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Outline for Outbreak Response Plan

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f. Develop a hypothesis that explains the etiology of the outbreak

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Outbreak Preparedness

There are many actions jurisdictions can take ahead of time to prepare for an outbreak, including determining the baseline level of disease and when the outbreak plan should be activated, establishing what roles are needed and who will be responsible for those roles, developing a communication plan, identifying existing and potential partnerships, preparing necessary tools or kits for field staff, and practicing an outbreak response. In this section, consider what you can do to prepare your facility for a potential future outbreak.

1.a. Activation of the outbreak plan

A program is responsible for determining the local threshold level of various infections that will trigger an outbreak investigation and response. These thresholds might not be based solely on surveillance data but could include concerning reports from disease intervention specialists (DIS) or clinical providers. In general, an outbreak can be defined as occurring whenever disease levels exceed what is expected in a given community. Community can be defined as a population as small as a facility or establishment, census tract, or neighborhood, or as large as a city, county, region, or any population defined by any number of sociodemographic characteristics. Unfortunately, there are no magic numbers that can be applied in all situations for determining an outbreak; threshold levels need to be defined and determined based on local epidemiology.

• What are the specific scenarios or thresholds when your jurisdiction will activate the outbreak investigation and response plan?

• At what frequency will data be reviewed to determine if an outbreak is occurring? Who is responsible for performing and reviewing these data analyses?

• What are the data systems to be used to identify the outbreak and to capture response efforts?

• Who is responsible for determining that there is an outbreak or for leading a response?

• Who in your organization needs to be notified of an outbreak?

• What are the specific jurisdictional responsibilities that can be determined in advance?

• Under what circumstances would you use an incident management system to respond to an outbreak?

1.b. Roles and responsibilities

A program may define the necessary roles needed during an outbreak response and decide who or what job categories will fulfill the responsibilities of those roles. Additionally, facilities may define how the daily responsibilities of those assigned to support the outbreak response will be redefined or

redistributed to others that are not part of the response. What roles and responsibilities need to be defined in the outbreak plan?

• Outbreak lead—Who will lead the response? This may vary by disease. You can list all the individuals or positions that could potentially lead an outbreak response for various Infections.

• Outbreak investigation team—Once the existence of an outbreak has been confirmed, the outbreak response team should be activated.

- The location, nature, and size of the outbreak will determine who should be included in the outbreak response team, but there should be individuals who could provide expertise and leadership during an outbreak.
- Determining who should be included in the outbreak response team and their roles and responsibilities can be thought through in advance of an outbreak.

Those roles might include

◦ Leadership, management, and oversight of outbreak activities.

◦ Surveillance activities.

◦ Epidemiologic activities and investigation.

◦ Data management and security.

◦ Contact investigation and partner services.

◦ Oversight of laboratory specimen collection, transport, and testing.

◦ Risk communication and communication with local health department.

◦ Control and prevention measures.

◦ Coordination with external partners and agencies.

◦ Provider and public education and outreach.

◦ Support activities such as logistics and budgetary management.

1.c. Additional staffing capacity

During an outbreak response, there may be a need for additional case investigation, data entry, epidemiology, or even laboratory staff. Health departments can also consider how to shift resources during an outbreak, establish the point at which to request additional staff, and determine how to request additional staff.

• What will the impact be on other routine program priorities if and when staff are shifted to work on the response?

• What are the experiences or cultural competencies of the facility in working with the affected population?

• What are the available laboratory services?

• What are the culture and antibiotic testing capabilities for the public health and other local laboratories?

• What is the quality of the laboratory services?

• What are the sources of clinical care in the community?

• How well do clinical services (staffing, training of clinicians, medication availability, etc.) meet the needs of the facility?

• What Lab services would be able to handle extra case volume if there were an outbreak?

Developing Memorandums of Understanding (MOUs) to move staff between the organization or procedures to move staff within a clinical department can be done in advance of an outbreak response.

It is important to connect with your organization emergency response/outbreak response to understand what type of staffing, resources, and support they may be able to provide during future outbreaks.

They may have preparedness tools, including other outbreak response plans, standard meeting schedules, and staff, available to help manage a response.

• Consider what additional roles would be necessary if there were an outbreak in your jurisdiction and who might fill those roles for various infection outbreaks.

• How can you prepare for potential needs for additional case investigation, data entry, and epidemiology staff?

• What credentialing or training would be required or helpful?

• What capacity might there be for staff to travel from other jurisdictions to support a response?

• What Organizational processes currently exist for transferring staff between departments or jurisdictions?

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1.d. Data security

Even during an outbreak, data security and confidentiality standards to protect personally identifiable information should be upheld. Having a plan in place prior to an outbreak may assist local staff with adherence to these standards during an outbreak.

