CDC's Division of STD Prevention

Sexually Transmitted Disease Outbreak Response Plan Guide

January 2019

A more recent version of this document exists. View the current verison (Updated December 10, 2020). Additional guidance for outbreak detection, response plans, and control activities is available on CDC's STD Outbreak Response Resoures page.

Purpose And Scope Of This Document

The purpose of this document is to provide an outline, considerations, and/or a starting point for jurisdictions to develop their own STD outbreak response plan. This is a guide to be modified as necessary to meet the needs of each jurisdiction. This guide can inform discussion throughout the health department as part of developing an outbreak response plan. STD program managers should not expect to develop or manage each section but are encouraged to identify the stakeholders to be responsible for each section. Programs should review and update their outbreak response plans annually to ensure they are relevant to program changes.

We recognize that STD programs are currently strained, as many areas have been seeing increases in STDs in recent years. With these increases there have been questions and concerns about what constitutes an STD outbreak. In general, an outbreak is defined as an increase of disease among a specific population in a geographic area during a specific period of time. However, specific definitions for STD outbreaks are relative to the local context. For example, a small increase in congenital syphilis morbidity in an area with no recent reported cases requires critical action, although it may not qualify as an "outbreak" based on statistical tests.

While the larger increase in STDs still requires resources and programmatic attention (and possible changes in approach or prioritization), this document is meant to address more defined increases that require a more focused and urgent response. The focus of this document is on the investigation aspect of the response. The types of situations this document addresses include individual cases and/or clusters of

- Organisms with clinically significant resistance (e.g., gonorrhea that is unsuccessfully treated with recommended therapy).
- Organisms not previously or recently detected in the jurisdiction (e.g., lymphogranuloma venereum [LGV] or chancroid).
- New/rare clinical presentations of diseases (e.g., ocular syphilis).
- New populations or subgroups affected (e.g., syphilis among females or among attendees of a specific school).
- New geographic areas (e.g., syphilis on a Native American reservation that has not seen syphilis in many years).
- Any other distinguishing characteristic related to cases in a cluster.

Outline for Outbreak Response Plan*

1. Outbreak Preparedness
    a. Activation of the outbreak plan
    b. Roles and responsibilities
    c. Additional staffing capacity
    d. Data security
    e. Communication plan
    f. Identification of existing partnerships, both internal and external to the health department

2. Managing a Response
    a. Management structure and staffing mix
    b. Informing, coordinating, and engaging with partners
    c. Prioritization of disease

3. Outbreak Investigation and Response
    a. Determine the existence of an outbreak
    b. Verify the diagnoses
    c. Establish a case definition and find cases
    d. Describe the data in terms of person, place, and time
    e. Determine who is at risk of becoming ill
    f. Develop a hypothesis that explains the etiology of the outbreak
    g. Compare the hypothesis with established facts
    h. Plan a more systematic study
    i. Implement prevention and control measures
    j. Debrief, evaluate response, and summarize findings

*After-action report template provided in the Appendix.

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 program for a potential future outbreak.

1.a. Activation of the outbreak plan

A program is responsible for determining the local threshold level of various STDs 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 (e.g., adolescents or persons who inject drugs). 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 (see CSTE Syphilis Outbreak Detection Guidance).

- *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 STD 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, programs 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 STDs.*
- *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 media.*
    - *Control and prevention measures.*
    - *Coordination with external partners and agencies.*
    - *Provider and public education and outreach.*
    - *Support activities such as logistics and budgetary management.*

Helpful Hint: *During an outbreak response it is important for people to be flexible; however, you don't want to pull staff in so many directions that nothing is accomplished.*

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. For example, DIS are essential for contact-tracing investigations and partner services, but DIS capacity within the jurisdiction can be quickly overrun during a large outbreak. STD programs may determine the capacity of their DIS staff, clinical services, and laboratory services before an outbreak occurs. 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.

- *How many DIS are available to carry out program activities?*
- *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 DIS in working with the affected population?*
- *What are the available STD 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 STD care in the community?*
- *How well do STD clinical services (staffing, training of clinicians, medication availability, etc.) meet the needs of the community?*
- *What clinics would be able to handle extra case volume if there were an outbreak?*

Developing Memorandums of Understanding (MOUs) to move staff between jurisdictions or procedures to move staff within a health department can be done in advance of an outbreak response. It is important to connect with your agency's emergency response/outbreak response office or division 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 STD 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 MOUs or processes currently exist for transferring staff between departments or jurisdictions?*
- *What additional MOUs or agreements would be helpful to establish in advance?*

Helpful Hint: *You could consider working with the communicable disease groups, as they may already have outbreak plans in place and have thought through how to move staff during outbreak responses.*

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 STD program.*
- *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 media, and the public are vital during an investigation and response. Follow the policies and procedures at your health department to work with your general counsel and media staff.

