INFLUENZA VIRUS OUTBREAK AND RESPONSE PLAN: INOVA HEALTH NETWORK

Disaster Plan
GPH-GU 5270 Sec 001
Bethlehem Tesfaye & Carly Malburg

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INOVA HOSPITAL SYSTEMS
8110 Gatehouse Road, Falls Church, VA 22042

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Preface

The influenza virus is one of the most common viruses to cause human disease. Influenza causes high mortality rates each year. [1] There are four different types of influenza virus: A-D. Influenza A and B are the most likely to cause human influenza, also referred to as the " flu".[1] Typically, flu season occurs in the United States in the winter months from October until March; without proper precautions, such as vaccination and preparedness programs, the yearly flu can quickly reach epidemic transmission levels.[1] Typically, the elderly, very young, pregnant women and those who are of lower socioeconomic status, unemployed, and other vulnerable groups are the most negatively affected by the flu virus.[1]

The population of focus for this plan is Northern Virginia, specifically the INOVA hospital network. INOVA is a non-profit healthcare network that serves a very diverse community.[6] Its main focus is in maximizing access and equitable care to all members of its community.[6] Northern Virginia is part of the Commonwealth of Virginia and the metropolitan area of Washington D.C. Northern Virginia is home to 2.5 million residents of which 50.2% are considered to be part of a minority population, 10% of that 2.5 million are also estimated to live below the US established poverty line.[10] This population was chosen because it includes the majority of those most negatively affected by influenza and there is a strong foundation of resources through the INOVA network to help this population.

Signature Line

The undersigned have reviewed, approved in full, and will support implementation of the following Influenza Virus Response Plan for INOVA.

_____ _____

Don Smith, MHA Date

Director of Emergency Preparedness, Fairfax County

_____ _____

Katrina Jacobsen, MD Date

Health Commissioner, Fairfax County

_____ _____

Mary Roberts, MD Date

President of Board of Health, NOVA

INOVA Mission Statement[6]

INOVA's mission is to provide world-class healthcare-every time, every touch-to each person in every community we have the privilege to serve.

Statement of Purpose

The purpose of this plan is to educate the community on the influenza virus, how it is transmitted, how to slow the spread, and how to prevent members of the community from becoming infected with the influenza virus. We intend to execute this plan by creating the following:

- A response plan for the INOVA health community that establishes guidelines of how to manage and minimize the effect the virus will have on the community. This plan will implement preventative measures into the community that will maintain community members without needing to declare a state of emergency.
- A response plan strictly for the hospitals to be used in an event of a state of emergency should there be a large or unexpected influenza outbreak. This will minimize the risk of the hospital becoming overwhelmed with cases and rendering them unable to provide care to the community members impacted by the influenza virus and other health problems.

Governing Authorities

1. Local
    1. County emergency response and medical groups
    2. Fairfax County-level departments/agencies
    3. Johns Hopkins Office of Critical Event Preparedness and Response (CEPAR)
2. State
    1. Virginia Department of Health (VDH)
    2. Northern Virginia Emergency Response System (NVERS)
    3. The District of Columbia Department of Health (DC Health)
    4. The District of Columbia Hospital Association (DCHA)
    5. Bethesda Hospitals' Emergency Preparedness Partnership (BHEPP)
3. Federal
    1. Centers of Disease Control and Prevention
    2. National Institute of Health and Human Services
    3. Federal Emergency Management Agency

Definitions[1]

Influenza (Flu) is a contagious respiratory illness caused by influenza viruses that infect the nose, throat, and lungs. It can cause mild to severe illness, and at times can lead to death. It is mainly transmitted through tiny droplets suspended when people with flu cough, sneeze, or talk. Common flu symptoms include chills, cough, sore throat, runny or stuffy nose, body aches, headaches, and fatigue. Some might experience fever, vomiting, and diarrhea—the highest incidence of flu seen in children and adults above 65 years old. The primary prevention of the flu is to get an annual flu vaccine.

Communication Plans[9]

The Northern Virginia Hospital Alliance (NVHA) serves as both a planning and response entity. It provides real-time information sharing between regional hospitals and local emergency management offices. The regional hospital coordinating center (RHCC) provides coordination and interoperable communications using an 800MHz Medcomm radio system that connects all the NVHA members such as Fire/EMS, hospital command center, and emergency department.[5] Redundant communications systems of deployed voice or data satellite terminals in every hospital command center and video conferencing linking all NVHA hospital command centers. The Northern Virginia Emergency Response System (NVERS) coordinates with State and regional partners integrating response capabilities and information sharing. The Virginia Healthcare Alerting and Status System (VHASS) utilizes joint message boards such as WebEOC, forms, patient tracking, bed status board, and mass notification/alerting system to share situational awareness between the NVHA hospitals, neighboring Virginia hospital regions, State Health Department and local EOCs.

