to perform their duties; to government entities for civil and criminal law enforcement; to a person who shows compelling circumstances affecting the health or safety of an individual with notice to the individual; and for routine uses of the records that are specifically identified and published in a Federal Register notice. Both HIPAA and the Privacy Act contain standards for safeguarding the records.

There is also the Freedom of Information Act (FOIA), a federal statute, which requires Federal agencies to make certain information available to the public upon request.[22] However, there are exemptions to this requirement that allow Federal agencies to withhold certain types of information from public disclosure, including personnel and medical files and similar files when disclosure would constitute a clearly unwarranted invasion of personal privacy.

Security is a similarly important issue. Legal issues may arise regarding sharing of electronic records as well as inadvertent disclosure of personal information. Those responsible legally for maintaining confidentiality need to assure that electronic transmission of personal health information will be secure. Concern also exists regarding the exchange of personally identifiable information between Federal and non-Federal entities. For example, the Office of Management and Budget has raised the issue as to whether recipients of Federal data must encrypt this information and/or use two-factor authentication to access it.[23]

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[22] 5 U.S.C. 552.
[23] OMB Memorandum 06-16

Expanding, Interconnecting, and Coordinating Telehealth Networks

The use of Telehealth during public health emergencies and disaster medical responses often depends on existing networks. When those networks and programs are strengthened for general purposes, it enhances their use for public health emergency and disaster medical response. While the scope of this report is limited to public health emergency preparedness and disaster medical responses, the discussion in this section addresses Telehealth generally in order to provide a picture of what exists and how it might be used to improve our preparedness and response efforts.

As stated earlier, lack of standardization (e.g., administrative, clinical, and technical) of Telehealth and Telemedicine technologies is limiting their effectiveness. The Health Information Technology Standards Panel (HITSP), a public-private partnership with the goal of harmonizing IT interoperability standards already in existence, has released for public review interoperability standards for electronic health records during public health emergency or disaster medical responses.[24] HHS anticipates that HITSP interoperability standards will help inform the standards development process, identified in section 3004 of the Public Health Service Act (PHSA) (as added by section 13101 of the HITECH Act (title XIII and title IV of division B) of the American Recovery and Reinvestment Act of 2009 (Pub. L. 111-5). Section 13111 of the HITECH Act requires Federal agencies, as they implement, acquire, or upgrade health information technology systems used for the direct exchange of individually identifiable health information between agencies and with non-Federal entities, to utilize, where available, health information technology systems and products that meet standards and implementation specifications adopted under section 3004 of the PHSA, as added by section 13101 of the HITECH Act. The HITECH Act also establishes two Federal advisory committees (the HIT Policy Committee and the HIT Standards Committee), which will submit recommendations to the National Coordinator regarding standards, implementation specifications, and certification criteria for the electronic exchange and use of health information. The National Coordinator will then review and decide whether to endorse some or all of the recommended standards, specifications, and criteria, and submit a report to the Secretary of HHS. In this process, the HIT Standards Committee will provide for their testing by the National Institute of Standards and Technology (NIST), and the National Coordinator will ensure that all relevant recommendations of the National Committee on Vital and Health Statistics (NCVHS) are considered. Once the Secretary receives the endorsed standards, specifications, and criteria, she will determine whether to propose their adoption and publish that determination in the Federal Register. The standards and specifications recognized or adopted in this process shall serve as the foundation for the Nationwide Health Information Network (NHIN), the means through which smaller, local networks that have adopted these standards are able to talk to each other. At the time of this report, nineteen organizations have built interoperable solutions and are participating in pilot testing. The NHIN could be a vehicle for information transfer during a disaster and the results of these pilot tests should be incorporated into any future plans to leverage the NHIN during public health emergencies and disaster medical responses. A unique feature of NHIN, which increases

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[24]http://www.hitsp.org/InteroperabilitySet_Details.aspx?MasterIS=true&InteroperabilityId=51&PrefixAlpha=1&AP refix=IS&PrefixNumeric=04

utility in the field, is that it supports the exchange of structured, standardized documents in computable XML (Extensible Markup Language) format.

Improving Coordination at the Federal Level

This section of the report begins by describing existing Federal and Federally-funded Telehealth networks, including regional health information networks (RHIN) funded by the Secretary and regional broadband networks funded through the Universal Service Rural Health Care (RHC) support mechanism pilot program overseen by the Federal Communications Commission. The section concludes by offering suggestions on how Federal coordination of Telehealth and health IT for use during a public health emergency and disaster medical response might be improved.

Current Federal Telehealth Initiatives and Networks
This section describes some of the major Telehealth activities taking place at the following Federal agencies: FCC, HHS, NASA, the Department of Energy (DOE), VA, and DoD among others. Within HHS, the following offices' activities are described: ONC, FDA, NIH, CMS, HRSA, IHS, Substance Abuse and Mental Health Services Administration (SAMHSA), and CDC.

Federal Communications Commission's Universal Service RHC pilot program:
The RHC program, established in 1998, ensures that rural healthcare providers pay no more than their urban counterparts for their telecommunications needs in the provision of healthcare services.[25] Post Hurricane Katrina, FCC took special action to adapt the existing RHC program to assist during a public health emergency or disaster medical response by adopting temporary rules concerning telecommunications services costs for healthcare providers in disaster areas and eligibility for shelters or organizations serving disaster victims.

The existing RHC program is underutilized,[26] likely due to healthcare providers lacking access to the broadband facilities needed to support advanced Telehealth/Telemedicine applications. Therefore, the FCC initiated, on November 19, 2007, the RHC Pilot Program[27]- a program that is distinct from the RHC. It funds up to 85 percent of participants' costs incurred while deploying a dedicated broadband network to connect healthcare providers in rural and urban areas. The FCC recognizes that sufficient access to an underlying broadband infrastructure is a necessary condition for realizing the full benefits of a robust nationwide Telehealth network.

The launch of the Pilot Program was met with substantial interest. Sixty-nine of eighty-one applicants were selected to participate in the Pilot Program. Projects include large-scale networks connecting hundreds of facilities over a multi-state region, small-scale networks providing critical advanced broadband links, connections to insular areas and isolated regions,

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[25] *See, e.g.*, 47 U.S.C. § 254(h)(1)(A); *Universal Service First Report and Order*, 12 FCC Rcd at 9093-9161, paras. 608-749; 47 C.F.R. Part 54, Subpart G

[26] Less than 10 percent of the annually authorized $400 million in funding is disbursed each year. *See* October 2001 Monitoring Report, Section 5, Table 5.1a at p. 5-5; October 2002 Monitoring Report, Section 5, Table 5.1a at p. 5-5; December 2003 Monitoring Report, Section 5, Table 5.1 at p. 5-5; October 2004 Monitoring Report, Section 5, Table 5.2 at p. 5-6; December 2005 Monitoring Report, Section 5, Table 5.2 at p. 5-6; December 2006 Monitoring Report, Section 5, Table 5.2 at pp. 5-6, 5-7; *available at* Federal-State Joint Board Monitoring Reports, http://www.fcc.gov/wcb/iatd/monitor.html

[27] See the FCC Rural Health Pilot Program website at http://www.fcc.gov/cgb/rural/rhcp.html

and networks in states with severe shortages of healthcare professionals. Overall, it is anticipated that during this pilot phase, the construction of innovative and highly efficient broadband networks will connect over 6,000 healthcare providers across the country. Collectively, participants are eligible to receive approximately $139 million in each funding year of the three-year Pilot Program. Selected participants must complete build-out of their networks within five years from the date they receive their initial funding commitment letter from the program administrator. In order to enhance public health emergency and disaster medical responses, FCC requires that participants in the Pilot Program coordinate the use of their healthcare networks and provide access to HHS and other public health officials during a public health emergency and disaster medical response.

At the end of the RHC pilot program, the FCC will conduct an evaluation to enhance its understanding of the cost-effectiveness and efficacy of different types of networks and recommend changes where appropriate.

Office of the National Coordinator for Health Information Technology
ONC was originally created by Executive Order 13335 in 2004 to "provide leadership for the development and nationwide implementation of an interoperable health information technology infrastructure to improve the quality and efficiency of health care."[28] The HITECH Act in 2009 established the Office statutorily and charged it with coordinating Federal health IT policies and programs, conducting relevant executive branch agency outreach, and consulting with public and private entities.[29] As described earlier, several public-private initiatives are developing healthcare system interoperability standards as the government moves to implement standards and certified products within Federal healthcare systems. Today's health information environment is fragmented, with many disparate systems unable to communicate with each other or to transmit data in a consistent and secure method. ONC has developed a technological roadmap/architecture that can support interoperability across State and organizational lines – a critical element of successful Telehealth applications. The office also sponsors activities relating to the NHIN. In addition to the minimal patient diagnostic and procedure codes that characterize many of today's information exchanges, the NHIN collects extensive information, including patient demographics, allergies, medications, and history, which can significantly improve patient safety and improve the quality of care in clinical settings. The additional data also provides a rich trove of information to advance medical and population health research.

