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THERE'S A GAP FOR THAT: DETAILING POOR EMERGENCY RESPONSE OUTCOMES WHEN PUBLIC HEALTH PREPAREDNESS PLANS LACK OPERATIONAL SUBSTANCE

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NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

THERE'S A GAP FOR THAT: DETAILING POOR EMERGENCY RESPONSE OUTCOMES WHEN PUBLIC HEALTH PREPAREDNESS PLANS LACK OPERATIONAL SUBSTANCE

by

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March 2022

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Since the attacks of 9/11, the U.S. government has provided funding to federal, state, and local emergency response entities in order to prepare better for accidental, intentional, and natural threats. Public health departments have received grant funding in order to implement, maintain and exercise response plans within their purview. Grant requirements (deliverables) via the Centers for Disease Control and Prevention (CDC) have included submitting preparedness plans and providing after-action reports from both real-world emergencies and exercise events to ensure the funds are invested appropriately and effectively. Analysis in this thesis of real-world emergencies and the lessons learned from them demonstrates the grant funding is falling short of its goal by not assessing for operational content and practicality. The subsequent development in this thesis of an all-hazards audit tool should ensure the ability to assess operational content and identify gaps, which will lead to an improved state of readiness.

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THERE'S A GAP FOR THAT: DETAILING POOR EMERGENCY RESPONSE OUTCOMES WHEN PUBLIC HEALTH PREPAREDNESS PLANS LACK OPERATIONAL SUBSTANCE

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ABSTRACT

Since the attacks of 9/11, the U.S. government has provided funding to federal, state, and local emergency response entities in order to prepare better for accidental, intentional, and natural threats. Public health departments have received grant funding in order to implement, maintain and exercise response plans within their purview. Grant requirements (deliverables) via the Centers for Disease Control and Prevention (CDC) have included submitting preparedness plans and providing after-action reports from both real-world emergencies and exercise events to ensure the funds are invested appropriately and effectively. Analysis in this thesis of real-world emergencies and the lessons learned from them demonstrates the grant funding is falling short of its goal by not assessing for operational content and practicality. The subsequent development in this thesis of an all-hazards audit tool should ensure the ability to assess operational content and identify gaps, which will lead to an improved state of readiness.

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LIST OF ACRONYMS AND ABBREVIATIONS

APHL	American Public Health Laboratories
CBP	Customs and Border Patrol
COAD	Community Organizations Active in Disaster
ConOPS	Concept of Operations
COPD	Chronic Obstructive Pulmonary Disease
CRI	Cities Readiness Initiative
DGMQ	Division of Global Migration and Quarantine
DHHS	Department of Health and Human Services
DHS	Department of Homeland Security
DOJ	Department of Justice
EID	Emerging Infectious Disease
EUA	Emergency Use Authorization
EMS	Emergency Medical Services
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
GAO	Government Accountability Office
GIS	Geographic Information System
HAN	Health Alert Network
HPAI	Highly Pathogenic Avian Influenza
HSEEP	Department of Homeland Security Exercise and Evaluation Program
ICS	Incident Command System
IND	Investigation New Drug
LRN	Laboratory Response Network
MCM	Medical Countermeasures
ME	Medical Examiner
MOU	Memorandum of Understanding
MSA	Metropolitan Statistical Area
NIH	National Institutes of Health
NIMS	National Incident Management System

NIOSH	National Institute of Occupational Safety and Health
OB/GYN	Obstetrics/Gynecology
PAPR	Powered Air-Purifying Respirator
PEI	Potentially Exposed Individual
PHEP	Public Health Emergency Preparedness
POD	Point of Dispensing Site
PPE	Personal Protective Equipment
PUI	Person Under Investigation
SNS	Strategic National Stockpile
TAR	Technical Assistance Review
TOPOFF	Top Officials
VHF	Viral Hemorrhagic Fevers
VOAD	Volunteer Organizations Active in Disaster
WHO	World Health Organization

EXECUTIVE SUMMARY

A. PROBLEM STATEMENT

For 20 years, public health departments have been receiving federal funding to prepare for responses to public health emergencies.[1] Public health departments submit written response plans as stipulated by grant requirements, but these plans are not examined for their ability to carry out a successful emergency response. Nor are they adequately assessed for their operational content; as a result, when tested in a real-world emergency, the response incurs considerable delays with mitigation and reaching a recovery phase. In fact, several real-world public health emergencies were not planned for, which led to a delay during their respective response. This lack of planning placed a further burden not only on the public health system, but on other responder systems such as healthcare, the fire service, and emergency medical services. The diseases that caused these public health emergencies were in existence for many decades and had there been a clear, definable set of planning components that pre-identified gaps, this would have led to a better response outcome.

It is entirely possible to measure and assess the quality of public health preparedness plans and it is being done in certain, more restricted, settings. Seventy-two health departments in the United States receive additional funding via the CDC's Cities Readiness Initiative.[2] These jurisdictions are required to submit written plans specific to medical countermeasures distribution and dispensing to the public.[3] More important, these

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[1] "CDC's Public Health Emergency Preparedness Program: Every Response Is Local," Center for Preparedness and Response, October 7, 2021, https://www.cdc.gov/phpr/whatwedo/phep.htm.

[2] "Cities Readiness Initiative," State and Local Readiness, December 18, 2020, https://www.cdc.gov/cpr/readiness/mcm/cri.html.

[3] "Operational Readiness Review," State and Local Readiness, November 2, 2021, https://www.cdc.gov/cpr/readiness/orr.html.

particular written plans are measured for operability on a biannual basis.[4] Taking this best practice and applying it with an all-hazards approach for all health departments can lead to response plans that expeditiously resolve a public health emergency. The mere submission of plans does not make public health better prepared.

B. PURPOSE OF RESEARCH

Public health departments cannot continue to receive funding without producing defensible documentation that demonstrates their ability to efficiently respond to a public health emergency. Response plans must be thoroughly measured and assessed for operational content, either through real-world incidents or planned exercises. This thesis introduces a resource for public health departments that will help to develop functional response plans. As a result, the U.S. government can demonstrate fiscal accountability while defending the nation against intentional, accidental, and natural threats.

C. METHOD OF DATA GATHERING AND ANALYSIS

Over the last ten years, there have been three global public health emergencies: the 2009 novel H1N1 pandemic influenza, the 2015 Ebola virus, and the 2016 Zika virus.[5] These incidents serve as case studies to assess for lessons learned and identify planning gaps. Two of the three emergencies—the Ebola virus and the Zika virus—did not have any preparedness plans prior to the response; yet they were emerging in other countries decades before arriving in the United States.[6] Health officials were blindsided when the novel H1N1 influenza virus emerged in the spring of 2009. Preparedness planning practitioners

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[4] Centers for Disease Control and Prevention, *Public Health Emergency Preparedness (PHEP) Operational Readiness Review Guidance*, Budget Period 1 Supplemental July 1, 2018 to June 30, 2019 (Atlanta, GA: Centers for Disease Control and Prevention, 2018), 177, https://www.cdc.gov/cpr/readiness/00_docs/CDC_ORR_Guidance_September2018_Final_508_9.11.18.pdf

[5] As of this writing, the novel coronavirus pandemic response, (COVID-19) is ongoing; it is too early to have relevant data from this outbreak.

[6] Alexandra Phelan and Lawrence O. Gostin, "On Zika Preparedness and Response, the U.S. Gets a Failing Grade," *Health Affairs* (blog), April 28, 2016, https://www.healthaffairs.org/do/10.1377/hblog20160428.054662/full/.

were expecting H5N1 avian flu to have a global impact in the world.[7] As a result, response plans were written to that effect and did not address the possibility of a novel, non-avian flu emerging with virulent spread. While not every possible aspect can be planned for every disease, there are basic planning considerations regardless of the specific disease or pathogen in question.

A review of the literature reveals evidence of these planning gaps, and even the absence of plans altogether. Subsequently, further review exposed the impacts that the significant gaps had on previous emergency responses. Equally, research conducted for this thesis found a model practice in the CDC's Cities Readiness Initiative (CRI) local technical assistance review process that resulted in a successful deployment of medical countermeasures during the H1N1 novel influenza virus response.[8] Each disease from the case studies rendered different types of planning resources. Multiple guidance documents, planning checklists, and CDC websites were researched in order to extract pertinent and relative planning elements to insert into a prototype tool. While there were several different checklists for pandemic flu planning, each was in a different webpage location and had to be combined in order to be useful and create a comprehensive plan. Guidance documents for Zika and Ebola were labeled as archived content and did not include usable checklists but provided planning considerations, including actionable lists.

D. OVERVIEW OF FINDINGS

This research determined that without pre-established response plans and without a comprehensive list of planning elements, public health practitioners struggle through an emergency response. Further exploration found that planning resources are scattered and not user-friendly. In other words, public health planners are forced to hunt through various

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[7] Association of Public Health Laboratories, *Lessons from a Virus: Public Health Laboratories Respond to the H1N1 Pandemic* (Silver Springs, MD: Association of Public Health Laboratories, 2011), 29, https://www.aphl.org/aboutAPHL/publications/Documents/ID_2011Sept_Lessons-from-a-Virus-PHLs-Respond-to-H1N1-Pandemic.pdf.

[8] Centers for Disease Control and Prevention, *Division of Strategic National Stockpile: Local Technical Assistance Review Tool Users Guide* (Atlanta, GA: Centers for Disease Control and Prevention, 2010), 3, https://health.mo.gov/emergencies/sns/pdf/Local-TAR-Guide-January2010.pdf.

resources and websites to piece together components to develop a response plan. In addition, these resources are guidelines and/or planning templates that have not been formally tested for practicality. They are not mandated, but rather mere suggestions and guidelines to consider for plan writing. There is no auditing process that ensures the crucial components to a successful response are contained in its associated plan. With no standardization, planners are left to their own devices and varied interpretation methods in order to create a plan.

While there was a lack of standardization and consistency in the planning guidance, there was one practice that provided successful response outcomes for CRI recipients. The local technical assistance review for CRIs offered a set of prescribed planning elements that were required content for their medical countermeasures response plans.[9] Taking this concept, planning elements were placed into the prototype auditing tool, and lessons learned from the three case studies were tested against it. The results revealed that the lessons learned could have been avoided if the audit tool was in place prior to the disease outbreak. Due to the complexity of diseases, especially novel and emerging ones, there are unknowns that are impossible to prepare for. However, there are basic fundamentals of disease proliferation and emergency response that health practitioners can be prepared for, which are included in the prototype.

E. RECOMMENDATIONS AND JUSTIFICATIONS

Results from the case studies confirm public health is not prepared for novel, emerging diseases. The nation's public health infrastructure lacks formalized, pre-established decision-making processes. Therefore, when responding to these emergencies, public health consistently experiences barriers that prevent a swift resolution. However, the following recommendations to the CDC will improve upon the current planning practices and ensure the nation is better prepared for the next significant public health emergency.

[9] Centers for Disease Control and Prevention, 3.

1. Consolidate Planning Tools into One Document Per Hazard in One Retrievable Location

Public health preparedness planners are able to draft concise, operational response plans when resources for each hazard are succinct and explanatory. When all planners are utilizing the same resources, there is consistency during emergency responses. Placing these resources at the federal level provides access to all state, territorial, tribal, and local health departments.

2. Adopt an All-Hazards Audit Tool to Measure Response Plans

Utilizing an all-hazards audit tool ensures that plans are measured consistently throughout the country. The tool will assess the status of preparedness levels of each health department that receives grant funding. The tool will designate each listed planning requirement as completed, in progress, or not started. This enables the health departments to quickly identify their planning gaps and prioritize their mitigation measures.

3. Monitor Preparedness Plans On a Biannual Basis

Establishing a schedule in association with an auditing process ensures that there is forward progress to improve the preparedness levels for all health departments. Utilizing the data from the audit results allows the CDC to assess the need for more grant funding and would possess tangible evidence to support this request to the U.S. government. Consistent use of the audit tool would provide the CDC with invaluable feedback that includes identifying when the tool and planning resources require updates; and when health departments are unable to achieve completion status in a reasonable time and need further assistance. This practice confirms accountability of grant requirements and maintains fiscal responsibility to the U.S. government and its citizens.

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I. INTRODUCTION

A. PROBLEM STATEMENT

During the 2009 novel H1N1 pandemic influenza virus response, public health officials used two separate plans in their response: the Pandemic Influenza Plan and the Strategic National Stockpile/Medical Countermeasures Plan (SNS/MCM). The Pandemic Influenza Plan is neither reviewed nor audited for content via the Centers for Disease Control and Prevention (CDC), and at the time of the novel H1N1 pandemic response, pandemic influenza plans did not address novel influenza viruses, only H5N1 Avian influenza.[1] By not being prepared for the likelihood of a novel influenza, public health officials experienced delays with their response. Public health laboratories thought that they would have more time, that the virus would originate in Asia, and that the pandemic would more than likely be H5N1.[2] Contrary to the Pandemic Influenza Plan, the SNS/MCM Plan addresses medical countermeasures distribution and dispensing.[3] This plan is audited annually using a tool with a substantial set of measurable criteria. During the H1N1 pandemic influenza response, once public health departments received medical countermeasures, they were able to immediately dispense them to the public.[4]

The lack of written response plans for the 2014 Ebola virus and the 2015 Zika virus handicapped their timely containment. The Ebola virus response had significant delays in activating quarantine stations at U.S. ports of entry and with identifying and monitoring

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[1] Trust for America's Health, *Pandemic Flu Preparedness: Lessons from the Frontlines* (Washington, DC: Trust for America's Health, 2009), 3, http://www.centerforhealthsecurity.org/our-work/pubs_archive/pubs-pdfs/2009/2009-06-04-tfah2009-pan-flu-06.pdf.

[2] Association of Public Health Laboratories, *Lessons from a Virus*, 29.

[3] Centers for Disease Control and Prevention, *Division of Strategic National Stockpile*, 9.

[4] Kunal J. Rambhia et al., "Mass Vaccination for the 2009 H1N1 Pandemic: Approaches, Challenges, and Recommendations," *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science* 8, no. 4 (2010): 325, https://doi.org/10.1089/bsp.2010.0043.

travelers returning from Ebola-affected countries.[5] For the Zika response, existing mosquito vector control plans did not address this type of virus.[6] Although the mosquito species that could carry and spread Zika virus to humans lived in the United States, there was no proactive planning that had considered the threat until cases presented there.[7] These particular incidents demonstrate the consequences of not having preparedness response plans, and further, of not having plans audited by public health officials. By contrast, when a written plan had an assessment tool with a set of defined measures, as in the case of the SNS/MCM plan during the H1N1 Pandemic, that aspect of the response had a successful outcome.

To have an effective response, written emergency operations plans should be in place to address the minimum anticipatory actions. Such plans should be formally audited annually; that is, tangibly tested and measured for their quality, feasibility, and comprehensiveness. Although health departments must have existing plans and submit them annually or during designated grant cycles, auditing them is not required. When asked, subject matter experts at the CDC attribute the lack of auditing of other preparedness plans to a lack of funding and support. Not replicating the SNS/MCM audit process for other plans is a conundrum. No evidence or documentation explains the reasons or contributing factors accounting for this status quo.

B. RESEARCH QUESTION

How can components of prior and existing SNS/MCM Plan audit tools be used and applied to other response plans?

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[5] Beth P. Bell et al., "Overview, Control Strategies, and Lessons Learned in the CDC Response to the 2014–2016 Ebola Epidemic," *Morbidity and Mortality Weekly Reports Supplements* 65, no. 3 (July 8, 2016): 10, https://doi.org/10.15585/mmwr.su6503a2.

[6] Phelan and Gostin, "On Zika Preparedness and Response."

[7] Phelan and Gostin.

C. LITERATURE REVIEW

This literature review included research that provided details of how public health's role evolved after the attacks of 9/11 and how preparedness plans were assessed. Next, case studies involving three significant public health emergency responses occurring over the last ten years were reviewed for best practices and lessons learned. Best practices from the 2009 H1N1 pandemic influenza response found existing auditing processes contributed to successful outcomes during the response. Lessons learned from other responses revealed there were no plans in place. As a result, a prototype auditing tool was created from resource documents from each disease discussed in the case studies. Details of each area of research are discussed in the following sections.

1. The Role of Public Health: Pre- and Post-9/11

Before the 9/11 attacks, public health's role centered on health promotion, disease prevention, and outbreak response.[8] However, as a result of 9/11 and the anthrax letter attacks, disease prevention and outbreak response activities not only covered accidental and natural threats, but also intentional ones. After 9/11, the CDC formed the Public Health Emergency Preparedness Cooperative Agreement in 2002 that funded and mandated preparedness deliverables to state, local, tribal, and territorial public health departments.[9] Two years later, to further address gaps in medical countermeasures' distribution, the CDC formed the Cities Readiness Initiative (CRI) providing additional preparedness funding to 72 metropolitan statistical areas.[10] This initiative enabled public health to dispense medical countermeasures that protects over half of the nation's population.[11] The CDC created the

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[8] "What Is Public Health?," Public Health in Action, 2022, https://www.cdcfoundation.org/what-public-health.

[9] Ali S. Khan, "Public Health Preparedness and Response in the USA Since 9/11: A National Health Security Imperative," *Lancet* 378, no. 9794 (September 3, 2011): 2, https://doi.org/10.1016/S0140-6736(11)61263-4.

[10] Paul G. Renard, Jr. et al., "Improvements in State and Local Planning for Mass Dispensing of Medical Countermeasures: The Technical Assistance Review Program, United States, 2007–2014," *American Journal of Public Health* 107, no. S2 (September 2017): 201, https://doi.org/10.2105/AJPH.2017.304037.

[11] Renard, Jr. et al., 201.

Technical Assistance Review auditing process to objectively review documented plans and quantify medical countermeasures' distribution and dispensing capabilities.[12] This tool allowed public health to identify gaps in existing SNS/MCM preparedness plans.

2. Public Health Emergencies—Case Studies

The selected case studies demonstrated the disparity among existing public health preparedness plans. As Yin recommends for case study selection, each public health emergency was selected based on the access to sufficient data and its ability to clarify the research question.[13] These case studies demonstrated that when a written plan does not have an assessment tool with a set of defined measures, the associated response renders poor outcomes.

The 2009 novel H1N1 influenza virus caused public health practitioners to employ their pandemic influenza response plans. However, prior to this outbreak, the focus on pandemic flu planning was geared toward H5N1, "bird-flu," not a novel influenza strain.[14] Pandemic influenza plans did not have guidelines to mitigate new flu viruses. According to scientists from the National Institutes of Health (NIH), lessons learned from the H1N1 response suggest that response plans should consider other variant strains of influenza.[15]

Likewise, health officials spent decades responding to cases of Ebola virus in Africa. However, once an infected case arrived in the United States, it took several weeks to secure ports of entry and establish a monitoring system for travelers returning from Ebola-affected countries.[16] Congressional testimony from former Governor Ridge and former Senator Lieberman before the House of Representatives Committee on Homeland

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[12] Renard, Jr. et al., 201.

[13] Robert K. Yin, *Case Study Research: Design and Methods*, 5th ed. (Thousand Oaks, CA: Sage Publications, Inc., 2014), 28.

[14] Trust for America's Health, *Pandemic Flu Preparedness*, 3.

[15] J.K. Taubenberger and D.M. Morens, "Pandemic Influenza – Including a Risk Assessment of H5N1," *Revue Scientifique et Technique (International Office of Epizootics)* 28, no. 1 (April 2009): 14, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2720801/.

[16] Bell et al., "Overview, Control Strategies, and Lessons Learned," 10.

Security supported the claim that the federal government did not have systems in place to address not only exposed, suspected cases, but also effectively treat actively infected patients.[17]

A similar reactionary response transpired with Zika virus. This disease was also present in other countries for many decades. However, existing mosquito vector control plans did not address all disease-carrying mosquito species. Texas, one of the few states to experience local human transmission of Zika virus, had operational response guidelines for mosquito control that addressed all mosquito-borne diseases except for Zika.[18] Public health policy experts Lawrence Gostin and James Hodge reported to the Journal of the American Medical Association the disparity of mosquito abatement standards that exists among local and state authorities.[19] In the Health Affairs Blog, Lawrence Gostin and Alexandra Phelan argued that the lack of emergency funding would adversely affect reproductive care for Zika-exposed mothers and their unborn children.[20]

3. Previous Audit Tools and a Conceptualized All-Hazards Prototype

Previous versions of the CDC's CRI review tool were assessed by the RAND Corporation for their effectiveness in measuring preparedness plans.[21] Guidance documents exist for pandemic plans, but have not been implemented in a formal auditing

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[17] *Defending against Bioterrorism: How Vulnerable Is America? Hearing before the Committee on Homeland Security*, House of Representatives, 114th Cong., 1st sess., November 3, 2015, 1, https://www.govinfo.gov/content/pkg/CHRG-114hhrg99747/pdf/CHRG-114hhrg99747.pdf.

[18] Texas Department of State Health Services, *Vector Control 2015: Response Operating Guidelines* (Austin, TX: Texas Department of State Health Services, 2015), 6–7, https://dshs.texas.gov/commprep/response/1ROG/pdf/2015-ROG-Vector-Control.doc.

[19] Lawrence O. Gostin and James G. Hodge, "Is the United States Prepared for a Major Zika Virus Outbreak?," *Journal of the American Medical Association* 315, no. 22 (2016): 2396, https://jamanetwork.com/journals/jama/fullarticle/2514046.

[20] Phelan and Gostin, "On Zika Preparedness and Response."

[21] Henry H. Willis et al., *Initial Evaluation of the Cities Readiness Initiative* (Santa Monica, CA: RAND Corporation, 2009), iii, https://www.rand.org/pubs/technical_reports/TR640.html.

process.[22] Planning guidance for Ebola and Zika was created during their respective responses. However, this guidance did offer helpful additions to the prototype tool. Templates, tools, and guidelines from the CDC, the American Public Health Association (APHA), the National Institutes of Health (NIH), and the World Health Organization (WHO) were compiled and analyzed for a list of components to add to the prototype tool. All of the components needed for the analysis were publicly available via these websites.

D. RESEARCH DESIGN

This thesis conducted a gap analysis of three public health emergency responses: the 2009 novel H1N1 influenza virus, the 2014 Ebola virus disease, and the 2015 Zika virus. These responses were presented as three individual case studies. These case studies allowed us to analyze evidence in multiple circumstances to discover common patterns.[23] As a result, these real-world events represented the challenges public health departments faced, including barriers to mitigation and the quantifiable lessons learned from each response. Furthermore, these selected case studies support Yin's exemplary case study research format: they are significant, unusual, nationally important in policy formation, and display sufficient evidence.[24]

The sources selected to support the case study analysis included lessons learned from the CDC and from third-party, non-profit, non-partisan, unbiased entities that annually review public health services and emergency responses to ensure quality improvement of state and local health departments as well as federal health-related agencies. Additional sources substantiating the response failures included data from congressional hearings and reputable public health experts. Outbreak and response timelines provided further detail on failure points of each case study.

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[22] "Preparing for Pandemic Influenza," Policy Statements and Advocacy, November 8, 2006, https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/18/09/19/preparing-for-pandemic-influenza.

[23] Yin, *Case Study Research*, 144–45.

[24] Yin, 204–5.

For the next portion of the thesis design, previous and current versions of the CDC's CRI review tool were analyzed to show how this program's structure and its quantifiable scoring tool provided clarity and accountability for preparedness planning and emergency response.[25] Results demonstrated the portions of the existing SNS/MCM audit tool that allowed for a successful MCM distribution response during H1N1.

Next, by taking portions of the SNS/MCM audit tool, existing checklists and planning guidance, a prototype audit tool was designed. From this tool, I simulated a process similar to the CRI auditing procedure. This prototype allows the reader to visualize the auditing experience.[26] The prototype was applied to the original failure points of the three case studies to test the prototype's efficacy. This area of the thesis explored whether or not an audit tool could provide a better response outcome. This process provided opportunities to discover modifications to the prototype that could not be predicted without the case studies. This was an organic exploration and subsequent discovery that could lead to more efficient public health emergency responses in the future.

Chapter II provides the necessary background and reasons why public health had to evolve into a response agency. Chapter III will highlight significant public health emergencies within the last 10 years that reveal delays and inadequacies with response mechanisms. Chapter IV explores how an existing audit tool assisted with a successful medical countermeasures distribution and dispensing campaign during the 2009 H1N1 influenza response. Chapter V introduces the reader to a prototype tool that would have prevented these response issues and stop the same from occurring with other public health emergencies in the future.

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[25] Willis et al., *Initial Evaluation of the Cities Readiness Initiative*, 48.

[26] Seth Gottlieb, "POC, Prototype, or Pilot? When and Why," *Content Here: Where Content Meets Technology* (blog), March 6, 2007, http://www.contenthere.net/2007/03/poc-prototype-or-pilot-when-and-why_92.html.

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II. BACKGROUND OF PUBLIC HEALTH EMERGENCY PREPAREDNESS PLANNING

The following chapter is a chronological exploration of public health's evolution into emergency response after the 9/11 attacks. Information provided details the gradual formulation of preparedness planning, laboratory testing capacity, and strengthening response capabilities. Real-world responses demonstrate the roles and responsibilities public health practitioners embraced in order to mitigate emerging public health threats.

A. PRE-9/11

In the United States, the role of public health includes the promotion of healthy lifestyles, the prevention of disease and injury, and the prevention and response to infectious diseases. Programs and services within public health may include immunizations, family planning and contraception, nutrition and breastfeeding education, school health education, sexually-transmitted infection prevention and treatment services, and other infectious disease surveillance and treatment. However, in 1984, public health was introduced to the first incident of bioterrorism. In order to affect an outcome of a local election in The Dalles, Oregon, the Rajneeshees religious cult tainted a local restaurant's salad bar with *Salmonella typhimurium*, which caused food poisoning, infecting over 700 people.[27]

But it was not until the mid-1990s that government officials took note of several events in other countries that placed the idea of bioterrorism on their radar. During this decade, Russia's bioweapon facility in Koltsovo, Novosibirsk was known for experimenting with the smallpox virus and viral hemorrhagic fevers, including Ebola and Marburg.[28] In 1994, during a presentation to the National Academy of Sciences, a Russian bioweapons expert, Anatoliy Vorobyov, confirmed the top three pathogens considered for

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[27] Kathleen C. Bailey, *The Biological and Toxin Weapons Threat to the United States* (Fairfax, VA: National Institute for Public Policy, 2001), 7.

[28] D. A. Henderson, "Bioterrorism as a Public Health Threat," *Emerging Infectious Diseases* 4, no. 3 (September 1998): 488, https://wwwnc.cdc.gov/eid/article/4/3/98-0340_article.

bioterrorism were smallpox, anthrax, and plague.[29] In 1995, the members of the Japanese cult Aum Shinrikyo not only released Sarin gas in the Tokyo subway, but also planned to obtain botulinum toxin and anthrax cultures, and had previously traveled to Africa to obtain Ebola virus for bioweaponry.[30] Also in 1995, Iran confirmed it produced artillery to aerosolize *Bacillus anthracis* and botulinum toxin.[31] These incidents forced government officials to critically assess the current state of bioterrorism preparedness in the nation.

In order to fully understand the vulnerabilities within the United States, government officials conducted assessments that explored preparedness levels in response to public health related emergencies. Several tabletop exercises took place throughout the United States. In May 2000, the United States Department of Justice (DOJ) and the Federal Emergency Management Agency (FEMA) co-sponsored the TOPOFF (Top Officials) Exercise Series. The exercise scenario involved a bioterrorism agent released in Denver, Colorado.[32] According to the exercise series, pneumonic (respiratory) plague had been weaponized by terrorists, and there was a subsequent mustard gas release in Portsmouth, New Hampshire.[33] Lessons learned from this exercise concluded government officials needed to improve crisis and consequence management, adhere to the unified command structure, and ensure protection measures for both emergency responder and healthcare personnel.[34] In June of 2001, the Dark Winter Exercise was held at Andrews Air Force Base in Washington, D.C., in which former senior government officials responded to an intentional smallpox attack in the United States.[35] Results from this exercise were similar

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[29] Henderson, 488.

[30] Henderson, 488.

[31] Henderson, 488.

[32] National Response Team, *Exercise TOPOFF 2000 and National Capital Region (NCR): After Action Report* (Washington, DC: National Response Team, 2001), 1, https://www.nrt.org/sites/2/files/TOPOFF.pdf.

[33] National Response Team, 1.

[34] National Response Team, 9.

[35] "Dark Winter," Events Archive, 2001, http://www.centerforhealthsecurity.org/our-work/events-archive/2001_dark-winter/index.html.

to those in the TOPOFF series. However, participating government officials were even more concerned that decision making processes were especially difficult and complex when a biological pathogen was weaponized.[36] These exercises highlighted systemic weaknesses and difficulties responders could expect to face; exercise analysts subsequently found the nation unprepared for a biological attack.[37]

B. 9/11 AND THE ANTHRAX LETTERS ATTACK

Three unexpected events soon challenged the public health's emergency response capabilities. While after-action reports from the TOPOFF and Dark Winter exercises were still in draft form, the 9/11 terrorist attacks on the World Trade Center towers in New York City, and the Pentagon in Washington, D.C., occurred.[38] Still reeling from this unprecedented, catastrophic event, less than one month later, the U.S. experienced the anthrax letters attack: letters containing weaponized, inhalational anthrax, a highly infectious bacterium targeting the respiratory tract and mimicking flu-like symptoms, were sent via the United States Postal Service to several states on the east coast. Media personnel, United States Senators, and United States Postal Workers were either sent or came in contact with these letters.[39] Facilities in Florida, New York City, New Jersey, Connecticut, and Washington, D.C., were all affected.[40] A total of twenty-two people were infected with either cutaneous (skin) or inhalation (lungs) anthrax; five of those infected with the inhalation form died.[41] Inhalational anthrax is the most severe type with an 85–90% mortality rate sans treatment, and a 45% mortality rate with immediate aggressive

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[36] Tara O'Toole, Mair Michael, and Thomas V. Inglesby, "Shining Light on 'Dark Winter,'" *Clinical Infectious Diseases* 34, no. 7 (April 2002): 981, https://doi.org/10.1086/339909.