Mutual Aid Agreement

As part of the NVHA member, INOVA Fairfax hospital has mutual aid agreements with local jurisdictional EOCs, the Virginia Department of Health, regional partners in the State of Maryland, and the District of Columbia.

Concept of Operations (CONOPS)

I. Public Health Concept of Operations

This plan aims to mitigate the spread of the influenza virus within the Northern Virginia community during an epidemic incident. The means of mitigation include implementing precautionary measures, education initiatives, and vaccination campaigns. The influenza virus occurs annually, meaning it circulates through a population each year at about the same time. This virus typically is the cause of epidemics in the population due to rapid spread within a short period. Seasonal Influenza contributes significantly to global morbidity and mortality and is also the source of influenza pandemics. There are unique features associated with the influenza virus in humans that increase the risk of the virus

becoming epidemic and a pandemic. The three groups of influenza viruses are A, B, and C, but only group A viruses cause epidemics or pandemics.[7]

Type A virus is further subdivided by typing two important surface glycoproteins: hemagglutinin (HA) and neuraminidase (NA). Re-assortment of the surface glycoprotein gene segments may result in novel Influenza A virus strains that can result in pandemics due to the lack of immunity in the general population. This significant antigenic change is called *antigenic shift*. In contrast, seasonal influenza viruses often have smaller and frequent point mutations, which lead to more gradual shifts in their genomes and do not cause major pandemics. This is known *as antigenic drift*; it is why new influenza vaccines must be prepared yearly. Antibodies produced against the previous strain may not fully protect against the altered virus but generally, confer enough protection to prevent an outbreak. Pandemic Influenza leads to severe morbidity and mortality, especially for groups at high risk for complications from flu.[7]

Without proper precautions and preparations, strains that have undergone considerable antigenic shift (such as H1N1 2009-2010 strain) have a high likelihood of causing pandemics. Wild birds are the natural reservoirs for the Influenza A virus, allowing them to be constant sources of Influenza transmission, whereas humans are the only reservoirs for Influenza B virus.[8] Influenza viruses can be resistant to environmental factors. For example, the virus can survive in contaminated manure in cool climates for about three months, where one gram of this infected manure can infect one million birds.[2] The virus can also survive in water at different temperatures. Typically, the influenza virus is the most active and deadly in Northern Virginia between October and January, but cases continue to be reported through March. This plan encompasses all four phases of disaster management: mitigation, preparedness, response, and recovery.

II. Disaster Management Plan: Influenza Epidemic

A. Phase I: Mitigation

1. The following measures will be implemented in the spring and summer months ahead of the seasonal influenza season:
    a) Circulation of educational materials on the influenza virus throughout the community. These materials will include information on the virus, how it is spread, and who is at the highest risk and the most vulnerable to contract the virus. The materials will also include information on steps to prevent contracting the virus (including vaccination programs) and what to do if you become infected.
    b) These materials will be distributed in the following locations throughout the Northern Virginia community:
        (1) Common meeting and gathering areas including grocery stores, banks, shopping centers, libraries, fitness centers, and town halls

(2) Medical, wellness, and rehabilitation facilities including hospitals, urgent cares, and private medical practices
(3) Community centers
(4) Faith-based organizations
(5) Recreational areas
(6) Schools including pre-school/day-care facilities, K-12, community colleges, and universities
(7) Nursing and assisted living facilities

c) The materials will also be broadcast throughout the Northern Virginia area on radio, television, and news platforms and will be available in formats fully accessible for people living with disabilities.
(1) Special attention will be given to vulnerable populations such as the elderly (people over 65), children, pregnant women, individuals of lower socioeconomic status, unemployed persons, disabled, people in congregant care facilities, homeless, and those belonging to minority groups and undocumented persons, members of the LGBTQ communities, etc. These vulnerable populations will be targeted because they are at the highest risk of contracting and spreading the influenza virus.[8]

B. Phase II: Preparedness
1. The following measures will be implemented in the spring and summer months ahead of the seasonal influenza season:
a) Hospitals, medical, rehabilitation, and wellness facilities will be adequately stocked with personal protection equipment, vaccination doses, and sick beds ahead of the influenza season to prepare for the rise in cases. This is to mitigate the continued spread of the virus and ensure those who do become infected are treated quickly and appropriately.
b) A triage flow system will be established for each facility mentioned above should the facility experience an unmanaged spike in influenza cases. This chart will assist facility staff in evaluating the incoming patients to the facility and determining if they should be seen and treated, be seen via a telehealth appointment, or referred and sent to an alternative facility for care.
(1) The triage flow system intends to prevent health facilities from being overwhelmed with patients and maintain a viable personal protection equipment stock.