ONC also leads the Federal Health Architecture (FHA) program, [30] whose goal is to advance health information technology interoperability among Federal, State, local, and Tribal governments and private sector organizations. This has direct benefits to Telehealth utilization during public health emergencies and disaster medical responses because multiple sectors are involved in the response.

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[28] Executive Order 13335, http://edocket.access.gpo.gov/cfr_2005/janqtr/3CFR13335.htm
[29] See section 3001 of the PHSA, as added by section 13101 of the HITECH Act (Title XIII and Title IV of Division B) of the American Recovery and Reinvestment Act of 2009 (ARRA) (Pub. L. No. 111-5).
[30] See FHA website for a list of the Federal agencies and departments that participate in FHA. http://www.hhs.gov/fedhealtharch/members.html

ONC works closely with several State initiatives including the Health Information Security and Privacy Collaboration (HISPC) and the State Alliance for e-Health (the State Alliance). These initiatives address issues that have a direct benefit to U.S. citizens and cannot be resolved at the Federal level alone. The work of the HISPC has provided collaborative, replicable solutions to critical issues and has expanded the base of informed stakeholders who promote interstate interoperability for health information exchange, including Telehealth applications. The State Alliance is a State legislative/executive-level advisory body that has been tasked with identifying and assessing consensus-based approaches to resolve State-level health IT issues that pose challenges to the interoperable exchange of electronic health information. After conducting an analysis of major issues regarding electronic health information exchange activities within states and across State lines, they produced a list of recommendations including:

- Expediting the paper and electronic licensure process and facilitating the use of a common credentials verification program;
- Coordinating and streamlining reimbursement encumbrances of State government-based electronic exchange of health information; and
- Promoting health information technology and IT exchange among State Medicaid agencies.

It has been suggested that HHS could engage the States to develop and recommend solutions to control for interstate variability in:

- Licensure laws and processes that directly impede Telemedicine, which could be particularly valuable in providing treatment in austere areas;
- Privacy and security laws, which pose challenges to the transmission of electronic health information in a public health emergency or disaster medical response;
- Processes relating to electronic exchange of health information among State and public health programs, coordination of which should help promote a more comprehensive collection of health information for use during public health emergencies and disaster medical responses; and
- Consumer and provider education.

Approximately seventy-five percent of states are pursuing activities, at various levels of maturity, related to health information exchange and interoperability among networks. In addition to the work of State governments, there is a State-level, ONC-led project to facilitate collaboration among public and private partnerships and help structure statewide health information exchange.[31] These partnerships involve a variety of stakeholders, including those focused on technical data exchange locally, statewide and regionally. This project has produced field research that helps guide Health Information Exchange (HIE) development among states, informs Federal-level HIE strategies, and helps to align multilevel efforts to establish a NHIN.

Since 2006, ONC has been leading the Interagency Health Information Technology Policy Council. Representatives from more than 20 Federal departments and agencies regularly interact and exchange information about Federal health IT activities and examine collaborative

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[31] The State-Level Health Information Exchange (HIE) Consensus Project (Project) began in 2006 under a contract from the Office of the National Coordinator for Health Information Technology (ONC) with the Foundation of Research and Education (FORE) of the American Health Information Management Association (AHIMA).

approaches to implementing health IT policy. Additionally, ONC has been working closely with the FCC on its RHC to expand access to healthcare for America's rural and underserved communities through the creation of broadband Telehealth networks in 42 states and three U.S. territories.

Through these efforts, ONC has developed a Federal Health IT Strategic Plan[32] (the Plan), which identifies existing Telehealth activities in civilian Federal agencies and departments and describes the additional Federal activities necessary to achieve the nationwide implementation of this technology infrastructure throughout both the public and private sector. The Plan has two primary areas of focus, patient-focused healthcare and population health, both of which are inextricably tied to forward progression in Telehealth implementations. The Plan describes the importance of a collaborative relationship, where possible, among the following four Federal Telehealth initiatives described in greater detail in other sections of this report:

- Medicaid Reimbursement -- States may decide to pay Medicaid services provided through Telemedicine applications. Telemedicine is not formally defined for the Medicaid program and Medicaid law does not recognize Telemedicine as a distinct service; however, states are required to pay services provided through Telemedicine to supplement or enhance the more traditional methods of providing medical care.
- HRSA Telehealth Grants -- provided through the Telehealth Network Grant Program, Telehealth Resource Centers, and the LPGP.
- The IHS Telehealth program -- supports a broad range of activities in four strategic areas: innovation, resource/infrastructure development, business modeling, and collaboration. These activities occur in partnership with IHS Areas and individual IHS/Tribal facilities already engaged or planning to be engaged in Telehealth service delivery.
- The VA Telehealth initiatives -- both internal in conjunction with DoD. These initiatives draw on general Telehealth, health informatics, and disease management.

The potential application of some of these reimbursement strategies may enhance the accountability and fiscal recovery of healthcare systems and protect providers financially. This would speed recovery and sustain those providing care during the response in the aftermath of a public health emergency and disaster medical response.

Food and Drug Administration
The FDA Center for Devices and Radiological Health (CDRH) works to ensure the safety and effectiveness of the medical devices used in Telemedicine systems. CDRH has responsibility for the regulation of medical devices and radiation-emitting electronic products used for Telemedicine. Each of CDRH's principal areas of responsibility – pre-market review, post-market surveillance, quality systems, standards, and science -- includes program activities related to Telemedicine. CDRH stresses its commitment to the open, public development of guidance documents and CDRH policy addressing Telemedicine devices. CDRH has placed a high priority on the development of policy regarding software that is regulated as a medical device.and is striving to better adapt this program to the receipt and management of Telemedicine device adverse event data. A review and analysis of these devices is conducted using the following:

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[32] See The Federal Health IT Strategic Plan at this website
http://www.hhs.gov/healthit/resources/HITStrategicPlan.pdf

- Quality systems: CDRH believes that current good manufacturing practice requirements as set forth in the quality system regulation, including design controls., represent one of the best approaches toward the assurance of Telemedicine device safety and effectiveness.
- Standards development: CDRH is committed to participation with the medical, manufacturing, and patient communities in the development of standards, including device, practice, and nomenclature standards, which provide the necessary environment for Telemedicine systems to flourish.
- Telemedicine related scientific research: CDRH carries out research related to Telemedicine, in particular in the development of performance evaluation methodologies for components of Telemedicine systems and for the evaluation of electromagnetic compatibility issues.

Interoperability, standards development and performance evaluation are all key components to the success of any Telehealth network. In developing a National Strategy for Telehealth for use during public health emergencies and disaster medical responses, it will be critical to address and account for each of these important elements.

National Institutes of Health
The NIH has a number of telehealth initiatives in various stages of development including the following two programs which are currently fully deployed and in operational status throughout the U.S.

A DHHS-developed, and NLM-hosted Radiation Event Medical Management (REMM) System, which is described in the REMM web site [http://www.remm.nlm.gov] as having been developed to: "Provide guidance for health care providers, primarily physicians, about clinical diagnosis and treatment during mass casualty radiological/nuclear (rad/nuc) events; Provide just-in-time, evidence-based, usable information with sufficient background and context to make complex issues understandable to those without formal radiation medicine expertise; and Provide web-based information that is also downloadable in advance, so that it would be available during an event if the Internet is not accessible".

A NLM-developed Wireless Information System for Emergency Responders (WISER), which is described in the WISER web site [http://wiser.nlm.nih.gov] as having been "designed to assist first responders in hazardous material incidents. WISER provides a wide range of information on hazardous substances, including substance identification support, physical characteristics, human health information, and containment and suppression advice".

Centers for Medicare and Medicaid Services
The CMS Telehealth initiative is the statutory payment authority for Telehealth services, under Section 1834(m) of the Social Security Act. For Medicare purposes, the Social Security Act is very specific as to what is defined as covered and payable as Medicare Telehealth services.

<u>Medicare Telehealth Services</u>

Section 1834(m) of the Social Security Act authorizes the Secretary of the Department of Health and Human Services to pay for Telehealth services that are furnished via a telecommunications system to an eligible individual enrolled under Medicare Part B.

Medicare Part B beneficiaries are eligible for Telehealth services only if they are presented from an originating site located:

- in an area that is designated as a rural health professional shortage area;
- in a county that is not included in a Metropolitan Statistical Area; or
- in an entity that participates in a Federal Telemedicine demonstration project that has been approved by (or receives funding from) the Secretary of Health and Human Services as of December 31, 2000.