[37] Center for Counterproliferation Research, *Anthrax in America: A Chronology and Analysis of the Fall 2001 Attacks* (Washington, DC: National Defense University, 2002), 6, https://fas.org/irp/threat/cbw/anthrax.pdf.

[38] Center for Counterproliferation Research, 1.

[39] Center for Counterproliferation Research, 1.

[40] Center for Counterproliferation Research, 2.

[41] Center for Counterproliferation Research, 1.

antibiotic treatment.[42] The initial case and first death, photojournalist Robert Stevens, was initially misdiagnosed with pneumonia.[43] Although he received a tainted letter, there was no way for Mr. Stevens to suspect it contained anthrax. As a result, he waited to seek care well after symptoms developed. It was the timing of several fellow co-workers falling ill that quickly raised suspicions and initiated rapid testing.[44]

Within a year of both the 9/11 attacks and anthrax letters, several changes occurred to address the nation's security. First, the United States Postal Service had to quickly activate new irradiation procedures for federal mail. In a congressional report via the Government Accountability Office (GAO), from November 2001 through April 2008, "1.2 million containers of D.C. federal mail were irradiated costing over $74.7 million."[45] Next, response planning was completely revamped, the Department of Homeland Security was formed, and new grant funding streams were established. The 9/11 attacks raised many issues with the existing preparedness levels of first responders. According to the CDC, first responders were poorly trained and lacked proper equipment for their roles.[46] The CDC also found that the high rates of respiratory illness in New York City rescue workers were linked to inadequate use of personal protective equipment.[47] As a result, more attention was focused on protecting first responders who were now evolving their response initiatives for terror attacks.

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[42] "Types of Anthrax," Anthrax, November 20, 2020, https://www.cdc.gov/anthrax/basics/types/index.html.

[43] Center for Counterproliferation Research, *Anthrax in America*, 6.

[44] Center for Counterproliferation Research, 1.

[45] Phillip R. Herr, *United States Postal Service: Information on the Irradiation of Federal Mail in the Washington, D.C., Area*, GAO-08-938R (Washington, DC: Government Accountability Office, 2008), 3, https://www.gao.gov/products/gao-08-938r.

[46] Khan, "Public Health Preparedness and Response in the USA Since 9/11," 1.

[47] Khan, 1.

C. THE BIRTH OF PUBLIC HEALTH EMERGENCY PREPAREDNESS

After the 9/11 attacks, public health took on a new role to address and prepare for the potential of bioterrorism attacks. Beginning in 2002, the Public Health Emergency Preparedness (PHEP) Cooperative Agreement was established via the CDC in order to fund state, local, tribal, and territorial public health departments. Since its inception, the purpose of the cooperative agreement has afforded the public health system the capability to effectively respond to evolving threats and other emergencies beyond normal daily capacity levels.[48]

As a result of the CDC funding stream, public health began to develop its emergency preparedness infrastructure. As a start, the CDC wanted public health officials to integrate effectively during an emergency with other response agencies such as emergency management, law enforcement, fire/EMS, and hospital partners. Therefore, public health departments were required to obtain the Federal Emergency Management Agency's (FEMA) National Incident Management System/Incident Command System (NIMS/ICS) training.[49] Public health emergency preparedness staff participated in both discussion- and operations-based response exercises with emergency responders. Previously siloed programs within public health that were never a part of an emergency assembled into inter-departmental collaborations in order to work synergistically during a response. For instance, staff from both nutrition and nursing services became a part of response teams during disease outbreaks and bioterrorism exercises. Standard operating procedures used by field level public health responders became a part of a larger comprehensive written response plan to encompass all levels and phases of a public health emergency.[50]

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[48] Department of Health and Human Services, *Hospital Preparedness Program - Public Health Emergency Preparedness Cooperative Agreement Department of Health and Human Service* (Washington, DC: Department of Health and Human Services, 2018), 1–2, https://www.cdc.gov/phpr/readiness/00_docs/HPP-PHEP-Cooperative-Agreement-CDC-RFA-TP17-17010201SUPP18.pdf.

[49] Centers for Disease Control and Prevention, *Division of Strategic National Stockpile*, 7.

[50] Centers for Disease Control and Prevention, 54.

The funding and grant deliverables also helped to address gaps and deficiencies related to medical countermeasures capacity in the event of a bioterrorism attack. Assessments found the existing National Pharmaceutical Stockpile did not fully address how the stockpile would reach affected populations.[51] In 2003, the National Pharmaceutical Stockpile formed in 1999 was renamed the Strategic National Stockpile and placed under the Department of Health and Human Services in collaboration with the CDC.[52] To build further logistical infrastructure around this capacity, the CDC adopted the best practice of antibiotic use from the 2001 anthrax letters response and applied it to form the Cities Readiness Initiative (CRI) Program the following year, in 2004.

The CDC's CRI program was implemented in 72 cities and metropolitan statistical areas (MSAs) to provide additional funding and preparedness mandates related to the Strategic National Stockpile, including medical countermeasures distribution and dispensing.[53] The premise behind the CRI program was for designated public health departments to provide medical countermeasures to 100% of their populations within 48 hours in order to prevent illness or death from the bioterrorism agent.[54] This timeframe correlates with the incubation period for anthrax. In order to preventatively treat such a significant portion of a population within 48 hours, local health departments had to identify points of dispensing sites and establish them in a ready-state for the public to access and obtain the necessary medical countermeasures.

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[51] Steven D. Bice, "The U.S. National Pharmaceutical Stockpile Program: 'Buying Is the Easy Part,'" in *Proceedings of the Second Chemical and Biological Medical Treatment Symposium - Industry II World Congress on Chemical and Biological Terrorism*, ed. Barbara Price, Slavlvo Bokan, and Zvonko Oreliovec (Aberdeen, MD: Applied Science and Analysis Inc., 2002), 453, https://www.hsdl.org/?abstract&did=713135.

[52] "Stockpile Responses: History," Stockpile Responses, February 11, 2022, 1, https://www.phe.gov/about/sns/Pages/responses.aspx.

[53] Centers for Disease Control and Prevention, "Cities Readiness Initiative."

[54] Willis et al., *Initial Evaluation of the Cities Readiness Initiative*, xiii.

D. PUBLIC HEALTH LABORATORY CAPACITY

In addition to the medical countermeasures planning for a bioterrorism response, laboratory capacity for testing and specimen identification is crucial. This proved to be a critical component during the response to the anthrax letter attacks, and fortunately there was a laboratory system in place that was able to test for bioterrorism agents. Becoming operational in 1999, the Laboratory Response Network (LRN), a multi-tiered network of laboratories throughout the United States, was established by the Association of Public Health Laboratories (APHL), the CDC, and the Federal Bureau of Investigation (FBI) under Presidential Decision Directive 39.[55] The LRN was tasked with maintaining "an integrated national and international network of laboratories fully equipped to respond quickly to acts of chemical or biological threats, emerging infectious diseases, and other public health threats and emergencies."[56]

Nonetheless, due to the complexity of a multi-state response to the anthrax letters, a significant burden was placed on the LRN to test and rapidly identify the suspected bioterrorism agent. Not only were public health laboratories in the affected areas impacted (Florida, New York City, New Jersey, Connecticut, and Washington, D.C.), fire and law enforcement agencies from across the nation responded to suspicious powder packages, including the west coast:

> The Arizona PHL, for example, was far from any confirmed case of anthrax. Yet it received over 1,000 suspect samples and had staff doing anthrax testing on Thanksgiving, Christmas Eve and Christmas, with three shifts per day. When all was said and done, LRN laboratories successfully identified the method of exposure and tested over 125,000 samples to rule out anthrax contamination.[57]

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[55] Nancy Maddox, *10 Years after 9/11 & Anthrax: Lab Preparedness Put to the Test* (Silver Spring, MD: Association of Public Health Laboratories, 2011), 2, https://www.aphl.org/aboutAPHL/publications/Documents/COM_2011Sep_LMAnthrax10YearsFeature.pdf.

[56] "Frequently Asked Questions about the Laboratory Response Network (LRN)," Emergency Preparedness and Response, Lab Info, April 10, 2019, 1, https://emergency.cdc.gov/lrn/factsheet.asp.

[57] Maddox, *10 Years after 9/11 & Anthrax*, 4.

While the laboratories across the nation were able to meet the demands of this response, more work was needed to ensure sustainability in future responses. The CDC convened a meeting in December 2001 to identify and address lessons learned from the anthrax response and devise a work plan to prepare for future attacks.[58]

E. THE STATUS OF PREPAREDNESS: 2000–2008

From tragic events, preparedness measures emerged. Training, system enhancements, program creation, and funding opportunities improved from identified gaps prior to and as a result of 9/11. The nation was on a path to establish a more resilient infrastructure, and the CDC monitored the effectiveness of the funding. The following table highlights the progression of public health preparedness planning.

Table 1. The Status of Preparedness Planning from 2000–2008

Pre-9/11	Post-9/11
• Limited Tabletop Exercises with Preparedness Deficiencies[59]	• Mandated Training on NIMS/ICS[60]
• A "Young and Untested"[61] Laboratory Response Network	• Rapid Anthrax Identification via the Laboratory Response Network
• National Pharmaceutical Stockpile with Minimal Distribution Planning[62]	• Strategic National Stockpile with Distribution and Dispensing Considerations[63]
• Non-Existent Public Health Emergency Preparedness Program	• CDC Public Health Emergency Preparedness Cooperative Agreement and Cities Readiness Initiative Program

[58] Center for Counterproliferation Research, *Anthrax in America*, 8–9.

[59] Center for Counterproliferation Research, 6.

[60] Centers for Disease Control and Prevention, *Division of Strategic National Stockpile*, 7.

[61] Maddox, *10 Years after 9/11 & Anthrax*, 2.

[62] Bice, "The U.S. National Pharmaceutical Stockpile Program."

[63] Centers for Disease Control and Prevention, "Cities Readiness Initiative."

The PHEP funding and accompanying grant deliverables provided a basis for public health to train and prepare its personnel, to build upon its existing infrastructure, and to maintain its status as subject matter experts for biological, chemical, radiological, and nuclear threats. These actions were incrementally phased throughout the 2000s and further advancements in preparedness assessments occurred later in the decade. In 2007, the CDC requested the RAND Corporation to conduct an initial, independent analysis of the CRI program to determine if CRIs had improved their ability to dispense medical countermeasures.[64] Based on the initial evaluation, RAND concluded the CRIs improved their ability "to rapidly dispense lifesaving medications and other medical supplies on a large scale."[65] Based on this assessment, the CRI program provided clear objectives in order to reach an improved state of readiness. Public health departments' capabilities significantly changed since the attacks of 9/11.

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[64] Willis et al., *Initial Evaluation of the Cities Readiness Initiative*, xiii.

[65] Willis et al., xiii.

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III. REAL-WORLD PUBLIC HEALTH EMERGENCIES—CASE STUDIES

The following chapter discusses real-world public health emergencies that serve as case studies to test whether the public health system in the United States is sufficiently prepared to protect the public's health. The real-world cases were selected based on the challenges public health departments faced, including barriers to mitigation, and the availability of quantifiable lessons learned from each response. These case studies are indelibly etched in public health history and dynamically changed the response strategies applied to public health emergencies.

A. CASE STUDY: THE NOVEL H1N1 INFLUENZA RESPONSE, 2009

Influenza has been a global health threat for centuries. In a typical year in the United States, influenza sickens between 5 to 20 percent of the population; over 200,000 are hospitalized, and 36,000 will die.[66] There are three types of influenza viruses that affect humans: Type A, B, and C.[67] Influenza A viruses are further typed by their strain: hemagglutinin (H) and neuraminidase (N); currently there are 18 H strains and 11 N strains of influenza A viruses.[68] Influenza A viruses are responsible for causing pandemics, which are new influenza strains that spread rapidly, cause more severe illness, and have higher fatality rates.[69] The structure of influenza virus strains is further complicated by their genetic details. For example, three pandemics have happened in the twentieth century, occurring in 1968, 1957, and 1918; all three were Influenza A H1N1 strains, but were

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[66] "NIH Fact Sheets - Influenza," NIH Fact Sheets Home, June 30, 2018, https://archives.nih.gov/asites/report/09-09-2019/report.nih.gov/nihfactsheets/ViewFactSheet44bd.html?csid=133&key=I#I.

[67] "Types of Influenza Viruses," Influenza (Flu), November 2, 2021, https://www.cdc.gov/flu/about/viruses/types.htm.

[68] Centers for Disease Control and Prevention and National Center for Immunization and Respiratory Diseases (NCIRD).

[69] "Pandemic Influenza (Flu)," Influenza (Flu), May 12, 2020, https://www.cdc.gov/flu/pandemic-resources/index.htm.

genetically different from each other.[70] The next pandemic did not occur until the next century.

Pandemic planning based on known viruses did not prepare the country for new ones. A novel H1N1 influenza virus made its way from Mexico to California in April of 2009. While pandemic influenza planning had been in place since the 1976 Swine Flu outbreak, it was not until the H5N1 influenza strain emerged in the late 1990s in Asia that the emphasis and mandates for pandemic flu planning proved paramount.[71] However, the focus on pandemic flu planning was geared towards H5N1, not a novel influenza strain.[72] Mostly in Asia, H5N1 viruses were common in poultry, infecting people with mortality rates up to 60%.[73] Therefore, pandemic plans focused on preparing specifically for the H5N1 virus. Pandemic influenza plans did not have guidelines to mitigate new flu viruses. Consequently, plans did not support the H1N1 response.[74]

While pandemic flu planning was forced to change due to lessons learned, health departments inadequately addressed response considerations. Grant deliverables from 2009 to 2017 had been assessed not for content, but rather only that they were in place. The CDC in 2018 released interim planning guidelines and a supplemental checklist that expands the scope of pandemic flu planning to include vaccine manufacturing delays.[75] This new interim guidance is just that, interim. In other words, this guidance has not been permanently adopted. Over ten years after the H1N1 influenza response, grant deliverables

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[70] Centers for Disease Control and Prevention.

[71] Taubenberger and Morens, "Pandemic Influenza – Including a Risk Assessment of H5N1," 14.

[72] Trust for America's Health, *Pandemic Flu Preparedness*, 3.

[73] "The 2009 H1N1 Pandemic: Summary Highlights, April 2009-April 2010," H1N1 Flu, June 16, 2010, 1, https://www.cdc.gov/h1n1flu/cdcresponse.htm.

[74] Trust for America's Health, *Pandemic Flu Preparedness*, 3.

[75] Centers for Disease Control and Prevention, *Interim Updated Planning Guidance on Allocating and Targeting Pandemic Influenza Vaccine during an Influenza Pandemic* (Atlanta, GA: Centers for Disease Control and Prevention, 2020), 3, https://www.cdc.gov/flu/pandemic-resources/national-strategy/planning-guidance/index.html.

are just now starting to address the need for operational readiness.[76] The grant agreement for this current 5-year project period reads, "…beginning in Budget Period 1 Supplement, PHEP recipients must start adapting work plans as necessary to ensure they have in place essential planning and operational elements to respond to an emerging infectious disease (EID) such as pandemic influenza, in addition to an intentional release of a Category A agent such as anthrax."[77] Although this deliverable is addressed in the current grant funding agreement, it will take several years of exercise and evaluation in order to make the plans fully operational.

This delay in preparedness planning creates an issue if another novel influenza virus emerges before health departments are ready. Not having the critical components of a robust pandemic influenza plan will make it difficult for public health departments to respond effectively and expeditiously. If a vaccine is not allocated correctly, public messaging is not concise, and staff are not prepared to respond, health officials lose credibility with the public. If public health departments are not mandated to exercise a pandemic influenza scenario, they may choose other priorities to work on.

In order to better prepare for the next pandemic, public health departments should test the interim guidance and supplemental checklist. As a result, planning gaps will be identified and mitigated prior to a real-world response. Based on lessons learned and the interim guidance, the following should be addressed:

- Ensure response plans are adaptable and science-driven to address all H and N flu strains that can range from mild to severe[78]
- Identify pandemic flu vaccine populations and priority target groups[79]
- Establish vaccination clinics to account for the entire population[80]

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[76] Office of Public Health Preparedness and Response, *Public Health Preparedness and Response: 2018 National Snapshot* (Atlanta, GA: Centers for Disease Control and Prevention, 2018), 56, https://www.cdc.gov/cpr/pubs-links/2018/documents/2018_Preparedness_Report.pdf.

[77] Department of Health and Human Services, *Hospital Preparedness Program*, 7.

[78] Trust for America's Health, *Pandemic Flu Preparedness*, 3.

[79] Centers for Disease Control and Prevention, *Interim Updated Planning Guidance*, 14.

[80] Centers for Disease Control and Prevention, 15.

- Ensure public messaging addresses vaccination target groups[81]
- Calculate and assess both workforce and school absenteeism[82]
- Test plans and submit an after action report[83]

Additionally, public health must continue to message the importance of annual flu vaccination, which imparts healthy lifestyle choices. Seasonal influenza vaccine programs not only protect the public from the flu, they prepare for future severe pandemics.[84] Ironically, seasonal influenza vaccination coverage is routinely low each season even when influenza case numbers and severity are high: "The 2017–18 flu season was a high severity season with high levels of outpatient clinic and emergency department visits for flu-like illness, high flu-related hospitalization rates, and elevated and geographically widespread flu activity across the United States for an extended period."[85] Regardless of the severity of the flu season, vaccination coverage for adults that year was 37.1%, which was a 6.2% decrease from the previous flu season.[86] Low vaccination coverage places a high demand on healthcare, emergency response, and public health systems respectively. The workforce and educational systems also suffer through high absenteeism. The consequences of ignoring preventative measures are exponential in a pandemic.

B. CASE STUDY: EBOLA RESPONSE, 2014

The Ebola virus has been around for many decades, causing communicable disease spread with high mortality rates predominantly in African countries. Scientists first found

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[81] Centers for Disease Control and Prevention, 4.

[82] Trust for America's Health, *Pandemic Flu Preparedness*, 4.

[83] Centers for Disease Control and Prevention, *Interim Updated Planning Guidance*, 13.

[84] Rambhia et al., "Mass Vaccination for the 2009 H1N1 Pandemic," 328–29.

[85] "Estimates of Influenza Vaccination Coverage among Adults—United States, 2017–18 Flu Season," FluVaxView, November 5, 2018, https://www.cdc.gov/flu/fluvaxview/coverage-1718estimates.htm.

[86] Centers for Disease Control and Prevention.

the Ebola virus in 1976 near the Ebola River, in an area which is now known as the Democratic Republic of Congo.[87]

Ebola virus is considered a Category A agent that may be used for bioterrorism, along with anthrax, botulism, plague, smallpox, tularemia, and viral hemorrhagic fevers.[88] All but one disease in this list, smallpox, are currently naturally occurring. According to the CDC's bioterrorism agents list, these high-priority agents pose a risk to national security because they:

- can be easily disseminated or transmitted from person to person;
- result in high mortality rates and have the potential for major public health impact;
- might cause public panic and social disruption; and
- require special action for public health preparedness.[89]

The Ebola virus can pose a significant threat to the United States. The CDC has been monitoring this disease since 1976, but it took an unsuspecting flight into the United States to wreak havoc on the healthcare system and instill intense public fear.[90] A Liberian national arrived in the United States from Monrovia, Liberia. He left Liberia on September 19, 2014, and arrived in Dallas, Texas on September 20, 2019.[91] On October 8, 2014, he died of Ebola at Texas Health Presbyterian Hospital.[92] During the time of his travel and subsequent death, West Africa was experiencing its worst Ebola epidemic. Data in Figure 1 illustrates the numbers of cases that affected the entire West Africa region from 2014 to 2016:

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[87] "History of Ebola Virus Disease (EVD) Outbreaks," Ebola (Ebola Virus Disease), February 22, 2022, https://www.cdc.gov/vhf/ebola/history/chronology.html.

[88] "Bioterrorism Agents/Diseases by Category," Emergency Preparedness & Response, April 4, 2018, https://emergency.cdc.gov/agent/agentlist-category.asp.

[89] Centers for Disease Control and Prevention, 1.

[90] Bell et al., "Overview, Control Strategies, and Lessons Learned," 10.

[91] Jolie Kaner and Sarah Schaack, "Understanding Ebola: The 2014 Epidemic," *Globalization and Health* 12, no. 1 (December 2016): 4, https://doi.org/10.1186/s12992-016-0194-4.

[92] Elizabeth Anderson-Fletcher, Dusya Vera, and Je'Anna Abbott, "How Mindful Is Your Company? Lessons for Organizations from the Texas Health Presbyterian Hospital Ebola Crisis," *Organizational Dynamics* 46, no. 4 (October 2017): 1, https://doi.org/10.1016/j.orgdyn.2017.06.001.

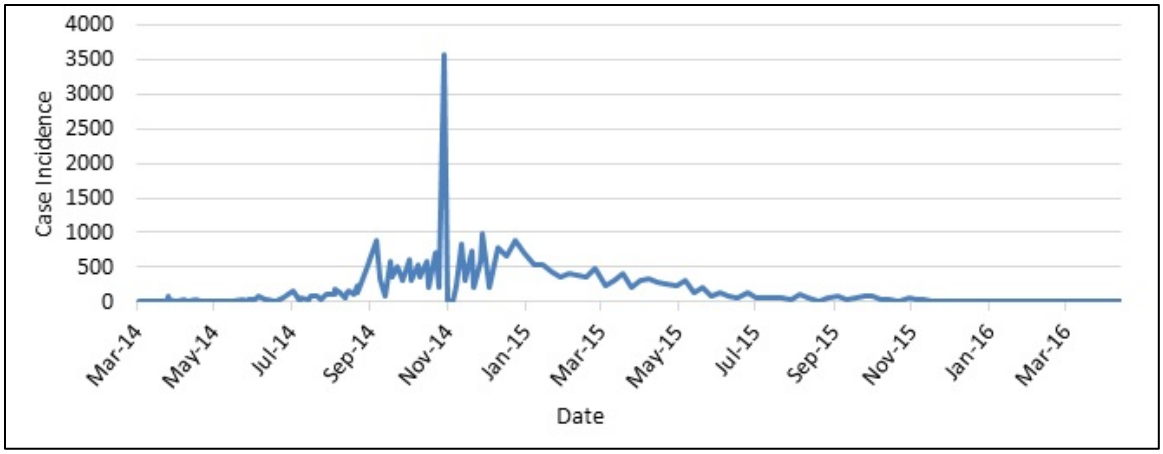

Figure 1. The Frequency of New Cases in Guinea, Liberia, and Sierra Leone during the Ebola Outbreak from March 25, 2014, to April 13, 2016[93]

Figure 2 reveals the timeline from the traveler's Ebola virus exposure to his death, which totals only 24 days. Several cascading events occurred with this case, beginning with his misdiagnosis by the hospital.[94] On September 25, he became symptomatic, sought care in the emergency department, and was sent home. On September 28, he was rushed to the hospital via ambulance.[95] The emergency medical services crew was not wearing personal protective equipment, and the ambulance unit remained in service for another two days before it was decontaminated.[96] The patient was not diagnosed until September 30 when tests revealed he was positive for Ebola virus.[97]

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[93] "2014 Ebola Outbreak in West Africa Epidemic Curves," Ebola (Ebola Virus Disease), April 3, 2019, https://www.cdc.gov/vhf/ebola/history/2014-2016-outbreak/cumulative-cases-graphs.html.

[94] Anderson-Fletcher, Vera, and Abbott, "How Mindful Is Your Company?," 204.

[95] Michelle S. Chevalier et al., "Ebola Virus Disease Cluster in the United States, Dallas County, Texas, 2014," *Morbidity and Mortality Weekly Report* 63 (November 14, 2014): 1–3, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm63e1114a5.htm.

[96] Anderson-Fletcher, Vera, and Abbott, "How Mindful Is Your Company?," 204.

[97] Chevalier et al., "Ebola Virus Disease Cluster."

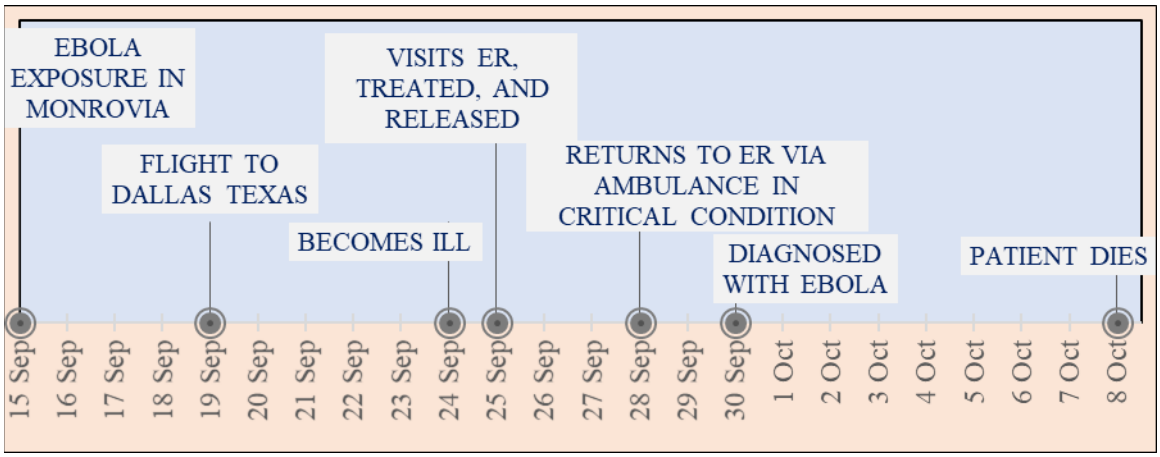

Figure 2. Timeline of the First Traveler-Related Ebola Case in the United States[98]

Globally, local public health departments did not have robust response plans pertaining to viral hemorrhagic fever diseases such as Ebola. Public health did not see this coming, and there was no prior funding specifically for Ebola preparedness measures. This is evidenced by the emergency release of response funding and the absence of grant deliverables pertaining to viral hemorrhagic disease planning. The 2013–2014 CDC grant report for public health emergency preparedness does not mention Ebola or the general preparedness measures for viral hemorrhagic fevers.[99] Nonetheless, in the fall of 2014, emergency funding was released for the Ebola response, and local health departments had to prepare and respond simultaneously.

Ports of entry remained vulnerable to potentially infected travelers ***after*** the index case was discovered in the United States. Compounding the situation further was the CDC's delay in defining the routes of disease transmission and which body fluids were affected.[100] The CDC distributed revised protocols to clarify this information on October

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[98] Anderson-Fletcher, Vera, and Abbott, "How Mindful Is Your Company?," 204.

[99] Office of Public Health Preparedness and Response, *2013–2014 National Snapshot of Public Health Preparedness* (Atlanta, GA: Centers for Disease Control and Prevention, 2014), https://www.cdc.gov/cpr/pubs-links/2013/documents/2013_Preparedness_Report.pdf.

[100] Anderson-Fletcher, Vera, and Abbott, "How Mindful Is Your Company?," 207.

20, 2014.[101] However, this was **12 days *after*** the death of the index case. Nonetheless, "the CDC worked closely with the U.S. Customs and Border Protection (CBP), the U.S. Department of Homeland Security, and state and local public health departments to establish a system to screen travelers upon entering the United States and follow up with all travelers returning from Ebola-affected countries in West Africa."[102]

Government officials who had no medical background were able to conclude that our nation was unprepared for this type of response. In November of 2015, former Governor Ridge and former Senator Lieberman, who were serving as co-chairs on the Blue Ribbon Study Panel on Biodefense, updated the United States House of Representatives Committee on Homeland Security on the vulnerabilities our nation faces in response to bioterrorism:

> Unfortunately, our level of readiness has not kept pace with the growing risk. Last year, the Ebola crisis showed us that we are not fully prepared to confront biological threats. We learned that the Federal Government did not have the systems in place to address the situation and lacked clear lines of authority. We learned that many front-line health care workers did not have the skills or basic training needed. We learned that officials lacked a plan for communicating the Government's response to the public, including reassuring the American people that it could keep the contagion from spreading through international air travel.[103]

While local public health departments have subsequently incorporated the Ebola virus disease into their response plans or have a separate Ebola virus response plan, the CDC does not address the operational context of these existing plans; only that each funding recipient has a plan in place. While pandemic preparedness planning resources included checklists and toolkits, these resource types were not available for Ebola virus disease preparedness planning. The CDC provided the healthcare system with succinct checklists, but public health practitioners were given a verbose planning resource from

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[101] Anderson-Fletcher, Vera, and Abbott, 207.

[102] Bell et al., "Overview, Control Strategies, and Lessons Learned," 10.

[103] U.S. Congress. House., 1.

2015, the Ebola Concept of Operations (ConOps) Planning Template[104] and planning "tips."[105] One may argue that the focus on containment and management of the disease is concentrated on the healthcare system's capacities, calling for more precise resources. Nonetheless, when public health planning practitioners are left to search elusive resources and interpret adequate context for their preparedness plans, the lack of consistency increases the likelihood of a poor response outcome.

Regardless of the planning mechanisms health departments have implemented, the United States remains vulnerable to future Ebola cases. Outbreaks of Ebola virus have been ongoing since 2018 in several highly populated areas in Africa.[106] If the disease makes it into the United States again, the public fear alone could cause a major response issues for public health departments and the healthcare system. This fear extends to the healthcare workers. In 2016, healthcare workers were surveyed regarding Ebola patients. "Of approximately 428 surveyed, 25.1% felt it was ethical to refuse care to Ebola patients; and 25.9% were unwilling to provide care to them."[107] This same study revealed significant issues regarding exposure to Ebola. In fact, of those healthcare workers surveyed, 90% were concerned about exposing their families and friends, which rendered a high predictor rate for those unwilling to care for Ebola patients.[108] Female healthcare workers are further impacted by exposure: "Female healthcare workers, who may be more likely to be primary care providers for their family, were also more likely to be unwilling to care for patients

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[104] Centers for Disease Control and Prevention, *Ebola Concept of Operations (ConOps) Planning Template* (Atlanta, GA: Centers for Disease Control and Prevention, 2015), https://www.cdc.gov/cpr/documents/ebola-concept-of-operations-planning-template-8-20-2015.pdf.

[105] "Top 10 Ebola Response Planning Tips: Ebola Readiness Self-Assessment for State and Local Public Health Officials," Ebola (Ebola Virus Disease), August 6, 2019, https://www.cdc.gov/vhf/ebola/outbreaks/preparedness/planning-tips-top10.html.

[106] "2018 Eastern Democratic Republic of the Congo Outbreak," Ebola (Ebola Virus Disease), November 5, 2019, https://www.cdc.gov/vhf/ebola/outbreaks/drc/2018-august.html.

[107] Deepa Maheswari Narasimhulu et al., "Healthcare Workers' Attitudes toward Patients with Ebola Virus Disease in the United States," *Open Forum Infectious Diseases* 3, no. 1 (January 2016): 1, https://doi.org/10.1093/ofid/ofv192.

[108] Narasimhulu et al., 6.

with Ebola."[109] The CDC's National Institute for Occupational Safety and Health (NIOSH) recommends that pregnant healthcare workers not care for patients with Ebola.[110] However, there are no recommendations for non-pregnant female healthcare workers who may be breast feeding or who are the primary caregiver to infants and children:[111]

> Therefore, it is in the public interest to find the means to make it possible for HCWs to care for patients without abandoning their responsibility to their families, perhaps by providing workers with (1) child care assistance and (2) temporary living quarters to reduce the risk of disease transmission to family members as well as insurance to protect them and their families should they become ill. Subsequently, if healthcare workers and first responders have not continued training on screening measures, knowledge retention may wane over time. These were significant preparedness issues in 2014, and will resurface if an infected person enters the United States.[112]

In order to sustain a readiness state for Ebola and all other viral hemorrhagic fevers, the primary vulnerable access points—the country's ports of entry—need to be the priority in the response strategy. In addition, subject matter experts' recommendations focus on training and exercise provisions to test and evaluate both emergency response and healthcare personnel. According to sources analyzing lessons learned from the Texas Health Presbyterian Hospital, exercise drills should test the following:

- operational responses of fire/EMS, law enforcement, emergency dispatchers, hospitals, and healthcare providers;
- screening accuracy for suspect Ebola cases; and
- safe application and removal of personal protective equipment.[113]

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[109] Narasimhulu et al., 6.

[110] "Reproductive Health and the Workplace," Workplace Safety and Health Topic, November 15, 2019, https://www.cdc.gov/niosh/topics/repro/infectious.html.

[111] Narasimhulu et al., "Healthcare Workers' Attitudes toward Patients," 6.

[112] Bell et al., "Overview, Control Strategies, and Lessons Learned," 9.

[113] Anderson-Fletcher, Vera, and Abbott, "How Mindful Is Your Company?," 207.

These drills may be brief but have a frequency of at least every 6 months and include an inspection of personal protective equipment.[114] Public health departments should assess their jurisdictions for these measures and coordinate any training resource needs. Regardless of whether there is a current outbreak, the state of readiness should remain a constant for prehospital and hospital workforces.

C. CASE STUDY: ZIKA RESPONSE, 2015

The Zika virus stumped many health officials in South America and the United States. Zika virus was first discovered in 1947, named after the Zika Forest in Uganda; prior to 2007, at least 14 cases of Zika had been documented.[115] It is a mosquito-borne virus, carried by the *Aedes* species mosquito (*Ae. aegypti* and *Ae. albopictus*).[116] According to the CDC, symptoms are mild and may include fever, rash, headache, joint pain, red eyes, and muscle pain.[117]

In October of 2015, Brazil declared a surge of babies born with a particular birth defect: microcephaly.[118] This occurs when an infant's head is smaller than expected due to improper brain development.[119] The correlation between microcephaly and a vector-borne disease was not initially made. Initial public messaging stated the virus was spread only by mosquitoes. By the end of March 2016, the World Health Organization concluded the Zika virus was the cause of microcephaly—the virus could be passed onto the fetus

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[114] Anderson-Fletcher, Vera, and Abbott, 205.

[115] "Overview," Zika Virus, October 7, 2019, https://www.cdc.gov/zika/about/overview.html.

[116] Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases (NCEZID), and Division of Vector-Borne Diseases (DVBD).

[117] Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases (NCEZID), and Division of Vector-Borne Diseases (DVBD).

[118] "One Year into the Zika Outbreak: How an Obscure Disease Became a Global Health Emergency," Emergencies, May 5, 2016, 4, http://www.who.int/emergencies/zika-virus/articles/one-year-outbreak/en/.

[119] "Potential Range of *Aedes Aegypti* and *Aedes Albopictus* in the United States, 2017," Zika Virus, March 11, 2020, https://www.cdc.gov/zika/vector/range.html.

during pregnancy.[120] Further information on Zika virus transmission was discovered in a male Zika virus case from New York City. A male with no travel history to any area with Zika virus transmission developed symptoms and tested positive for the virus approximately one-week after sexual intercourse with a female who was diagnosed with Zika virus after recent travel to a Zika area.[121] Several months had passed since the initial identification of Zika in the Americas. Health officials changed the messaging after conclusive data confirmed the virus could be passed via sexual intercourse and from mother to fetus. Health officials could have initially stated all causes of Zika virus were not fully identified and for the public to take precautionary measures until further data was obtained. Instead, sexual partners carrying the Zika virus had unprotected sex, spreading the virus further; and women who became pregnant had the potential for spreading the virus to their unborn babies resulting in possible birth defects.

Health officials in the United States watched this disease spread through South America and Mexico. Then it arrived in Texas, Florida, and the U.S. Territories.[122] Mosquito control programs took on many different approaches throughout the United States because many U.S. localities do not fall within existing mosquito control districts. For example, Miami-Dade County reported significant underfunding for its abatement efforts. Other smaller jurisdictions could "do little more than advise inhabitants to use over-the-counter insect repellents."[123]

Guidelines for monitoring pregnant women did not occur until ***after*** Zika arrived in the United States. The lack of preparedness was palpable with many public health experts, particularly from public health subject matter experts, Alexandra Phelan and Lawrence Gostin:

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[120] World Health Organization, "One Year into the Zika Outbreak," 4.

[121] Alexander Davidson et al., "Suspected Female-to-Male Sexual Transmission of Zika Virus — New York City, 2016," *MMWR. Morbidity and Mortality Weekly Report* 65, no. 28 (July 22, 2016): 716–17, https://doi.org/10.15585/mmwr.mm6528e2.

[122] Phelan and Gostin, "On Zika Preparedness and Response."

[123] Phelan and Gostin, 1.

> It is one thing to fail to prepare for an emerging infectious disease if the risks are uncertain. But it is quite another to fail to act when the facts are clear: we know that Zika is coming to the U.S., that it harms newborns, and will disproportionately affect poor women and their children. Failure to prepare for a storm that is spreading rapidly in our region, heading for our shores, and which could affect the next generation is unconscionable. It is also a major political mistake. Imagine if nine months following a Zika virus outbreak this summer babies are born with severe birth defects, and poor women testify in Congress holding their babies. It would, and should, result in a public moral outrage.[124]

The 2015–2016 grant guidance did not support or mention any activities related to mosquito-borne diseases. A search for terms: mosquito, Zika, vector, or even West Nile virus renders no results in the official grant document.[125] As a result of the positive cases in the U.S., additional grant funding was released by the CDC, and public health departments were required to submit new Zika response plans to remain in grant compliance. However, submitted response plans were not assessed for context or response effectiveness by funding stewards. Local health departments were not asked to exercise or evaluate newly drafted Zika response plans and were not required to submit after action reports for real-world responses or surveillance activities. Much like Ebola and H1N1, public health departments were inadequately prepared for the Zika virus.

While Zika cases showed a sharp decline in 2017, a surge occurred in the fall of 2018 in Sonora, Mexico where cases doubled.[126] As of December 2021, there is one declared Zika virus outbreak in India, many countries have had current or past transmission, and the mosquitoes that can carry the virus still exist in most countries.[127] In the United States, the Zika-carrying species of mosquitoes are likely to proliferate in a

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[124] Phelan and Gostin, 1.

[125] Centers for Disease Control and Prevention, *Instructions for Preparing an Annual Performance Report and Continuation Funding Application* (Washington, DC: Public Health Emergency, 2015), https://www.phe.gov/Preparedness/planning/hpp/Documents/hpp-bp4-continuation-guidance.pdf.

[126] Cara Christ, "Arizona Zika Updates," *AZ Dept. of Health Services Director's Blog* (blog), accessed November 23, 2018, https://directorsblog.health.azdhs.gov/arizona-zika-updates/.

[127] "Zika Travel Information," Travelers' Health, December 10, 2021, https://wwwnc.cdc.gov/travel/page/world-map-areas-with-zika.

majority of the country. The following illustration demonstrates the Zika-potential mosquito ranges in the United States:

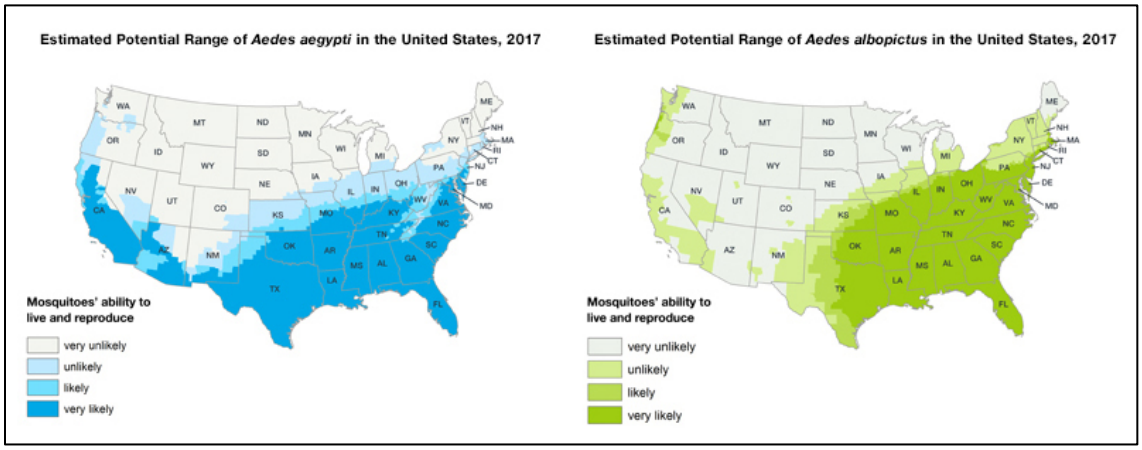

Figure 3. "CDC's estimate of the potential range of *Aedes aegypti* and *Ae. albopictus* in the United States. (Maps do not represent risk for spread of disease)."[128]

Public health officials cannot assume there will be no further Zika transmission. There is no preventative vaccine for this virus, yet it has a devastating effect on unborn children.[129] The World Health Organization estimates it will cost up to $10 million to care for one child with microcephaly in the United States.[130]

Similar to the Ebola virus planning resources, there are no checklists to offer consistent Zika planning resource elements. Existing guidance documents are antiquated, verbose, and scattered. The only readily available guidance document from the CDC is "archived and no longer being maintained or updated."[131] Public health preparedness

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[128] Centers for Disease Control and Prevention, "Potential Range."

[129] Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases (NCEZID), and Division of Vector-Borne Diseases (DVBD), "Overview."

[130] World Health Organization, "One Year into the Zika Outbreak."

[131] Centers for Disease Control and Prevention, *Zika: CDC Interim Response Plan* (Atlanta, GA: Centers for Disease Control and Prevention, 2017), 1, https://www.cdc.gov/zika/pdfs/zika-draft-interim-conus-plan.pdf.

planners are once again left to piece together resources and decide which provisions are important to include in a response plan. Public health must continue to keep mosquito-borne viruses relevant to the public. Mosquito control programs must monitor mosquito activity and eliminate sources of mosquito breeding.[132] The CDC needs to ensure that public health response plans address all disease-carrying mosquito species.

These case studies demonstrate a vulnerability in preparedness planning that can lead to poor response outcomes. These emergency responses validate the argument that public health has been in a reactionary mode instead of utilizing existing disease surveillance measures to be better prepared. Two emerging diseases were discussed in this section, the Ebola virus and Zika virus. There were no existing plans with well-defined preparedness and response measures established prior to their respective outbreaks. Identifying response measures in order to audit preparedness plans will ensure the minimum emergency provisions are in place. An audit tool for all types of public health threats is tangible and can provide a proactive approach.

[132] "Mosquito Control," Zika Virus, March 2, 2021, https://www.cdc.gov/zika/vector/index.html.

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IV. EXISTING PUBLIC HEALTH PREPAREDNESS PROGRAM AUDITING PROCESSES

The following chapter describes the existing audit tool that was in effect during the 2009 H1N1 pandemic influenza response, followed by the measures in the tool that directly correlated to the best practices of the response. Last, the chapter concludes with other examples of applying components of the existing audit tool to other hazards such as natural disasters and other disease outbreaks.

The CDC's Cities Readiness Initiative (CRI) Program mandates a readiness review of each grant recipient. During the timeframe of the H1N1 response, the established auditing process was the Technical Assistance Review (TAR), which scored states and local CRIs on a weighted scoring range from 0 to 100.[133] The TAR evaluated the capacity to obtain and deliver medical countermeasures via the CDC's Strategic National Stockpile by assessing the following core functions:

1. Developing a plan with Strategic National Stockpile (SNS) elements
2. Management of SNS
3. Requesting SNS
4. Tactical communications
5. Public information and communication
6. Security
7. Regional/Local distribution site
8. Controlling inventory
9. Distribution
10. Dispensing
11. Hospitals and alternate care facilities coordination
12. Training, exercise, and evaluation[134]

[133] Christopher Nelson et al., *Analysis of the Cities Readiness Initiative* (Santa Monica, CA: RAND Health, 2012), 5, https://www.rand.org/pubs/technical_reports/TR1200.html.

[134] Willis et al., *Initial Evaluation of the Cities Readiness Initiative*, 15.

This review focused on rapid countermeasure dispensing in the event of a weaponized anthrax attack.[135] However, CRIs demonstrated the ability to apply the TAR core functions to real-world, non-bioterrorism events and improve readiness capabilities. A 2012 CRI program analysis conducted by the RAND Corporation reported that several CRI sites used elements of the CRI points of dispensing (POD) models for seasonal influenza vaccination; tuberculosis and mumps outbreaks; information dissemination; and H1N1 vaccination clinic setup.[136] One site reported that using its CRI plan provided the ability to accurately estimate staffing for vaccination sites during the H1N1 response.[137] James Blumenstock, chief program officer at the Association of State and Territorial Health Officials, commented on the CRI Program's strength to build an infrastructure for medical countermeasure distribution: "public health systems were highly effective in managing and coordinating a complex logistical operation of receiving, staging, storing, distributing, and dispensing medical countermeasures."[138]

These real-world applications show a direct correlation between operational readiness and structured program reviews. To further support this claim, the following depicts the actual components of the TAR tool applied to best practices that occurred during the H1N1 response.

A. POD SET-UP, STAFFING, AND DISPENSING

The capacity to effectively run POD operations is evaluated in Section 10 of the TAR Tool: Dispensing Prophylaxis (Figure 4).[139] POD set-up requirements are measured in item 10.7 that requires MOUs, contact information, equipment inventory, floor plans,

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[135] Institute of Medicine, "Medical Countermeasures Distribution and Dispensing in Response to the 2009 H1N1 Influenza Pandemic," in *Medical Countermeasure Dispensing: Emergency Use Authorization and the Postal Model, Workshop Summary* (Washington, DC: National Academies Press, 2010), 1, https://www.ncbi.nlm.nih.gov/books/NBK53127/.

[136] Nelson et al., *Analysis of the Cities Readiness Initiative*, 27.

[137] Nelson et al., 27.

[138] Institute of Medicine, "Medical Countermeasures Distribution and Dispensing."

[139] Willis et al., *Initial Evaluation of the Cities Readiness Initiative*, 87–89.

delivery location, security and parking plans.[140] In addition, clinic flow charts must provide site specific plans that designate locations for entrance/exit, screening and dispensing.[141] Adequate staffing for POD sites and dispensing operations is measured in Item 10.9 to assess whether there is an adequate amount of core management teams for each dispensing site; item 10.10 assesses personnel availability to staff all POD sites; and item 10.11 requires a current database of personnel, including enough to account for shift changes and absenteeism.[142] Additionally, item 10.13 addresses breaks and schedules, but also focuses on other logistical considerations to ensure staff will not have any barriers to working the POD sites, i.e., family care, lodging, and meals.[143]

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[140] Willis et al., 88.

[141] Willis et al., 88.

[142] Willis et al., 88.

[143] Willis et al., 89.

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SECTION TEN: DISPENSING PROPHYLAXIS (24%)		
10.1		**The local mass prophylaxis/dispensing plan addresses procedures for the following operational issues:** ☐ **Number of regimens of medication that can be dispensed to an individual.** ☐ **Minimum data elements that need to be collected for each unit of medication dispensed.** ☐ **Handling of symptomatic individuals.** ☐ **Handling of unaccompanied minors.** ☐ **Handling of non-English speakers / hearing impaired / visually impaired / functionally illiterate.** ☐ **Crowd control, traffic management, and security.** ☐ **Shift hours and shift change procedures.** ☐ **Established hotline/call-bank procedures or other mechanisms to address questions/concerns from the public.** ☐ **Established mechanisms to monitor adverse events.**
	1	All of the elements listed are included in the local mass prophylaxis/dispensing plan.
	0.5	Six to eight of the elements listed are included in the local mass prophylaxis/dispensing plan.
	0	Less than six of the elements listed are in the local mass prophylaxis/dispensing plan.
10.2		**Modified clinical involvement:** **The local mass prophylaxis/dispensing plan include a rapid dispensing strategy for dispensing at dispensing/POD sites.**
	1	Rapid dispensing methods and procedures are documented in the plan.
	0.5	Rapid dispensing methods have been identified but plans and procedures are not documented.
	0	Rapid dispensing methods have not been identified.
10.3		**Alternate dispensing modalities are included in the plan.**
	1	Alternate dispensing modes and procedures are documented in the plan.
	0.5	Alternate dispensing modes have been identified but plans and procedures are not documented.
	0	Alternate dispensing modes have not been identified.
10.4		**The local mass prophylaxis/dispensing plan include established criteria, authorization and procedures to alter clinical dispensing model to increase client throughput.**
	1	Plans are in place.
	0	Plans are not in place.
10.5		**The plan specifies procedures for providing prophylaxis to first responders and critical infrastructure personnel.**
	1	First responder and critical infrastructure prophylaxis plans are in place.
	0	First responder and critical infrastructure prophylaxis plans are not in place.
10.6		**The plan specifies procedures for providing prophylaxis to homebound and other at-risk populations.**
	1	Homebound and at-risk population prophylaxis plans are in place.
	0	Homebound and at-risk population prophylaxis plans are not in place.
10.7		**There are site specific plans for each of the dispensing/POD sites that include the following information:** ☐ **MOU for use of the facility.** ☐ **Facility manager with contact information and procedures for accessing the site.** ☐ **Address and telephone numbers at the facility.** ☐ **Inventory of available office equipment on site.** ☐ **Inventory of available material handling equipment on site.** ☐ **Written floor plans/clinic flow charts (traditional and streamlined).** ☐ **Specific delivery location identified w/ plans to ensure 24/7 unblocked access by delivery trucks.** ☐ **Crowd control, traffic management, and security plans.** ☐ **Parking plan.**
	1	All dispensing sites have a site specific plan.
	0.5	50% of dispensing sites have a site specific plan.
	0	Site specific plans are not available.
10.8		**The plan specifies how the following items will be made available at every dispensing/POD site before dispensing starts:** ☐ **Drug fact sheets.** ☐ **Agent fact sheets.** ☐ **Dispensing/medical supplies.** ☐ **Name/Address/Patient History (NAPH) forms.** ☐ **Office supplies.** ☐ **Office equipment.** ☐ **Command & Control vests or other identifiers.** ☐ **Communication equipment.** ☐ **Signs (interior and exterior).** ☐ **Crowd & traffic control equipment.**
	1	Plans are in place to ensure that all of the items listed above are available at each dispensing site, at time of event.
	0.5	Plans are in place to ensure at least 75% of the items listed above are available at each dispensing site, at time of event.
	0	No plan exists.
10.9		**Core management teams with back-ups have been identified and trained for each dispensing/POD site.**
	1	Core management teams have been identified and trained for each dispensing/POD sites.
	0.5	Core management teams have been identified and trained for 50% of the dispensing/POD sites.
	0	Core management teams have been identified for less than 50% of the dispensing/POD sites.
10.10		**Personnel available to staff Dispensing/POD sites.**
	1	Personnel are available to staff 100% of the dispensing/POD sites.
	0.5	Personnel are available to staff 50% of the dispensing/POD sites.
	0	Personnel are available to staff less than 50% of the dispensing/POD sites.
10.11		**Volunteer/Staff database is maintained and current:** ☐ **There are there enough people in the database to run each of the POD sites, including shift changes.** ☐ **The database includes enough extra people to compensate for absent individuals.**
	1	Database is in place.
	0.5	Volunteers have been identified but not included in a database.
	0	Database is not in place.

Figure 4. "Section 10—Dispensing Prophylaxis, Items 10.1-10.13."[144]

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144 Source: Willis et al., 87–89.

Figure 4 Continued from Previous Page

10.12		**The plan includes a Job Action Sheet and Just-In-Time training materials for all dispensing/POD roles identified in the plan.**	
		May Include Common POD Roles, such as: ☐ **POD Manager** ☐ **IT/Communications** ☐ **Safety Officer** ☐ **Logistics Officer** ☐ **Greeters** ☐ **Triage Team** ☐ **Greeter/Triage Team** ☐ **Forms/Data Collection** ☐ **Dispensing Team** ☐ **Inventory Control** ☐ **Runners** **OTHER(S):** ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ _____	
	1	Job action sheets and just-in-time training materials for all POD roles are documented and available for review.	
	0.5	At least job action sheets for all POD roles are documented and available for review.	
	0	Job action sheets have not been developed.	
10.13		**The local plan addresses staff/volunteer management (for example, work breaks, shift schedules, meals/snacks, lodging, family care, etc.).**	
	1	The local plan addresses staff/volunteer management and has written agreements with organizations providing services.	
	0	The local plan does not address staff/volunteer management.	
		SECTION TEN: Points _____ Divided by 13 = _____	

B. RECEIVING, STAGING, STORING OF MEDICAL COUNTERMEASURES

The capacity to take receipt of, stage, and store medical countermeasures is evaluated in Section 7 of the TAR Tool: Regional/Local Distribution Site (Figure 5).[145] Items 7.1, 7.2, and 7.3 require the CRI to identify and validate primary and back-up facilities to effectively receive, stage, and store the medical countermeasures. These facilities must also ensure rapid deployment of the assets to the designated points of dispensing sites.[146] Resembling Section 10: Dispensing Prophylaxis, Section 7 also requires a full staff to manage and deploy the countermeasures, items 7.4 through 7.11, and 7.16.[147] Schedules, meals, lodging, and family care are addressed in item 7.17.[148]

[145] Willis et al., 82.

[146] Willis et al., 82.

[147] Willis et al., 82–84.

[148] Willis et al., 84.

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SECTION SEVEN: REGIONAL/LOCAL DISTRIBUTION SITE (14%)
--- PF APPLICABLE ---

7.1		**Have a Regional Distribution Site (RDS) strategy that expedites the movement of medical material to the PODs and hospitals and/or alternate care facilities:** ☐ **Adequate RDS facilities have been identified to ensure rapid delivery of medical material.** ☐ **Primary and backup locations have been identified.** ☐ **Time and distance-based locations.** ☐ **Population-based.**
	1	Strategically located RDS sites (show sites plotted on a local map) have been secured and feasible timelines for rapid movement of medical materials have been established.
	0.5	A RDS plan is being developed but incomplete.
	0	There is not a RDS plan that accounts for the movement of medical materiel.
7.2		**RDS facilities reviewed and validated by State SNS Coordinator using RSS Site Survey Tool.**
	1	All locations have been reviewed and validated by the SNS Coordinator.
	0.5	At least 50% of all locations have been reviewed and validated by the SNS Coordinator.
	0	Less than 50% of all locations have been reviewed and validated by the SNS Coordinator.
7.3		**MOAs are in place for reviewed and validated RDS sites.**
	1	The local jurisdiction has a signed MOA with all RDS sites.
	0.5	The local jurisdiction has a signed MOA with half the RDS sites.
	0	The local jurisdiction does not have signed MOAs with any RDS sites.
7.4		**The following RDS Managers/staff have been identified with back-up and POC information for each RDS facility identified: (0.5 points for each position for a total of 8 points—includes both primary and backup).**

PRIMARY	BACKUP
☐ **RDS Manager/Leader**	☐ **RDS Manager/Leader**
☐ **Security Manager/Leader**	☐ **Security Manager/Leader**
☐ **Safety Manager/Leader**	☐ **Safety Manager/Leader**
☐ **Communications / IT Manager/Leader**	☐ **Communications / IT Manager/Leader**
☐ **Inventory Control Manager/Leader**	☐ **Inventory Control Manager/Leader**
☐ **Shipping / Receiving Manager/Leader**	☐ **Shipping / Receiving Manager/Leader**
☐ **Pick Team Manager/Leader**	☐ **Pick Team Manager/Leader**
☐ **Quality Control Manager/Leader**	☐ **Quality Control Manager/Leader**

7.5		**RDS Leaders/Managers and back-ups have job action sheets and have been trained in RDS Operations.**
	1	All RDS leaders and their back ups have: ☐ A job action sheet. ☐ Trained in RDS operations. ☐ Proof of training is documented.
	0.5	All RDS leaders and their backups have a job action sheet.
	0	None of the RDS leaders and their backups have been trained in RDS operations.
7.6		**Safety Manager/Leader and back-ups have job action sheet and have been trained in their RDS function.**
	1	All Safety managers/leaders and their backups have: ☐ A job action sheet. ☐ Trained in their RSS function. ☐ Proof of their RDS function training is documented.
	0.5	All Safety managers/leaders and their backups have a job action sheet.
	0	None of the Safety managers/leaders and their backups have been trained in their RSS function.
7.7		**Communications/IT Support and back ups have job action sheet and have been trained in their RDS function.**
	1	All Communications/IT Support managers and their backups have: ☐ A job action sheet. ☐ Trained in their RDS function. ☐ Proof of their RDS function training is documented.
	0.5	All Communications/IT Support managers/leaders and their backups have a job action sheet.
	0	None of the Communications/IT Support managers/leaders and their backups have been trained in their RSS function.
7.8		**Inventory Manager/Leader and back-ups have job action sheet and have been trained in their RDS function.**
	1	All Inventory managers/leaders and their backups have: ☐ A job action sheet. ☐ Trained in their RDS function. ☐ Proof of their RDS function training is documented.
	0.5	All Inventory managers/leaders and their backups have a job action sheet.
	0	None of the Inventory managers/leaders and their backups have been trained in their RSS function.
7.9		**Shipping/Receiving Manager/Leader and back-ups have job action sheet and have been trained in their RDS function.**
	1	All Shipping/Receiving managers/leaders and their backups have: ☐ A job action sheet. ☐ Trained in their RDS function. ☐ Proof of their RDS function training is documented.
	0.5	All Shipping/Receiving managers/leaders and their backups have a job action sheet.
	0	None of the Shipping/Receiving managers/leaders and their backups have been trained in their RDS function.
7.10		**Pick Team Manager/Leaders and back-ups have job action sheet and have been trained in their RDS function.**
	1	All Pick Team managers/leaders and their backups have: ☐ A job action sheet. ☐ Trained in their RDS function. ☐ Proof of their RDS function training is documented.
	0.5	All Pick Team managers/leaders and their backups have a job action sheet.
	0	None of the Pick Team managers/leaders and their backups have been trained in their RDS function.

Figure 5. "Section 7—Regional/Local Distribution Site, Items 7.1-7.13."[149]

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[149] Source: Willis et al., 82–84.

Figure 5 Continued from Previous Page

7.11		**Quality Control Managers/Leaders and back-ups have job action sheet and have been trained in their RDS function.**	
	1	All Quality Control managers/leaders and their backups have: ☐ A job action sheet. ☐ Trained in their RDS function. ☐ Proof of their RDS function training is documented.	
	0.5	All Quality Control managers/leaders and their backups have a job action sheet.	
	0	None of the Quality Control managers/leaders and their backups have been trained in their RDS function.	
7.12		**Call-down rosters for 24/7 operations for all RDS Managers and staff/volunteers are reviewed for accuracy and tested quarterly.**	
	1	Documented call down lists are reviewed for accuracy and tested quarterly and corrections to call down lists are documented.	
	0.5	Documented call down lists are reviewed for accuracy quarterly.	
	0	No written documentation that verifies staff call down rosters are reviewed quarterly.	
7.13		**Just-in-time (JIT) training materials have been developed for each of the RDS functions to familiarize personnel working within those functions:** ☐ **Safety** ☐ **Pick Teams** ☐ **Other functions, as appropriate** ☐ **Shipping/Receiving** ☐ **Quality Control** ☐ **Communications/IT** ☐ **Inventory Management**	
	1	Training materials have been developed for each of the RDS functions.	
	0.5	Training materials have been developed for 50% of the RDS functions.	
	0	Less than 50% of the training material has been developed for the RDS functions.	
7.14		**An inventory of material handling equipment for each RDS site should be documented along with a list of materials/supplies that need to be procured and/or delivered at the time of event.**	
	1	An inventory listing containing appropriate material handling equipment is available for 100% of the RDS sites.	
	0.5	An inventory listing is available for 75% of the RDS sites.	
	0	An inventory listing is available for none of the RDS sites.	
7.15		**An inventory of office equipment for each RDS site should be documented along with a list of materials/supplies that will need to be delivered and/or procured at time of event.**	
	1	An inventory listing containing appropriate office equipment is available for 100% of RDS sites.	
	0.5	An inventory listing is available for 75% of the RDS sites.	
	0	An inventory listing is not available for any of the RDS sites.	
7.16		**The local plan lists individuals who are authorized to sign for SNS materiel.**	
	1	The local plan has identified and documented individuals who are authorized to sign for SNS materiel.	
	0	The local plan has not identified and documented individuals who are authorized to sign for SNS materiel.	
7.17		**The local plan addresses staff/volunteer management (for example, work breaks, shift schedules, meals/snacks, lodging, family care, etc.).**	
	1	The local plan addresses staff/volunteer management and has written agreements with organizations providing services.	
	0	The local plan does not address staff/volunteer management.	
SECTION SEVEN: Points _____ Divided by 24 = _____			

C. DISTRIBUTION OF MEDICAL COUNTERMEASURES

The ability to distribute medical countermeasures to points of dispensing sites is measured in Section 9 of the TAR Tool: Distribution (Figure 6).[150] Staffing for managing the distribution operations is listed in item 9.1.[151] This also includes the number of drivers needed, item 9.5. Also in item 9.5, the number and type of vehicles must be determined.[152] Contingencies to ensure adequate transportation assets, primary and back-up agencies, and written agreements must be in place as stipulated in items 9.3 and 9.4.[153] Item 9.2 evaluates operations plans that map delivery locations/schedules and routes; and accounts for fueling, repair, and return.[154]

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[150] Willis et al., 86.

[151] Willis et al., 86.

[152] Willis et al., 86.

[153] Willis et al., 86.

[154] Willis et al., 86.

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SECTION NINE: DISTRIBUTION (10%) --- PF APPLICABLE ---		
9.1		**Distribution Manager and back-up(s) have a job action sheet and have been trained in their function.**
	1	The local jurisdiction has identified a distribution manager and backup, has a written job action sheet regarding distribution functions, and the distribution manager and backup has received documented training in distribution functions.
	0.5	The local jurisdiction has identified a distribution manager and backup and has a written job action sheet regarding distribution functions.
	0	The local jurisdiction has not identified a distribution manager and backup.
9.2		**Plan includes distribution strategy for delivery of medical materiel (such as delivery locations, routes, delivery schedule/frequency, fueling, repair, recovery, etc).**
	1	The local plan includes a detailed strategy (mapping, frequency, routing, scheduling, etc.).
	0.5	The local plan includes general strategy for distributing materiel.
	0	The local jurisdiction does not have a distribution strategy in place.
9.3		**Primary agency/organization has been assigned to distribute medical materiel and a written agreement is in place.**
	1	Written agreements describing arrangements with agencies/organizations that will distribute materiel are in place and available for review.
	0	The State does not have the above in place.
9.4		**Back-up agency/organization has been assigned to distribute medical materiel and a written agreement is in place.**
	1	Written agreements describing arrangements with agencies/organizations that will distribute materiel are in place and available for review.
	0	The local jurisdiction does not have the above in place.
9.5		**Resource needs have been identified and those resource needs are accessible to perform distribution activities to include:** ☐ **Number of vehicles needed.** ☐ **Number of drivers needed.** ☐ **Types of vehicles needed.** ☐ **Type and number of support personnel needed.**
	1	The local jurisdiction has identified all the resources needed to perform distribution activities.
	0.5	The local jurisdiction has identified at least 50% of the resources needed to perform distribution activities.
	0	The local jurisdiction has identified less than 50% of the resources needed to perform distribution activities.
9.6		**Dispensing sites have been inventoried to determine what, if any, Material Handling Equipment (MHE) are available for sites that are designated to receive materiel (off-loading and loading as needed such as pallet jacks, hand carts/dollies, and forklifts).**
	1	All dispensing sites designated to receive material have been inventoried and plans are in place to support MHE needs.
	0.5	50% of all dispensing sites designated to receive material have been inventoried and plans are in place to support MHE needs.
	0	Steps have not been taken to identify the MHS needs at dispensing sites designated to receive materiel.
9.7		**Just-in-time (JIT) training materials have been developed for the distribution functions:** ☐ **Chain of custody protocol.** ☐ **Routing information.** ☐ **Security/communication procedures.** ☐ **Appropriate use of material handling equipment.** ☐ **Loading and off-loading materials.**
	1	All of the above just-in-time training materials have been developed.
	0.5	Two to four just-in-time training materials have been developed.
	0	Less than two of the just-in-time training materials have been developed.
SECTION NINE: Points _____ Divided by 7 = _____		

Figure 6. "Section 9—Distribution, Items 9.1-9.7."[155]

D. THE AUDIT TOOL APPLIED TO ALL-HAZARDS RESPONSES

The TAR tool was particularly designed for an intentional anthrax attack.[156] However, there are other examples of applying some of the elements from the TAR tool to non-infectious disease responses. Considering an all-hazards approach, several CRI sites applied certain sections or portions of the TAR measures to natural disasters. One CRI site applied tactical communications plans (Section 4 of the TAR tool), public information messaging (Section 5 of the TAR tool), incident management team protocols and procedures (Section 2 of the TAR tool), and distribution networks (Section 9 and Section 10 of the TAR tool) for evacuation, mass care, and sheltering operations during a major flood incident.[157] Another CRI site used their mutual aid agreements (Section 10 of the

155 Source: Willis et al., 86.

156 Willis et al., xiii.

157 Nelson et al., *Analysis of the Cities Readiness Initiative*, 27.

TAR tool), volunteer coordination (Section 10 of the TAR tool), and tactical communications (Section 4 of the TAR tool) portions of its CRI plan to respond to a tornado incident.[158]

The following highlights some of the components of the TAR tool that may have been applied to these natural disaster incidents.

1. Tactical Communications

For sheltering operations, the FEMA/American Red Cross Shelter Field Guide (FEMA Publication P-785) states logistical equipment resources are needed in a shelter, including communications equipment.[159] The ability to effectively communicate is measured in Section 4 of the TAR Tool: Tactical Communications Plan (Figure 7).[160] When primary systems are inoperable, back-up systems and further redundant contingencies are necessary. Item 4.4 ensures that other forms of communication equipment are in ready-state, including radios with various frequency types, web-based systems, satellite phones, and HAM/amateur radio operators.[161] Therefore, the CRI had the communications resources already established and could apply them to sheltering operations.

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[158] Nelson et al., 27.

[159] Federal Emergency Management Agency and American Red Cross, *Shelter Field Guide*, FEMA P-785 (Washington, DC: Federal Emergency Management Agency, 2015), 17, http://www.nationalmasscarestrategy.org/wp-content/uploads/2015/10/Shelter-Field-Guide-508_f3.pdf.

[160] Willis et al., *Initial Evaluation of the Cities Readiness Initiative*, 77.

[161] Willis et al., 77.

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SECTION FOUR: COMMUNICATIONS PLAN (TACTICAL) (3%)			
4.1		**Tactical communication and/or IT support call-down lists are reviewed and updated quarterly.**	
	1	Local jurisdiction communication/IT support call-down lists are reviewed and updated quarterly.	
	0	There is no written documentation substantiating that communication/IT support call down rosters are reviewed and updated quarterly.	
4.2		**Communications/IT support has a job action sheet.**	
	1	A job action sheet is included in the plan and communication/IT support.	
	0	A job action sheet has not been developed.	
4.3		**Communication pathways are established between command and management locations and support agencies:** **Local EOC(s)** **Dispensing Sites** **Security** **Local Health Department (s)** **Hospitals/Alternate Care Facilities** **Transportation Resources** **State and/or Regional EOC** **RSS Location** **Regional Distribution (if applicable)**	
	1	The local jurisdiction is able to produce for review documentation (matrix/flow-chart) that delineates established communications pathways.	
	0	Document(s) delineating communication pathways between command and management locations are unavailable for review.	
4.4		**Redundant communications systems are in place and are tested quarterly to ensure communications remain available in the event primary communication systems are unavailable.** ☐ **Land-line telephones** ☐ **Ham/Amateur radio operators** ☐ **Cell phones** ☐ **UHF/VHF/800 MHz radio systems** ☐ **Satellite phones** ☐ **Web-based communications** (E-Team, Web EOC, HAN, Workspaces, etc.) ☐ **Email** **Emergency notification systems** (reverse 911, 311, 211, code red, etc.) ☐ **Fax**	
	1	The local jurisdiction has more than four communication systems in place linking management and command locations and support agencies and those systems are tested quarterly.	
	0.5	The local jurisdiction has at least four communication systems in place linking management and command locations and support agencies and those systems are tested less than quarterly.	
	0	The local jurisdiction has less than four communication systems and/or is unable to effectively communicate with all management and	
4.5		**Communication networks (equipment/hardware) between command and management locations and support agencies are tested and exercised quarterly.**	
	1	The local jurisdiction provides supporting documentation that reflects communication networks are tested and exercised quarterly and has a corrective action plan to address identified discrepancies.	
	0.5	The local jurisdiction provides documentation that reflects communication networks have been tested and exercised within the preceding 12 months.	
	0	The local jurisdiction does not provide written documentation that supports communication networks have been tested and exercised within the preceding 12 months.	
4.6		**Designated personnel (identified in item 2.2) are trained in the use of redundant communications equipment.**	
	1	The local jurisdiction can provide documentation to support that designated personnel have been trained.	
	0	The local jurisdiction is unable to document that designated personnel have been trained.	
SECTION FOUR: Points _____ Divided by 6 = _____			

Figure 7. "Section 4—Distribution, Items 4.1-4.6."[162]

2. Public Information Messaging

The FEMA Shelter Field Guide states effective communication is essential for shelter operations. According to the guide, a communication plan should include shelter information for the public and an internal media policy for sheltering staff.[163] Public information messaging is assessed in Section 5 of the TAR Tool: Public Information Communications Plan (Figure 8).[164] Public messaging during disasters not only informs affected populations of the impacts, but it also provides directions and next steps. For example, when populations must be evacuated and sheltered, public messaging informs those affected on what to bring and not to bring to the shelter; and what to expect upon

162 Source: Willis et al., 77.

163 Federal Emergency Management Agency and American Red Cross, *Shelter Field Guide*, 36–38.

164 Willis et al., *Initial Evaluation of the Cities Readiness Initiative*, 78.

arrival.[165] This strategy prevents unexpected issues with medications and specialized medical equipment. In other words, evacuees can be informed to bring their prescription medication(s), oxygen systems, wheelchairs, and CPAP (continuous positive airway pressure) machines with them, including power sources to keep electrical medical equipment operating. Also suggested in FEMA's sheltering guidelines, the public can be informed if the shelter would accept pets other than service animals, and if so, to bring vaccination documentation from their veterinarian.[166] These examples are directly related to the messaging templates discussed in 5.4 and 5.5 in which "dispensing sites" terminology can be replaced with the term, "shelter locations."[167] The CRI would have similar messaging established for points of dispensing sites that could be similar to the messages needed for shelter sites. In addition, in 5.2, it requires a communication plan, including identifying a media policy.[168] The CRI would already have this in place for points of dispensing sites, and portions of the media policy could be applied to sheltering operations.

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[165] Federal Emergency Management Agency and American Red Cross, *Shelter Field Guide*, 37.

[166] Federal Emergency Management Agency and American Red Cross, 24.

[167] Willis et al., *Initial Evaluation of the Cities Readiness Initiative*, 78–79.

[168] Willis et al., 78.

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SECTION FIVE: PUBLIC INFORMATION AND COMMUNICATION (PIC) (7%)			
5.1		**Local public information and communication personnel (identified in 2.2) have been trained on responsibilities associated with a mass prophylaxis campaign:** ☐ **Training opportunities are documented.** ☐ **Job action sheets have been developed.**	
	1	All of the above bullets are completed, documented, and verified.	
	0.5	One of the above bullets is completed, documented, and verified.	
	0	Local jurisdiction cannot provide verification of any of the above items.	
5.2		**Written PIC plan:** ☐ **Is part of the all hazards public information plan.** ☐ **Addresses coordination between local jurisdictions as well as with state to ensure message consistency.** ☐ **Identifies a media policy for dispensing sites.**	
	1	All the components regarding a mass prophylaxis campaign mentioned above are included in the comprehensive written PIC plan.	
	0.5	One to two of the components regarding a mass prophylaxis campaign mentioned above are included in the comprehensive written PIC plan.	
	0	None of the mass prophylaxis campaign components are present in the comprehensive written PIC plan.	
5.3		**The following PIC responsibilities appear on the job action sheet of the PIC liaison or other designated dispensing site staff:** ☐ **Coordinate information with the lead PIO and/or JIC.** ☐ **Serve as a point of contact for the media.** ☐ **Handle public information messages, methods, and materials at the POD.**	
	1	All the components above are included in the dispensing site plans.	
		One to two of the components above are included in the dispensing site plans.	
	0	None of the above are included in the dispensing site plans.	
5.4		**Messages have been developed for dispensing at the local level, including messages to:** ☐ **Prepare the public before an event.** ☐ **Direct people to the dispensing sites.** ☐ **Inform people about alternative dispensing methods.** ☐ **Help people navigate the dispensing sites.** ☐ **Provide information to people once they leave the dispensing sites.** ☐ **Ensure medication compliance.**	
	1	Messages for a mass prophylaxis campaign have been developed, completed, documented, and verified for all of the above bullets.	
	0.5	Messages for a mass prophylaxis campaign have been developed, completed, documented, and verified for three to five of the above bullets.	
	0	Messages for a mass prophylaxis campaign have been developed, completed, documented, and verified for two or less of the bullets were documented and verified.	
5.5		**Methods to disseminate the messages indicated in item 5.4 above have been developed, including:** ☐ **Methods of communication for the messages that get people to the dispensing sites.** ☐ **Methods of communication for the messages that get people through the dispensing sites.** ☐ **Alternate methods to disseminate messages in case of electrical outages.** ☐ **Development of pre-event media relationships.**	
	1	Methods for disseminating messages during a mass prophylaxis campaign have been developed, completed, documented, and verified for all of the above bullets.	
	0.5	Methods for disseminating messages during a mass prophylaxis campaign have been developed, completed, documented, and verified for two or three of the above bullets.	
	0	Methods for disseminating messages during a mass prophylaxis campaign have been developed, completed, documented, and verified for one or less of the bullets were documented and verified.	
5.6		**Materials (fact sheets, press releases, signs) or templates have been developed and cleared:** ☐ **To direct people to the dispensing sites.** ☐ **To help people navigate the dispensing sites.** ☐ **To provide information to people after they leave the dispensing site.** ☐ **On category A agents.** ☐ **On medications used for prophylaxis and treatment.** ☐ **A plan for mass reproduction and storage of printed materials.**	
	1	All of the above bullets are completed, documented, and verified.	
	0.5	Three to five of the above bullets are completed, documented, and verified.	
	0	Two or less of the bullets were documented and verified.	
5.7		**Local plan for communication needs of at-risk populations, including:** ☐ **Bullets from 5.5.** ☐ **Definition and identification of at-risk population groups.** ☐ **Development of alternate methods for disseminating information to at-risk populations.** ☐ **Development of materials that are easy to read and have been translated to top languages in the community.** ☐ **A mechanism is in place to translate information for non-English speaking, hearing impaired, visually impaired, or functionally illiterate individuals.**	
	1	All of the above bullets are completed, documented, and verified.	
	0.5	Two to four bullets are completed, documented, and verified.	
	0	One or less of the bullets were documented and verified.	
SECTION FIVE: Points _____ Divided by 7 = _____			

Figure 8. "Section 5—Public Information and Communication, Items 5.1-5.7."[169]

[169] Source: Willis et al., 78–79.

E. CONCLUSION

The 2012 RAND analysis concluded, "simply having a plan and resources is no guarantee of the ability to respond. However, resources, plans, and partnerships are generally thought to provide a necessary foundation for mounting an effective response."[170] Whether applying the audit tool for its intended use for medical countermeasures management or altering the content for an all-hazards approach, the outcomes of each applied response were successful because the tool provided the ability to prepare and resolve gaps prior to real-world incidents. The tool itself did not make the response plans operational; it was rather the ability to confirm that all the tool's components were established prior to an emergency. As the RAND analysis points out, "the term *operational capabilities* refers to the ability to put resources and plans into practice in real-life operational contexts."[171] CRI grantees validated the tool's ability to make plans operational by administering its applicable components swiftly and effectively in real-world responses.

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[170] Nelson et al., *Analysis of the Cities Readiness Initiative*, 3.

[171] Nelson et al., 3.

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V. FILLING IN THE GAPS—AN INTRODUCTION TO AN ALL-HAZARDS AUDITING PROCESS

In order to prevent significant complications during a public health emergency, preparedness plans need to include a specific set of elements that address the basic actions that take place during a response. This chapter introduces an all-hazards auditing tool prototype that includes major categories of diseases and natural disasters. Three sections of the tool were developed and will be covered in this chapter. These sections were created based on this author's expertise and designed with the intent to prepare for potential obstacles to mitigation, account for the manifestation and proliferation of disease, identify gaps, and ultimately assess the operational content of a public health response plan, annex, or protocol. In this chapter, the prototype content is cross-walked with the identified issues and lessons learned from the three case studies described in Chapter III.

The prototype is not a final product; the tool's completed sections and items address only the categories pertaining to the three case studies: H1N1 pandemic influenza, Ebola virus, and Zika virus. The prototype tool is located in Appendix A, and applicable portions of the tool are extracted and discussed further in this chapter. The next steps for this prototype are to complete the remaining subsections of Section III, and input the assessment measures for the remaining sections IV through VIII. The prototype's overarching architecture is sectioned into the following technical categories within the scope of public health:

1. Novel Pandemic Influenza
2. Arboviral Diseases – Neuroinvasive and Non-Neuroinvasive
3. Category A Agents
4. Category B Agents
5. Category C Agents
6. Coronaviruses
7. Vaccine Preventative Diseases – Non-Influenza
8. Natural Disasters

A. PROTOTYPE SECTION I: NOVEL PANDEMIC INFLUENZA

This section, from pages A75 through A92, items #1-130, contains preparedness planning elements; disease surveillance; infection control measures; healthcare surge management; vaccine distribution; antiviral distribution; public messaging and risk communications; mental/behavioral health support resources; fatality surge management; avian-based influenza; other zoonotic-based influenza (swine and other animals); and training, exercise, and real-world response evaluation elements.

B. PROTOTYPE SECTION II: ARBOVIRAL DISEASES – NEUROINVASIVE AND NON-NEUROINVASIVE

The main genera of Arboviral diseases include flavivirus, alphavirus, and orthrobunyavirus; and are described as either neuroinvasive (causing neurological disease such as meningitis or encephalitis) or non-neuroinvasive (other non-neurological signs and symptoms).[172] This section, from pages A92 through A103, items #1-84, contains overarching preparedness planning elements; vector surveillance and control; West Nile virus-based surveillance indicators; human case surveillance and management/epidemiology; healthcare coordination; pregnancy registry reporting (as determined by applicable Arboviral diseases); medical countermeasures considerations (vaccine availability); public messaging and risk communications; and training, exercise, and real-world response evaluation elements.

C. PROTOTYPE SECTION III: CATEGORY A AGENTS

Category A agents are grouped together for their disease severity and their ability to be weaponized, used for bioterrorism incidents.[173] However, each disease is different from the others and requires individualized mitigation measures. As a result, this section is sub-sectioned for each disease: anthrax (III-A); botulism (III-B); plague (III-C); smallpox

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[172] "Arboviral Diseases, Neuroinvasive and Non-Neuroinvasive, 2015 Case Definition," National Notifiable Diseases Surveillance System (NNDSS), April 16, 2021, https://ndc.services.cdc.gov/case-definitions/arboviral-diseases-neuroinvasive-and-non-neuroinvasive-2015/.

[173] Centers for Disease Control and Prevention, "Bioterrorism Agents/Diseases by Category."

(III-D); tularemia (III-E); and viral hemorrhagic fevers (III-F), Ebola, Marburg, Lassa, Machupo.[174]

Overarching preparedness planning elements that are applied to all Category A agents are contained in items #1-4. Because these agents can be used for bioterrorism attacks, item #4 specifically calls for law enforcement coordination to determine intent and cause:

Table 2. Prototype Section III-F, Page A104, Item #4

4	Each Category A agent's plan discusses coordination with Federal, state, and local law enforcement agencies to determine intentional, accidental, or natural cause.

Viral hemorrhagic fevers' planning content is assessed from pages A104 through A123, items #1-155, containing additional planning elements; disease surveillance and epidemiology; public health monitoring and movement, isolation and quarantine; EMS support and patient transportation; specimen collection and laboratory testing; healthcare surge management; waste management considerations; fatality management; public messaging and risk communications; medical countermeasures considerations (vaccine availability and antiviral availability); and training, exercise, and real-world response evaluation elements.

D. PROTOTYPE SECTION IV: CATEGORY B AGENTS

A placeholder on the tool prototype includes Category B agents. While these diseases can also be used for bioterrorism and require enhanced public health capacity, they result in lower morbidity and lower mortality rates than Category A agents.[175] Diseases in this category include: "brucellosis, epsilon toxin of *Clostridium perfringens*, *Salmonella*, *Escherichia coli* 0157:H7, S*higella*, Glanders, Melioidosis, psittacosis, Q

[174] Centers for Disease Control and Prevention.

[175] Centers for Disease Control and Prevention.

fever, ricin toxin, Staphylococcal enterotoxin B, typhus fever, viral encephalitis from alphaviruses, and water safety threats – *Vibrio cholerae, Cryptosporidium parvum*."[176]

E. PROTOTYPE SECTION V: CATEGORY C AGENTS

Category C agents are an important addition to the tool prototype. These agents are considered emerging diseases that could be used for bioterrorism attacks in the future due to their availability and potential for high morbidity and mortality rates.[177] The CDC lists only two diseases for this classification, Nipah virus and Hantavirus, but this category may expand with evolving data and intelligence.[178]

F. PROTOTYPE SECTION VI: CORONAVIRUSES

When coronaviruses cross from animal to humans, they can cause significant morbidity and mortality.[179] Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome Coronavirus (MERS-CoV) are included in this list.[180] The recent response to the 2019 novel coronavirus (COVID-19) is still too early in the outbreak to derive data, but is a placeholder on this section of the prototype tool.

G. PROTOTYPE SECTION VII: VACCINE PREVENTABLE DISEASES – NON-INFLUENZA

There is a host of vaccine preventable diseases that public health must respond to. Measles and meningococcal disease are included on this prototype tool because of their high infectious attack rates. Measles is a highly contagious disease that results in high hospitalization rates and potentially fatal complications.[181] Meningococcal disease is a

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[176] Centers for Disease Control and Prevention.

[177] Centers for Disease Control and Prevention.

[178] Centers for Disease Control and Prevention.

[179] "Human Coronavirus Types," Coronavirus, February 15, 2020, https://www.cdc.gov/coronavirus/types.html.

[180] National Center for Immunization and Respiratory Diseases.

[181] "Complications of Measles," Measles (Rubeola), November 5, 2020, https://www.cdc.gov/measles/symptoms/complications.html.

rapidly progressing bacterium with a high mortality rate; among those who survive, many have long-term, permanent disabilities.[182]

H. PROTOTYPE SECTION VIII: NATURAL DISASTERS

While public health may not be the lead agency in natural disasters, personnel are often second responders for sheltering operations, disease prevention, and environmental controls.[183] Wildfires, flooding, hurricanes, earthquakes, drought, volcanoes, and extreme weather are some examples in which public health may respond as a support agency. In addition, wildfires are not always classified as naturally-occurring. They can be man-made, whether intentionally or accidentally. This caveat has been noted in this section of the prototype tool.

I. APPLYING THE PROTOTYPE TO EACH CASE STUDY

This prototype was tested against the lessons learned from each of the case studies to demonstrate its effectiveness had it been in place during these three public health responses. Items may cross into other sections, but this redundancy is meant to ensure that the items are applied to each particular category.

1. Case Study: The Novel H1N1 Influenza Response, 2009

The first pandemic of the 21st century resulted in planning gaps and ill-prepared health departments nationwide. As previously discussed in Chapter III, lessons learned from the response concluded with a list of recommendations. Applying the prototype to each of these recommendations assesses for operational content and renders the following results:

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182 "Diagnosis, Treatment, and Complications," Meningococcal Disease, February 7, 2022, https://www.cdc.gov/meningococcal/about/diagnosis-treatment.html.

183 "Natural Disasters and Severe Weather," Natural Disasters and Severe Weather, February 14, 2022, https://www.cdc.gov/disasters/index.html.

Recommendation 1: Ensure that response plans are adaptable and science-driven to address all H and N flu strains that can range from mild to severe[184]

Table 3. Prototype Application and Rationale – Section I, Pages A75 through A76, Items #12-15, and #18

12	The plan identifies all possible influenza types, subtypes, and strains (hemagglutinin and neuraminidase).
13	The plan outlines the four pandemic phases.
14	The plan describes the six pandemic intervals.
15	The plan outlines the pandemic severity levels: very high, high, moderate, low.
18	The plan accounts for the following periodic reassessment throughout the pandemic:
□ Incubation period, infectious period □ New scientific information □ Changes in vaccine production capacity	
□ Risk of severe outcomes by age and risk groups □ Advances in other health and public health response measures	

This section of the prototype ensures that the pandemic influenza plan encompasses all pre-determined scientific data for any type of pandemic: influenza types, subtypes, and strains (Item #12); pandemic phases and intervals (Items #13 and 14); and accounts for all levels of severity (Item #15). In addition, the ability to reassess for new scientific information, changes in incubation period, infectious period, risk by age and risk groups, and advances in response measures (Item #18) demonstrates the plan's ability to be adaptable because the science behind a novel pandemic is continuously monitored for changes and progression.

Recommendation 2: Identify pandemic flu vaccine populations and priority target groups[185]

This section of the prototype addresses all the demographic data associated with the jurisdiction's population (item #21) and places the population in vaccine tier groups (Tiers 1–5) in item #19. The detailed tiered list ensures that all demographic possibilities

[184] Trust for America's Health, *Pandemic Flu Preparedness*, 3.

[185] Centers for Disease Control and Prevention, *Interim Updated Planning Guidance*, 14.

have been accounted for within the jurisdiction. Amounts in each tier group would be compared to the total number of the jurisdiction's population in order to confirm that total counts are accurate. The tool also lists a contingency in the event vaccine supply is at lower levels of availability or productivity is further delayed (item #20).

Table 4. Prototype Application and Rationale – Section I, Pages A76 through A78, Items 19–21 a-d

19	The plan describes each of the Vaccine Target Groups (Tiers 1–5) and establishes rationale for each.		
20	The plan sub-categorizes vaccine tier groups based on short supply and extremely short supply of vaccine; and based on pandemic severity.		
21	The plan includes a demographic community profile of the jurisdiction identifying the following populations based on Vaccine Target Groups (Tiers 1–5):		
	a	Homeland and national security	Military forces, mission critical personnel, and mission essential personnel
			Essential military support and sustainment personnel
			Intelligence services
			National Guard personnel
			Other domestic national security personnel
			Other active duty military and essential support
	b	Healthcare and community support services	Public health personnel
			Inpatient health care providers
			Outpatient and home health providers
			Health care providers in long-term facilities
			Pharmacists and pharmacy technicians
			Community support and emergency management
			Mortuary services personnel
			Other health care personnel
	c	Other critical infrastructure	Emergency services and public safety sector personnel (EMS, law enforcement, fire)
			Manufacturers of pandemic vaccine and antivirals
			Communications/information technology (IT); electricity; nuclear; oil and gas; water sector personnel; and financial clearing and settlement personnel
			Critical governmental personnel – operational and regulatory functions

19	The plan describes each of the Vaccine Target Groups (Tiers 1–5) and establishes rationale for each.		
20	The plan sub-categorizes vaccine tier groups based on short supply and extremely short supply of vaccine; and based on pandemic severity.		
21	The plan includes a demographic community profile of the jurisdiction identifying the following populations based on Vaccine Target Groups (Tiers 1–5):		
			Banking and finance; chemical; food and agriculture; pharmaceutical, postal and shipping; and transportation sector personnel (critical infrastructure with greater redundancy)
			Other critical government personnel
	d	General Population (including access and functional needs populations)	Pregnant women
			Infants and toddlers 6–35 months old
			Household contacts of infants under 6 months old
			Children 3–18 years old with high risk condition
			Children 3–18 years old without high risk condition
			Adults 19–64 years old with high risk condition
			Adults ≥ 65 years old
			Healthy adults 19–64 years old

Recommendation 3: Establish vaccination clinics to account for the entire population.[186]

The prototype addresses not only public health operated vaccine clinics, but also vaccine administration among licensed healthcare providers. Item #54 would derive a list of all partners that could administer vaccine; and item #66 confirms their capacity to conduct vaccine operations. Item #67 provides the added measure of ensuring that all external vaccine administrators possess operational plans. Item #70 mandates the health department to have a list of all vaccine facilities within the jurisdiction to ensure 100% vaccine coverage for the entire population. External vaccine administrators must submit their served population counts annually as stipulated in item #70-b. Item #70-e ensures

[186] Centers for Disease Control and Prevention, 15.

population estimates are mapped and counted for. Items #70-c and -d would confirm that vaccine locations met building accessibility requirements for at-risk and functional needs populations. For added measure, item #79 would address the possibility of administering a second dose of vaccine to all applicable populations. This sub-area of the prototype accounts for the varying possibilities involving vaccine coverage to 100% of the jurisdiction's population.

Table 5. Prototype Application and Rationale – Section I, Pages A82, A84 through A86, Items 54, 66–67, 70 a-e, 71 a, and 79

54	The health department has an established Health Alert Network with listed contact information of all licensed healthcare partners and facility infection preventionists (if applicable) within the jurisdiction.	
66	Healthcare facilities in the jurisdiction have the capability of conducting medical countermeasure dispensing (vaccines, antivirals, antibiotics) to their applicable populations during a pandemic.	
67	The health department has submitted a list of licensed facilities listed in Item #54 that have confirmed all items listed in this section are included in their operational plan and have participated in testing the listed components of their operational plan.	
70	The health department has an established list of vaccination sites and facility points of contact for each Vaccine Target Group and covers 100% of the population in the jurisdiction. This list also includes Closed Points of Dispensing Sites and formal written agreements/commitments of participating agencies.	
	a	Vaccination sites and points of contact lists are reviewed and updated annually.
	b	Each contact listed in Item #67 submits their population counts annually.
	c	Vaccination POD facility accessibility accounts for access and functional needs populations.
	d	Vaccination POD locations account for reaching at-risk/vulnerable populations.
	e	Vaccine sites/locations are mapped and provide estimates of population coverage for vaccine administration.
71	The plan establishes the following procedures for vaccine distribution:	
	a	Tracking the number and priority of vaccine recipients
79	Distribution and dispensing considerations include potential 2-dose vaccine administration.	

Recommendation 4: Ensure public messaging addresses vaccination target groups[187]

Table 6. Prototype Application and Rationale – Section I, Page A88, Item 98

98	Public messaging includes the description and explanation (rationale) for each Vaccine Target Group.

Item #98 ensures that public messaging includes vaccination target groups. This is an important aspect of the operational plan to assist with vaccine compliance. Vaccine is not going to be readily available, and the public needs to understand the rationale associated with each vaccine group.

Recommendation 5: Calculate and assess both workforce and school absenteeism[188]

The prototype addresses workforce absenteeism in item #22 a-d. Calculations for varying amounts of workforce reductions are mandated, including up to 30% in the critical infrastructure tier. Absenteeism rates for all other tiered groups are also addressed in item 22-c. The jurisdiction must also account for the reduction of public health staff in item 22-d. School absenteeism is addressed in item 36 a-c in addition to considering triggers and activation processes for school closures and subsequent reopening. A good practice is conducting school absenteeism rates during every regular influenza season. As a result, this prototype enforces this practice.

[187] Centers for Disease Control and Prevention, 4.

[188] Trust for America's Health, *Pandemic Flu Preparedness*, 4.

Table 7. Prototype Application and Rationale – Section I, Page A78 Item 22 a-d; Page A80, Item 36 a-c

22	The demographic community profile includes information on the following:	
	a	Sub-prioritization of vaccine availability at 10%, 25%, and 50% for major critical workforce in Tier 1 Group.
	b	Reduction of critical workforce in Tier 1 Group due to absenteeism up to 30%.
	c	Reduction of workforce in Tier 2–5 Groups due to absenteeism up to 30%.
	d	The plan addresses the health department's continuity of operations in the event there is a workforce reduction due to absenteeism up to 30%.
36	A process is established to monitor school absenteeism rates during both seasonal and pandemic influenza.	
	a	Triggers are established from school absenteeism rates and overall pandemic case information to determine school closure activations.
	b	Processes are established for school closure activation.
	c	Triggers and procedures are established to determine when school facilities can reopen.

Recommendation 6: Test plans and submit an after-action report[189]

The prototype devotes an entire subsection to training, exercise, and assessing real-world events for each disease category. Any exercise or real-world event captures data that measures the response actions and evaluates the response plan content. The after-action report is required for both exercises and real-world incidents; and the improvement plan component of the after-action report ensures that necessary corrective actions are completed.

[189] Centers for Disease Control and Prevention, *Interim Updated Planning Guidance*, 13.

Table 8. Prototype Application and Rationale – Section I, Page A91, Item 129

129	Any level of exercise or real-world response that tests the plan includes an after action report and improvement plan.

When applied to the lessons learned from the 2009 H1N1 novel influenza virus, the prototype corrects these planning gaps. Subsequent measures were also placed in the prototype tool to address overarching, secondary issues during a response such as reopening a school after it was closed or the potential for administering a 2-dose novel influenza vaccination series. While some of these contingencies might remain a work in progress, having this information in one place, in one tool will streamline the process of comprehensive pandemic flu planning.

2. Case Study: Ebola Response, 2014

As discussed in Chapter III, the Ebola virus pandemic confirmed the United States was not prepared for biological threats.[190] Several documents identified lessons learned and recommendations. Applying the prototype rendered the following results:

Recommendation 1: Provide healthcare workers with childcare assistance and temporary living quarters to reduce the risk of disease transmission to family members[191]

The following portions of the prototype ensure the welfare of all persons being monitored or under isolation and quarantine, including healthcare workers and their families. Additionally, this measure is a provision for all responders and support personnel who may come in contact with this pathogen: public health staff, emergency responders, medical examiner/coroner personnel, laboratory and specimen transport personnel, waste management personnel.

[190] U.S. Congress. House., 1.

[191] Bell et al., "Overview, Control Strategies, and Lessons Learned," 9.

Table 9. Prototype Application and Rationale – Section III, Page A111, Item #55 a-k

55	The jurisdiction has arrangements in place for the welfare of any monitored persons, PEIs, and the isolated and quarantined PUIs and address the following:	
	a	Cleaning and decontamination of residence
	b	Waste removal
	c	Temporary living quarters
	d	Childcare services
	e	Temporary removal of pets
	f	Alternate sheltering location
	g	Meals
	h	Ongoing assessment for mental health services
	i	Other medical care and treatment not affiliated with Ebola exposure
	j	Employment considerations (telecommuting, medical leave arrangements)
	k	Any applicable legal regulations as identified by the local and state legal authorities

Table 10. Prototype Application and Rationale – Section III, Page A110, Item #39, a; Page A113, Item #67 and Item 69, a; Page A115, Item #83; Page A117, Item #97, a-b; Page A118, Item #109, a-b; Page A120, Item #120, a-b; and Item 121, a-b.

39	Monitoring of public health personnel for pre- and post-exposure is in place.	
	a	Provisions listed in Item **#55 a-k** are established.
67	Monitoring of emergency responders for pre- and post-exposure is in place.	
69	Procedures are in place to notify local health department of possible PUI and emergency responder exposure to PUI or confirmed Ebola patient.	
	a	Provisions listed in Item **#55 a-k** are established.
83	Monitoring of laboratory and specimen transport personnel for pre- and post-exposure is in place; and provisions listed in Item **#55 a-k** are established.	
97	Monitoring for pre- and post-exposure of healthcare personnel conducting care and treatment for Ebola patients is established with the healthcare facility.	
	a	Notification is made to the local health department of healthcare worker exposure.
	b	Provisions listed in Item **#55 a-k** are established.
109	Monitoring for pre- and post-exposure of waste management personnel is in place.	
	a	Notification is made to the local health department of any personnel exposure.
	b	Provisions listed in Item **#55 a-k** are established.
120	Monitoring of ME/Coroner personnel for pre- and post-exposure is in place.	
	a	Procedures are established to notify local health department of possible exposure to ME/Coroner personnel during decedent processing.
	b	Provisions listed in **Item #55 a-k** are established.
121	Monitoring of mortuary personnel for pre- and post-exposure is in place.	
	a	Procedures are established to notify local health department of possible exposure to mortuary service personnel during decedent processing.
	b	Provisions listed in **Item #55** a-k are established.

Recommendation 2: Pregnant healthcare workers should not care for Ebola patients;[192] breastfeeding healthcare workers and those who are the primary caregiver to infants and children should not care for Ebola patients[193]

As with the first recommendation, other frontline female personnel in addition to healthcare workers should limit exposure to the Ebola virus. This is measured throughout Section III of the prototype:

Table 11. Prototype Application and Rationale – Section III, Page A110, Item #40; Page A113, Item #68; Page A115, Item #82, Page A117, Item #96, and Page A119, Item #117.

40	Protocols are established to limit exposure to public health employees with higher risk (co-morbidities, pregnancy, breastfeeding).
68	Protocols are established to limit exposure to emergency responders with higher risk (co-morbidities, pregnancy, breastfeeding).
82	Protocols are established to limit exposure to employees [specimen collection, laboratory, and specimen transport] with higher risk (co-morbidities, pregnancy, breastfeeding).
96	The healthcare facility has established protocols to limit exposure to employees with higher risk (co-morbidities, pregnancy, breastfeeding).
117	Protocols to limit exposure to ME/Coroner and mortuary personnel with higher risk (co-morbidities, pregnancy, breastfeeding) are established.

Recommendation 3: Conduct exercise drills at least semi-annually to test the screening accuracy for suspected Ebola cases and safe application and removal of personal protective equipment[194]

Much of the workforce during an Ebola response will require use of personal protective equipment. Therefore, this measurement is found in several areas of Section III. In addition, due to the same scheduling recommendations, Ebola screening procedures can

[192] National Institute of Occupational Safety and Health (NIOSH), "Reproductive Health and the Workplace."

[193] Narasimhulu et al., "Healthcare Workers' Attitudes toward Patients," 6.

[194] Anderson-Fletcher, Vera, and Abbott, "How Mindful Is Your Company?," 207.

be tested during the PPE drills and exercises. Specific training checklists and donning/doffing procedures are detailed via CDC.[195]

Table 12. Prototype Application and Rationale – Section III, Pages A109 through A110, Item #38 a-f; Page A114, Item #70, Item #71, a-e, Item #72; Page A115, Item #81; Page A117, Item #98 a-f and Item #99; Page A118, Item #108; Page A119, Item #118 b-g; and Pages A119 through A120, Item #119, b-g.

38	The health department has the proper PPE for assessment of PUIs, PEIs, or confirmed Ebola patients.	
	a	Health department personnel are trained on the use of PPE, including proper donning and doffing procedures.
	b	Health department personnel are fit-tested for applicable respirators, including PAPRs.
	c	PPE donning and doffing protocols are established and include a checklist to ensure compliance.
	d	PPE-outfitted doffing and donning assistants are assigned to directly assist the public health entry team with applying and removing PPE (health department personnel that will come in contact with a PEI, PUI, or confirmed Ebola case).
	e	A trained observer is assigned to guide donning/doffing assistants and the public health entry team to ensure compliance (identifies improper techniques, follows the PPE checklist, ensures proper hygiene procedures are followed).
	f	Corrective actions are identified and addressed before the next scheduled drill.
70	Emergency responders are trained and conduct routine drills on screening accuracy and proper PPE donning and doffing procedures.	
71	**a**	Responder personnel are fit-tested for applicable respirators, including PAPRs.
	b	PPE donning and doffing protocols are established and include a checklist to ensure compliance.
	c	PPE-outfitted doffing and donning assistants are assigned to directly assist the entry team with applying and removing PPE (responder personnel that will come in contact with a PEI, PUI, or confirmed Ebola case).
	d	A trained observer is assigned to guide donning/doffing assistants and the responder entry team to ensure compliance (identifies improper techniques, follows the PPE checklist, ensures proper hygiene procedures are followed)
	e	Corrective actions are identified and addressed before the next scheduled drill.
72	Drills and exercises are conducted with hospitals and other healthcare facilities.	

[195] "Guidance on Personal Protective Equipment (PPE) to Be Used by Healthcare Workers during Management of Patients with Confirmed Ebola or Persons under Investigation (PUIs) for Ebola Who Are Clinically Unstable or Have Bleeding, Vomiting, or Diarrhea in U.S. Hospitals, Including Procedures for Donning and Doffing PPE," Ebola (Ebola Virus Disease), August 30, 2018, https://www.cdc.gov/vhf/ebola/healthcare-us/ppe/guidance.html.

81	Personnel that package, ship, and transport Category A specimens have the appropriate PPE and training.	
98	Healthcare personnel are trained and conduct routine drills on screening accuracy and proper PPE donning and doffing procedures.	
	a	Healthcare personnel are trained on the use of PPE, including proper donning and doffing procedures.
	b	Healthcare personnel are fit-tested for applicable respirators, including PAPRs.
	c	PPE donning and doffing protocols are established and include a checklist to ensure compliance.
	d	PPE-outfitted doffing and donning assistants are assigned to directly assist the healthcare entry team with applying and removing PPE (healthcare personnel that will come in contact with a PEI, PUI, or confirmed Ebola case)
	e	A trained observer is assigned to guide donning/doffing assistants and the healthcare entry team to ensure compliance (identifies improper techniques, follows the PPE checklist, ensures proper hygiene procedures are followed)
	f	Corrective actions are identified and addressed before the next scheduled drill.
99	Screening and PPE drills and exercises are conducted with EMS and fire agencies.	
108	Vendor personnel have the appropriate PPE available for waste handling procedures and are trained on donning and doffing procedures.	
118	Appropriate PPE is available to the ME/Coroner personnel; and they are trained to its use, including proper donning and doffing procedures.	
	b	Donning and doffing drills are conducted semi-annually.
	c	ME/Coroner personnel are fit-tested for applicable respirators, including PAPRs.
	d	PPE donning and doffing protocols are established and include a checklist to ensure compliance.
	e	PPE-outfitted doffing and donning assistants are assigned to directly assist the ME/Coroner team with applying and removing PPE (responder personnel that will come in contact with a PEI, PUI, or confirmed Ebola case).
	f	A trained observer is assigned to guide donning/doffing assistants and the ME/Coroner team to ensure compliance (identifies improper techniques, follows the PPE checklist, ensures proper hygiene procedures are followed).
	g	Corrective actions are identified and addressed before the next scheduled drill.
119	Appropriate PPE is available to mortuary personnel, and they are trained to its use.	
	b	Donning and doffing drills are conducted semi-annually.
	c	Mortuary personnel are fit-tested for applicable respirators, including PAPRs.
	d	PPE donning and doffing protocols are established and include a checklist to ensure compliance.
	e	PPE-outfitted doffing and donning assistants are assigned to directly assist the ME/Coroner team with applying and removing PPE (responder personnel that will come in contact with a PEI, PUI, or confirmed Ebola case)
	f	A trained observer is assigned to guide donning/doffing assistants and the ME/Coroner team to ensure compliance (identifies improper techniques, follows the PPE checklist, ensures proper hygiene procedures are followed)
	g	Corrective actions are identified and addressed before the next scheduled drill.

Recommendation 4: Exercise drills should include an inspection of personal protective equipment semi-annually.[196]

Inspection requirements for personal protective equipment (PPE) are specifically outlined in the prototype tool and should be conducted for all personnel required to use of PPE. Use of PPE should always accompany an inspection just prior to use; for PPE that is not routinely utilized, it is essential to inspect it at least every six months.

Table 13. Prototype Application and Rationale – Section III, Page A109, Item #38 a; Page A113, Item #65; Page A115, Item #81; Page A116, Item #94 a; Page A118, Item #108 a; Page A119, Item #118 a, and Item #119 a.

38	The health department has the proper PPE for assessment of PUIs, PEIs, or confirmed Ebola patients.	
	a	At minimum, PPE inspections are conducted semi-annually.
65	At minimum, responder agencies conduct PPE inspections semi-annually.	
81	Personnel that package, ship, and transport Category A specimens have the appropriate PPE and training; PPE inspections are conducted semi-annually.	
94	Healthcare facilities have the proper PPE for assessment, treatment, and care of PUIs or confirmed Ebola patients.	
	a	At minimum, PPE inspections are conducted semi-annually.
108	Vendor personnel have the appropriate PPE available for waste handling procedures and are trained on donning and doffing procedures.	
	a	At minimum, PPE inspections are conducted semi-annually.
118	Appropriate PPE is available to the ME/Coroner personnel; and they are trained to its use, including proper donning and doffing procedures.	
	a	At minimum, PPE inspections are conducted semi-annually.
119	Appropriate PPE is available to mortuary personnel, and they are trained to its use.	
	a	At minimum, PPE inspections are conducted semi-annually.

As discussed in Chapter III, the overarching issues of the response involved the improper use of PPE. Healthcare workers experienced the most vulnerability to exposure from Ebola patients during donning and doffing of PPE.[197] Therefore, essential elements

[196] Anderson-Fletcher, Vera, and Abbott, "How Mindful Is Your Company?," 205.

[197] Narasimhulu et al., "Healthcare Workers' Attitudes toward Patients," 4.

of this section of the prototype heavily assess the proper use of PPE. Conducting an annual review of this particular response plan along with the prototype tool will assist with keeping personnel proficient on proper PPE donning and doffing procedures. In addition, due to the high transmissibility of Ebola, response and auxiliary personnel must not cause further exposure to their families. Ensuring logistical safeguards, i.e., alternate living quarters, childcare services, meals, etc., will ultimately protect the entire community from the spread of Ebola virus.

3. Case Study: Zika Response, 2015

Arboviral diseases are categorized into three genera: *Flavivirus*, *Alphavirus*, and *Orthobunyavirus,* and vary as to their disease state and effects on the human population.[198] Not all mosquitoes carry infectious diseases, but human travel and mosquito migration patterns have made it easy for Arboviral diseases to spread. For example, a human merely has to travel to a country where mosquitos carry disease; be bitten, come back to the States and be bitten again by a non-disease carrying mosquito—and then that mosquito acquires the disease.[199] Now that mosquito can spread the disease to other humans. This is how West Nile virus made it to the United States from Africa and how Zika virus arrived in Miami from Brazil in 2015.[200] Some Arbovirus diseases can cause symptoms while others may not; and alarmingly, some Arboviral diseases are spread without mosquitos. Transmission without the vector is a hidden weapon. Diseases such as West Nile virus and Zika virus may transmit via organ transplants, blood transfusions, through breastmilk, and through sexual intercourse.[201] What can be derived from the lessons learned from the 2015 Zika virus response in the United States is that efforts must include vector control measures

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[198] Centers for Disease Control and Prevention, "Arboviral Diseases, Neuroinvasive and Non-Neuroinvasive."

[199] Centers for Disease Control and Prevention, *Surveillance and Control of Aedes Aegypti and Aedes Albopictus in the United States* (Atlanta, GA: Centers for Disease Control and Prevention, 2017), 2, https://www.cdc.gov/chikungunya/pdfs/Surveillance-and-Control-of-Aedes-aegypti-and-Aedes-albopictus-US.pdf.

[200] Centers for Disease Control and Prevention, 2.

[201] Centers for Disease Control and Prevention, "Arboviral Diseases, Neuroinvasive and Non-Neuroinvasive."

and source reduction strategies.[202] In addition, based on the type of Arboviral genera, some diseases are managed better via human case surveillance while others are efficiently managed via mosquito surveillance. Based on these assumptions, Section II of the prototype tool provides a comprehensive approach to all Arboviral disease possibilities and also takes into account the possibility that vector control responsibilities may not be under the purview of health departments, but instead fall under the authority of mosquito control districts or stand-alone environmental health departments.

Recommendation 1: Establish a vector control authority

Table 14. Prototype Application and Rationale – Section II, Page A92, Item #2

2	The plan identifies and lists the vector control authority (public health, environmental health, or district) for vector control and surveillance; and the authority's jurisdictional boundaries (city, town, district, region, county, or state)

Recommendation 2: Include a detailed Arboviral disease hazard profile, life cycle, and modes of transmission

Table 15. Prototype Application and Rationale – Section II, Pages A92 through A93, Item #6, a-g; Page A94, Item #12

6	The plan includes a hazard profile that identifies the disease-carrying mosquito species present in the jurisdiction.	
	a	The plan includes the Arboviral diseases that are positive in the mosquito species and are locally-acquired (transmission by vector).
	b	The plan includes the general case definitions for both neuroinvasive and non-neuroinvasive Arboviral diseases.
	c	The plan differentiates the preferred method for monitoring or predicting Arboviral outbreaks (detecting cases in people versus mosquito-based surveillance)
	d	The plan includes the life cycle of each mosquito species identified in the jurisdiction.
	e	The plan includes disease transmission cycles for each Arboviral disease listed.

[202] Centers for Disease Control and Prevention, *CDC Guidelines for Development of State and Local Risk-Based Zika Action Plans* (Atlanta, GA: Centers for Disease Control and Prevention, 2016), 17, https://www.cdc.gov/zika/zap/pdfs/action-plan/zika-action-plan_3-10-16.pdf.

	f	The plan lists the modes of transmission for each Arboviral disease. (e.g., blood transfusion, organ transplantation, perinatal transmission, sexual transmission, breastfeeding, and laboratory exposures)
	g	The plan identifies primary and secondary mosquito vectors for each Arboviral disease listed.
12	The plan differentiates preferred method of Arboviral disease surveillance: mosquito-based versus human case detection.	

Recommendation 3: Establish prevention measures

Table 16. Prototype Application and Rationale – Section II, Page A97, Item #35 and Item #37; Page A99 Item #47 and Item #48

35	Case management includes information on preventing transmission with mosquitoes.
37	Travel health notices and levels are monitored.
47	There is information sharing and coordination with local blood, organ, and tissue collection agencies with the applicable health authority (local or state level).
48	Blood, organ, and tissue collection agencies follow FDA guidance when an active transmission area is confirmed.

Recommendation 4: Establish surveillance measures

Table 17. Prototype Application and Rationale – Section II, Page A99, Items #49 through #55

Pregnancy registry reporting (as determined by applicable Arboviral diseases)	
49	The health department has a process in place to report applicable Arboviral disease cases during pregnancy that are inputted into a national birth registry.
50	Zika prevention kits are available via the health department and distributed as necessary.
51	The health department assists with provider outreach for ultrasound testing and other medical testing; pre- and post-natal care; and mental health services.
52	The health department monitors surveillance of cases for birth defects, abnormalities, and developmental issues pre-and post-natal.
53	A process is in place to initiate and test asymptomatic pregnant women when applicable.
54	Messaging to women includes cautionary travel considerations and use of condoms or abstinence.
55	Messaging includes advising men to use condoms or abstain from sexual contact with pregnant women.

Recommendation 5: Establish source reduction measures

Table 18. Prototype Application and Rationale – Section II Page A94, Item #14 and Item #15; Page A95, Item 24 d; Pages A95 through A96, Item #25 b-g; Page A96, Item #27 a-e.

14	The plan includes vector control activities that targets both adult and larval mosquitoes.	
15	Mosquito population data, including larval sites and speciation, and disease positive case counts, is collected and plotted in a geographic information system (GIS) mapping.	
24	**Beginning of mosquito season**	
	d	Initiate source reduction (container elimination).
25	**Confirmed Local Transmission Phase**	
	b	Eliminate larval and adult habitats within 100–200 yards/meters around a case's home. Treat with larvicide and adulticide as applicable.
	c	Treat any water-holding containers that cannot be dumped, covered, discarded, or otherwise modified with long-lasting larvicide.
	d	Encourage use of insect repellents, window and door screens, and air-conditioning use.
	e	Initiate/maintain adult sampling to estimate adult mosquito abundance and evaluate effectiveness of insecticide treatments.
	f	Initiate community source reduction, adult mosquito and case containment initiatives to minimize the spread of infected mosquitoes.
	g	Monitor effectiveness of vector control efforts through mosquito trapping surveillance.
27	**Widespread Transmission Outbreak Phase**	
	a	Divide outbreak area into operational management areas where control measures can be effectively applied to reduce mosquito density. Repeat as necessary.
	b	Conduct door-to-door inspections and area-wide mosquito control (reach over 90% coverage of the control area within a week).
	c	Identify and treat, modify, or remove mosquito-producing containers.
	d	Combine outdoor spatial and residual spraying with source reduction and larviciding (including residual spraying of container surfaces and adjacent mosquito resting areas).
	e	As applicable, treat storm drains, roof gutters, and other cryptic water sources.

The prototype introduced in this chapter addressed the lessons learned in each case study. Planning measures were placed in the prototype that would have prevented the real-world response issues from occurring. This prototype can assist jurisdictions with identifying their capabilities and their challenges. Some public health practitioners may

argue this creates more work and uses more manpower to complete. While it may not fix every possible obstacle incurred during a public health emergency, it will advise the health department when barriers to mitigation are probable before the emergency happens. The tool aggregates otherwise disparate lessons learned, best practices, scientific background, essential planning elements, and multi-disciplinary critical infrastructure in one document. As a result, it can dispatch efforts more efficiently, reduce liability and hold all grantees accountable for the funding.

The remainder of the prototype will be complete by the end of the PHEP 5-year project period, June 30, 2024. This includes content for the remaining subsections of Section III and Sections IV through VIII. The tool's measurements require some supplemental explanation for both the plan writer and assessor. Therefore, after the prototype is completed, a user's manual will be created with a projected completion timeline of September 30, 2024. A user's manual should accompany a tool of this complexity, much like the user's guide that accompanied the Cities Readiness Initiative Local Technical Assistance Review.[203] A user's guide or manual would assist plan writers and assessors alike, and would limit assumptions and interpretation disparity among item content.

The overall vision for this prototype is to propose its full content to the CDC. By October 1, 2024, the tool with the accompanying user's manual will be submitted in hopes that this prototype is validated and promulgated by the CDC as a standardized tool. In the interim, the author intends to implement the tool within her jurisdiction to support its validity and improve upon current written response plans.

[203] Centers for Disease Control and Prevention, *Division of Strategic National Stockpile*.

VI. CONCLUSION

A. UNPREPARED AND BLINDSIDED

For over 18 years, the CDC's Public Health Emergency Preparedness (PHEP) Program has funded state and local health departments to better prepare for public health emergencies that threaten the nation.[204] Health departments develop written plans that detail how accidental, intentional, and natural threats are mitigated and capture best practices and lessons learned during exercises and real-world incidents. However, available templates and other resources to draft comprehensive plans are not standardized, concise or available in one repository. Regardless, per PHEP grant requirements, response plans and after action reports are annually submitted to the CDC, but are not assessed for operational content and practicality. The CDC only confirms that plans are in place and exercised. Furthermore, not every type of public health threat has a written plan associated with it, not every plan is exercised and existing plans are lacking in content. For example, per the CDC, the Cities Readiness Initiative (CRIs) in Arizona were advised to exercise a pandemic flu scenario with antiviral medical countermeasures for its exercise grant requirement.[205] Furthermore, the CDC confirmed the Pinal County CRI would meet its exercise distribution and dispensing requirement by dispensing antiviral medical countermeasures to a closed point of dispensing site.[206] However, the CDC did not have an antiviral screening form to ascertain the appropriate antiviral to dispense to each person. In fact, no CRI has an antiviral screening form in their existing medical countermeasures plan.[207] The Pinal County CRI had to research antiviral prescribing information within multiple sources to create a screening form (see Appendix B). Over 10 years after the H1N1

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[204] Centers for Disease Control and Prevention, "CDC's Public Health Emergency Preparedness Program."

[205] Arizona Department of Health Services, Medical Countermeasures (MCM) – Full Scale Exercise Concepts and Objectives Meeting Minutes, April 17, 2019; SNS Planning Meeting Notes, August 6, 2019.

[206] Richard Turner, email message to author, August 26, 2019.

[207] Edward Valinski, email message to author, February 7, 2020.

pandemic influenza response, CRIs do not have an antiviral screening form. These are the insufficiencies that create vulnerabilities during a real-world response.

Public health has demonstrated it is unprepared for and often blindsided by emerging threats. During planning for the H5N1 bird flu, novel H1N1 swine flu emerged. No plans were in place when the Ebola virus and the Zika virus arrived in the United States. While tracking cases of MERS-CoV (Middle East Respiratory Syndrome Coronavirus) in the Middle East, a novel coronavirus emerged in Wuhan, China and made it to the United States. While the response is still occurring, there are already evident signs of procedural issues. For example, on January 8, 2020, the CDC began alerting health clinicians to assess incoming patients with respiratory issues about any travel history to Wuhan, China. On January 17, 2020, the CDC initiated enhanced health screenings for travelers at three United States airports that receive ***most*** of the travelers arriving from Wuhan, China: San Francisco (SFO), New York – John F. Kennedy Airport (JFK), and Los Angeles (LAX).[208] It took nine days to consider a few points of entry into the United States for enhanced health screenings. Regardless, four days later the first case of novel coronavirus was confirmed in a return traveler in the state of Washington, and the CDC added two more airports that same week for enhanced health screenings: Atlanta-Hartsfield (ATL) and Chicago O'Hare (ORD).[209] Again, evidence of more insufficiencies during a real-world response. Public health cannot continue to ***react*** to novel diseases, they must be in a better state of readiness.