• Identify which staff have a need for and permission to access laboratory, surveillance, and case management information, especially staff that does not normally work in the facility.

• Ensure data collection is limited to information essential to the investigation and is maintained and transmitted in a secure environment. • Data collection, analysis, and reporting should adhere to confidentiality and security statutes and protocols.

1.e. Communication plan

Communication with key stakeholders, the Local DOH, and the State DOH are vital during an investigation and response. Follow the policies and procedures at your facility to work with your general counsel and clinical staff. It is important to establish clear communication processes to keep information consistent, minimize rumors, and prevent stigmatizing the affected facility. One person may be designated as the primary point of contact for DOH to ensure consistent messaging. Local public information officers can be engaged early in the process to help coordinate messaging inquiries. Email will be sent out to families and posted for staff in the building immediately following a positive case or when we have residents with sign of respiratory infection. Engaging the facility affected by the outbreak is important. Think about how you would anticipate approaching and working with the affected facility.

6 1.f. Identification of existing partnerships

Responding to an outbreak will often involve more than just clinical staff. Taking advantage of existing partner relationships may be of exceptional value. Furthermore, establishing new partners prior to an outbreak will likely result in a more productive partnership than looking for partner assistance in the midst of a crisis.

• What established partnerships are there within the health department that can or should be harnessed given the nature of the outbreak?

• What established partnerships do you already have with medical providers, professional provider organizations, community-based organizations, local businesses, laboratories, media outlets, and other possible partners?

• What new partnerships can and should be established (including any non-traditional partners for your priority populations?

• What roles and responsibilities should these partners have during an outbreak?

- Will partners be included in outbreak team meetings?
- What kind of privacy and confidentiality protocols and expectations are necessary?

Managing a Response

During an outbreak response, your program will likely not be able to function normally. Demands on staff will likely be higher, and routine policies and procedures may have to be amended.

2.a. Management structure

Think about the need for or benefit to using the incident command system during your outbreak. There can be benefits to involving people and structures that are familiar with emergency and outbreak response (for example, they are frequently able to move resources faster, and there are clear lines of communication); however, they would likely need to be oriented towards unique aspects and sensitivities of an Infection Outbreak. As mentioned in the section on preparing for an outbreak, having an outbreak response team can also help coordinate the response with clearly defined roles. Additionally, many state and local health departments have established Incident Management Systems (IMS) for responding to large events and outbreaks. Discussions with local emergency response staff or communicable disease groups that have responded to outbreaks in the past may help inform whether an IMS structure is appropriate for particular responses. During the outbreak response, regular meetings that include various aspects of the health department (surveillance, laboratory, clinical providers, leadership, communications, and outside partners) can be helpful so that everyone remains engaged and focused on the outbreak and information is shared efficiently. Daily meetings can also be beneficial to inform enhanced surveillance activities with a smaller subset of people. Discussion topics should include

- Review of available information, including successes and barriers that are impeding progress.
- Case definition.
- Purpose and scope of investigation.
- Available and needed resources.
- Roles of each group involved in the outbreak response.
- Schedule of regular updates.

• Discussion of any political sensitivities pertaining to the outbreak and investigation.

• Development of initial awareness strategy.

• Informing state and federal staff of outbreak initiation.

2.b. Informing, coordinating, and engaging with partners

Programs work with many partner organizations, and it is important to inform and engage them when there is an outbreak. State and local health departments will likely need to work together, as many outbreaks will spread beyond local jurisdictions and may require “surge support.” State health departments may need to coordinate with health departments in neighboring states. Cases may present in surrounding jurisdictions, so it is important to alert them of an outbreak and determine how these cases will be investigated. It is also important to notify CDC of outbreaks you are investigating. Your CDC prevention specialist can help you identify additional resources (if appropriate) and can connect you to other state and local partners who may have insights into the specific outbreaks you are responding to. Additionally, keeping CDC in the loop may help streamline outbreak-related communication. Health care providers are important partners that may be able to provide new screening protocols to increase case finding and extend laboratory hours to ensure more people are tested and treated. Releasing a health alert to providers can alert them to the problem and remind them of common signs and symptoms of disease and appropriate screening and treatment guidelines. Additionally, other community partners can help spread the word about the outbreak and teach individuals how to recognize signs and symptoms and how to protect themselves.

2.c. Prioritization of disease

You may need to change disease prioritization during an outbreak. For example, if you are seeing a large number of early cases in a location that does not normally see cases, you may no longer have time to follow up on cases. Provide guidance to the facility and decide how to prioritize these cases. The outbreak response team can help establish new disease priorities to help ensure staff resources are used most effectively. You can also reach out to your CDC prevention specialist for guidance on how to reprioritize activities during an outbreak.

• What changes should be made to your standard disease investigation priorities during the outbreak?

• Will you change policies related to field testing/treatment or who receives preventive treatment during an outbreak?

During an outbreak, facility capacity/capabilities may be overwhelmed quickly.

Complete Care Organization can increase facility capacity by shifting internal staff (e.g., by deploying current staff who previously worked as facility) or moving staff from other organization neighboring facility. If an outbreak starts to exceed the state's current resources, the state can request additional support from other states or from CDC. The following are some considerations before requesting additional support:

• How many resources are needed and for how long?

• What skill sets are needed (e.g. phlebotomy, rapid testing, and/or other languages)?

• What are the expectations of responding staff? What are the expected responsibilities and duties, work hours, and command structure (i.e., to whom will the facility report)?

• How will travel and other costs be funded?

• How will the incoming Clinical Providers be credentialed? What confidentiality agreements may be required? What data systems and other local resources will they be able to access? Could/should they be issued cell phones by the health department? How should they conduct field work?

• What are the facilities plans after responding Clinical Providers leave?

Outbreak Investigation and Response

An outbreak investigation identifies the characteristics of affected persons in the outbreak and the characteristics of the underlying risk network. This information can guide intervention efforts to improve health outcomes, prevent additional infections, and ultimately control the outbreak. An outbreak investigation includes the examination of current data and potentially the collection of new data to identify factors associated with transmission. The following are the goals of an outbreak investigation:

• Determine the size and scope of the outbreak and the risk network (e.g., undiagnosed cases, diagnosed cases not previously linked to the outbreak, and/or persons at risk of infection).

• Identify factors associated with transmission.

• Understand connections between cases.

• Assess risk for ongoing transmission.

• Determine the interventions that might stop the outbreak.

There is no single correct list of steps for an outbreak investigation, but it is important to have a systematic approach so that critical steps will not be overlooked during the intensity of the identification and response. The steps are not fixed in this specific order and are often not linear (steps occur

simultaneously and may recur). Additionally, many components are dynamic and could change as additional information is gathered.

3.a. Determine the existence of an outbreak

In general, you need to establish a baseline of disease and determine if the observed numbers exceed the expected levels. This could include changes that might not be routinely reported in surveillance data, such as changes in rates among sub-populations or unique clinical findings. Sometimes Clinical providers or an astute clinician may identify an outbreak that is not apparent in surveillance data. Local health officials may take different views of the normal rise and fall in cases and whether changes merit an investigation.

• Describe how your facility will detect outbreaks.

• What systematic analysis and reviews of surveillance data will occur and how frequently? What is the threshold when the plan is to be initiated?

• How might the observations and experiences of the Clinical provider be incorporated into the analysis? Clinical provider may have epidemiological and contextual information that are not captured by surveillance reports.

• How will you include partner services and contact investigation data, as well as observations by health departments, community-based organization partners, and clinical staff?

• How do you want to be notified of an outbreak, and what initial information should be collected about the outbreak.

3.b. Verify the diagnoses

An investigation could be initiated when the defined threshold for a particular infection crossed. Furthermore, routine meetings that include diverse program staff (DIS, clinicians, epidemiologists, surveillance staff, etc.) can help identify concerning increases that may not be detected through surveillance data and that may require more vigilant monitoring. A facility response will be tailored to the individual circumstances surrounding the increase. The intensity and scope of an investigation and response may differ depending on the number of cases, the magnitude of increase in a specific population, or some other factor. It is important to be aware of changes in local reporting practices, changes in diagnostic methods, influx of populations, or a new physician or clinic in town with differing testing practices, all of which may cause “artificial” increases in reported cases. You can reach out to surrounding jurisdictions to see if they are also seeing an increase. If you are concerned about a change

in clinical symptoms of infections in your area, you could reach out to providers that normally report a high volume of infections to see if they have noticed any of these symptoms in their patients.

Facilities may also want to review cases that have been interviewed, consider testing in high-risk settings, or perform cluster interviews of individuals related to a possible outbreak. It is also important to verify that a laboratory or other diagnostic error is not the reason for the increase in cases. Facilities may need to review clinical data to ensure cases fit the case definition and have been classified appropriately.

• If an increase in disease is identified, what are possible alternative explanations other than an outbreak? For example, did a new provider report a large number of cases at once? Are there data entry or data merging errors? What steps would be undertaken to determine this?

3.c. Establish a case definition and find cases

You will need to develop an outbreak case definition. This may be a modified surveillance case definition and should include information about the case in terms of person, place, and time. Information about a person may include age, sex, ethnicity, and gender. Place information usually includes a geographic location (county and/or city), but it can be as small as a unit, wing and facility location. Time information should be specific dates or a period of time in which cases occurred. These cases may be a subset of the total 12 number of infection type cases occurring in the jurisdiction, so it is important that everyone understand the case definition and use it consistently. Having a structured questionnaire may be helpful when investigating outbreaks, and such a questionnaire can be developed ahead of time with modification during an outbreak. Finding cases may require active, direct contact with selected physicians or clinics, certain institutions such as hospitals, ALF and SNF, or other jurisdictions, or cases may be found by public announcements. Case finding may include collecting and reporting pertinent information on cases. This information may include descriptive information (e.g., age, gender, and/or residence) and information about the symptoms and onset of disease.