The statute describes the following eligible originating sites:

- the office of a physician or practitioner;
- a critical access hospital;
- a rural health clinic;
- a Federally qualified health center;
- a hospital;
- a hospital-based or critical access hospital-based renal dialysis center (including satellites);
- a skilled nursing facility; and
- a community mental health center.

Only physicians or practitioners that meet the statutory definitions referenced in Section 1834(m) are eligible to furnish and receive payment for Medicare Telehealth services. These distant site practitioners include: physicians, clinical nurse specialists, nurse practitioners, physician assistants, certified nurse midwives, clinical psychologists, clinical social workers, and registered dietitians or nutrition professionals.

The statute defines Medicare Telehealth services as professional consultations, office visits, office psychiatry services, and any additional service specified by the Secretary of Health and Human Services. In addition, the statute requires the Secretary to establish a process for adding services to or deleting services from the list of Medicare Telehealth services on an annual basis. Since establishing the process, the Centers for Medicare & Medicaid Services (CMS) have added a limited number of other physician fee schedule services that CMS determined to be appropriate for Telehealth. Currently, Medicare covers and pays for services provided via Telehealth when they substitute for a face-to-face, "hands-on" encounter for:

- Consultations;
- Office or other outpatient visits;
- Individual psychotherapy;
- Pharmacologic management;
- Psychiatric diagnostic interview examination;
- End-stage renal disease related services;
- Individual medical nutrition therapy; or
- Neurobehavioral status exam

For Medicare payment to occur, interactive audio and video telecommunications must be used. As defined by 42 CFR 410.78, an interactive telecommunications system is defined as "multimedia communications equipment that includes, at a minimum, audio and video equipment permitting two-way, real-time interactive communication between the patient and distant site physician or practitioner." For purposes of furnishing Medicare Telehealth services, telephones, facsimile machines, and electronic mail systems do not meet the definition of an interactive telecommunications system. In the case of Federal Telemedicine demonstration programs conducted in Alaska or Hawaii, Medicare payment is permitted for Telehealth services when asynchronous "store and forward technology," in single or multimedia formats, is used as a substitute for an interactive Telecommunications system.

At present, specific funding strategies related to the unique clinical considerations of public health emergencies and disaster medical responses have not been comprehensively addressed. Funding schemas would likely be valuable considerations of any overriding National Strategy.

Medicare Physician Services Utilizing Telecommunications Technologies
Medicare defines physician services as professional services performed by physicians, including surgery, consultation, and home, office, and institutional calls. A service may be considered a physician's service when the physician either examines the patient in person or is able to visualize some aspect of the patient's condition without the interposition of a third person's judgment. Direct visualization would be possible by means of x-rays, electrocardiogram and electroencephalogram tapes, tissue samples, etc.

Services not requiring an in-person 'hands on' patient encounter that may be delivered via telecommunications systems are paid according to usual Medicare part B rules and not as a telehealth service. For example, the interpretation by a physician of an electronically transmitted x-ray, electrocardiogram or electroencephalogram reading are covered Medicare services and not subjected to the Telehealth conditions of payment. The Telehealth geographic eligibility criteria, originating site facility and interactive telecommunications system requirements do not apply.

Services provided by means of a telephone call between a physician and a beneficiary, or between a physician and a member of a beneficiary's family, are covered under Medicare; however, CMS does not specifically pay for the calls themselves. Rather, the physician work resulting from telephone calls is considered to be an integral part of the pre-work and post-work of other physician services. Thus the physician fee scheduled amount for the latter services already includes payment for any associated telephone calls.

In concert with existing Medicare law and implementing regulations, and where appropriate, the established practices for consultative capabilities could be useful as a foundation for considerations of applicability to medical specialty provision in remote and disaster impacted healthcare systems and their patient population.

Use of Telehealth in Delivery of Home Health Services
Section 1895(e) of the Social Security Act governs Medicare's home health prospective payment system (PPS) and provides that Telehealth services are outside the scope of the Medicare home

health benefit and home health PPS. Nothing in this Section prevents a home health agency (HHA) from furnishing a home health unit of service via a telecommunications system if such services do not substitute for in-person home health services ordered as part of a physician certified plan of care. Services provided via a telecommunications system are not considered a home health visit for the purposes of eligibility or payment under Title XVIII. As stated in 42 CFR 409.48(c), a visit is an episode of personal contact with the beneficiary by staff of the HHA, or others under arrangements with the HHA for the purposes of providing a covered service. The provision clarifies that there is nothing to preclude an HHA from adopting Telemedicine or other technologies that they believe promote efficiencies, but that those technologies will not be specifically recognized or reimbursed by Medicare under the home health benefit.

Home Healthcare considerations would likely have significant potential for application to, and mitigation of a number of public health emergency and disaster medical response environments. In general, it would apply where social distancing is a strategic imperative of public health response, such as a severe influenza pandemic.

Medicaid and Telemedicine
The Federal Medicaid statute (Title XIX of the Social Security Act) does not recognize Telemedicine as a distinct service. Any State wishing to cover/reimburse for Telemedicine services should submit a State Plan Amendment to CMS for approval.

Health Resources and Services Administration

HRSA has been awarding grants to communities to implement Telehealth technologies and capabilities since 1988. As a part of its mission, the Agency has long believed that Telehealth technologies are an integral part of improving access to care for underserved populations. This would have special application in a disaster. HRSA's Office for the Advancement of Telehealth (OAT) provides an operational focus for HRSA's Telehealth activities, including technical assistance and the administration of many of its Telehealth grant programs. The foci of HRSA's Telehealth grants are the increase and improvement of cost-effective use of Telehealth technologies to meet the needs of underserved people, including the geographically isolated (living in rural and remote areas) and the functionally isolated (low-income, uninsured or under-insured, disabled or elderly).

From October 1, 2005 through September 30, 2007, OAT administered 148 Telehealth/ Telemedicine projects. Twenty-four (24) of these projects were awarded new funds totaling more than $6.1 million, while the remaining grants have been operating under no-cost extensions. The Office administers a wide variety of grants ranging from programs to expand access to specific specialty services, such as radiology, dermatology, neurology and genetic counseling, etc, to Telemonitoring in the home for patients with chronic disease, to distance education and training programs to enhance the clinical and administrative workforce, to programs for building the capability of communities to respond to public health emergencies and medical disasters using Telehealth technologies.   Continuing and consumer education programs are broadcast daily to approximately 125-200 sites.

Not all of HRSA's Federally funded Telehealth activities involve direct clinical service / consultation or distance education. For example, the LPGP supports states in the adoption of policies to overcome the cross-state licensure barriers that can hinder the effective deployment of Telehealth services during a public health emergency and disaster medical response. Additionally, the Telehealth Resource Center Grant Program supports a national network of regional technical assistance centers that help communities develop Telehealth services more effectively.

By utilizing and encouraging links with other Federal agencies' programs, it has been possible to maximize the impact of HRSA's funding by providing educational, direct care consultation and administrative services through Telehealth. Moreover, as has been previously detailed in the 1997 DoC Telemedicine Report to Congress[33] and the 2001 HHS Telemedicine Report to Congress,[34] information provided by HRSA's clinical and distance learning grant programs has been critical in addressing difficult Federal policy issues related to payment and quality. These reports were drafted in conjunction with the Joint Working Group on Telemedicine, a group chaired and staffed by OAT. It has been a useful conduit for sharing information and avoiding duplication of funding. Since 1995, its membership has included all Federal agencies with major telehealth programs, including the military, the VA, DoC, Department of Agriculture, etc. Thus,

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[33] Available at http://www.ntia.doc.gov/reports/telemed/index.htm
[34] Available at ftp://ftp.hrsa.gov/telehealth/report2001.pdf

HRSA has built upon its grantee experience to develop valuable lessons-learned to inform not only its programs, but those of its Federal and private sector partners.

Indian Health Service

Telehealth offers new tools for improving access, quality, and value in Indian healthcare. Many Federal and Tribal operated healthcare facilities have implemented a diverse array of Telehealth projects and activities. There is great potential to improve healthcare delivery, address shortages and unequal distribution of critical health professional staff, improve educational outreach, and facilitate public health emergency and disaster medical response planning through the integration of Telehealth into the IHS healthcare delivery system.