B. RECOMMENDATIONS

The following recommendations call upon the CDC to ***proactively*** prepare and assess health departments for operational capabilities essential for a coordinated and efficient response. These solutions will also create more proficiency in fiscal responsibility with the PHEP funding.

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[208] "First Travel-Related Case of 2019 Novel Coronavirus Detected in United States," CDC Newsroom, January 21, 2020, https://www.cdc.gov/media/releases/2020/s0215-Diamond-Princess-Repatriation.html.

[209] Centers for Disease Control and Prevention.

1. Consolidate Planning Tools into One Document per Hazard in one Retrievable Location

As discussed in Chapter III, the CDC has not provided health departments with succinct lists for planning content. Multiple sources had to be utilized to draft the all-hazards audit tool prototype. For pandemic flu planning alone, two checklists and three guidance documents were used. Additionally, some of the existing planning guidance are archived content that has not been updated in several years and remains in interim, provisional form. For Zika virus, the last available case definition is from 2015. One guidance document dated in March 2016 does not include guidance for U.S. territories despite suffering high counts of Zika cases.[210] American Samoa had 131 cases, Puerto Rico had 35,395 cases, and the U.S. Virgin Islands had 986 cases.[211] Further, the cover page from the CDC's 2017 interim response plan reads: "This PDF is archived for historical purposes and is no longer being maintained or updated."[212] While the CDC provided comprehensive checklists for pandemic flu planning, there were no checklists for Zika and Ebola. The World Health Organization (WHO) had a detailed checklist for Ebola, but much of the content pertained to international responses in Africa. Preparedness planners have to examine thirty-eight pages of the CDC's Ebola Concept of Operations Planning Template to derive adequate planning elements and must read through a separate lengthy website to ascertain personal protective equipment requirements.[213]

Local public health agencies are the proverbial "boots on the ground" that must have consistent, concise, and standardized tools in order to develop effective response plans. The more preparedness planners have to search for resources, the more variant the plans can be. If public health continues on the path of status quo, with subpar guidance

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[210] Centers for Disease Control and Prevention, *CDC Guidelines for Development of State and Local Risk-Based Zika Action Plans*, 1.

[211] "2016 Case Counts," Zika Virus, April 24, 2019, https://www.cdc.gov/zika/reporting/2016-case-counts.html.

[212] Centers for Disease Control and Prevention, *Zika: CDC Interim Response Plan*, 1.

[213] Centers for Disease Control and Prevention, *Ebola Concept of Operations (ConOps) Planning Template*; and Centers for Disease Control and Prevention, "Guidance on Personal Protective Equipment (PPE)."

documents or no resources at all, there will continue to be poor response outcomes. Checklists can streamline planning content if they are available and well-summarized. Having one repository available to health department planners and having consolidated planning tools per hazard will create consistent and concise planning documents.

2. Adopt an All-Hazards Audit Tool to Measure Response Plans

As discussed in Chapter III, there has to be a *measurable* state of readiness and the ability to identify planning gaps that can prevent or delay a successful response. The CDC directly audits only medical countermeasure plans from state and local health departments that receive particular funding through the Cities Readiness Initiative.[214] As described in Chapter IV, there are specific lists of items that are reviewed to ensure there is operational content in medical countermeasure plans.[215] This same process needs to be in place for all-hazards and all PHEP-funded health departments. There needs to be a detailed process to ensure response plans are not just checked for their existence, but fully assessed for their operational content. An all-inclusive assessment tool crafted from a previously successful audit tool, checklists, guidance documents, and from best practices detailed in Chapter V demonstrated it is needed for preparedness planning. When operational content is analyzed and gaps are discovered, they need to be fixed. Conversely, not all diseases can be easily planned for. We cannot have a vaccine or laboratory testing media for every disease. Nonetheless, plans should reflect the extent of the health department's response capabilities, note what insufficiencies are present, and set a list of priorities to remedy them.

3. Monitor Preparedness Plans on a Biannual Basis

After utilizing the all-hazards auditing tool to assess for preparedness capabilities and planning gaps, a scheduled review should be conducted to ensure optimal progression and hold the funding streams accountable. The tool should be utilized in its entirety every 2 years. First, if capabilities are not continuously measured for relevance, they become inefficient. Therefore, public health cannot ignore response capacity strengths. Second, the

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[214] Centers for Disease Control and Prevention, "Cities Readiness Initiative."

[215] Centers for Disease Control and Prevention, *Division of Strategic National Stockpile*.

planning gaps need to continue on a forward progression to reach completion. Not all planning gaps can be resolved immediately. Some may require more funding, manpower, time and attention. Often when there are gaps that need long-term solutions, multi-agency coordination is key.[216] As a result, the priority for rectifying planning gaps needs to be on a consistent and frequent schedule. Two years provides a reasonable strategic approach and provides evidence of fiscal responsibility.

The consequences will be severe for the nation's homeland security whether the next big response is for a naturally occurring disease or an intentional, weaponized agent. It should not take 10 years to create screening forms for existing medical countermeasures caches. Public health practitioners should not have to search multiple sites and agencies for planning templates. Health departments should not have to wait weeks for the CDC to make a decision on closing ports of entry. CDC leadership needs to realize its public health system can do better. As evidenced by the case studies described in Chapter III, public health has frequently been behind in planning and delayed in response. One can argue these recommendations create more work for both the CDC and health departments, and both entities are already underfunded and understaffed. However, the emergency is going to happen regardless, and when it does, public health has no option but to respond. It would be better if all health departments knew their preparedness levels because there was a process in place to determine such. Public health cannot continue to build the ship as it sails.

[216] Trust for America's Health, *Pandemic Flu Preparedness*, 9.

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APPENDIX A. THE PROTOTYPE AUDIT TOOL

The following tool is a prototype designed for auditing public health preparedness plans. The tool is divided into sections; sections are divided into disease categories. For purposes of the reviewing the prototype, not all categories have defined audit components listed; only the categories for the three case studies are included (Pandemic influenza, Ebola virus, and Zika virus); and discussed in Chapter V. Audit components were derived from several sources referenced under each disease category.

Section I: Novel Pandemic Influenza

Bhavsar, Tina R., Deborah L. Esbitt, Patricia A. Yu, Yon Yu, and Susan E. Gorman. "Planning Considerations for State, Local, Tribal, and Territorial Partners to Receive Medical Countermeasures from CDC's Strategic National Stockpile During a Public Health Emergency." *American Journal of Public Health* 108, no. S3 (September 2018): S183–87. https://doi.org/10.2105/AJPH.2018.304472.

Centers for Disease Control and Prevention. *Interim Updated Planning Guidance on Allocating and Targeting Pandemic Influenza Vaccine during an Influence Pandemic*. June 2, 2020. https://www.cdc.gov/flu/pandemic-resources/national-strategy/planning-guidance/index.html.

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Centers for Disease Control and Prevention, and National Center for Immunization and Respiratory Diseases (NCIRD). "Types of Influenza Viruses." Centers for Disease Control and Prevention, November 2, 2021. https://www.cdc.gov/flu/about/viruses/types.htm.

Centers for Disease Control and Prevention, Office of Public Health Preparedness and Response, Division of the Strategic National Stockpile. *Division of Strategic National Stockpile: Local Technical Assistance Review Tool Users Guide*. Atlanta, GA: Centers for Disease Control and Prevention, 2010. https://health.mo.gov/emergencies/sns/pdf/Local-TAR-Guide-January2010.pdf.

Holloway, Rachel, Sonja A. Rasmussen, Stephanie Zaza, Nancy J. Cox, Daniel B. Jernigan, and Influenza Pandemic Framework Workgroup. "Updated Preparedness and Response Framework for Influenza Pandemics." *Morbidity and Mortality Weekly Reports*, Recommendations and Reports, 63, no. 6 (September 26, 2014): 1–9. https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6306a1.htm.

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Section II: Arboviral Diseases

Centers for Disease Control and Prevention. "Arboviral Diseases, Neuroinvasive and Non-Neuroinvasive, 2015 Case Definition." National Notifiable Diseases Surveillance System, April 16, 2021. https://ndc.services.cdc.gov/case-definitions/arboviral-diseases-neuroinvasive-and-non-neuroinvasive-2015/

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———. *Surveillance and Control of Aedes aegypti and Aedes albopictus in the United States*. Atlanta, GA: Centers for Disease Control and Prevention, 2017. https://www.cdc.gov/chikungunya/pdfs/Surveillance-and-Control-of-Aedes-aegypti-and-Aedes-albopictus-US.pdf.

———. *Zika: CDC Interim Response Plan*. Atlanta, GA: Centers for Disease Control and Prevention, 2017. https://www.cdc.gov/zika/pdfs/zika-draft-interim-conus-plan.pdf.

Centers for Disease Control and Prevention, Division of Vector-Borne Diseases (DVBD). *West Nile Virus in the United States: Guidelines for Surveillance, Prevention, and Control*. 4th revision. Fort Collins, CO: Centers for Disease Control and Prevention, 2013. https://www.cdc.gov/westnile/resourcepages/pubs.html.

Section III: Category A Agents: Viral Hemorrhagic Fevers – Ebola Virus Disease

Centers for Disease Control and Prevention. *Ebola Concept of Operations (ConOps) Planning Template.* Centers for Disease Control and Prevention, August 20, 2015. https://www.cdc.gov/cpr/documents/ebola-concept-of-operations-planning-template-8-20-2015.pdf.

———. "Guidance on Personal Protective Equipment (PPE) to Be Used by Healthcare Workers during Management of Patients with Confirmed Ebola or Persons under Investigation (PUIs) for Ebola Who Are Clinically Unstable or Have Bleeding, Vomiting, or Diarrhea in U.S. Hospitals, Including Procedures for Donning and Doffing PPE." Ebola (Ebola Virus Disease), August 30, 2018. https://www.cdc.gov/vhf/ebola/healthcare-us/ppe/guidance.html.

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National Institute of Allergy and Infectious Diseases. "Protocol Details: A Multicenter, Multi-Outbreak, Randomized, Controlled Safety and Efficacy Study of Investigational Therapeutics for the Treatment of Patients with Ebola Virus Disease." NIH Clinical Center, 2019. https://clinicalstudies.info.nih.gov/ProtocolDetails.aspx?A_2019-I-0003.html.

World Health Organization. *Ebola Virus Disease, Consolidated Preparedness Checklist, Revision 1.* Geneva: World Health Organization, 2015. https://www.who.int/csr/resources/publications/ebola/ebola-preparedness-checklist/en/.

Please note: The term "jurisdiction" includes any Tribal Nation and pertains to the land/property or its residents.

I. Novel Pandemic Influenza					
Preparedness Planning Elements		**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
1	The jurisdiction has a pandemic influenza plan (referred to as "the plan" in this Novel Pandemic Influenza section of this tool).				
	a The plan's revision page includes an annual review and allows for list of updates.				
2	The plan establishes a process for its activation.				
3	The plan establishes a process for activation of the public health emergency operation center.				
4	Incident command roles are established for this type of response and assigned personnel are NIMS-compliant.				
5	The plan outlines a process for declaring a public health emergency at the local level.				
6	The jurisdiction is a signatory of an EMAC and/or State Mutual Aid Compact.				
7	The plan outlines a process for activating the EMAC or State Mutual Aid Compact.				
8	If applicable, Tribal or other sovereign nations are signatories on the EMAC or State Mutual Aid Compact.				
9	The plan outlines the formal process to request applicable medical countermeasures from the Strategic National Stockpile.				
10	The plan outlines the process for utilizing Emergency Use Authorization (EUA) and Investigational New Drug (IND) indicated medical countermeasures.				
11	The plan outlines a process for deactivation, demobilization, and recovery.				
12	The plan identifies all possible influenza types, subtypes, and strains (hemagglutinin and neuraminidase).				
13	The plan outlines the four pandemic phases.				
14	The plan describes the six pandemic intervals.				
15	The plan outlines the pandemic severity levels: very high, high, moderate, low.				
16	The plan incorporates lessons learned from previous pandemic responses.				
17	The planning framework further describes the pandemic intervals utilizing the following eight pandemic planning domains: (further assessment is located throughout the Novel Pandemic Influenza section of this tool)				
	a Incident management				

				Completed	In Progress	Not Started	Comments/Notes
	b	Surveillance and epidemiology					
	c	Laboratory					
	d	Community mitigation					
	e	Medical care and countermeasures					
	f	Vaccine					
	g	Risk communications					
	h	State and local coordination					
18	The plan accounts for the following periodic reassessment throughout the pandemic:						
	□ Incubation period, infectious period	□ New scientific information	□ Changes in vaccine production capacity				
	□ Risk of severe outcomes by age and risk groups	□ Advances in other health and public health response measures					
19	The plan describes each of the Vaccine Target Groups (Tiers 1–5) and establishes rationale for each.						
20	The plan sub-categorizes vaccine tier groups based on short supply and extremely short supply of vaccine; and based on pandemic severity.						
21	The plan includes a demographic community profile of the jurisdiction identifying the following populations based on Vaccine Target Groups (Tiers 1–5):						
	a	Homeland and national security	Military forces, mission critical personnel, and mission essential personnel				
			Essential military support and sustainment personnel				
			Intelligence services				
			National Guard personnel				
			Other domestic national security personnel				
			Other active duty military and essential support				
	b	Healthcare and community support services	Public health personnel				
			Inpatient health care providers				
			Outpatient and home health providers				
			Health care providers in long-term facilities				
			Pharmacists and pharmacy technicians				

				Completed	In Progress	Not Started	Comments/Notes
			Community support and emergency management				
			Mortuary services personnel				
			Other health care personnel				
	c	Other critical infrastructure	Emergency services and public safety sector personnel (EMS, law enforcement, fire)				
			Manufacturers of pandemic vaccine and antivirals				
			Communications/information technology (IT); electricity; nuclear; oil and gas; water sector personnel; and financial clearing and settlement personnel				
			Critical governmental personnel – operational and regulatory functions				
			Banking and finance; chemical; food and agriculture; pharmaceutical, postal and shipping; and transportation sector personnel (critical infrastructure with greater redundancy)				
			Other critical government personnel				
	d	General Population (including access and functional needs populations)	Pregnant women				
			Infants and toddlers 6–35 months old				
			Household contacts of infants under 6 months old				
			Children 3–18 years old with high risk condition				
			Children 3–18 years old without high risk condition				

			Adults 19–64 years old with high risk condition				
	d			**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
			Adults ≥ 65 years old				
			Healthy adults 19–64 years old				
22	The demographic community profile includes information on the following:						
	a	Sub-prioritization of vaccine availability at 10%, 25%, and 50% for major critical workforce in Tier 1 Group.					
	b	Reduction of critical workforce in Tier 1 Group due to absenteeism up to 30%.					
	c	Reduction of workforce in Tier 2–5 Groups due to absenteeism up to 30%.					
	d	The plan addresses the health department's continuity of operations in the event there is a workforce reduction due to absenteeism up to 30%.					
23	The community profile population counts are reviewed annually and updated with every census and when there is an adjustment to the population estimate.						
24	The following legal considerations are addressed in the plan (list applicable statutes, ordinances, or regulations):						
	a	Civil unrest/maintaining public order					
	b	Isolation and quarantine					
	c	School closures					
	d	Public transportation					
	e	Crisis Standards of Care					
	f	Canceling mass gathering events					
	g	Emergency declarations					
	h	Modification of tier structure					
	i	Modification of vaccine tier administration					
25	Communication pathways exist with the following:						
	a	Resource request processes are established between state and local health departments.					
	b	Resource request processes are established between local health departments and critical workforce partners in the Tier 1 Group.					

	c Resource request processes are established between local health departments and the health care system partners.				
		Completed	**In Progress**	**Not Started**	**Comments/Notes**
	d Resource request processes are established between local health departments and any other identified partners and stakeholders in Tier 2–4 Groups.				
26	The plan discusses how state, local, tribal, territorial, and regional entities coordinate and integrate their respective response activities.				
27	A local multi-disciplinary workgroup is established and part of the planning process. List is not in priority order.				
	a **The workgroup includes the following partners/stakeholders: partners may not be applicable or may serve in multiple categories.**				

□ Health Department*	□ Environmental Health	□ Mental Health/Crisis Professionals	Others:
□ Law Enforcement	□ Emergency Management	□ County and Municipal Legal Counsel	□ _____
□ Fire Department	□ EMS Agency	□ 9–1-1 Centers/Public Safety Answering Points	
□ Tribal Nations	□ Pharmacies	□ Hospitals/Healthcare Coalition	□ _____
□ Healthcare providers	□ Skilled nursing providers	□ Boarding care facility/HUD housing authority	
□ Urgent Care/Clinics	□ Home Health Agency	□ Hospice/Palliative Care Agency	□ _____
□ Local obstetrician providers	□ Local pediatrician providers	□ Local dentistry providers	
□ Medical Examiner/Coroner	□ Vital Records/Statistics	□ Funeral Board Representative	□ _____
□ Department of Education	□ Post-Secondary Education	□ Pre, Primary, and Secondary Education	
□ Animal Control Services	□ Public Works	□ Department of Transportation	*Health Department should include: Health Director, Medical Officer, Lead Epidemiologist, Finance Officer, Public Information Officer, MCM Coordinator, PHEP Coordinator, Immunization Coordinator, Director of Nursing, WIC Director, Community Health Programs, Call Center personnel, Transportation personnel, Ombudsmen, Laboratory Director (if lab services are in health department), and any other special services or programs. (not all are applicable to the health department; positions and titles may vary)
□ Veterinarian Services	□ Wildlife Agency	□ Agricultural Agency	
□ Local Agricultural Affiliates	□ Department of Corrections	□ Faith-Based Organizations	
□ Homeland Security Affiliate	□ Airport and Mass Transit	□ Organizations Serving Populations At-Risk	
□ Military Installations	□ Utility Agencies	□ Community Emergency Response Teams	
□ Veteran's Administration	□ Immunization Services	□ Metropolitan Medical Response System	
□ Customs/Immigration	□ Elected Officials	□ National Disaster Medical System	
□ Red Cross	□ Private Businesses	□ Medical Reserve Corps	
□ Community Call Centers	□ Biohazard waste agencies	□ Access/Functional Needs Organizations	
□ Facilities that house access/functional needs individuals		□ Communities/Volunteers Active in Disaster (COAD/VOAD)/Other Volunteers	

Disease Surveillance			Completed	In Progress	Not Started	Comments/Notes
28	The health department has a medical electronic disease reporting system for reportable/notifiable diseases.					
29	The health department has a process for daily monitoring and subsequent investigation management of all reportable/notifiable diseases received from the medical electronic disease reporting system.					
30	The health department has an electronic syndromic surveillance system.					
31	The health department has a data use agreement with each hospital or hospital system for electronic syndromic surveillance data exchange.					
32	The health department maintains situational awareness from data received from the electronic syndromic surveillance system.					
33	The health department has access to influenza-like illness data from hospitals.					
34	The jurisdiction has access to mortality data from the Medical Examiner's/Coroner's Office.					
35	Seasonal influenza surveillance is conducted year-round.					
36	A process is established to monitor school absenteeism rates during both seasonal and pandemic influenza.					
	a	Triggers are established from school absenteeism rates and overall pandemic case information to determine school closure activations.				
	b	Processes are established for school closure activation.				
	c	Triggers and procedures are established to determine when school facilities can reopen.				
37	A process is established to initiate and demobilize enhanced surveillance.					
38	Ensure specimen test kit capacity for rapid identification of influenza.					
39	Ensure process is established for laboratory testing for identification of influenza strains/subtypes.					
40	The health department has redundant laboratory testing locations/facilities identified for surge capacity of influenza specimens.					

41	A statewide process is established for drafting and revising case definitions.				
		Completed	**In Progress**	**Not Started**	**Comments/Notes**
42	A process is established to track daily pandemic influenza case counts.				
43	An epidemiological curve is created and maintained throughout the season/outbreak.				
44	Reports of case counts render the following information, also location mapping of:				
	a Suspect, probable, and rule-out status				
	b Strain/Sub-type of influenza virus				
	c Hospitalization, if applicable				
	d Quarantined, if applicable				
	e Fatalities				
	f Age				
	g Gender				
	i Type of vaccination population group (Tier 1–5)				
	j Influenza vaccination status (seasonal versus pandemic vaccination, if applicable)				
	k Employment or school location of cases (if applicable)				
	l Co-morbidities, if applicable				
45	Case reporting from **Items 44 a-l** are used to determine percentage affected in each vaccine population group.				
46	Case reporting from **Items 44 a-l** are used to establish community outreach and education efforts.				
47	Triggers and subsequent processes are established from case reporting and overall pandemic influenza rates to determine the necessity to cancel and subsequently resume mass gatherings.				
Infection Control Measures		**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
48	Pre-identified local health department authorities have access to the CDC EPI-X Notification System and are trained on its use.				
49	Travel ports of entry that may impact the jurisdiction have been identified and are listed in a GIS map.				

			Completed	In Progress	Not Started	Comments/Notes
50		Methods and procedures are in place to identify and establish any applicable travel restrictions within and outside of the jurisdiction.				
51		Quarantine station(s) have been identified within the jurisdiction's region.				
52		Travel health notices and their levels are monitored.				
53		The health department has established procedures to investigate and contain potential travel-associated cases.				
54		The health department has an established Health Alert Network with listed contact information of all licensed healthcare partners and facility infection preventionists (if applicable) within the jurisdiction.				
	a	Pre-established messaging provides healthcare providers information about novel and pandemic influenza, case definition, health department reporting procedures, and infection control and clinical guidelines.				
	b	Methods are in place to regularly update healthcare providers on the current status of the pandemic.				
	c	Methods are in place to regularly update healthcare providers on changes to the current clinical guidance, when applicable.				
	d	Methods are in place to rapidly address questions from healthcare providers and provide subsequent guidance as applicable.				
	e	Processes are in place to update and alter clinical guidelines based on healthcare provider input/feedback and via the CDC, when applicable.				
55		Non-pharmaceutical and pharmaceutical interventions are identified in the plan.				
	a	The jurisdiction has pre-established vendors for emergency procurement of the following:				
	□ face masks	□ Nitrile gloves	□ NIOSH-approved N-95 respirators	□ eye protection (goggles, glasses, shields, splash guards)	□ vaccine supplies	
	□ protective barrier gowns	□ alcohol-based hand sanitizer	Other equipment: □ _____ □ _____ □ _____			

	Healthcare Surge Management	Completed	In Progress	Not Started	Comments/Notes
***This section measures pandemic preparedness capabilities involving healthcare providers, hospitals, and/or healthcare coalitions. The health department may not have jurisdiction over these partners or certain criteria listed in this section. However, this section does measure the level of preparedness that affects the community and should be used to improve healthcare surge management.**					
56	Healthcare entities have process in place to notify their local health department of both their facility command center activation and operational plan activation.				
57	The local health department has assisted the healthcare sector with testing pandemic operational plans that address the following:				
	□ healthcare of persons with pandemic influenza; □ legal issues affecting staffing and patient care; □ continuity of services for other patients; □ protection of the healthcare workforce; □ medical supply contingency plans				
58	Healthcare operational plans ensure the needs of vulnerable, at-risk, and access/functional needs populations are addressed during a pandemic.				
59	Healthcare operational plans provide for real-time situational awareness of the following during a pandemic:				
	□ patient visits; □ hospital bed and intensive care needs; □ medical supply needs; □ medical staffing needs				
60	Healthcare operational plans identify and test surge capacity of the following during a pandemic:				
	□ healthcare services; □ workforce; □ fatality management; □ PPE supplies; □ testing/specimen supplies				
61	Healthcare entities maintain a current roster of all active and formerly active healthcare personnel available for emergency healthcare services.				
62	Healthcare entities have identified triggers in their operational plan to determine medical staffing emergencies.				
63	Healthcare entities have exercised the operational plan to obtain appropriate credentials of volunteer healthcare personnel (including any applicable in-state, out-of-state, international, returning retired, and non-medical volunteers) to meet staffing needs during a pandemic.				

		Completed	In Progress	Not Started	Comments/Notes
64	Healthcare facilities in the jurisdiction have tested a plan for isolating and cohorting patients with known or suspected influenza, for training clinicians, and for supporting the needs for personal protective equipment.				
65	Healthcare facilities in the jurisdiction have tested an operational plan to initiate, support and implement quarantine of potentially exposed healthcare personnel.				
66	Healthcare facilities in the jurisdiction have the capability of conducting medical countermeasure dispensing (vaccines, antivirals, antibiotics) to their applicable populations during a pandemic.				
67	The health department has submitted a list of licensed facilities listed in **Item #54** that have confirmed all items listed in this section are included in their operational plan and have participated in testing the listed components of their operational plan.				
68	The health department has listed the capacity of the jurisdiction's healthcare delivery system in its pandemic influenza plan.				
Vaccine Distribution		**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
69	The plan establishes procedures for activating vaccine distribution and dispensing operations, including external vaccine administration partners.				
70	The health department has an established list of vaccination sites and facility points of contact for each Vaccine Target Group and covers 100% of the population in the jurisdiction. This list also includes Closed Points of Dispensing Sites and formal written agreements/commitments of participating agencies.				
	a Vaccination sites and points of contact lists are reviewed and updated annually.				
	b Each contact listed in **Item #67** submits their population counts annually.				
	c Vaccination POD facility accessibility accounts for access and functional needs populations.				
	d Vaccination POD locations account for reaching at-risk/vulnerable populations.				
	e Vaccine sites/locations are mapped and provide estimates of population coverage for vaccine administration.				

			Completed	In Progress	Not Started	Comments/Notes
71	The plan establishes the following procedures for vaccine distribution:					
	a	Tracking the number and priority of vaccine recipients				
	b	Location and vaccine administrator information				
	c	Ensuring the necessary equipment and supplies are available at all points of distribution in the community				
	d	The logistical support for the points for distribution				
	e	Security considerations and supplemental response plans during transport, at POD locations, and at designated inventory/storage locations				
	f	Cold chain requirements during transport, at POD locations, and in storage				
	g	Biohazardous waste considerations				
72	The health department has designed screening/consent forms for vaccine administration and are provided to all vaccine administration entities/sites.					
73	The health department has an electronic inventory management system, including a manual/paper-based back-up system in the event of an electronic failure.					
	a	The inventory system provides the ability to monitor vaccine inventory levels and availability.				
	b	The inventory system provides the ability to order and allocate vaccine.				
	c	The health department has procedures in place to report vaccine inventory levels to the state health department.				
74	The plan includes procedures for obtaining vaccine from federal or state designated entities (whichever level is responsible for distributing vaccine to local health departments).					
75	The plan establishes vaccine distribution strategies for the jurisdiction.					
	a	Security plans for escorting vaccine throughout the jurisdiction are in place.				
	b	Distribution routes are pre-established and account for road closures.				
76	The plan addresses vaccine ordering procedures with vaccine administration partners in the jurisdiction.					

			Completed	In Progress	Not Started	Comments/Notes
77		All vaccine administrators in the jurisdiction have access to the designated statewide electronic immunization information system.				
	a	All vaccine administrators have processes in place to document vaccine administration in the immunization system.				
78		Establish methods for monitoring, tracking, investigating, and reporting vaccine adverse events.				
79		Distribution and dispensing considerations include potential 2-dose vaccine administration.				
	a	Distribution considerations include potential co-administration of adjuvant during vaccine administration.				
	b	Vaccine administrators have processes in place to send out reminder notices for the 2nd dose.				
Antiviral Distribution			**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
80		The plan establishes procedures for antiviral receipt, distribution, and dispensing.				
81		The plan addresses antiviral prophylaxis and treatment considerations.				
82		The plan establishes antiviral priority groups during the absence of pandemic vaccine availability and when antiviral caches are in low supply.				
83		The plan identifies healthcare partners pre-determined to receive and administer antivirals to their affected populations, if applicable.				
84		The plan details the types of antivirals utilized for pandemic influenza prophylaxis and treatment.				
85		The health department has screening forms for antiviral distribution.				
	a	The screening forms address pre-exposure prophylaxis dosing.				
	b	The screening forms address post-exposure prophylaxis dosing.				
	c	The screening forms address treatment dosing.				
	d	The screening forms address antiviral selection and dosing for the following considerations:				

	□ pregnant	□ breastfeeding	□ respiratory history (COPD, emphysema, asthma)	□ kidney history or dialysis	□ food allergies	□ cancer
	□ diabetes	□ auto-immune disorders	□ antiviral allergies	□ current signs/symptoms	□ time after exposure or signs/ symptoms onset	

86	Contingency plans are in place for unlicensed antiviral drugs administered under Investigational New Drug or Emergency Use Authorization provisions as needed.				
87	The plan establishes methods for monitoring, tracking, investigating, and reporting antiviral adverse events.				
Public Messaging and Risk Communications		**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
88	The health department has identified public health communications staff to serve as subject-specific spokespersons.				
	a Public health communications staff and spokespersons are trained on risk communications for use during a pandemic influenza response.				
	b Public health communications staff and spokespersons have successfully completed advanced level public information-related FEMA NIMS/ICS courses.				
89	The jurisdiction has a written crisis emergency risk communications plan that addresses key messaging related to pandemic influenza.				
	a The plan's revision page includes an annual review and allows for list of updates.				
90	The health department has identified key community partners, stakeholders, and media contacts to provide pandemic influenza information and situational awareness.				
91	Public health messaging systems have been identified and implemented.				
	a Public health messaging systems include the following types:				

	□ Hotline(s)	□ Social messaging	□ TV announcement
	□ Website(s)	□ Print media	□ Radio announcement
	□ Billboards	□ Internet banner advertisement	□ Road signs/posters/flyers
	□ Call Center(s)	□ Poison Control Center(s)	□ Town halls/public meetings

Others:
□ _____ □ _____
□ _____ □ _____

92	There is redundancy in place with the above-listed communication systems to ensure expedited messaging transmission and confirmed receipt of information.				