C. Phase III: Response
    1. The following measures will be implemented during the influenza season:
        a) Launching vaccination programs will educate the public on the influenza vaccine, availability, and eligibility to receive it.
            (1) Special attention will be given to vulnerable populations such as the elderly (people over 65), children, pregnant women, individuals of lower socioeconomic status, unemployed persons, and those belonging to minority groups.
                (a) Members of these vulnerable populations will be targeted because they are at high risk of spreading and contracting the influenza virus.
        b) Offer incentives to the Northern Virginia community members who choose to receive the vaccine.
        c) Have emergency response teams in place to support community hospitals and medical and wellness facilities should there be a surge in cases that overloads the facilities. This included implementing the medical facility triage flow system to ensure those who are in the most critical care are receiving attention and those who are not in critical care are protected from the virus.

D. Phase IV: Recovery
    1. The following measures will be implemented at the end of annual influenza season (late winter/early spring):
        a) Monitoring the spread of the virus to identify which areas members of the Northern Virginia community are being affected the most by the virus. Then scaling up the influenza protection and prevention initiatives in these areas to mitigate any continued virus transmission and promote quicker recovery.
        b) Data collection and survey will evaluate what aspects of the response plan did not work or need improvement to better prepare for the next season. This includes: -
            (1) Analyze and compare transmission, recovery, vaccination adherence, and mortality rates from years prior against the current years' data to identify what areas and populations within the community were affected the most to understand better what needs to be done differently in the coming years.

III. Community Needs Assessment

The severity of influenza epidemics ranges from serious illness to death. Early knowledge and needs assessment must be completed to provide an efficient and equitable response to contain and mitigate the further spread of influenza infection, especially among the

vulnerable elderly, children, people with disabilities, pregnant women, and minority groups.[11]

Local organizations such as community-based organizations and faith-based sectors that serve these communities, including community members, are essential stakeholders in building trust to increase the uptake of influenza prevention measures. Health sectors are also responsible for identifying potential health outcomes among these groups to provide guidance and risk awareness.

This plan was developed after reviewing the virus's effects on the Northern Virginia community during previous influenza seasons. After analyzing the data collected from previous influenza seasons, it was determined that this community needs a proactive approach to the influenza season, specifically within vulnerable populations.[3] During the 2018 and 2019 influenza seasons, approximately 1,813 in the Virginia area died due to the flu.[3] Most of these deaths occurred within the first two months of the flu season, with deaths most commonly reported among the elderly and young people.[3] These deaths might have been prevented with earlier communication of the upcoming flu season, the precautions needed, and the importance of receiving the flu immunization.[8]

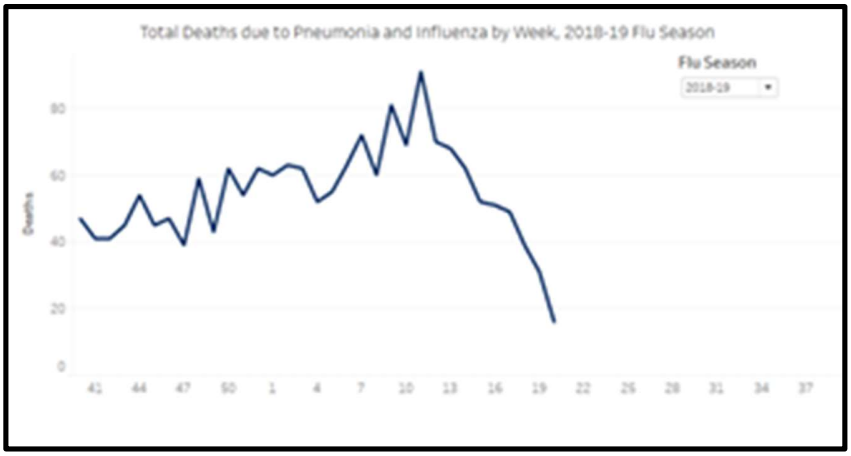


Figure 1. Mortality rates from the 2018-2019 flu season take from VDOH report

In summary, to mitigate the further spread of the virus, health care, and public health sectors need to educate community members and patients about the importance of compliance. Such efforts include immunization, isolation measures, symptom awareness, personal transmission prevention measures such as hand-washing, covering coughs and sneezes, and self-isolation.[11] Community leaders should also take a prominent role in helping to educate the public; despite ample resources, there is always a proportion of communities that remain unvaccinated and do not follow influenza guidelines. Although a needs assessment might be challenging to complete each year, continuous communication with the public, media, and local organizations and aggressive vaccination programs will ensure continuity of care and prevent contracting the influenza virus.

IV. Matching Community Resources to Community Needs

Health care services need to provide leadership and guidance on the actions needed in the influenza pandemic and response efforts. Partnering with other stakeholders such as local, community, and government sectors will assist the health sector in disseminating critical information and providing necessary aid to more community members. Strategies such as telephone hotlines, automated messages, print materials including symptom assessment toolkits, telehealth, and advice lines with language services will reduce the risk of disease transmission as well as hospital surge.[8] Such provision will address the community's needs on different levels and help healthcare personnel triage persons to emergency rooms, urgent care centers, and primary care clinics accordingly.

Implementing aggressive vaccination campaigns by the local and government stakeholders is another critical resource in meeting the community's needs. The influenza vaccine has proven to be the most effective line of defense against the spread of the influenza virus.[4] However, every year, too many people go without being vaccinated because they did not know where they could receive it or were apprehensive of receiving it. This includes offering incentives at vaccination sites and effectively communicating to the community how safe, effective, and essential the flu vaccine is. Different incentives can include free transportation to vaccination sites, time off work, complimentary refreshments, free vaccinations, and even monetary incentives.

Non-pharmaceutical interventions (NPIs) also need to be made accessible and affordable to the community as they are proven to be effective in limiting the spread of the influenza pandemic.[8] Local and state governments can assist the health sector in implementing NPIs. NPIs allow individuals and communities to be part of the response efforts in mitigating the influenza pandemic.

V. Evaluating the Effectiveness of The Disaster Response

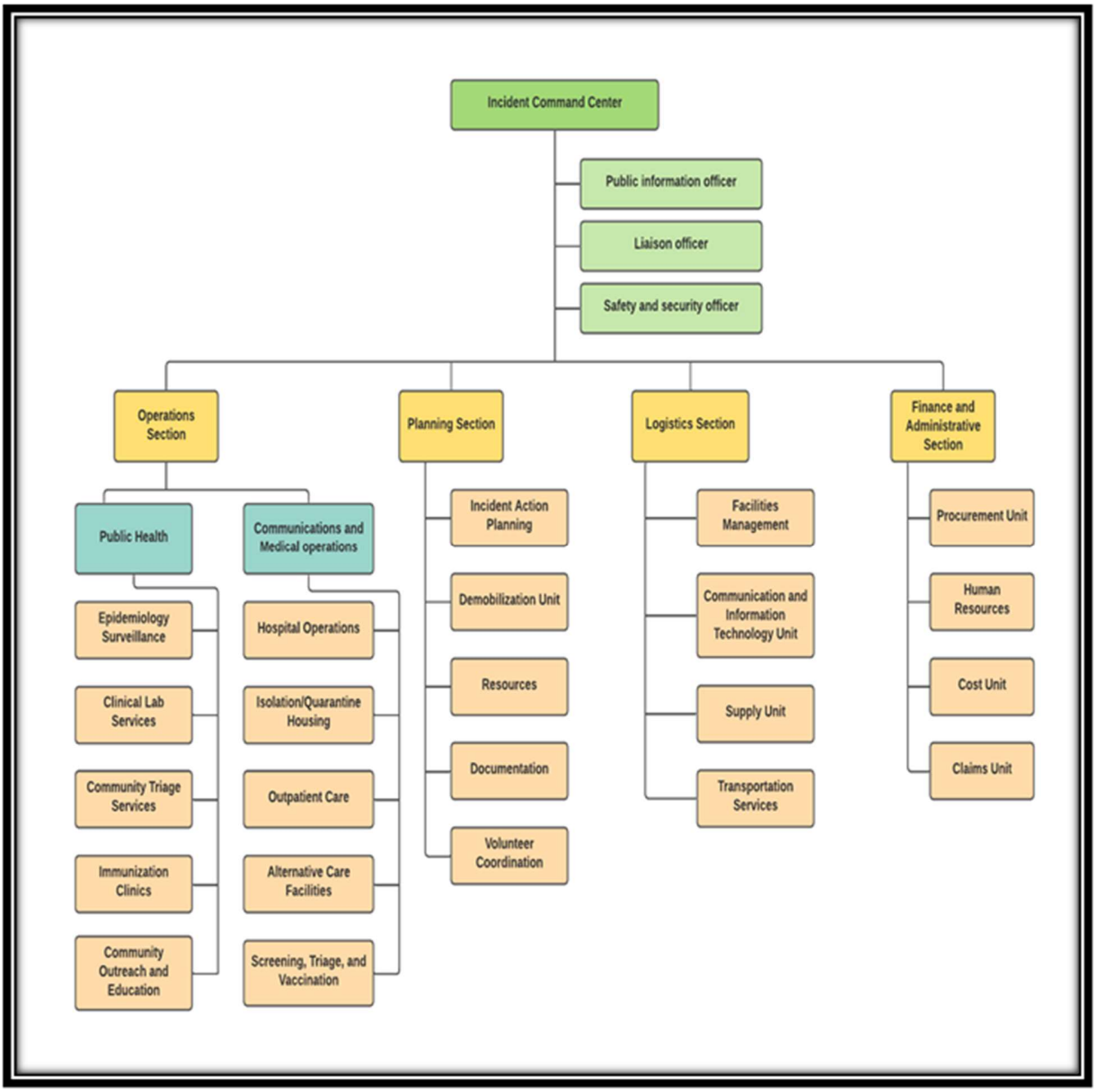
One overarching concern with responding to an influenza epidemic is knowing it and its community impact is not consistent season to season. Therefore, it is crucial to have a disaster response plan that has a solid foundation but is also flexible and easily adjusted. Stakeholders need to be constantly evaluating and evolving the plan throughout the influenza season to ensure its effectiveness and viability.

During phase one of the plan, stakeholders will continuously review epidemiological surveillance reports and evaluations of NPIs and pharmaceutical interventions. This will allow stakeholders to revise response efforts in real-time to serve the community better. In addition, stakeholders will identify the priorities of the response plan and assess if it needs to be adjusted throughout the season. Finally, stakeholders will also be able to better assess the impact of the virus through reviewing the morbidity and mortality rates, hospital admissions, vaccine effectiveness, supply shortages, and socioeconomic impacts in real-time.[8]

During phase two of the disaster plan, stakeholders will conduct interviews and surveys of community members and local partners on how the plan was carried out and its impact on preventing an influenza outbreak. An influenza outbreak is a continuous uncontrolled

transmission of the virus that requires ongoing public engagement to promote community resilience.[11] We will use this collected data to determine the effectiveness and improvement of the plan prior to the next influenza season.

Annex 2: Incident Command System Chart



Annex 3: Mitigation Strategy

Training Seminar Title: Influenza Epidemic Preparedness in Northern Virginia	
Objectives of your Training Seminar (What mitigation strategy are you advocating?)	Epidemic preparedness: Minimizing the transmission of influenza virus.
Estimate Length of Training	1 hour on an annual basis.
Target Audience and max size of audience.	Community members in Northern Virginia including community leaders and stakeholders. 50 members per training group.
Who would be a good candidate (e.g., structural engineer, health dept. official, first responder?) as Facilitator of this session? Why?	Healthcare leaders or Public health officials such as infectious disease specialists or Department of Health Immunization/Infectious disease leaders. These are the best candidates for the role as facilitator as they are experts in managing an influenza virus including but not limited to how the virus is spread, prevented, and treated. They are also experts in how to care for and educate community members.
What do you want community members to do as a result of their attending this session?	• Become vaccinated against the influenza virus annually if they are eligible. • Avoid gatherings, events, or behaviors that promote the transition of the virus. • Frequently wash their hands and high-touched surfaces with soap or appropriate disinfectants. • Stay home from work, school, and away from close contact or heavily crowded areas if they are sick.
Strategies to increase community uptake of your mitigation (We have lots of useful links for checklists on the Course Home page under the Important Links page.) List the ones you think might be useful (in the appropriate language) or provide a title or two of a list or handouts that you think would be good to give out to attendees.	• Hand out educational flyers or pamphlets about the flu virus including how it is transmitted, prevented, and signs and symptoms • Hand out educational flyers or pamphlets on the influenza vaccine including what it is, safety information, side effects, and where they are offered in the community. • Offer vaccination incentives such as open to the public free vaccination days and free transportation to vaccination sites.

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