Telehealth tools have been used in Indian health facilities to improve care for acute and chronic medical conditions, develop capacity for chronic disease management and care coordination, and extend distance education and innovative training. Some projects have focused on select needs. An important example is the IHS Joslin Vision Network (JVN) which provides diagnostic ophthalmologic services to patients with diabetes. To date, over 25,000 examinations for diabetic retinopathy have been performed for patients from 60 facilities in 16 states. Interpretations and recommendations for ophthalmologic care are provided through a national reading center in Phoenix. Other programs, such as the Alaska Federal Health Care Access Network (AFHCAN), have enhanced primary care and multi-specialty service delivery to Indian health beneficiaries in specific states.

AFHCAN is a multi-year collaboration of the Alaska Native Tribal Health Consortium, IHS, HRSA, DoD, VA, and the U.S. Coast Guard. From 2001 to 2007, more than 27,000 Federal beneficiaries in Alaska received clinical services through the AFHCAN Telehealth solution. Three-fourths of the ~50,000 Telehealth cases occurring during that time period addressed primary care needs, while approximately 11,000 other Telehealth cases required specialist evaluation and care. Overall, estimated travel savings realized by the AFHCAN systems exceeded $14 million. Of greater importance, the AFHCAN Telehealth solution facilitated access to timely care and consultation, for both primary and specialty care.

Efforts to increase service delivery in cost-effective, organizationally efficient, and network secure models continue. These efforts provide critical focus on telecommunication networks and information system infrastructure. Videoconferencing supports a growing number of Telehealth applications, including behavioral health, cardiology, and nutrition/dietetics services. Many other forms of "store-and-forward" technologies are also supported by the AFHCAN Telehealth solution.

The IHS telecommunication network connects IHS and participating Tribal sites via a cloud-based, Multi Protocol Label Switching network. The average site connects to the IHS network via broadband circuits. In turn, the IHS network connects to the HHS network (HHSNet) through two redundant connections in IHS offices in Albuquerque, New Mexico and Rockville, Maryland. The network consists of routers, switches, and hardware that support Quality of Service. Additional Telehealth components include videoconferencing units and bridges located at IHS Area offices and individual facilities. Early phase implementation of the secure,

enterprise-based AFHCAN Telehealth solution outside of Alaska supports multi-purpose store-and-forward consultation and Telehealth care in an expanding number of Indian health facilities.

The ability for the infrastructure to handle an increase in Telehealth volume and complexity during public health emergencies and disaster medical responses is vital. Current network capacity and utilization only permits modest surge capacity during times of increased need such as public health emergencies and disaster medical responses. IHS Network Operations Security Center (NOSC) estimates growth at about 30 percent increase in core bandwidth usage every year. In accordance, during 2009 NOSC has plans to increase bandwidth by 66 percent across the IHS network. The reasons for growth are mostly due to the increase in use of the Internet for production activities and the increase in use in telehealth, mostly related to teleradiology and video teleconferencing. Improvements in image management technology and software would also aid in network optimization.[35]

Telehealth information must be securely integrated with existing health information systems. As part of its commitment to NHIN, the IHS is committed to developing HITSP-compliant interfaces between the IHS Resource Patient Management System (RPMS) and various Telehealth systems (e.g. AFHCAN and JVN) that are increasingly included as components of health service delivery. Collaboration work between the AFHCAN and JVN Telehealth systems also increases overall efficiencies and Telehealth outreach. These efforts build on important public health information-sharing activities already underway within IHS. For example, the Immunization Data Exchange initiative enables secure, automated sharing of immunization information between CDC-supported State Immunization Information Systems and the IHS RPMS system. Additional benefit of Telehealth information integration is anticipated through existing Tribal and future IHS facility participation in Regional Health Information Organizations or HIEs.

It is reasonable to consider how these integrations to the NHIN might be expanded and strategically enhances in specific applications to public health emergencies and disaster medical responses. Such a consideration would inform a National Strategy.

Agency for Health Research and Quality
In September 2007, AHRQ funded 53 research grants through Ambulatory Safety and Quality. The research grants were awarded for various Telehealth initiatives across many states (e.g., Pennsylvania, Texas). Examples include:
- Improving preventive care in pediatric primary care settings, focusing on medication management.
- Using the personal health record to exchange data between providers to increase compliance of patients diagnosed with chronic hypertension.
- Undertaking peer review through a comparison clinical decision making against a pre-set standard.
- Achieving a more comprehensive and tailored use of the electronic health record to assist patients with their appointments, the availability of educational materials and to communicate with their providers.

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[35] Source: IHS Network Operations Security Center provided February 23, 2009.

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- Advancing the use of technology in the treatment and monitoring of chronic illnesses such as diabetes and cardiopulmonary disease, and preparing to adequately shelter patients in place during a pandemic influenza.
- Implementing a Telepharmacy program to connect remote metro pharmacists with several rural Minnesota hospitals for review and approval of medication orders during after-hours, weekends, holidays, and other times when the individual hospital pharmacies are closed.

Unfortunately, these projects are not connected to a regional HIE, nor are there plans in the immediate future to achieve interoperability or additional connectivity among states.

Specific engagement on issues related to public health emergencies and disaster medical responses would be invaluable to a National Strategy and coincides with recommendations addressing routine Telehealth applications to environments suffering compromised infrastructure, austerity, and public health and medical catastrophe should be a consideration of a National Strategy.

Substance Abuse and Mental Health Services Administration
The Public Health and Medical Services Annex to the National Response Framework, the nation's road map for disaster response, defines public health and medical services as including "behavioral health needs consisting of both. mental health and substance abuse considerations for incident victims and response workers." The final report from the President's New Freedom Commission on Mental Health: Achieving the Promise: Transforming Mental Health Care in America lists as Goal 6, the use of technology to access mental health care. This report specifically calls for the increased use of telehealth and electronic records as a method for transforming mental health care in America.

SAMHSA has developed a system called Digital Access to Medication (D-ATM). SAMHSA's Center for Substance Abuse Treatment has been actively working on a project to design and develop a centralized data base of recent patient medication dosing information to ensure continuity of care when a service disruption occurs. This is an internet-based system involving an application programming interface that will allow Opioid Treatment Programs with compatible clinical software to communicate with the central database. However, the D-ATM is in a pilot stage and has a planned implementation time of three years. Currently, the components do not connect with RHIN or any other HHS networks and there are no future plans to do so.

During the Katrina response and recovery period, SAMHSA made available its existing network of telephone based crisis counseling /suicide hotlines, the National Suicide Prevention Lifeline, to take all event-related mental health calls. This network linked Katrina survivors that had been relocated across the country with existing and expanded services addressing their concerns and suicide prevention needs through the use of one common, national, phone number. Innovated web-based strategies are being used to expand the reach of the Lifeline and could serve as one of the portals for connecting post-disaster victims needing mental health services with the healthcare system, providing appropriate referrals and directing of care.

Centers for Disease Control and Prevention

CDC's Telehealth efforts can be classified in a number of different ways: domestic versus international; those with sustainable funding versus pilot programs; and those funded at the State, Tribal, territorial or major city level by line-item grants.

Current CDC Telehealth initiatives for healthcare professionals are spearheaded by the Clinician Outreach and Communication Activity (COCA)[36] in partnerships with national clinician organizations for the purpose of timely communication of information on disease outbreaks and terrorism events. COCA has established partnerships with over 150 healthcare professional societies and non-governmental organizations capable of rapid communications based on scheduled conference calls, timely presentations, or mass e-mailings to healthcare providers and members of the professional organizations.

To facilitate the rapid dissemination of information to clinicians, CDC also operates the Clinician Registry for Terrorism and Emergency Response Updates and Training Opportunities. This registry, which has approximately 40,000 members, is a system through which CDC informs clinicians via weekly e-mail updates of recent changes to information on smallpox, SARS, influenza, and other related health issues. CDC also uses the registry to announce new training opportunities for clinicians related to terrorism and public health emergency and disaster medical response topics.

The CDC Clinical Information Service is part of the 800.CDC.INFO contact center (800.232.4636) – a resource for clinical information and material (posters, pamphlets, CD ROMs, etc.) covering CDC health-related topics. The CDC Clinical Information Service is a 24/7/365 toll-free telephone information system designed for clinicians and the public to facilitate the rapid dissemination of bioterrorism information, natural disaster updates, and the latest on emerging diseases.

CDC provides internet-based broadcasts in which experts present critical information related to current health issues. These Web broadcasts are archived and are accessible for an extended period on CDC's Public Health Training Network Archive of Web casts[37].

Generally, the focus of CDC efforts has been human health surveillance and educational requirements. To that end, a National Strategy for Human Health Surveillance was funded and completed in 2008. This document describes goals and current status, and offers recommendations on advancing a more complete capability of laboratory and syndemic surveillance. While this would impact overall health and medical situational awareness, it does not speak to a comprehensive strategy for Telehealth in preparing for public health emergencies and disaster medical responses.