		Completed	In Progress	Not Started	Comments/Notes
93	The jurisdiction has identified all primary languages used with the community as acknowledged in the demographic data and community profile.				
	a Public messaging is rapidly translated in each language identified within the community.				
	b Public health messaging is appropriately delivered to and comprehendible by the following populations:				
	□ Illiterate/low literacy □ Blind/low vision □ Deaf/hard of hearing				
94	Mechanisms are in place to respond to local questions from the public.				
95	Public messaging includes food consumption instructions pertaining to the category of influenza (avian versus other zoonotic).				
96	Public messaging includes information on the influenza subtypes and strains (hemagglutinin and neuraminidase).				
97	Public messaging includes transmission rates/communicability of the virus.				
98	Public messaging includes the description and explanation (rationale) for each Vaccine Target Group.				
99	Messaging informs the public of vaccine locations, vaccination information, and vaccine contraindications, if applicable.				
100	Public messaging includes information from mental/behavioral health experts.				
101	Public messaging includes information on self-preparedness, hygiene, and infection prevention methods (non-pharmaceutical interventions/social distancing measures).				
102	Public messaging includes possible or pending containment procedures (isolation and quarantine) that may affect the community.				
103	Public messaging includes all pertinent travel notices and restrictions addressed in the **Infection Control Measures Section**, if applicable.				
Mental/Behavioral Health Support Resources		**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
104	Support services are available to the community without barriers to access.				
105	Support services are available to all external and internal workforce entities.				

106	The health department has proactive health and wellness resources available to public health employees for workforce resiliency.				
Fatality Surge Management		**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
107	The jurisdiction has a written fatality management plan that addresses contingencies for fatality surge for a pandemic influenza event.				
	a The plan's revision page includes an annual review and allows for list of updates.				
108	There is a communication pathway between the local public health department and the Medical Examiner/Coroner's Office for notification of cause of death due to pandemic influenza.				
109	Contingencies are in place for decedent surge management due to pandemic influenza.				
	a Back-up medical examiner/coroner staffing is in place to meet surge demand.				
	b Additional mortuary service providers are in place for fatality surge.				
	c Provisions addressing cultural and religious requirements are in place for fatality surge.				
	d Surge management procedures address both burial and cremation decedent processing.				
	e Safety procedures are established to prevent spread of disease during decedent processing.				
	f Equipment and supplies are in place to meet surge demand.				
	g Vital Records/Vital Statistics staffing contingencies and emergency procedures are established to meet surge demand of decedent paperwork processing as stipulated via statutory requirements.				
Avian-Based Influenza		**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
110	Are local poultry-based commercial facilities identified in the Pandemic Flu Plan?				
111	Do commercial facilities have an emergency response plan for highly pathogenic avian influenza (HPAI), including culling procedures?				
112	Do emergency response plans include culling considerations and procedures?				

113	Are local wildlife services (Game and Fish Services) a part of the HPAI surveillance with the U.S. Fish and Wildlife Services?				
114	Do communication pathways exist with the following:				
	a U.S. Fish and Wildlife Services to/from state/local wildlife services				
	b Local wildlife services to/from local health department/local environmental health department.				
Other Zoonotic-Based Influenza (swine and other animals)		**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
115	Are zoonotic-based venues identified in the Pandemic Flu Plan (petting zoos, fairs, farms, ranches)?				
116	Are local commercial, swine facilities identified in the Pandemic Flu Plan?				
117	Do commercial facilities have an emergency response plan for zoonotic influenza?				
118	Do emergency response plans include culling considerations and procedures?				
119	Are local and/or state agricultural services a part of zoonotic surveillance?				
120	Do communication pathways exist with the following:				
	a U.S. Department of Agriculture to/from state/local agricultural services				
	b Local agricultural services to/from local health department/local environmental health department				
	c State/local veterinarian services to/from local health department/local environmental health department				
	d State/local veterinarian service to/from local animal control services				
	e Local animal control services to/from local health department/local environmental health department				
Training, Exercise, and Real-World Response Evaluation Elements		**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
121	Personnel have been assigned to lead, plan and oversee training, exercise, and evaluation pertaining to the pandemic influenza plan.				
122	Assigned training, exercise, and evaluation personnel have successfully completed the Department of Homeland Security Exercise and Evaluation Program (HSEEP).				

			Completed	In Progress	Not Started	Comments/Notes
123		The jurisdiction can demonstrate that all current public health employees have successfully completed FEMA NIMS/ICS courses based on their level of responsibility during an emergency response.				
124		The jurisdiction can demonstrate all current public health employees have been trained on the written pandemic flu plan, including all roles and responsibilities.				
125		The health department is available to train and exercise external vaccine administration partners on pandemic operations.				
126		Communication drills with personnel listed in the current ICS chart for a pandemic response are conducted quarterly.				
127		An HSEEP-compliant full-scale exercise has occurred in the last 5 years that tests the following metrics and processes: (or all metrics were tested in one real-world response)				
128	**a**	Medical countermeasures request(s)				
	b	Medical countermeasures receipt				
	c	Medical countermeasures distribution				
	d	Medical countermeasures dispensing: mass vaccination				
	e	Medical countermeasures dispensing: antiviral distribution				
	f	Medical countermeasures inventory management				
	g	Medical countermeasures storage operations				
	h	Security plan operations during medical countermeasures transport/distribution				
	i	Security plan operations during medical countermeasures mass dispensing				
	j	Emergency procurement				
	k	Vaccine administration safety and screening accuracy				
	l	Antiviral distribution safety and screening accuracy				
	m	Command and control during medical countermeasures distribution				
	n	Command and control during medical countermeasures dispensing				
	o	Public messaging and risk communications				
129		Any level of exercise or real-world response that tests the plan includes an after action report and improvement plan.				

		Completed	In Progress	Not Started	Comments/Notes
130	The jurisdiction has documented progression/completion of improvement plan items listed in the after action report.				
Additional Notes for this Section					

II. Arboviral Diseases – Neuroinvasive and Non-Neuroinvasive
(Flavivirus, Alphavirus, and Orthrobunyavirus)

			Preparedness Planning Elements	Completed	In Progress	Not Started	Comments/Notes
***If vector control services are not under the health department's jurisdiction, portions of this section may not apply. Every effort should be made to assess vector control capacity with applicable partners and authorities. This section does measure the level of preparedness that affects the community.**							
1	The jurisdiction has a written Arboviral plan. (referred to as "the plan" in this Arboviral Diseases section of this tool).						
	a	The plan's revision page includes an annual review and allows for list of updates.					
2	The plan identifies and lists the vector control authority (public health, environmental health, or district) for vector control and surveillance; and the authority's jurisdictional boundaries (city, town, district, region, county, or state)						
3	Inter-communication pathways exist between vector control authorities and human disease management/epidemiology authorities.						
4	The plan identifies the laboratory services for vector specimens.						
5	The plan identifies the laboratory services for human specimens.						
6	The plan includes a hazard profile that identifies the disease-carrying mosquito species present in the jurisdiction.						
	a	The plan includes the Arboviral diseases that are positive in the mosquito species and are locally-acquired (transmission by vector).					
	b	The plan includes the general case definitions for both neuroinvasive and non-neuroinvasive Arboviral diseases.					

			Completed	In Progress	Not Started	Comments/Notes
	c	The plan differentiates the preferred method for monitoring or predicting Arboviral outbreaks (detecting cases in people versus mosquito-based surveillance)				
	d	The plan includes the life cycle of each mosquito species identified in the jurisdiction.				
	e	The plan includes disease transmission cycles for each Arboviral disease listed.				
	f	The plan lists the modes of transmission for each Arboviral disease. (e.g., blood transfusion, organ transplantation, perinatal transmission, sexual transmission, breastfeeding, and laboratory exposures)				
	g	The plan identifies primary and secondary mosquito vectors for each Arboviral disease listed.				
7	The plan accounts for the following annual periodic reassessment of general Arboviral disease evolution:					
	□ New scientific information	□ Creation/absence of vaccine	□ Advances in other health and public health response measures			
8	The plan establishes the start and conclusion of routine seasonal vector control and surveillance.					
9	The plan establishes a set of triggers for response activation beyond routine seasonal vector control and surveillance.					
	a	The plan establishes a set of triggers and process for activation of the public health emergency operations center.				
	b	Incident command roles are established for this type of response and assigned personnel are NIMS-compliant.				
	c	The plan outlines a process for declaring a public health emergency at the local level.				
	d	The jurisdiction is a signatory of an EMAC and/or State Mutual Aid Compact.				
	e	The jurisdiction outlines a process for activating the EMAC or State Mutual Aid Compact.				

			Completed	In Progress	Not Started	Comments/Notes
	f	The plan outlines a set of triggers and a formal process for notifying the CDC and for requesting a CDC Emergency Response Team for assistance.				
	g	The plan outlines a process for deactivation, demobilization, and recovery procedures.				
10	Legal considerations are addressed in the plan. List applicable statutes, ordinances, or regulations including the following:					
	a	Isolation and quarantine				
	b	Community mitigation measures				
	c	Emergency declarations				
Vector Surveillance and Control			**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
11	The vector control authority receives/provides information and situational awareness from/to the health department as applicable.					
12	The plan differentiates preferred method of Arboviral disease surveillance: mosquito-based versus human case detection.					
13	The jurisdiction has pre-established vendors for emergency procurement of the following:					
	□ Mosquito traps	□ Vector staff PPE	□ insect repellent	□ adulticide	□ larvicide	□ dry ice
14	The plan includes vector control activities that targets both adult and larval mosquitoes.					
15	Mosquito population data, including larval sites and speciation, and disease positive case counts, is collected and plotted in a geographic information system (GIS) mapping.					
16	Health/Environmental Department staff have access, training, and report into ArboNET or other mosquito electronic reporting systems.					
17	Information from ArboNET or other designated mosquito electronic reporting systems and are shared with applicable partners and stakeholders.					
18	The plan identifies the following types of specimen collection traps and equipment for the jurisdiction:					
	□ Ovitraps	□ BG-Sentinel trap	□ Gravid female trap	□ Mechanical aspirators	□ Landing-biting counts	

			Completed	In Progress	Not Started	Comments/Notes
19	The plan establishes procedures for maintaining cold-chain requirements for mosquito specimens.					
20	The plan establishes procedures for transporting mosquito specimens to processing laboratory.					
21	The plan establishes safety procedures for vector control personnel during insecticide application and other identified processes.					
22	The jurisdiction has established the following **mosquito**-based surveillance indicators to indicate levels of risk:					
	a	Immature stage survey indices (larvae and pupae)				
	b	Papal Surveys				
	c	Eggs per ovitrap per week				
	d	Female adults per sticky trap per week				
	e	Adult infection rates				
23	The plan lists the insect repellents suggested for use and confirms they are registered by the U.S. Environmental Protection Agency (EPA) for skin and clothing applications.					
The plan details the following seasonal surveillance procedures and case transmission phases:						
24	**Beginning of mosquito season**					
	a	Initiate adult sampling to identify or confirm areas of high adult mosquito abundance.				
	b	Adult sampling includes speciation.				
	c	Concentrate control efforts around places with high mosquito density.				
	d	Initiate source reduction (container elimination).				
	e	Evaluate the efficacy of source reduction and larvicide treatment.				
25	**Confirmed Local Transmission Phase** (single case, or cases in same household). Plan should address the following abatement procedures:					
	a	Conduct a rapid insecticide resistance study for local mosquito populations.				
	b	Eliminate larval and adult habitats within 100–200 yards/meters around a case's home. Treat with larvicide and adulticide as applicable.				

			Completed	In Progress	Not Started	Comments/Notes
	c	Treat any water-holding containers that cannot be dumped, covered, discarded, or otherwise modified with long-lasting larvicide.				
	d	Encourage use of insect repellents, window and door screens, and air-conditioning use.				
	e	Initiate/maintain adult sampling to estimate adult mosquito abundance and evaluate effectiveness of insecticide treatments.				
	f	Initiate community source reduction, adult mosquito and case containment initiatives to minimize the spread of infected mosquitoes.				
	g	Monitor effectiveness of vector control efforts through mosquito trapping surveillance.				
26	**Confirmed, Multi-person Local Transmission Phase**. Plan should address the following abatement procedures:					
	a	Continue abatement actions from the Confirmed Local Transmission Phase.				
	b	Determine geographic boundaries that will be used for aggressive response efforts.				
	c	Designate county/jurisdiction as an area of "active transmission."				
	d	Monitor effectiveness of vector control efforts through mosquito trapping surveillance.				
27	**Widespread Transmission/Outbreak Phase.** Plan should address the following abatement procedures:					
	a	Divide outbreak area into operational management areas where control measures can be effectively applied to reduce mosquito density. Repeat as necessary.				
	b	Conduct door-to-door inspections and area-wide mosquito control (reach over 90% coverage of the control area within a week).				
	c	Identify and treat, modify, or remove mosquito-producing containers.				
	d	Combine outdoor spatial and residual spraying with source reduction and larviciding (including residual spraying of container surfaces and adjacent mosquito resting areas).				
	e	As applicable, treat storm drains, roof gutters, and other cryptic water sources.				

West Nile Virus-Based Surveillance Indicators		Completed	In Progress	Not Started	Comments/Notes
28	The jurisdiction has a process in place for avian-based surveillance.				
29	The plan mentions live bird serology for sentinel surveillance. (This measure does not have to be in place, but the information should be available in the plan if it becomes an option for future use).				
30	The plan mentions processes for equine and other vertebrates-related sentinel surveillance. (This measure does not have to be in place, but the information should be available in the plan if it becomes an option for future use).				
Human Case Surveillance and Management/Epidemiology		**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
31	The health department receives/provides information and situational awareness from/to the vector control authority as applicable.				
32	The health department has a process to monitor active Arboviral disease activity locally, statewide, nationwide, and internationally.				
33	The health department's medical electronic disease reporting system includes reportable/notifiable Arboviral diseases.				
34	The health department has a process for daily monitoring and subsequent investigation management of Arboviral diseases received from the medical electronic disease reporting system.				
35	Case management includes information on preventing transmission with mosquitoes.				
36	A process is established to initiate and demobilize enhanced surveillance.				
37	Travel health notices and levels are monitored.				
38	There is a process for specimen collection and laboratory testing for Arboviral diseases.				
39	The health department has redundant laboratory testing locations/facilities identified for surge capacity of specimens for Arboviral testing.				
40	A statewide process is established for drafting and revising case definitions.				
	Reports of case counts render the following information:				
	a Suspect, probable, and rule-out status				

			Completed	In Progress	Not Started	Comments/Notes
	b	Clinical symptoms, including evidence of neurological disorder, such as Guillain-Barre syndrome				
	c	Hospitalization, if applicable				
	d	Isolation/quarantine				
	e	Age				
	f	Gender				
	g	Co-morbidities				
	h	Pregnancy, if applicable				
	i	Previous Arboviral disease history				
	j	Exposure history				
	k	Travel history, if applicable				
	l	History of receiving blood products, organs, or tissue in relation to symptom onset				
	m	History of donating blood products, organs, or tissue in relation to symptom onset				
	n	Employment with increased outdoor exposure risk, or near positive mosquito pools				
	o	Location mapping of positive human cases is plotted in a geographic information system (GIS) mapping.				
Healthcare Coordination			**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
41	Laboratory and healthcare providers report suspect cases to local health department.					
42	Healthcare syndromic surveillance includes Arboviral diseases.					
43	The health department has an established Health Alert Network with listed contact information of all licensed healthcare partners and facility infection preventionists (if applicable), especially OB/GYN providers and pediatricians.					
44	The health department has triggers in place to message to healthcare providers information and updates about the identified circulating disease vectors, case definition, clinical guidelines, current status for each phase of vector surveillance:					
	a	Routine seasonal mosquito surveillance				

		Completed	In Progress	Not Started	Comments/Notes
	b Confirmed local transmission phase				
	c Confirmed multi-person local transmission phase				
	d Widespread transmission/outbreak phase				
45	Methods are in place to rapidly address questions from healthcare providers and commercial laboratories; and provide subsequent guidance as applicable.				
46	Healthcare providers identify triggers in their operational plan to determine contingencies involving surge of positive Arboviral cases.				
47	There is information sharing and coordination with local blood, organ, and tissue collection agencies with the applicable health authority (local or state level).				
48	Blood, organ, and tissue collection agencies follow FDA guidance when an active transmission area is confirmed.				
Pregnancy registry reporting (as determined by applicable Arboviral diseases)		**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
49	The health department has a process in place to report applicable Arboviral disease cases during pregnancy that are inputted into a national birth registry.				
50	Zika prevention kits are available via the health department and distributed as necessary.				
51	The health department assists with provider outreach for ultrasound testing and other medical testing; pre- and post-natal care; and mental health services.				
52	The health department monitors surveillance of cases for birth defects, abnormalities, and developmental issues pre-and post-natal.				
53	A process is in place to initiate and test asymptomatic pregnant women when applicable.				
54	Messaging to women includes cautionary travel considerations and use of condoms or abstinence.				
55	Messaging includes advising men to use condoms or abstain from sexual contact with pregnant women.				

Medical Countermeasures Considerations					
In the event medical countermeasures are applicable and are available (dependent on the identified Arboviral disease), the following procedures will be established in the plan. A placeholder for these procedures should be listed in the plan:					
	Vaccine Availability	**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
56	The plan establishes procedures for activating vaccine distribution and dispensing operations, including external vaccine administration partners.				
57	Individuals applicable to receive the vaccine are identified based on CDC recommendations (when available).				
58	Cold-chain and storage procedures are in compliance with vaccine manufacturing recommendations and CDC guidelines.				
59	The health department has screening forms for vaccine administration.				
60	Vaccine administration addresses applicability to co-morbidities, hypersensitivity, allergies, pregnancy, breastfeeding, age, and any other determinant.				
61	Contingency plans are in place for unlicensed vaccine administered under Investigational New Drug or Emergency Use Authorization provisions as needed.				
62	The plan establishes methods for monitoring, tracking, investigating, and reporting vaccine adverse events.				
	Public Messaging and Risk Communications	**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
63	Public health messaging systems have been identified and implemented.				
	a Public health messaging systems include the following types:	Others:			
	□ Hotline(s) □ Social messaging □ TV announcement	□ _____	□ _____		
	□ Website(s) □ Print media □ Radio announcement				
	□ Billboards □ Internet banner advertisement □ Road signs/posters/flyers	□ _____	□ _____		
	□ Call Center(s) □ Poison Control Center(s) □ Town Halls/Meetings				
64	There is redundancy in place with the above-listed communication systems to ensure expedited messaging transmission and confirmed receipt of information.				
65	The jurisdiction has identified all primary languages used with the community as acknowledged in the jurisdiction's demographic data and community profile.				

			Completed	In Progress	Not Started	Comments/Notes
	a	Public messaging is rapidly translated in each language identified within the community,				
	b	Public health messaging is appropriately delivered to and comprehendible by the following populations:				
	□ Illiterate/low literacy	□ Blind/low vision □ Deaf/hard of hearing				
66	Mechanisms are in place to respond to local questions from the public.					
67	Public Messaging is established **prior and during** routine mosquito season with the following information:					
	a	Education campaigns that focus on reducing and eliminating larval habitats				
	b	Vegetation management to reduce mosquito resting sites				
	c	Fact sheets/information regarding mosquito species in the jurisdiction				
	d	Fact sheets/information regarding personal protection measures				
	e	Travel alerts to countries with local transmission				
	f	When there is disease transmission in other countries, encourage travelers to take precautions while traveling and upon return (for up to 3 weeks)				
68	Identify triggers for press releases (increased mosquito activity, positive mosquito traps)					
69	Evaluate need for additional source reduction messaging					
70	Public Messaging is established **with confirmed local transmission** with the following information:					
	a	The signs and symptoms of Arboviral diseases, how it spreads, and how to seek care				
	b	Include messaging regarding applicable risks and populations at risk: travel to affected countries, sexual transmission, pregnancy, immunocompromised, age)				
	c	Education campaigns that focus on preventing or minimizing contact between vectors and suspected or confirmed human cases, especially during the first week of illness when an infected person is viremic and can infect mosquitoes, which can trigger contribute to a local outbreak				

			Completed	In Progress	Not Started	Comments/Notes
	d	Educate the public to continually dispose of water-holding containers to eliminate larval habitats				
	e	Inform the public regarding the number of cases of disease				
	f	Encourage use of insect repellent, window and door screens, and use of air-conditioning				
	g	Encourage travelers returning from other affected countries to take precautions upon return (for up to 3 weeks)				
71	Monitor social media and news traffic.					
72	Identify message gaps.					
73	Public Messaging is established **multi-person local transmission or outbreak** with the following information:					
	a	Reiterate source reduction and personal prevention practices				
	b	Education campaigns focusing on source reduction, including junk objects (broken appliances, cars, and tires)				
	c	Inform the public regarding outbreak status and number of cases				
	d	Education on how the Arboviral disease spreads				
74	Intensify messaging within the jurisdiction.					
75	Prepare for messaging in the event a vaccine is applicable and becomes available.					
Training, Exercise, and Real-World Response Evaluation Elements			**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
76	Personnel have been assigned to lead, plan and oversee training, exercise, and evaluation pertaining to the Arboviral plan.					
77	Assigned training, exercise, and evaluation personnel have successfully completed the Department of Homeland Security Exercise and Evaluation Program (HSEEP).					
78	The jurisdiction can demonstrate that all current public health employees have successfully completed FEMA NIMS/ICS courses based on their level of responsibility during an emergency response.					
79	The jurisdiction can demonstrate that all current public health employees have been trained on the written Arboviral plan, including all roles and responsibilities.					

		Completed	In Progress	Not Started	Comments/Notes
80	Communication drills with personnel listed in the current ICS chart for an Arboviral response are conducted quarterly.				
81	The health department is available to train and exercise external partners and stakeholders when requested.				
82	The HSEEP-compliant exercise includes evaluating the procedures and decision-making processes for each type of mosquito transmission phase.				
83	Any level of exercise or real-world response that tests the plan includes an after action report and improvement plan.				
84	The jurisdiction has documented progression/completion of improvement plan items listed in the after action report.				
Additional Notes for this Section					

III. Category A Agents (Anthrax, Botulism, Plague, Smallpox, Tularemia, Viral Hemorrhagic Fevers – Ebola, Marburg, Lassa, Machupo)					
Preparedness Planning Elements		**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
1	The jurisdiction has determined if the Category A agents will be placed in separate plans or annexes/appendices of a broader plan.				
2	All Category A agents are accounted for in the designated written plan, annex, or appendix. The designated written document will be referred to as "the plan" for each Category A agent listed in this section of the tool.				
3	Each Category A agent's plan has a revision page that includes an annual review and allows for a list of updates.				
4	Each Category A agent's plan discusses coordination with Federal, state, and local law enforcement agencies to determine intentional, accidental, or natural cause.				
Section III-A: Anthrax					
Section III-B: Botulism					
Section III-C: Plague					
Section III-D: Smallpox					
Section III-E: Tularemia					
Section III-F: Viral Hemorrhagic Fevers (VHFs)					
For the purpose of this subsection of Category A agents; Yellow Fever will not be included. Its genus, flavivirus, is considered under the Arboviral Section (Section II) for its transmission through mosquito vectors.					
1	The plan identifies the following viral hemorrhagic fevers (referred to as VHFs in this tool's subsection): Ebola, Marburg, Lassa, and Machupo.				
2	The plan includes the following for each VHF:				
	a General case definition				
	b Modes of transmission				
	c Incubation period				
	d Infectious period				
	e Level of transmissibility				
	f Level of severity				

			Completed	In Progress	Not Started	Comments/Notes
	g	Types of strains				
	h	Countries with recent or current outbreaks				
3	The plan establishes a process for plan activation.					
4	The plan establishes a process for activation of the public health emergency operations center.					
5	Incident command roles are established for this type of response and assigned personnel are NIMS-compliant.					
6	The plan outlines a process for declaring a public health emergency at the local level.					
7	The jurisdiction is a signatory of an EMAC and/or State Mutual Aid Compact.					
8	The plan outlines a process for activating the EMAC or State Mutual Aid Compact.					
9	If applicable, Tribal or other sovereign nations are signatories on the EMAC or State Mutual Aid Compact.					
10	The plan identifies applicable PPE and equipment for VHFs.					
11	The plan identifies the possible or potential medical countermeasures (vaccine, antivirals, or pharmaceuticals) for each VHF.					
12	The plan outlines a formal process to request applicable medical countermeasures from the Strategic National Stockpile.					
13	The plan outlines the process for utilizing Emergency Use Authorization (EUA) and Investigational New Drug (IND) indicated medical countermeasures.					
14	The plan outlines a process for deactivation, demobilization, and recovery procedures; and when to discontinue enhanced surveillance.					
15	The plan outlines a set of triggers and a formal process for notifying the CDC and for requesting CDC Emergency Response Team for assistance.					
16	Legal considerations are addressed in the plan. List applicable statues, ordinances or regulations including the following:					
	a	Civil unrest/maintaining public order				
	b	Isolation and quarantine				
	c	Temperature monitoring				

			Completed	In Progress	Not Started	Comments/Notes
	d	Public transportation				
	e	Crisis Standards of Care				
	f	Canceling mass gathering events				
	g	Emergency declarations				
	h	Biohazardous material disposal				
	i	Cremation decedent processing impacting air quality				
17	The plan discusses how state, local, tribal, territorial, and regional entities coordinate and integrate their respective response activities.					
18	Communication pathways exist with the following:					
	a	Resource request processes are established between state and local health departments.				
	b	Resource request processes are established between local health department and the healthcare system partners.				
	c	Resource request processes are established between local health department and emergency responders.				
	d	Resource request processes are established between local health department and Medical Examiner/Coroner.				
19	The health department has a 24/7 on-call process to receive calls from the public and from the partners and stakeholders listed above in **Item #18 a-d**					
20	The plan accounts for the following reassessment throughout the outbreak:					
	□ Incubation period, infectious period	□ New scientific information	□ Changes in demographic case data			
	□ Advances in other health and public health response measures	□ Applicability/availability of vaccine and antivirals				
21	A local multi-disciplinary workgroup is established and a part of the planning process.					
	a	**The workgroup includes the following partners and stakeholders:** **NOTE: List is not in a priority order. Some partners may not be applicable to the jurisdiction or may serve in several listed categories.**				

□ Health Department*	□ Environmental Health	□ Mental Health/Crisis Professionals	Others:
□ Law Enforcement	□ Emergency Management	□ County and Municipal Legal Counsel	

□ Fire Department	□ EMS Agency	□ 9–1-1 Centers/Public Safety Answering Points	□ _____
□ Tribal Nations	□ Pharmacies	□ Hospitals/Healthcare Coalition	
□ Air Quality authority	□ Healthcare providers	□ Boarding care facility/HUD housing authority	□ _____
□ Urgent Care/Clinics	□ Home Health Agency	□ Hospice/Palliative Care Agency	
□ Local obstetrician providers	□ Local pediatrician providers	□ Local dentistry providers	□ _____
□ Medical Examiner/Coroner	□ Vital Records/Statistics	□ Funeral Board Representative	
□ Department of Education	□ Post-Secondary Education	□ Pre, Primary, and Secondary Education	□ _____
□ Animal Control Services	□ Public Works	□ Department of Transportation	
□ Veterinarian Services	□ Wildlife Agency	□ Agricultural Agency	□ _____
□ Local Agricultural Affiliates	□ Department of Corrections	□ Faith-Based Organizations	
□ Homeland Security Affiliate	□ Airport and Mass Transit	□ Organizations Serving Populations At-Risk	□ _____
□ Military Installations	□ Utility Agencies	□ Community Emergency Response Teams	
□ Veteran's Administration	□ Immunization Services	□ Metropolitan Medical Response System	□ _____
□ Customs/Immigration	□ Elected Officials	□ National Disaster Medical System	
□ Red Cross	□ Private Businesses	□ Medical Reserve Corps	
□ Community Call Centers	□ Biohazard waste agencies	□ Access/Functional Needs Organizations	
□ Facilities that house access/functional needs individuals		□ Communities/Volunteers Active in Disaster (COAD/VOAD)/Other Volunteers	

*Health Department should include: Health Director, Medical Officer, Lead Epidemiologist, Finance Officer, Public Information Officer, MCM Coordinator, PHEP Coordinator, Immunization Coordinator, Director of Nursing, WIC Director, Community Health Programs, Call Center personnel, Transportation personnel, Ombudsmen, Laboratory Director (if lab services are in health department), and any other special services or programs. (not all are applicable to the health department; positions and titles may vary)

	Disease Surveillance and Epidemiology	**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
22	The health department has a medical electronic disease reporting system includes reportable/notifiable VHF diseases.				
23	The health department has a process for daily monitoring and subsequent investigation management of VHF diseases received from the medical electronic disease reporting system.				
24	The health department has an electronic syndromic surveillance system capturing VHF signs and symptoms.				