It is important to establish clear communication processes to keep information consistent, minimize rumors, and prevent stigmatizing the affected community. One person may be designated as the primary point of contact for media to ensure consistent messaging. Local public information officers can be engaged early in the process to help coordinate messaging and media inquiries.

National Public Health Information Coalition's Outbreak Communication Guide (https://www.nphic.org/toolkits/outbreak/) provides helpful suggestions and resources to guide communications before, during, and after an outbreak.

Engaging the community affected by the outbreak is important. Think about how you would anticipate approaching and working with the affected community. You want to make sure the community is aware of their increased risk without stigmatizing them. Consider how your messages will be received by the affected community.

Helpful Hint: *Health Alert Networks are a valuable tool in communicating with providers and other stakeholders. Ensuring ongoing recruitment of providers and updated contact lists is invaluable.*

1.f. Identification of existing partnerships

Responding to an outbreak will often involve more than just health department 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 (e.g., HIV, hepatitis, maternal and child health, or mental health)?*
- *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 [e.g., churches or barbershops])?*
- *What roles and responsibilities should these partners have during an outbreak?*
- *Are MOUs with key partners already established or necessary?*
- *Will partners be included in outbreak team meetings?*
- *What kind of privacy and confidentiality protocols and expectations are necessary? Confidentiality protocols can pertain to individual cases or any sensitive information about the outbreak*

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 STD 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 (DIS, 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 chalk talk 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 media and awareness strategy.*
- *Informing state and federal STD staff of outbreak initiation.*

Helpful Hint: *Working with your emergency management group may give you access to additional resources (e.g., staff, established organizational systems, logistical support, or additional funding) when an outbreak is declared.*

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

STD 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. You can consider sending an Epi-X report alerting jurisdictions to the outbreak and calling for information on cases outside of your jurisdiction. It is also important to notify CDC of outbreaks you are investigating. Your CDC DSTDP 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 clinic 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 syphilis cases in a location that does not normally see syphilis cases, you may no longer have time to follow up on gonorrhea cases. If you are seeing an LGV outbreak but do not normally interview chlamydia cases, you may need to specify that suspected LGV cases should be interviewed, provide guidance to the DIS, 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, DIS capacity may be overwhelmed quickly. Health departments can increase DIS capacity by shifting internal staff (e.g., by deploying current staff who previously worked as DIS) or moving staff from other jurisdictions. If an outbreak starts to exceed the state's current DIS resources, the state can request additional DIS support from other states or from CDC. The following are some considerations before requesting additional DIS:

- *How many DIS are needed and for how long?*
- *What skill sets are needed (e.g. phlebotomy, rapid HIV 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 DIS report)?*
- *How will travel and other costs be funded?*
- *How will the incoming DIS 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 health department's plans after responding DIS 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

Please see CSTE Syphilis Outbreak Detection Guidance for more information on how to determine the existence of an outbreak. Though this document is geared towards syphilis, it is applicable to any STD. 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 DIS or an astute clinician may identify an outbreak that is not apparent in surveillance data. For something like a case of gonorrhea that failed treatment, one case may justify an investigation. Local health officials may take different views of the normal rise and fall in cases and whether changes merit an investigation.

- *Describe how your health department 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 DIS be incorporated into the analysis? DIS 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 STD is 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 program's 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 STDs in your area, such as ocular syphilis, you could reach out to providers that normally report a high volume of STDs to see if they have noticed any of these symptoms in their patients. Programs 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. In regard to STDs, this might be particularly important for clusters involving LGV, chancroid, or antimicrobial-resistant gonorrhea. Programs 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 of sex partners. Place information usually includes a geographic location (county and/or city), but it can be as small as a school, party, or business establishment. Time information should be specific dates or a period of time in which cases occurred. These cases may be a subset of the total

number of STD cases occurring in the jurisdiction (e.g., gonorrhea among the homeless population), so it is important that everyone understand the case definition and use it consistently.

Chlamydia cases, or others that health department staff might not normally investigate or interview for partner services, may require an interview if they are considered part of an outbreak or cluster (e.g., LGV cluster). 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 jails or prisons, 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. For sexually transmitted infections, this may also include name, gender, and contact information of sexual partners; how they met partners (e.g., specific venues, websites, or phone applications); and/or HIV status.