International Activities
The CDC's international Telehealth activities are exemplified by the efforts of the National Center for Health Marketing (NCHM) / Global Communication and Marketing (GCM). CDC/NCHM/GCM currently has two ongoing Telehealth projects in Kenya and China.

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[36] Available at http://www.emergency.cdc.gov/coca/
[37]Available at http://www.emergency.cdc.gov/coca/training.asp

National Aeronautics and Space Administration
NASA's mission is to pioneer the future in space exploration, scientific discovery, and aeronautics research. NASA conducts its work in four principle organizations, called mission directorates:

- Aeronautics: pioneering and proving new flight technologies that improve our ability to explore and which have practical applications on Earth.
- Exploration Systems: creating new capabilities for affordable, sustainable human and robotic exploration
- Science: exploring the Earth, moon, Mars and beyond; charting the best route of discovery; and reaping the benefits of Earth and space exploration for society.
- Space Operations: providing critical enabling technologies for much of the rest of NASA through the space shuttle, the international space station and flight support.

It is NASA's work under these directorates that enables other organizations to benefit from its successes. NASA produces an annual premier publication that features successfully commercialized NASA technology. For more than 40 years, the NASA Innovative Partnerships Program has facilitated the transfer of NASA technology to the private sector, benefiting global competition and the economy. The resulting commercialization has contributed to the development of products and services in the areas of health and medicine, industry, consumer goods, transportation, public health, computer technology, and environmental resources. NASA has the capability, through partnerships, to develop leading edge technology in the health and medicine fields. The agency is particularly proud of its development, deployment and support of Small Business Innovation Research Phase III Internet Voice Distribution System, which can support 200 experimenters and payload support personnel in the International Space Stations. The ability to communicate the condition of its personnel through EZStream Telemetry monitoring is critical to future missions of the space program.

The advances made in Telehealth have been spurred by NASA's needs to communicate and continually assess the health status of personnel in the space station. According to NASA, "the goal of the Gemini Program was to develop techniques that would allow for advanced, long-duration space travel—a prerequisite of the ensuing Apollo Program." To accomplish this goal, NASA worked with a variety of innovative companies to develop propulsion systems, onboard computers, and docking capabilities critical not only to the to the status of the Gemini spacecraft, but also to the life-support systems and physiological-monitoring devices that were critical to the health of Gemini astronauts.

Spacelabs Medical, Inc. has been a pioneer in the field of medical Telemetry. Spacelabs Medical helped NASA better understand man's physiological reaction to space through a series of carefully calibrated bioinstrumentation devices that were capable of remote monitoring of orbiting astronauts' physical conditions in real time. Further development has occurred in technologies that monitor and help maintain astronauts' health in space, including fine tuning in the capability for transmission of health information back to Earth. NASA's continued development of its remote monitoring capabilities has dramatically changed and will continue to alter the course of patient care.

It is especially likely that the unique requirements and considerations of Aviation medicine and Aeronautic and Aerospace medical care would greatly inform and influence a National Strategy.

The Department of Energy (DOE)
Every DOE site has an electronic medical record system. Data collection for the medical record systems is the responsibility of each site. Currently, DOE has 35 plus sites operating EMR systems, with no communication between them.[38]

The mission of DOE is primarily directed towards management of the nuclear arsenal and does not focus on health related issues. Although the medical record systems operating in each site do not communicate with each other, there is an initiative to standardize the data elements between each system. At the National level, DOE operates the Occurrence Reporting System responsible for reporting all nuclear incidents, including accidental spills and direct threats. Critical personnel involved with the incident communicate through conventional modes, such as e-mail and telephone.

The personnel responsible for reporting such incidents use conventional e-mail capability to alert the other sites and pertinent agencies. DOE also utilizes the Biological Event Monitoring Team that is responsible for education and information dissemination to the many contractors and employees of DOE about health and safety policy and practices. DOE maintains a website used for the capture of electronic data and community agreements have been developed to ensure collection of biosurveillance data. As part of its mission, DOE also maintains an Emergency Operations Center responsible for relaying all pertinent information related to biological or nuclear incidents to all DOE sites.

The value of DOE input regarding worker safety, event response, hazardous environment, and biosurveillance would enrich practice and educational input of a National Strategy for the use of Telehealth during public health emergencies and disaster medical responses.

Veterans Administration
Telehealth in the VA is supported by a national information technology (IT) backbone network with four core nodes located near Sacramento, CA; Dallas, TX; Kansas City, MO; and Washington, DC. For healthcare, VA backbone core nodes serve VA IT network access points (i.e., 155 VA medical centers and 872 ambulatory care and community-based outpatient clinics) via 21 regional wide area networks (WANs). In fiscal year 2007, VA:

- Enrolled 31,340 veterans in care coordination home Telehealth (CCHT) programs operating from 155 sites around the country. Thus, at any one time 31,340 CCHT devices were transmitting chronic disease management and monitoring data via plain old telephone service (POTS) lines to data servers behind VA firewalls. CCHT uses other POTS-based devices for real-time interaction/clinical video conferencing with patients at home.
- Provided healthcare services to 43,914 veterans during FY07. 77,569 real-time general Telehealth encounters took place among 403 VA sites using both internet protocol and Integrated Services Digital Network video conferencing units operating

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[38] Source: Department of Energy

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at a minimum bandwidth of 384K. Of these veterans, 24,499 were provided with mental health services during 48,875 Telemental Health encounters.

- Conducted 84,493 asynchronous store-and-forward Telehealth encounters among 181 VA sites. Of these encounters, 69,379 were Teleretinal screenings for diabetic retinopathy using 60 reading stations that pull images from 156 digital retinal cameras located at VA image acquisition sites. All VA store-and-forward Telehealth encounters are supported by regional WAN's and/or the VA IT backbone network.

In September 2007, VA opened a National Teleradiology Program (NTP) in Palo Alto, CA, with the capacity to provide 120,000 final interpretations of radiologic imaging studies (e.g., x-ray, computerized tomography (CT), magnetic resonance imaging (MRI), etc.) per annum referred from any of VA's 155 Medical Centers or their affiliated clinics. Studies sent to the program are interpreted by a radiologist, who then creates a report and electronically transmits the report back to the VA medical center or clinic that requested the interpretation. In addition to providing interpretations, the program also provides radiologic consultation service to determine which imaging studies should be ordered and which technological imaging protocol should be used.

VA estimates that its Telehealth inventory and assets (except the NTP) would be available 50-70 percent during all hours and 100 percent outside of normal hours in support of public health emergencies and disaster medical responses.

In addition to assets above, VA has additional back-up capabilities to deliver care during emergencies or disasters. Specifically, <u>Mobile Satellite Systems</u>:
- <u>Very Small Aperture Terminal two-way satellite system</u> (i.e., ground station with a 1.2 meter satellite dish antenna) contained in seven transport cases located in numerous areas of the country;
- <u>Satellite Communications & Command systems</u> (i.e., ground station with 1.2 meter auto-deploy roof-mounted satellite dish antenna) in 24' mobile trailers; and
- Four locations with <u>Satellite Communication & Command Recreational Vehicle</u> (RV) (i.e. ground station with 1.75 meter auto-deploy vehicle-mounted satellite dish antenna) in an RV located in Florida.

- All VA mobile satellite systems can be deployed to any area of need to provide a wireless communication link for voice, data, and video, independent of local terrestrial/wire/line communication infrastructure.

VA healthcare is delivered to all 50 states and Puerto Rico through 19 regional administrative networks using VA's Computerized Patient Record System. Additionally, VA has national referral specialty healthcare centers around the country. As such VA healthcare, including Telehealth, is delivered across State lines.

Currently, the VA does not link with any non-VA regional health information management systems. However, DoD and VA have a history of close cooperation on Telehealth initiatives, particularly in developing EMR systems to help facilitate the exchange of clinical information between the two agencies for active duty military personnel. Section 1635 "Fully Interoperable Electronic Personal Health Information for the Department of Defense and Department of

Veterans Affairs" of Public Law 110-181 (National Defense Authorization Act 2008) effective January 28, 2008 requires DoD and VA to develop, under the auspices of a DoD/VA Interagency Program Office, electronic health record systems or capabilities that allow for full interoperability of personal healthcare information between the departments. Telehealth applications are frequently cited by both departments as evidence of the joint development of such capabilities. Additionally, VA plans to join with its Federal Health partners in an initiative to participate in testing of the NHIN[39]. VA plans to follow and participate in NHIN testing of the population health use case as well as other business use case scenarios.

Department of Defense
The Army Medical Department (AMEDD) has seven robust Telehealth/Telemedicine initiatives based in the United States that could be leveraged during a public health disaster. Clinical care programs and their associated network infrastructure provide distributed medical sub-specialty consultations across a particular region. In addition to clinical care, the AMEDD has a widely deployed Teleradiology infrastructure that enables transfer of images among military medical centers for diagnosis and interpretation and/or for continuity of care.

The Tele-Neurosurgery medical network is based at Walter Reed Army Medical Center (WRAMC) in Washington, DC and enables remote consultation among WRAMC and its four remote sites across the North Atlantic Regional Medical Command - Fort Knox located in Tennessee, Fort Bragg located in North Carolina, Andrews Air Force Base in Maryland and Quantico, Virginia.

WRAMC and the North Atlantic Regional Medical Command have implemented a virtual behavioral healthcare delivery system. Tele-Behavioral Health (TBH) Service was established to meet the needs of Soldiers, beneficiaries, and retirees whenever there is limited direct care capacity and/or limited TRICARE network capability. TBH provides cost-effective, high-quality, and timely access to outpatient behavioral healthcare regardless of patient location and acuity. WRAMC provides TBH services to a variety of bases from Ft Drum, NY to Ft. Know, KY. Currently, the TBH Service is interfacing with 22 Military Treatment Facilities (MTF) operated by the Army, Navy, and Air Force.

The Tele-Dermatology program is based at Great Plains Regional Medical Command (GPRMC) at Fort Sam Houston, TX and enables consultation among dermatologists located at Army and Air Force MTFs and primary care providers located at remote military facilities using a web-based, "store-and-forward" technology. There are 25 Army, Navy, and Air Force sites, located in 19 states and Europe, which are actively participating in the program.

The Teleechocardiology program is based at Brooke Army Medical Center (BAMC) at Fort Sam Houston, TX and enables consultation among cardiologists located at BAMC and primary care providers located at seven remote Army medical facilities in the Great Plains Regional Medical Command (Fort Hood, TX; Fort Polk, LA; Fort Carson, CO; Fort Leonard Wood, MO; Fort Sill, OK; Fort Riley, KS and Fort Leavenworth, KS).

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[39] U.S. Department of Health & Human Services. "Nationwide Health Information Network". Retrieved April 13, 2009 from http://www.hhs.gov/healthit/healthnetwork/background/

The Army Knowledge Online (AKO) Teleconsultation program is managed by GPRMC at Fort Sam Houston, TX. The AKO Teleconsultation program was established in 2004 to provide a user-friendly system, which would be available to deployed providers of all branches and echelons of care in the military. The consult groups currently include: dermatology, infectious diseases, ophthalmology, cardiology, burn-trauma, internal medicine, nephrology, neurology, orthopedics, pediatrics, preventive medicine, rehabilitation, rheumatology, toxicology, and urology.

The U.S. Army Tele-Radiology program enables radiologists at one location to view images captured at another location. The Army Picture Archiving Computer Systems Program Management Office, located at Fort Detrick, Maryland, has currently configured a Tele-radiology network to support smaller MTFs throughout the Army.

The capabilities of this enhanced digital medical imaging process and information technology have enabled the Army medical community to provide a higher relative standard of patient care in remote locations. Additionally, the program provides secure remote access image viewing for at-home or on-call clinicians and radiologists, and speeds support to the patient care process. There are twenty sites that currently have a Teleradiology capability within the USA.

The remote critical care Telehealth consultation program in the Pacific Command (PACOM) is operated in a hub and spoke configuration. The hub is located at Tripler Army Medical Center, in Honolulu, HI. Spokes are configured to provide real-time video, audio, hospital information system, and clinical monitoring physiology data from two remote locations to the central hub. The U.S. Naval Hospital Guam has 6 Intensive care unit (ICU) beds and was clinically activated as a remote consultation site in 2003. In 2007 the U.S. Army 121Combat Support Hospital (121CSH) in Seoul South Korea was activated as a clinical site with 7 ICU beds.

Interconnectivity exists among the Military Health System (MHS) sites within DoD. Some of the Telehealth programs are able to connect to other agencies for consultation. For example the radiology program interfaces and has connectivity with civilian radiology providers (e.g., Nighthawk) who provide the AMEDD with additional reading capacity. However, the majority of DoD's capabilities exist only on DoD Non-classified but Sensitive Internet Protocol Routing Network, without plans to connect to civilian or other Federal organization, due to security issues. DoD has stated that expansion of the MHS network is feasible; however, information assurance and security profile management will be required for addition of non-DOD facilities.

The U.S. Navy also has a robust Teleradiology capability, and participates in the Army Knowledge online Teleconsultation service. Several initiatives in development include: Psychological Health, for which sites for deployment of the necessary equipment are being identified; behavior imaging; home monitoring for Post Traumatic Stress Disorder; and a web-based program on cognitive processing for healthcare providers.

The U.S. Air Force has a growing Telemedicine presence in the DoD. Tele-radiology is the largest and most established Telehealth program in the Air Force. Within the Continental United States, there are three major hubs that provide between 85,000 and 100,000 Teleradiology

studies per year. Within the European theater, each site is connected to one or more other sites for weekend and night coverage. PACOM has developed the world's largest radiology network by deploying "Synapse®," a web-based system developed by Fuji. This system interconnects 64 million square miles and includes sites in Alaska, Japan, Korea, Guam, and Hawaii. It allows providers to share workload in real-time, between sites. All of these hubs, spokes, and web-based systems are being modernized to create a system called "Radnet" (short for Radiology Network). This system will provide Air Force-wide enterprise awareness of all studies as well as dynamic workload allocation among all sites.

There are a number of congressionally funded research programs within the Air Force that include a dynamic workload allocation engine for radiology, Telepathology, integration of "off-the-shelf" products for ophthalmology with the military healthcare record, and distance intubation education. The primary academic partners for the Air Force are the University of Pittsburgh and the University of Nebraska. There are currently eight Air Force sites with robotic pathology microscopes that provide a system for sub-specialty consultation and coverage.

The Air Force has partnered with the Army and utilizes the AKO theater Teleconsultation and teledermatology consultation systems. The Air Force is currently deploying Video Teleconferencing units in every mental health clinic in the Air Force, thus creating an interconnected network of providers.

The Air Force is creating several systems and conducting several programs in the following areas: cardiology, archiving system for electrocardiograms (ECG) for the Aeromedical Consultation Clinic (tracks all pilots), otolaryngology, web-based supervision for psychotherapy and other procedures, and web-based behavioral imaging as an approach for supervising behavior therapy in autistic children.

Whether the inherent differences between the healthcare system of the DoD / VA and the domestic sector are immediately apparent, the applications to a domestic disaster theater are considerable. Many of the impediments of private and competing healthcare systems and hospitals on a routine or day-to-day basis would be temporarily committed by certain public health emergency and disaster declarations. In anticipation of such situational changes and where applicable, these successful practices relating to EMR, Telehealth, and situational awareness in theater should advise a National Strategy for Telehealth in public health emergencies and disaster medical responses.

Suggestions for Promoting Greater Coordination at the Federal Level and Beyond

At the November 2008 public meeting, the NBSB suggested the following action items:

1. The Board will charge the Disaster Medicine Working Group with assisting ASPR in convening a task force to advise in the development of a strategy for the use of telehealth and its applications to enhance the care provided in a public health emergency and medical disaster setting.
2. The Disaster Medicine Working Group will identify strategic Telehealth issues for

consideration by the Board, create a broad outline for addressing the issues, and identify experts who should be consulted and engaged. All Board members are welcome to take part in the Disaster Medicine Working Group discussions.

Examples of items that the strategy might address include:

- Creation of a Telehealth and eHealth Disaster Resource Initiative to consider the proper interval for updating of the strategy and consideration for the application of the strategy to public health emergencies and medical disaster responses;
- Evaluation of the unique portability requirements inherent to austere environments;
- Integration of a Telemedicine Disaster Resources Network;
- Evaluation of material and fiscal support and reimbursement requirements for proper utilization of Telehealth and eHealth initiatives for disaster-related field operations;
- Creation and development of resource access and utilization policies;
- Development of information interoperability (e.g., between evacuation, mass care, and health and medical support functions) policies;
- Development of policy for National Disaster Medical System integration of the Disaster Medical Information Suite with other systems;
- Establishment of means and methods to integrate:
  - mass prophylaxis campaigns
  - mass casualty and mass decedent event management;
  - medical material and practitioner accountability practices
  - information capture to facilitate disaster epidemiology
- Development of an inventory of resources, personnel, and technology that may be brought to bear during a public health emergency and disaster medical response and incorporation of the protocols policy and practice for its utilization;
- Determination of the Federal role in the creation, maintenance and direction of a National strategy.
- Establishment of specific objectives with respect to strategies to reduce health disparities and specific plans for ensuring that populations with unique needs are appropriately addressed.
- Discuss the need for the Strategy for Telehealth to be congruent with the National Health Security Strategy.

At the January 2009 meeting of The Institute of Medicine's Forum on Medical and Public Health Preparedness for Catastrophic Events in San Diego, CA, there was discussion that HHS develop a National Strategy for the use of Telehealth during public health emergencies and disaster medical responses that will:

- Address the need for electronic medical records as they would apply to public health emergencies and disaster medical responses for congruence between the National Disaster Medical System and public and private healthcare entities.

- Consider germane IT and informatics "interoperability" issues for all emergency support functions as defined by the National Response Framework.

- Consider current applications and innovative response strategies for eHealth, Telehealth and IT considerations in public health emergencies and disaster medical responses

environments -- specifically remote consultation, countermeasures strategies, patient tracking, compensation, and confidentiality.

Discussion

In addition to the NBSB discussions regarding Telehealth, it is important to recognize that ONC is already leading numerous Federal collaborative efforts, and the Federal Health IT Strategic Plan calls for closer collaboration among Telehealth initiatives led by CMS, HRSA, IHS, and the VA. Within HRSA, OAT requires its grantees to link with other Federal agencies' programs where possible – for example, they are required to apply for the FCC Universal Service Program for discounted Telecommunications costs. HRSA and AHRQ, through grant programs and research projects, provide input for Telehealth policy decisions.

ONC endorses the creation of a Telehealth inventory and strategy applicable to public health emergencies and disaster medical responses to gain a more thorough understanding of the people, systems, and resources available to support disaster response. The inventory would initially serve as a basis for the network of networks. In the future the registry should evolve into a more comprehensive database with greater granularity.

The keys to success in health information exchange are as follows:
- Focus on implementing basic public health emergency and disaster medical response capabilities, such as identifying and tracking patients across different settings and providing critical, relevant data, such as patient allergies.
- Leverage existing HIT to enhance biodefense.
- Recognize that many challenges to health information exchange are not technical but legal and governmental, such as sharing information across States and patient concerns about confidentiality.
- Ensure collaboration among government entities and the private sector, recognizing that much of the information needed to improve HIT resides in the private sector.

NHIN, described briefly in the earlier section on Telehealth for Public Health Emergencies, will provide a key mechanism to enhance Federal coordination. During the April 2009 NHIN demonstration, the NDMS repository will exchange data through a Health Information Exchange currently in use at local Gulf State providers such as hospitals, pharmacy benefit departments, or physicians' group. The exchange of medical information will allow NDMS providers to construct a more comprehensive medical history, which could result in improved patient care. NDMS plans to field the medical deployment suite's new capabilities in time for the 2009 hurricane season that begins in June. Despite the challenges, the NDMS medical deployment suite has shown sufficient success and promise that the VA and National Guard have requested dialogue aimed at establishing standards for the sharing of medical records and tracking applications.

ATA is currently struggling with questions of an inventory's capabilities, cost-effectiveness, and privacy protections. It is important to note that with rapidly changing technology, any inventory would rapidly become obsolete unless it is updated periodically. A National Telehealth Strategy would help determine how the inventory would be maintained and updated.

Conclusions

The United States has not reached optimal use of Telehealth technologies during public health emergencies and disaster medical responses. To do so policy, practice, and culture changes must occur, and while there are many groups across the country identifying challenges and working on solutions, there is currently no single coordinated vision or strategy for Telehealth use during public health emergencies and disaster medical responses. After careful examination of the state of existing National Telehealth resources and determination of the potential for coordination of these efforts, the Working Group in discussions with the NBSB and with feedback from the Institute of Medicine's Forum on Medical and Public Health Preparedness for Catastrophic Events have determined that Telehealth and eHealth could apply some existing clinical and technical practices, networks and technological capabilities for information transfer, and rapidly insert intellectual and clinical consultation into remote and compromised environments during public health emergencies and disaster medical responses. They also suggested that applying uniform accounting and electronic asset and reimbursement strategies for materials and services would enhance the overall incident management, accurately represent the event, enhance the event review and lessons learned, and allow applications of objective evaluation to speed recovery and establish reliable best practices for the future.

Appendix A: Telehealth Inventory

The first charge under PAHPA's Telehealth provisions is the creation of an inventory of Telehealth initiatives in existence on the date of enactment, December 19, 2006. There is an enormous amount of expertise in disaster response and applicable technologies within government, academia, and private institutions. The primary response to a public health emergency or medical disaster will, as with most responses, occur at the local jurisdictional level. The ability to quickly access national resources and expertise from a single trusted location could greatly enhance and support this response. The creation and maintenance of a nationwide registry of Telehealth capabilities and resources would provide an effective mechanism for mobilizing an expanded response to such emergencies. An ideal inventory would be a comprehensive and dynamic accounting of potentially invaluable Telehealth networks, resources, and expertise available for use in all stages of emergency management – from planning to response to recovery.

The creation of such an inventory involves several considerations and challenges. Numerous initiatives have been carried out to connect hospital and healthcare systems with Federal, State, Tribal, and local public health and medical authorities. However, interoperability, the particular quality and standard of infrastructure, and content in transfer of such information is not comprehensively established. A comprehensive inventory in this form does not currently exist. Within HHS, HRSA has, in the past, conducted an inventory of its funded programs similar to the one required in the legislation. In doing so, they found a number of obstacles, including the identification of Telehealth resources, as well as significant costs, especially in maintaining and updating such an inventory.

The attached inventory represents a preliminary effort to identify directly or indirectly affiliated Federal Telehealth programs publicly represented at the time of the creation of ASPR. It is a broad list of publicly discoverable and subjectively identified Telehealth efforts, programs, and initiatives. It is not an attempt to present capabilities, capacity or accessibility of these programs, and is not meant to serve as an endorsement or verification of the integrity of any listing.

This report recommends the development of a nationwide registry, as described above. It remains to be determined whether or not the USG should play a role in the ownership or maintenance of such a registry.

[Note to Reviewers: The Inventory is available in a separate tab.]

Appendix B: Glossary of Terms

From the April 2008 *Defining Key Health Information Technology Terms* paper from ONC and the National Alliance for Health Information Technology, the following six definitions are proposed:

Electronic Medical Record (EMR): An electronic record of health-related information on an individual that can be created, gathered, managed, and consulted by authorized clinicians and staff within one health care organization.

Electronic Health Record (EHR): An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be created, managed, and consulted by authorized clinicians and staff across more than one health care organization.

Personal Health Record (PHR): An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be drawn from multiple sources while being managed, shared, and controlled by the individual.

Health Information Exchange (HIE): The electronic movement of health-related information among organizations according to nationally recognized standards.

Health Information Organization (HIO): An organization that oversees and governs the exchange of health-related information among organizations according to nationally recognized standards.

Regional Health Information Organization (RHIO): A health information organization that brings together health care stakeholders within a defined geographic area and governs health information exchange among them for the purpose of improving health and care in that community. RHIOs are the building blocks of the proposed National Health Information Network (NHIN) initiative.

Austere Care: Quality medical care delivered to individuals under conditions of duress, such as after a disaster or when medical supplies are insufficient for demand for emergency care. [40] .

Biosurveillance: Active data-gathering, analysis, and interpretation of biosphere data related to disease activity and threats to human and animal health to achieve early warning, detection, and situational awareness. [41]

Cloud-based Computing: A style of computing in which dynamically scalable and often virtualized resources are provided as a service over the Internet. [42]

Disaster Medical Response: The art and science of patient care under circumstances of stress when the number of patients exceeds the normal capacities. [43]

eHealth: Information and Communication Technologies tools and services for health. Covers the interaction between patients and health-service providers, institution-to-institution transmission of data, or peer-to-peer communication between patients and/or health professionals. Examples include health information networks, electronic health records, telemedicine services, wearable and portable systems which communicate, health portals, and many other ICT-based tools assisting disease prevention, diagnosis, treatment, health monitoring and lifestyle management. [44]

Emergency Support Function (ESF) #8: Public Health and Medical Services provides the mechanism for coordinated Federal assistance to supplement State, Tribal, and local resources in response to a public health and medical disaster, potential or actual incidents requiring a coordinated Federal response, and/or during a developing potential health and medical emergency. [45]

Enterprise Governance Board (EGB): Shortened version of the Public Health Emergency Medical Countermeasures (PHEMC) EGB. Chaired by The Assistant Secretary for Preparedness and Response (ASPR), and responsible for coordinating the research, development, regulation,

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[40] San Francisco Emergency Medical Services Agency "Austere Care Protocol" August 1, 2007. Retrieved April 13, 2009 from
www.sanfranciscoems.org/readDoc.php?cat=protocols&name=SFEMSA20070801Protocol100**AustereCare**&exten=pdf

[41] Homeland Security Presidential Directive/HSPD-21. Public health and medical preparedness. Washington, DC: The White House; October 18, 2007.

[42] *Gruman, Galen (2008-04-07).* "What cloud computing really means". *InfoWorld.* Retrieved March 13, 2009 from http://www.infoworld.com/article/08/04/07/15FE-cloud-computing-reality_1.html.

[43] James, James J, MD, DrPH, MHA. "Disaster Medicine and Public Health Preparedness: A Discipline for all Health Professionals". Concept Paper. June 9, 2008

[44] European Commission's Information Society. Retrieved April 13, 2009 from http://ec.europa.eu/information_society/activities/health/whatis_ehealth/index_en.htm

[45] FEMA Emergency Support Function #8 – Public Health and Medical Services Annex. Retrieved April 13, 2009 from http://www.fema.gov/pdf/emergency/nrf/nrf-esf-08.pdf

procurement, stockpiling, and deployment of medical countermeasures needed to protect the public during a public health emergency or medical disaster.[46]

Extensible Markup Language (XML): A general-purpose specification for creating custom markup languages. XML's purpose is to aid information systems in sharing structured data, especially via the Internet, to encode documents, and to serialize data.[47]

Mass Casualty Incident: An incident which generates more patients than available resources can manage using routine procedures.[48]

Mass Prophylaxis: The capability to protect the health of the population through administration of critical interventions (e.g., antibiotics, vaccinations, antivirals) to prevent the development of disease among those who are exposed or potentially exposed to public health threats.[49]

The National Response Framework: Presents the guiding principles that enable all response partners to prepare for and provide a unified national response to disasters and emergencies – from the smallest incident to the largest catastrophe. [50]

Nationwide Health Information Network (NHIN): An HHS initiative being developed to provide a secure, nationwide, interoperable health information infrastructure to connect providers, consumers, and others involved in supporting health and healthcare. The NHIN is envisioned to enable health information to follow the consumer, be available for clinical decision making, and support appropriate use of healthcare information beyond direct patient care so as to improve health.[51]

Public Health Emergency Preparedness: The capability of the public health and health care systems, communities, and individuals, to prevent, protect against, quickly respond to, and recover from health emergencies, particularly those whose scale, timing, or unpredictability threatens to overwhelm routine capabilities. Preparedness involves a coordinated and continuous process of planning and implementation that relies on measuring performance and taking corrective action[52].

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[46] U.S. Department of Health & Human Services. "Public Health Emergency Medical Countermeasures (PHEMC) Enterprise". Retrieved April 13, 2009 from http://www.hhs.gov/aspr/barda/phemce/index.html

[47] Bray, Tim; Jean Paoli, C. M. Sperberg-McQueen, Eve Maler, François Yergeau (September 2006). "Extensible Markup Language (XML) 1.0 (Fourth Edition)-Origin and Goals". *World Wide Web Consortium*. Retrieved April 13, 2009 from http://www.w3.org/TR/2006/REC-xml-20060816/#sec-origin-goals..

[48] Commonwealth of Virginia."Virginia Mass Casualty Incident Management Awareness Level Instructor Manual". Richmond, VA: Virginia Office of Emergency Medical Services, 2000. Retrieved April 13, 2009 from http://facultystaff.richmond.edu/~wgreen/conf7.pdf

[49] U.S. Department of Homeland Security. "Target Capabilities List A companion to the National Preparedness Guidelines". September 2007. Retrieved April 13, 2009 from https://www.rkb.us/download.cfm?id=1458

[50] U.S. Department of Homeland Security. "National Response Framework". January 2008. Retrieved April 13, 2009 from http://www.fema.gov/pdf/emergency/nrf/about_nrf.pdf

[51] U.S. Department of Health & Human Services. "Nationwide Health Information Network". Retrieved April 13, 2009 from http://www.hhs.gov/healthit/healthnetwork/background/

[52] Nelson C, Lurie N, Wasserman J, Zakowski S. "Conceptualizing and defining public health emergency preparedness". Am J Public Health. 2007 Apr;97 Suppl 1:S9-11. Epub 2007 Apr 5. Retrieved April 13, 2009 from http://www.ajph.org/cgi/content/full/97/Supplement_1/S9#otherarticles

Store and forward: A type of telehealth encounter or consult that uses still digital images of a patient for the purpose of rendering a medical opinion or diagnosis. Common types of S&F services include radiology, pathology, dermatology and wound care. Store and forward also includes the asynchronous transmission of clinical data, such as blood glucose levels and electrocardiogram (ECG) measurements, from one site (e.g., patient's home) to another site (e.g, home health agency, hospital, clinic)[53].

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[53] American Telemedicine Association. *Telemedicine/Telehealth Terminology*. Retrieved March 13, 2009, from http://www.americantelemed.org/files/public/abouttelemedicine/Terminology.pdf

Appendix C: Acronym List

AFHCAN   Alaska Federal Health Care Access Network

AHRQ   Agency for Healthcare Research and Quality

AKO   Army Knowledge Online

AMEDD   Army Medical Department

ASPR   Assistant Secretary for Preparedness and Response

ATA   American Telemedicine Association

BAMC   Brooke Army Medical Center

CCHT   VA Care Coordination Home Telehealth program

CDC   Centers for Disease Control and Prevention

CDRH   FDA Center for Devices and Radiological Health

CMS   Centers for Medicare & Medicaid Services

COCA   Clinician Outreach and Communication Activity

CPRS   VA's Computerized Patient Record System

CSAT   SAMHSA Center for Substance Abuse Treatment

CSH   Combat Support Hospital

D-ATM   Digital Access to Medication

DHS   Department of Homeland Security

DMAT   Disaster Medical Assistance Teams

DoC   Department of Commerce

DoD   Department of Defense

DOE   Department of Energy

EMAC	Emergency Management Assistance Compact
EMR	Electronic Medical Record
ESAR-VHP	Emergency System for Advance Registration of Volunteer Health Professionals
ESF	Emergency Support Function
FCC	Federal Communications Commission
FCVS	Federation Credentials Verification Service
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FHA	Federal Health Architecture
FMS	Federal Medical Station
FOIA	Freedom of Information Act
FSMB	Federation of State Medical Boards
FTCA	Federal Tort Claims Act
GPRMC	Great Plains Regional Medical Command
HAvBED	Hospital Available Beds for Emergencies and Disasters
HHA	Home Health Agency
HHS	Department of Health and Human Services
HIPAA	Health Insurance Portability and Accountability Act of 1996
HIE	Health Information Exchange
HIR	Health Information Repository
HISPC	Health Information Security and Privacy Collaboration
HIT	Health Information Technology

HITSP	Health Information Technology Standards Panel
HRSA	Health Resources and Services Administration
HSPD	Homeland Security Presidential Directive
IHS	Indian Health Service
IT	Information Technology
JPATS	Joint Patient Assessment and Tracking System (used by NDMS)
JVN	Joslin Vision Network
LPGP	Licensure Portability Grant Program
MGH	Massachusetts General Hospital
MHS	Military Health System
MTF	Military Treatment Facility
NASA	National Aeronautics and Space Administration
NBSB	National Biodefense Science Board
NCHM/GCM	CDC National Center for Health Marketing/Global Communication and Marketing
NDMS	National Disaster Medical System
NHIN	Nationwide Health Information Network
NLM	National Library of Medicine
NPDB	National Practitioner Data Bank
NOSC	Network Operations Security Center
NTP	VA National Teleradiology Program
OAT	HRSA Office for the Advancement of Telehealth
ONC	Office of the National Coordinator for Health Information Technology

OS	Office of the Secretary
PACOM	Pacific Command
PAHPA	Pandemic and All-Hazards Preparedness Act of 2006
PHEMC	Public Health Emergency Medical Countermeasures (Enterprise Governance Board)
PHSA	Public Health Service Act
POD	Point of Dispensing
POTS	Plain Old Telephone Service
PPS	Medicare's Home Health Prospective Payment System
RHC	Universal Service Rural Health Care
RPMS	IHS Resource Patient Management System
SAMHSA	Substance Abuse and Mental Health Services Administration
SARS	Severe Acute Respiratory Syndrome
TBH	Tele-Behavioral Health Service
UEVHPA	Uniform Emergency Volunteer Health Practitioners Act
USG	United States Government
VA	Department of Veterans Affairs
VHP	Volunteer Health Professional
VPN	Virtual Private Network
WAN	Wide Area Network
WRAMC	Walter Reed Army Medical Center
XML	Extensible Markup Language