			Completed	In Progress	Not Started	Comments/Notes
25		The health department has a data use agreement with each hospital or hospital system for electronic syndromic surveillance data exchange.				
26		The health department has a data use agreement with each hospital or hospital system for electronic syndromic surveillance data exchange.				
27		The health department maintains situational awareness from data received from the electronic syndromic surveillance system.				
28		Pre-identified local health department authorities have access to the CDC EPI-X Notification System and are trained on its use.				
29		Travel ports of entry that may impact the jurisdiction have been identified and are listed in a GIS map.				
30		Methods and procedures are in place to identify and establish any applicable travel restrictions within and outside of the jurisdiction.				
31		Quarantine station(s) have been identified within the jurisdiction's region.				
32		Travel health notices and their levels are monitored.				
33		The health department has established procedures to investigate and contain potential travel-associated cases.				
34		The health department has an established Health Alert Network with listed contact information of all licensed healthcare partners and facility infection Preventionists if applicable) within the jurisdiction.				
35	**a**	Pre-established messaging provides healthcare providers information about VHFs, case definition, health department reporting procedures, and infection control and clinical guidelines.				
	b	Methods are in place to regularly update healthcare providers on the current status of PUIs, PEIs, or confirmed cases.				
	c	Methods are in place to regularly update healthcare providers on changes to the current clinical guidance or the case definition, when applicable.				
	d	Methods are in place to rapidly address questions from healthcare providers and provide subsequent guidance as applicable.				

			Completed	In Progress	Not Started	Comments/Notes
	e	Processes are in place in update and alter clinical guidelines based on healthcare provider input/feedback and via the CDC, when applicable.				
36		Non-pharmaceutical and pharmaceutical interventions are identified in the plan.				
37	a	The jurisdiction has pre-established vendors for emergency procurement of the following:				
		□ face masks □ Nitrile gloves □ PAPRs □ NIOSH-approved N-95 respirators □ eye protection (goggles, glasses, shields, splash guards)				
		□ single use disposable impermeable gowns □ single use disposable boot covers □ single use disposable aprons □ biohazard bags				
		□ single use disposable impermeable coveralls □ single use disposable examination gloves with extended cuffs □ vaccine supplies, if applicable				
		□ thermometers for persons under temperature monitoring □ infrared thermometers □ specimen collection and shipping supplies				
		Other equipment: □ _____ □ _____ □ _____ □ _____ □ _____				
38		The health department has the proper PPE for assessment of PUIs, PEIs, or confirmed Ebola patients.				
	a	At minimum, PPE inspections are conducted semi-annually.				
	b	Health department personnel are trained on the use of PPE, including proper donning and doffing procedures.				
	c	Health department personnel are fit-tested for applicable respirators, including PAPRs.				
	c	PPE donning and doffing protocols are established and include a checklist to ensure compliance.				
	d	PPE-outfitted doffing and donning assistants are assigned to directly assist the public health entry team with applying and removing PPE (health department personnel that will come in contact with a PEI, PUI, or confirmed Ebola case).				
	e	A trained observer is assigned to guide donning/doffing assistants and the public health entry team to ensure compliance (identifies improper techniques, follows the PPE checklist, ensures proper hygiene procedures are followed).				

		Completed	In Progress	Not Started	Comments/Notes
	f Corrective actions are identified and addressed before the next scheduled drill.				
39	Monitoring of public health personnel for pre- and post-exposure is in place.				
	a Provisions listed in **Item #55 a-k** are established.				
40	Protocols are established to limit exposure to public health employees with higher risk (co-morbidities, pregnancy, breastfeeding).				
41	The jurisdiction has access to mortality data from the Medical Examiner/Coroner Office.				
Public Health Monitoring and Movement; Isolation and Quarantine		**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
Note: This section pertains to ANY individual that requires monitoring, isolation, or quarantine. Individuals include public health personnel, healthcare workers, emergency responders, medical examiner/coroner personnel, laboratory and specimen transport personnel, mortuary service personnel, waste management personnel, and any other applicable personnel.					
42	The plan defines criteria for person under investigation (PUI), possible exposed individual (PEI), and confirmed case.				
43	The plan defines active monitoring, direct active monitoring, and passive monitoring procedures and the length of time for each.				
44	The plan has established procedures for determining the suspect case's level of risk (high, medium, or low)				
45	The plan describes the process for notification via the CDC Division of Migration and Quarantine (DGMQ) to the health department of PEI, PUI, or confirmed case associated with the jurisdiction.				
46	The health department has an established process for how monitored persons will report their status daily and how they will alert if symptoms develop.				
47	Processes consider the potential to monitor multiple persons under investigation, pregnant women, children, persons with co-morbidities, and access and functional needs populations.				
48	The health department has a process in place to arrange for controlled movement, self-isolation, or self-observation of symptomatic persons under investigation (PUI).				

			Completed	In Progress	Not Started	Comments/Notes
49	The health department has a procedure in place to address monitored persons who are non-compliant with temperature and symptom monitoring and/or movement restrictions; or who do not respond to calls or emails from health department.					
50	The health department has a process in place to conduct contact investigations for those with potential exposure to a person with confirmed Ebola to determine risk and monitoring requirements.					
51	Protocols are established for notification to the health department of a symptomatic person under investigation that may not have been screened by the CDC DGMQ.					
52	Communication protocols include notification to hospital and EMS, 9–1-1 centers, emergency responders.					
53	Mental health services are available for Ebola patients and families.					
54	The jurisdiction has vendors in place to manage cleaning, disinfection, and decontamination of areas in the community, residences, and vehicles that a PUI or confirmed Ebola case have come in contact with.					
55	The jurisdiction has arrangements in place for the welfare of any monitored persons, PEIs, and the isolated and quarantined PUIs and address the following:					
	a	Cleaning and decontamination of residence				
	b	Waste removal				
	c	Temporary living quarters				
	d	Childcare services				
	e	Temporary removal of pets				
	f	Alternate sheltering location				
	g	Meals				
	h	Ongoing assessment for mental health services				
	i	Other medical care and treatment not affiliated with Ebola exposure				
	j	Employment considerations (telecommuting, medical leave arrangements)				
	k	Any applicable legal regulations as identified by the local and state legal authorities				

EMS Support and Patient Transportation			Completed	In Progress	Not Started	Comments/Notes
56	The lead agency is defined for the roles and responsibilities of EMS support and patient transport.					
57	Lead agency or consortium has the following addressed in protocols, plans, or procedures related to transport consideration:					
	a	Protocols for transport of symptomatic person(s) under investigation from their home to an assessment hospital or Ebola Treatment Center.				
	b	Protocols for transport from a healthcare provider's facility to an assessment hospital or Ebola Treatment Center.				
	c	Protocols for hospital notification of pending transport and arrival for a PUI, PEI, and confirmed Ebola case are established.				
	d	Process for intrastate and interstate, inter-facility transfers are identified.				
	e	Procedures are in place for multi-ambulance transfers for long distance inter-facility transports.				
	f	Coordination with EMS agencies and supporting airport when a confirmed Ebola patient is transported via air ambulance.				
	g	Law enforcement escort procedures are established.				
58	Notification and coordination among the following agencies are in place when a suspected case is identified through airport and airline screening processes:					
	a	State and local health departments				
	b	Affected airport authority				
	c	Affected airline authority				
	d	Receiving hospital (at minimum: Emergency Department, pre-hospital coordinator, and infection preventionist)				
	e	EMS transport agency, including medical director				
	f	Fire department, including medical director				
	g	Local and state law enforcement agencies				
59	EMS transport agencies have procedures and resources in place for disposal of contaminated waste and decontamination of ambulances.					

		Completed	In Progress	Not Started	Comments/Notes
60	Mental health services are available for all emergency responders, including 9–1-1 Centers and PSAPs; and all family members.				
61	9-1-1 Centers and PSAPs have prescreening protocols in place.				
	a Communication pathways are established with the local health department for questions, guidance, and feedback on prescreening protocols.				
62	Responder agencies have Ebola-specific protocols established, including on-scene assessment and treatment of person(s) under investigation.				
63	Protocols that identify the nearest hospital agencies established to take Ebola patients are established.				
64	Responder agencies have the proper PPE for treatment, care, and transport of PUIs or confirmed Ebola patients.				
65	At minimum, responder agencies conduct PPE inspections semi-annually.				
66	Responder agencies have pre-established vendors for emergency procurement of the following:				
	□ face masks □ Nitrile gloves □ PAPRs □ NIOSH-approved N-95 respirators □ eye protection (goggles, glasses, shields, splash guards)				
	□ single use disposable impermeable gowns □ single use disposable boot covers □ single use disposable aprons □ biohazard bags				
	□ single use disposable impermeable coveralls □ single use disposable examination gloves with extended cuffs □ waste management/disposal				
	Other equipment: □ _____ □ _____ □ _____ □ _____ □ _____				
67	Monitoring of emergency responders for pre- and post-exposure is in place.				
68	Protocols are established to limit exposure to emergency responders with higher risk (co-morbidities, pregnancy, breastfeeding).				
69	Procedures are in place to notify local health department of possible PUI and emergency responder exposure to PUI or confirmed Ebola patient.				
	a Provisions listed in **Item #55 a-k** are established.				

			Completed	In Progress	Not Started	Comments/Notes
70		Emergency responders are trained and conduct routine drills on screening accuracy and proper PPE donning and doffing procedures.				
71	**a**	Responder personnel are fit-tested for applicable respirators, including PAPRs.				
	b	PPE donning and doffing protocols are established and include a checklist to ensure compliance.				
	c	PPE-outfitted doffing and donning assistants are assigned to directly assist the entry team with applying and removing PPE (responder personnel that will come in contact with a PEI, PUI, or confirmed Ebola case).				
	d	A trained observer is assigned to guide donning/doffing assistants and the responder entry team to ensure compliance (identifies improper techniques, follows the PPE checklist, ensures proper hygiene procedures are followed)				
	e	Corrective actions are identified and addressed before the next scheduled drill.				
72		Drills and exercises are conducted with hospitals and other healthcare facilities.				
Specimen Collection and Laboratory Testing			**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
73		Applicable specimens; and media and specimen collection procedures are identified for each VHF.				
74		A testing algorithm is established to confirm if a specimen is positive, including applicable confirmatory testing.				
75		Laboratory facilities capable of conducting Ebola testing are identified statewide.				
76		The laboratory testing facilities have a communication pathway established with the local health department to notify when a test is confirmed positive.				
77		VHF strain(s)/sub-type(s) have been identified per each confirmed case.				
78		The health department has an internal process for specimen collection and transport to laboratory services for VHF diseases.				
79		Laboratory specimen transport agencies are identified within the jurisdiction and statewide.				
80		Category A compliant packaging and shipping containers are available for transport.				

		Completed	In Progress	Not Started	Comments/Notes
81	Personnel that package, ship, and transport Category A specimens have the appropriate PPE and training; PPE inspections are conducted semi-annually.				
82	Protocols are established to limit exposure to employees with higher risk (co-morbidities, pregnancy, breastfeeding).				
83	Monitoring of laboratory and specimen transport personnel for pre- and post-exposure is in place; and provisions listed in **Item #55 a-k** are established.				
84	Contingency plans are in place to address any laboratory surge issues at the state, regional, and federal level. (Include local level if health department has internal laboratory services)				
85	Emergency procurement procedures are in place in the event of a depletion of specimen collection/media supplies.				
86	Mental health services are available to laboratory and specimen transport personnel.				
Healthcare Surge Management		**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
***This section measures VHF preparedness capabilities involving healthcare providers, hospitals, and/or healthcare coalitions. The health department may not have jurisdiction over these partners or certain criteria listed in this section. However, this section does measure the level of preparedness that affects the community and should be used to improve healthcare surge management.**					
87	Healthcare entities have processes in place to notify their local health department of both their facility command center activation and operational plan activation.				
88	Hospitals with designations of: Frontline Healthcare Facilities, Ebola Assessment Hospitals, and Ebola Treatment Centers are identified statewide and within the jurisdiction, if applicable. The closest facilities are identified via GIS mapping.				
	a Each facility identifies the maximum number of patients they can receive and treat.				
89	MOUs are in place between healthcare facilities, hospital systems, or healthcare coalitions to address transfer of patients from non-assessment centers and/or Ebola Treatment Centers.				
90	Hospitals capable of Ebola testing are identified within the jurisdiction and statewide.				

			Completed	In Progress	Not Started	Comments/Notes
	a	Packaging, shipping, and transport procedures are established for specimens.				
	b	Category A compliant containers are available for transport.				
	c	Category A compliant packaging and shipping containers are available for transport.				
	d	Personnel that package, ship, and transport Category A specimens have the appropriate PPE and training.				
91		Procedures are in place for interfacility transports of PUIs, PEIs, and confirmed Ebola patients.				
92		Isolation procedures are established for incoming PUIs and PEIs until confirmed testing is completed.				
	a	Notification is made to health department when an incoming PUI or PEI arrives at healthcare facility.				
93		Procedures are in place to track the patients from the point they enter the healthcare facility until they are discharged.				
	a	Procedures are in place to limit movement of PUIs and confirmed patients for tests and treatments in the facility.				
	b	Procedures are in place for decontamination of durable equipment.				
	c	Procedures are in place to treat and disinfect Ebola-associated waste.				
94		Healthcare facilities have the proper PPE for assessment, treatment, and care of PUIs or confirmed Ebola patients.				
	a	At minimum, PPE inspections are conducted semi-annually.				
95		Healthcare facilities have pre-established vendors or MOUs with other facilities for emergency procurement of the following:				
		□ face masks □ Nitrile gloves □ PAPRs □ NIOSH-approved N-95 respirators □ eye protection (goggles, glasses, shields, splash guards)				
		□ single use disposable impermeable gowns □ single use disposable boot covers □ single use disposable aprons □ biohazard bags				
		□ single use disposable impermeable coveralls □ single use disposable examination gloves with extended cuffs □ waste management/disposal				
		Other equipment: □ _____ □ _____ □ _____ □ _____ □ _____				

			Completed	In Progress	Not Started	Comments/Notes
96	The healthcare facility has established protocols to limit exposure to employees with higher risk (co-morbidities, pregnancy, breastfeeding).					
97	Monitoring for pre- and post-exposure of healthcare personnel conducting care and treatment for Ebola patients is established with the healthcare facility.					
	a	Notification is made to the local health department of healthcare worker exposure.				
	b	Provisions listed in **Item #55 a-k** are established.				
98	Healthcare personnel are trained and conduct routine drills on screening accuracy and proper PPE donning and doffing procedures.					
	a	Healthcare personnel are trained on the use of PPE, including proper donning and doffing procedures.				
	b	Healthcare personnel are fit-tested for applicable respirators, including PAPRs.				
	c	PPE donning and doffing protocols are established and include a checklist to ensure compliance.				
	d	PPE-outfitted doffing and donning assistants are assigned to directly assist the healthcare entry team with applying and removing PPE (healthcare personnel that will come in contact with a PEI, PUI, or confirmed Ebola case)				
	e	A trained observer is assigned to guide donning/doffing assistants and the healthcare entry team to ensure compliance (identifies improper techniques, follows the PPE checklist, ensures proper hygiene procedures are followed)				
	f	Corrective actions are identified and addressed before the next scheduled drill.				
99	Screening and PPE drills and exercises are conducted with EMS and fire agencies.					
100	Mental health services are available to healthcare staff and families.					
101	Healthcare facilities have the ability to process decedents expiring in their facility.					
102	Healthcare facilities have decedent processing supplies to meet surge demand.					
103	Healthcare facilities have processes established to coordinate decedent processing and transport with the Medical Examiner/Coroner authority within the jurisdiction.					

Waste Management Considerations		Completed	In Progress	Not Started	Comments/Notes
104	Waste management vendors that meet Category A licensing requirements are identified within the jurisdiction and statewide.				
105	Coordination with waste water and utility companies is established within the jurisdiction to address contingencies for facilities that treat confirmed Ebola patients.				
106	State regulations identify procedures for final disposal of treated and disinfected Ebola-associated waste (incineration, autoclaving, etc.)				
107	Primary containment and decontamination procedures are established for facilities, equipment, and vehicles that a confirmed Ebola patient has been in contact with.				
108	Vendor personnel have the appropriate PPE available for waste handling procedures and are trained on donning and doffing procedures.				
	a At minimum, PPE inspections are conducted semi-annually.				
	b Personnel are fit tested for applicable respirators, including PAPRs.				
109	Monitoring for pre- and post-exposure of waste management personnel is in place.				
	a Notification is made to the local health department of any personnel exposure.				
	b Provisions listed in **Item #55 a-k** are established.				
110	Mental health services are available to waste management personnel and families.				
Fatality Management		**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
111	Mortuary service capabilities and surge capacity are defined within the jurisdiction.				
112	Mortuary services that can process Ebola-infected bodies, including the use of hermetically sealed caskets are identified within the jurisdiction.				
113	An MOU is in place with additional mortuary service resources for fatality surge.				
114	Protocols are in place for receiving decedents from location of death (home, healthcare facility, etc.)				
115	The jurisdiction is able to purchase additional decedent processing supplies.				
116	The jurisdiction's Medical Examiner (ME)/Coroner and Vital Records authorities have contingencies in place to meet surge demand, including cultural and religious considerations/requirements.				

			Completed	In Progress	Not Started	Comments/Notes
117	Protocols to limit exposure to ME/Coroner and mortuary personnel with higher risk (co-morbidities, pregnancy, breastfeeding) are established.					
118	Appropriate PPE is available to the ME/Coroner personnel; and they are trained to its use, including proper donning and doffing procedures.					
	a	At minimum, PPE inspections are conducted semi-annually.				
	b	Donning and doffing drills are conducted semi-annually.				
	c	ME/Coroner personnel are fit-tested for applicable respirators, including PAPRs.				
	d	PPE donning and doffing protocols are established and include a checklist to ensure compliance.				
	e	PPE-outfitted doffing and donning assistants are assigned to directly assist the ME/Coroner team with applying and removing PPE (responder personnel that will come in contact with a PEI, PUI, or confirmed Ebola case).				
	f	A trained observer is assigned to guide donning/doffing assistants and the ME/Coroner team to ensure compliance (identifies improper techniques, follows the PPE checklist, ensures proper hygiene procedures are followed).				
	g	Corrective actions are identified and addressed before the next scheduled drill.				
119	Appropriate PPE is available to mortuary personnel, and they are trained to its use.					
	a	At minimum, PPE inspections are conducted semi-annually.				
	b	Donning and doffing drills are conducted semi-annually.				
	c	Mortuary personnel are fit-tested for applicable respirators, including PAPRs.				
	d	PPE donning and doffing protocols are established and include a checklist to ensure compliance.				
	e	PPE-outfitted doffing and donning assistants are assigned to directly assist the ME/Coroner team with applying and removing PPE (responder personnel that will come in contact with a PEI, PUI, or confirmed Ebola case)				

			Completed	In Progress	Not Started	Comments/Notes
	f	A trained observer is assigned to guide donning/doffing assistants and the ME/Coroner team to ensure compliance (identifies improper techniques, follows the PPE checklist, ensures proper hygiene procedures are followed)				
	g	Corrective actions are identified and addressed before the next scheduled drill.				
120	Monitoring of ME/Coroner personnel for pre- and post-exposure is in place.					
	a	Procedures are established to notify local health department of possible exposure to ME/Coroner personnel during decedent processing.				
	b	Provisions listed in **Item #55 a-k** are established.				
121	Monitoring of mortuary personnel for pre- and post-exposure is in place.					
	a	Procedures are established to notify local health department of possible exposure to mortuary service personnel during decedent processing.				
	b	Provisions listed in **Item #55 a-k** are established.				
122	Medical Examiner/Coroner personnel have procedures in place for disinfection and decontamination of decedent equipment.					
123	Mortuary service personnel have procedures in place for disinfection and decontamination of decedent equipment.					
124	Mental health services are available to ME/Coroner personnel and families.					
125	Mental health services are available to mortuary personnel and families.					
Public Messaging and Risk Communications			**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
126	The plan establishes the triggers and list of criteria for initiating press releases.					
127	Prewritten messages are established to discuss PUIs, PEIs, and confirmed cases within the jurisdiction.					
128	Prewritten messages are established to discuss the following information:					
	a	The types of VHFs and the VHF associated with the outbreak				
	b	The transmissibility, risk, severity, and lethality of the VHF				
	c	Risk of exposure and disease				
	d	Travel alerts				

			Completed	In Progress	Not Started	Comments/Notes
	e	Preventative actions				
	f	Signs and symptoms				
	g	Notification to health department of potential exposure or presence of signs and symptoms				
	h	Mental/behavioral health support resources available in the community				
129		Healthcare facilities have public messaging in coordination with public health authorities to communicate patient status, including deaths.				
130		Prewritten messages are established to notify the public of local mental/behavioral health support resources available in the community				
131		The health department has the capability to prepare for messaging in the event a vaccine is applicable and becomes available.				
132		The health department has the capability to prepare for messaging in the event an antiviral is applicable and becomes available.				
Medical Countermeasures Considerations						
In the event medical countermeasures are applicable and are available (dependent on the identified VHF), the following procedures will be established in the plan. A placeholder for these procedures should be listed in the plan:						
Vaccine Availability			**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
133		The plan establishes procedures for activating vaccine distribution and dispensing operations, including external vaccine administration partners.				
134		Individuals applicable to receive the vaccine based on CDC recommendations (when available) are identified.				
135		Cold-chain and storage procedures are in compliance with vaccine manufacturing recommendations and CDC guidelines.				
136		The health department has a screening form for vaccine administration.				
	a	Screening addresses applicability to co-morbidities, hypersensitivity, allergies, pregnancy, breastfeeding, age, and any other determinant.				

		Completed	In Progress	Not Started	Comments/Notes
137	Contingency plans are in place for unlicensed vaccine administered under Investigational New Drug or Emergency Use Authorization provisions as needed.				
138	Methods for monitoring, tracking, investigating, and reporting vaccine adverse events.				
Antiviral Availability		**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
139	The plan establishes procedures for antiviral receipt, distribution, and dispensing.				
140	The plan addresses antiviral treatment considerations for the identified VHF.				
141	The plan addresses the available antiviral drug(s) for the identified VHF.				
142	Individuals applicable to receive the antiviral treatment are identified based on CDC recommendations (when available).				
143	The plan identifies healthcare partners pre-determined to receive and administer antivirals to their affected populations, if applicable.				
144	Contingency plans are in place for unlicensed antiviral drugs administered under Investigational New Drug or Emergency Use Authorization provisions as needed.				
145	The health department has screening form for antiviral distribution.				
	Note: This section may be altered based on CDC, FDA, and manufacturing guidelines. These assessment considerations are for current known information of general antiviral use.				
	a The screening form addresses treatment dosing.				
	b The screening form assesses for the following considerations:				
	□ pregnant □ breastfeeding □ kidney history or dialysis □ cancer □ food allergies □ diabetes				
	□ auto-immune disorders □ antiviral allergies □ current signs/symptoms □ time after exposure or signs/symptoms onset				
146	The plan establishes methods for monitoring, tracking, investigating, and reporting antiviral adverse events.				
Training, Exercise, and Real-World Response Evaluation Elements		**Completed**	**In Progress**	**Not Started**	**Comments/Notes**
147	Personnel have been assigned to lead, plan and oversee training, exercise, and evaluation pertaining to the VHF plan.				

		Completed	In Progress	Not Started	Comments/Notes
148	Assigned training, exercise, and evaluation personnel have successfully completed the Department of Homeland Security Exercise and Evaluation Program (HSEEP).				
149	The jurisdiction can demonstrate that all current public health employees have successfully completed FEMA NIMS/ICS courses based on their level of responsibility during an emergency response.				
150	The jurisdiction can demonstrate that all current public health employees have been trained on the written plan, including all roles and responsibilities.				
151	Communication drills with personnel listed in the current ICS chart for a VHF response are conducted quarterly.				
152	The health department is available to train and exercise external partners and stakeholders when requested.				
153	The HSEEP-compliant exercise includes evaluating the procedures and decision-making processes for each type of VHF.				
154	Any level of exercise or real-world response that tests the plan includes an after action report and improvement plan.				
155	The jurisdiction has documented progression/completion of improvement plan items listed in the after action report.				
Additional Notes for this Section					

IV. Category B Agents (Brucellosis, Epsilon toxin of Clostridium perfringens, Salmonella, Escherichia coli 0157:H7, Shigella, Glanders, Melioidosis, Psittacosis, Q fever, Ricin toxin, Staphylococcal enterotoxin B, Typhus fever, Viral encephalitis from alphaviruses, water safety threats – Vibrio cholerae, Cryptosporidium parvum)

V. Category C Agents (Emerging Infectious Diseases – such as: Nipah virus and Hantavirus)

VI. Coronaviruses (Severe Acute Respiratory Syndrome – SARS, Middle East Respiratory Syndrome Coronavirus – MERS-CoV, and 2019 Novel Coronavirus – nCoV)

VII. Vaccine Preventable Diseases – Non-Influenza (Measles, meningococcal)

VIII. Natural Disasters*
Wildfires* (may also pertain to man-made)
Flooding
Hurricanes
Earthquakes
Drought
Volcanoes
Extreme Weather (heat and cold)

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APPENDIX B. TIER I PUBLIC HEALTH ANTIVIRAL SCREENING FORM

PINAL COUNTY PUBLIC HEALTH

Tier I: Public Health Antiviral Screening Form

Name: _____ **Age:** _____ **Phone:** _____

Address: _____**City:**_____**State:**____ **Zip:** _____

1. **Complete the following questions. Some Yes and No questions are separated columns, please read carefully.**
2. **If you do not know the answer to a question, place a question mark next to the question.**

SECTION 1: DETERMINING HISTORY OF ANTIVIRAL USE AND ALLERGIES

Have you ever taken antiviral medication for the flu?	Yes	No	If **yes**, were they **pills** or an **inhaler**? Circle pills or inhaler.
Is there a possibility you are allergic to antiviral medications? **See list on the back of the form.**	Yes	No	If **yes**, circle the medication on the back of the form.

SECTION 2: DETERMINING ANTIVIRAL OPTION

			For Screeners & Dispensers; circle appropriate box		**For Screeners & Dispensers; circle appropriate box**
Pregnant or possibly pregnant?		Yes	**Must dispense Tamiflu; see next section for dosing schedule.**	No	**May dispense Tamiflu or Relenza based on tolerance to pills or inhaler**
Allergic to any foods?		Yes	**Must dispense Tamiflu; see next section for dosing schedule.**	No	**May dispense Tamiflu or Relenza based on tolerance to pills or inhaler**
Do you have asthma, COPD, emphysema, chronic bronchitis or any other respiratory disease history not attributed to the flu?		Yes	**Must dispense Tamiflu; see next section for dosing schedule.**	No	**May dispense Tamiflu or Relenza based on tolerance to pills or inhaler**
Breastfeeding?	Yes	No	**May dispense Tamiflu or Relenza based on tolerance to pills or inhaler** Source: Hale, Thomas W., and Hilary E. Rowe. *Medications & Mothers' Milk*. New York: Springer Publishing Company, 2017, 731, 1002.		

SECTION 3: DETERMINING TIME TO BEGIN ANTIVIRAL MEDICATION AND DOSING SCHEDULE

Are you receiving treatment for cancer, auto-immune diseases, kidney issues; or have a history of diabetes?				Yes	No
Have you been exposed to someone that is sick with the flu?	Yes	No	If yes, has it been more than 48 hours since exposure?	Yes	No
Do you currently have **any** of these signs and symptoms? **Fever*, runny nose, respiratory congestion, cough, sore throat, wheezing, short of breath, GI symptoms, body aches.**	Yes	No	If yes, has it been more than 48 hours since you have developed any of these signs and/or symptoms?	Yes	No

For Screeners and Dispensers: If fever is present, complete the next box.

***Fever:** self-reported or measured? If measured, record temp: _____° F/C

For Screeners and Dispensers: (Check which color option (yellow, blue, or white below)

☐	Yellow boxes circled. (any yellow box takes precedence over blue boxes or white boxes) **Need further medical direction/consultation**
☐	Blue boxes circled (any blue box takes precedence over white boxes): **Start medication immediately.** **For Exposed only, no signs and symptoms:** Tamiflu: One tablet per day for 10 days; Relenza: two blisters once a day **For Signs and Symptoms present:** Tamiflu: One tablet twice per day for 5 days; Relenza: two blisters twice a day
☐	Only white boxes are circled, no other colored boxes circled **Dispense applicable antiviral but may postpone starting medication until exposed or signs/symptoms develop**

Affix applicable Antiviral Label on back of form in space provided.

PCPHSD Tier 1: Public Health Antiviral Screening Form (Tamiflu and Relenza Version) October 2019

ANTIVIRAL MEDICATION LIST

ALLERGIC means that a doctor or medical professional has told you that you are allergic OR that you have had a life-threatening reaction to one of these drugs.

On the front of the form, only circle "yes" if you are ALLERGIC to any of these drugs listed:

Amantadine (no Brand/Trade name)	Baloxavir marboxil (generic) or Xofluza®
Oseltamivir (generic) or Tamiflu®	Peramivir (generic) or Rapivab®
Rimantadine (generic) or Flumadine®	Zanamivir (generic) or Relenza®

For Screeners/Dispensers/Medical Consultation (if applicable)
Place Antiviral Label in box below

Place selected antiviral label here

If applicable to Medical Consultation: if medication can be dispensed, please check **one** of the following boxes:

☐ Start medication immediately

OR

☐ May postpone starting medication until exposed or signs/symptoms develop

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