3.d. Describe the data in terms of person, place, and time

Data on cases may come from multiple sources, including surveillance data, investigator notes, clinical notes.

• Review how case report data are formatted and stored, and know what information is available for analysis.

• Review what individuals or agencies are reporting cases (e.g., clinicians, laboratories and health department staff.

• Review how data are collected from the source of the report and entered into the system, and review data completeness and accuracy.

• Explore how data linkages may be accomplished. Important case-level data may exist in surveillance systems or in acute communicable disease case reporting. Linking these systems together could improve efficiency and provide useful data for characterizing and interrupting the outbreak. Creating of a simple line list of outbreak cases can be helpful for describing and visualizing the data. A line list should include information in terms of time, place, and person (e.g., name, contact information, demographics, clinical and laboratory data, and some important risk factor information). Don't wait until the outbreak is over to describe the data. Looking at data from the beginning of and during the investigation can help you target interventions and determine where to put resources. You should re-evaluate periodically during the outbreak to determine whether the situation has changed.

Other examples of how to describe the data include:

Time: This may help you get a better understanding of the course of the outbreak and potentially how many more cases you can expect to see.

Place: Mapping cases by place of residence, work, or another location may help visualize affected areas. This can be more important with infections where visualizing visitors, new admissions, or staff returning from recent travel might help identify the vehicle or mode of transmission.

Person: Reviewing the characteristics of cases such as age, gender, race, travel history, social networks, or other risk factors can help you define the group at risk.

3.e. Determine who is at risk of becoming ill

Collect additional information, including potential review of medical records, interviews, or case investigations, as needed. Now you should have some basic knowledge of the number of ill people, when and where they were when they became ill, their general characteristics, and a working case definition. This information can help you understand what population is at risk and help you target interventions. This can also help you identify who should be targeted for increased screening. Possible ways to generate hypotheses include:

• Conducting key informant interviews or focus group(s) with Medical Director and clinicians. Explore reasons for the increase in cases and attempt to define some commonalities of cases that have been interviewed.

• Constructing hypotheses using information from interviews with several related cases.

• Reviewing medical records of selected cases for risk indicators and other demographic data.

• Performing outreach to and key informant interviews with members of the affected community.

• Reviewing the surveillance system and clinical, laboratory, and programmatic operational policies to identify system issues that would lead to an actual or perceived increase in cases.

• Reviewing available clinical services:

  ◦ Where are the cases seen initially?

  ◦ What is the volume of patients at facility with the infection? Has it changed?

  ◦ Have there been medication stock-outs or other changes in the supply chain?

3.f. Develop a hypothesis that explains the etiology of the outbreak

Case-control studies can help evaluate specific exposures and are the gold standard in outbreak investigations. However, case-control studies are time consuming and finding appropriate controls may be a challenge; they also may not be applicable in all situations. Ecologic analysis of varying data sources may also be appropriate for exploration of hypotheses. For example, if one hypothesis is that increased access to health care (and resulting increases in testing) may suggest an increase in reported disease, it may be valuable to explore trends in insurance and health care access among the population at risk and test volume over time. The initial hypothesis is a starting point and should address the at-risk population, transmission source, mode of transmission, exposures, and risk factors for the outbreak.

Following an outbreak investigation, there are many reasons that it is important to document the investigation, findings, and recommendations. Sometimes documentation is needed before certain actions will be taken. A report can also serve as a record of accomplishments, including how many interviews were conducted, partners elicited, and cases brought to treatment, and of the overall time and resources spent on the response. This data can help document the magnitude of the health problems and changes in disease trends, and it can serve as concrete evidence of program justification and needs. The process of writing a report and describing step-by-step events can help see the investigation as a whole from an unbiased view, and it can help with final interpretation and recommendations. The findings can also be shared with the broader public health community through conference presentations or journal publications.

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After-Action Report Template

Name of the outbreak:

Location:

Dates:

Staff hours contributed:

Total travel costs:

Collaborating entities:

Goals and objectives:

Executive summary:

Summary of the outbreak response; information should include:

• Dates when the outbreak response was initiated and deactivated.

• Activities performed during response.

- Total number of new cases identified.
- Outcome or disposition of those cases.
- Contact index and cluster index.
- Number of cases identified as result of investigation activities.
- Disposition of contacts.

Successes:

Challenges:

Recommendations for improve