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, jail databases, and social media sites.

- *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, health department staff, correctional facilities, substance abuse treatment centers, hospitals, or STD clinics).*
- *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 HIV 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:

Produce an "epidemic curve" by plotting the number of cases (y-axis) over the time of onset of illness (x-axis). 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 diseases where visualizing wind currents, sewage disposal outflows, or water supplies might help identify the vehicle or mode of transmission.

Person:

Reviewing the characteristics of cases such as age, gender, race, gender of sex partner(s), 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, what clinics may need to provide extended hours, etc.

Possible ways to generate hypotheses include:

- *Conducting key informant interviews or focus group(s) with DIS 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.*
- *Comparing cases with disease during the period of increase with STD clinic and other clinic attendees without disease.*
- *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 are the hours of the local STD Clinic? Have the hours changed?

- What is the volume of patients at the STD clinic? Has it changed?
- What are the policies regarding patient scheduling (e.g., appointments, walk-ins, or a combination)?
- Is there a co-pay? Has the policy changed recently?
- 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. In general for STDs, the specific exposure that caused disease (sex with an infected partner without a condom) is known.

3.g. Compare the hypothesis with established facts

The hypothesis should align with the clinical, laboratory, and other epidemiologic facts of the investigation. Do the proposed exposure, mode of transmission, and affected population fit with the known facts of the disease? It may be necessary to pose new hypotheses and perform additional questioning if your analysis of your original hypothesis does not match known facts of the disease. Keep in mind there may not be an obvious "smoking gun," as many health outcomes are multifactorial. By triangulating data across all hypotheses and discussing the findings collectively with partners, etiologic pathways may become apparent, as well as opportunities for prevention and intervention.

3.h. Plan a more systematic study

Though the field investigation and analysis may be over, there may still be a need or desire to evaluate something more systematically. You may want to better define the extent of the outbreak, evaluate new laboratory methods, determine the cost and effectiveness of a particular intervention or aspects of the response, etc. Sometimes these studies are performed after the outbreak, but they can help future responses. Weigh the value of collecting data that may fill in gaps in understanding or that may be valuable in informing future program priorities or outbreak planning. While collecting enhanced data may be valuable, there is also the potential that such efforts could burden the response staff and/or impede the timeliness of the response.

3.i. Plan a more systematic study

Unlike responses to many other outbreaks, STD outbreak responses can be sensitive, complicated, and often prolonged. Control and prevention measures should be aimed at interrupting transmission or limiting exposure, initiated throughout the response, and honed as information is gathered during the investigation. Interventions may include enhanced partner services (e.g., following up with suspects, associates, and social networks), enhanced surveillance (targeted screening or enhanced case-finding activities at jails, venues frequented by at-risk populations, or health clinics/emergency departments in areas with high rates), expanded clinical and laboratory services, and enhanced health promotion (such as provider trainings, media campaigns, or health alerts).

Determining who should be offered prophylactic treatment and whether field testing and treatment will be performed are important considerations for program leadership.

Partnerships with community stakeholders can expand opportunities for intervention and outreach to affected populations. It is important that the media be contacted by a public information officer who can ensure that similar information is shared to media and community partners in order to avoid confusion and to avoid stigmatizing the affected population.

3.j. Plan a more systematic study

After every outbreak investigation and response, a debrief or after-action meeting, including representatives from all areas of the health department and partner organizations, may be held to discuss the response and how to improve for next time. Notes taken from the meeting can inform improvements for the outbreak investigation and response plan. Preparedness counterparts may be helpful in providing tools and technical assistance on evaluating a response.

If you plan to evaluate the effectiveness of the response plan or your actions during an outbreak, consider early in the response (or even prior to the response) what data you will need for an effective evaluation. An evaluation of the outbreak response should focus on effectiveness of the outbreak response, cost of the response, efficient use of resources, productivity of interventions, and relationships with providers and CBOs, as well as organization and leadership of the response effort. Some outputs to consider for review include

- *Number of contacts and clusters initiated and the percent examined as a result of the outbreak response.*
- *Number of new cases identified as a result of the outbreak response, by provider type.*
- *Ratio of cases that were identified through active versus passive surveillance during the outbreak.*
- *Number of sex partners and clusters receiving preventive treatment during the outbreak.*
- *Increase in attendance at STD clinics within the target area during 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.

An example of a simple after-action report is available in the Appendix.

Appendix. 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 improvement: