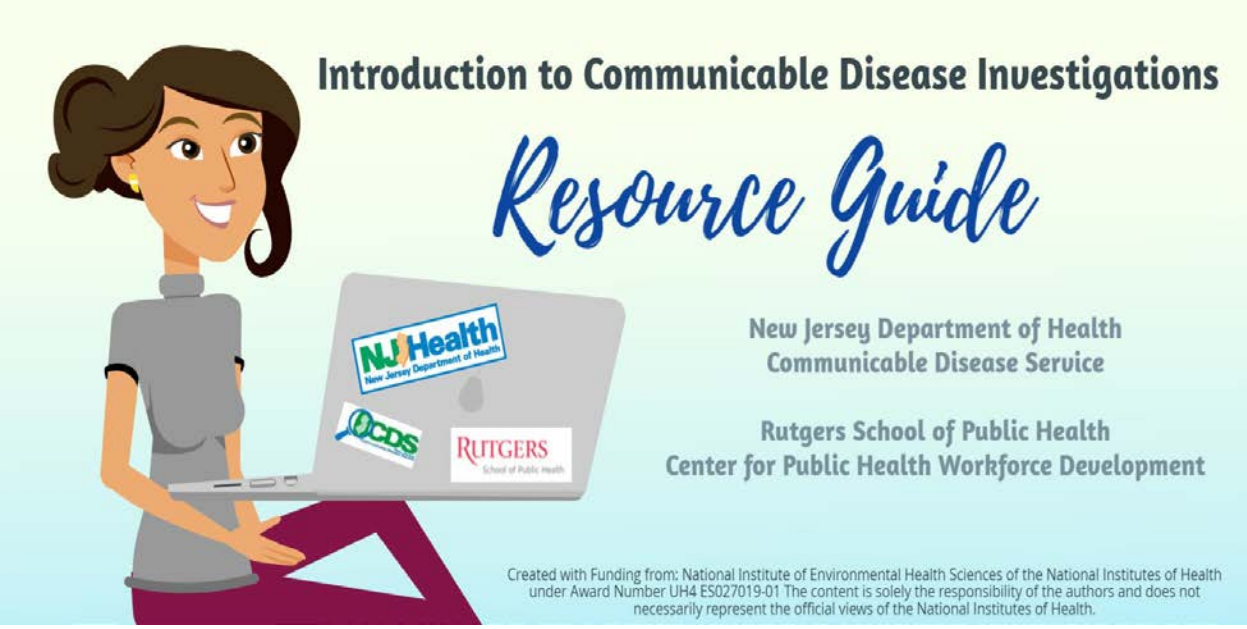

Introduction to Communicable Disease Investigations
Resource Guide
New Jersey Department of Health
Communicable Disease Service
Rutgers School of Public Health
Center for Public Health Workforce Development
Created with Funding from: National Institute of Environmental Health Sciences of the National Institutes of Health under Award Number UH4 ES027019-01 The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Welcome to the Communicable Disease Investigations Resource Guide!

Communicable disease investigation and response are key components of a public health department. Understanding the regulations that guide disease investigations and knowing your role within the investigation are critical to conducting a thorough response to infectious diseases in the community. The epidemiologists are often the front line, along with health care and other public health partners, in surveillance to identify, investigate, and contain confirmed and/or suspect cases of infectious disease.

This guide is designed as a companion resource to the online communicable disease investigator video series modules. Each section of this guide corresponds to one of the videos and provides more details on the key concepts they introduce, quiz questions, and more.

Welcome to your new role as a disease investigator!!!

Acronyms: The alphabet soup of public health!

Before getting started with this resource guide, take a moment to familiarize yourself with some common acronyms that you may encounter as a communicable disease investigator. You can refer to the list below, and maybe even add a few of your own that are important in your jurisdictions.

CDC: Centers for Disease Control and Prevention

CDRSS: Communicable Disease Reporting and Surveillance System

CDS: Communicable Disease Service

ELR: Electronic Laboratory Record

HERC: Health Educator/Risk Communicator

HIPAA: Health Insurance Portability and Accountability Act

HO: Health Officer

IZDP: Infectious and Zoonotic Disease Program

LHD: Local Health Department

LINCS: Local Information Network Communication System

NJAC: New Jersey Administrative Code

NJDOH: New Jersey Department of Health

NJLMN: New Jersey Learning Management Network

OLPH: Office of Local Public Health

REP: Regional Epidemiology Program

SOPHI: Situations of Public Health Importance

SME: Subject Matter Expert

VPDP: Vaccine Preventable Disease Program

The New Jersey Department of Health (NJDOH) will be a key partner in your work as a communicable disease investigator. The Communicable Disease Service (CDS) is responsible for surveillance and management of all communicable diseases, with the exception of HIV, STDs, and tuberculosis, which are managed by the Division of HIV, STD and TB Services. Here is some important contact information you will need:

- CDS: 609-826-5964
- HIV: 609-984-5940 or 973-648-7500
- STD: 609-826-4869
- TB: 609-826-4878

Staff at CDS can be reached at 609-826-5964 during business hours (8am to 5pm). For after-hours emergencies only, CDS maintains an on-call epidemiologist who is reachable to Local Health Department (LHD) staff by calling 609-392-2020 (clinicians and other public health partners should be contacting the LHD, not CDS directly after hours)

CDS contains three key programs:

- Infectious & Zoonotic Disease Program (IZDP) and the Vaccine Preventable Disease Program (VPDP) are organized by topic or disease type. Staff in these programs provide subject matter expertise for assigned diseases or topics (i.e. salmonella, measles, healthcare-associated infections, West Nile virus), coordinate programmatic surveillance efforts, often with external partners (i.e. influenza surveillance, vector-borne disease surveillance), and serve as liaison with Centers for

Disease Control and Prevention (CDC), neighboring states, professional associations, and in-state public health partners.

- The Regional Epidemiology Program (REP) is organized geographically and works with both disease-specific subject matter experts (SMEs) and with LHDs. Staff within REP provide technical assistance and training to LHDs on communicable disease investigation, coordinate outbreak response, and assist with immediately notifiable disease investigations. They maintain a network of public health partners within their target areas, to improve communicable disease notification and to ensure timely and appropriate reporting and investigation.

The New Jersey Administrative Code (NJAC) is the set of rules and regulations made by the executive branch agencies of New Jersey. The NJAC contains two key regulations for communicable disease: NJAC 8:57 (Reporting Communicable Diseases and Public Health Enforcement) and NJAC 8:52 (Public Health Practice Standards). Take some time to familiarize yourself with the contents of these regulations to ensure that you are acting within the requirements.

NJAC 8:57 Communicable Diseases

- This chapter provides requirements for communicable disease reporting by clinicians, health officers, veterinarians, certified animal control officers, managers of animal facilities, and administrators of healthcare facilities, correctional facilities, youth camps, child care centers, preschools, and institutions of higher education. It also provides requirements for reporting by laboratories and specimen submission by clinical laboratory directors.

- The chapter also covers investigation requirements and regulatory actions to be taken by the local health officer or the NJDOH when notified of a communicable disease such as, isolation and quarantine restrictions, medical examination and specimen submission requirements that may be placed upon a person ill with a communicable disease, restrictions that may be placed upon a foodhandler who is ill or infected with a communicable disease, and requirements for confidentiality and enforcement.

NJAC 8:57 regulations are maintained and updated by CDS. There are two basic groupings – immediately reportable diseases/outbreaks <u>and</u> routine communicable disease.

- Immediately reportable diseases should be reported *upon suspicion* (does not need to wait for confirmation) immediately by telephone to the LHD where the patient resides. LHDs should ensure that reporting entities have LHD contact information during and after business hours and provide them with reporting instructions. These diseases require immediate public health action to prevent further spread of illness. Reports of immediately reportable disease may <u>not</u> be faxed to CDS.

- Routine communicable diseases should be reported within 24 hours of diagnosis, either through the Communicable Disease Reporting and Surveillance System (CDRSS), which is preferred or via fax.

- Laboratory directors must enter immediately reportable disease data into the CDRSS within 24 hours of obtaining the result (in addition to reporting by telephone); and must enter data for routine communicable diseases within 72 hours of obtaining the result. CDRSS is a web-based surveillance system used by all LHD disease investigation staff.

- LHDs should ensure that clinicians, hospitals, long-term care facilities, schools, and other reporting entities have the LHD business AND after-hours contact information; this should be provided to partners at least annually.

- When reporting, the following information is required by regulation: name of the disease; name, age, date of birth, gender, race, ethnicity, home address and telephone number of the person who is ill or infected with such disease; date of onset of illness; name, address, institution, and telephone number of the reporting health care provider or administrator; laboratory data, which support the diagnosis; and other information as the NJDOH requires concerning a specific disease.

- Outbreak reports shall include the name, municipality, and telephone number of the location where the outbreak occurred; number ill; description of symptoms;

pertinent medical history and available diagnostic confirmation; and other information as may be requested by the health officer or NJDOH.

- Regulations also require reporting of communicable disease in domestic companion animals by veterinarians, certified animal control officer or manager of an animal facility within 24 hours of diagnosis or the next working day after diagnosis.

- Health officers (HOs) are required to notify NJDOH immediately by telephone of any immediately notifiable disease.

- HOs are required to initiate a public health investigation, with guidance provided by CDS, specifically, HOs are required to determine whether a single case or an outbreak of a reportable communicable disease exists; ascertain the source and spread of the illness; and determine and implement appropriate control measures.

- In response to an outbreak, HOs are required to submit a summary report to the NJDOH within 30 days of the completion of each outbreak investigation, and to all physicians who reported cases of illness connected with that outbreak. The report shall include, but not be limited to, a summary of findings, actions taken to control disease, and recommendations to affected parties.

- NJAC 8:57 regulations provide authority for a HO or the NJDOH, to institute isolation and quarantine precautions, including hospitalization if necessary, and restricted movement.

- NJAC 8:57 regulations are maintained by CDS and are currently under revision; NJAC 8:57 regulations refer to NJAC 8:52.

NJAC 8:52 Public Health Practice Standards or Performance for Local Boards of Health in NJ

- This chapter provides standards of performance for boards of health to ensure that public health services are provided for all New Jersey residents, designate required activities; and to align local activities with state and national standards.

- 8:52 regulations are maintained and enforced by NJDOH Office of Local Public Health (OLPH).

- Of relevance to communicable disease, each local health agency must have a full-time licensed HO and is responsible for compliance with all public health services

required by the State Sanitary Code, including chapter 8:57 Communicable Disease Regulations.

- Each local health agency shall ensure that valid and reliable surveillance systems are in place to monitor the occurrence of diseases and indicators of health.

- Each local health agency shall investigate the cause of illnesses or health threatening conditions and shall implement control measures to prevent the spread of disease or to address the known risk factors in the population served.

- Each local health agency shall ensure that there is a mechanism to receive reports and to respond to immediately reportable communicable diseases and conditions in accordance with NJAC 8:57-LS. This mechanism shall be capable of operating 24 hours per day, seven days per week, including weekends and holidays.

- Public health nursing services include participating in all components of communicable disease prevention and control, including clinical surveillance, case identification, and treatment.

- Environmental health services include using data and epidemiological methods to determine the etiology of, and recommend corrective actions for, diseases spread through humans, animals and the environmental media of air, soil, water and food; collecting specimens if necessary; and investigating food-borne, air-borne, water-borne, and other suspected disease outbreaks.

Responsibility of an LHD during a communicable disease investigation

- Reporting requirements are outlined in regulation (8:57); Diseases are reported to the LHD where the patient resides, or if unknown, to the LHD of the reporting entity.

- LHD communicable disease investigator staff (and back-ups, HO) should have email notifications set up in CDRSS for all immediately reportable diseases, as well as any routine diseases of interest. Apart from email notifications, communicable disease staff should be monitoring CDRSS for new cases on a daily basis during the work week.

- Upon receipt of an initial report, LHD should confirm patient is a resident of their jurisdiction and if not, transfer the case to the appropriate LHD (can be done through CDRSS – if immediately notifiable, a phone call should also be made to the receiving jurisdiction – LHD directory website).

- Immediately reportable diseases should be called by telephone to the LHD *upon suspicion*. Critical information should be obtained by phone, entered into CDRSS, and the LHD should call NJDOH to notify them and discuss next steps.

- Reports of reportable communicable diseases usually come in via CDRSS.

- CDS has investigation chapters on most reportable diseases posted online. These chapters outline the key features of those diseases – clinical description, appropriate laboratory testing, risk factors, incubation and infectious periods, isolation precautions, and management of contacts and special situations.

- Several diseases have specific forms or worksheets. CDC forms are required forms and must be returned to CDS once completed (information should still be entered into CDRSS). Worksheets usually don't need to be sent to CDS but should be used as a guide when interviewing a health care provider or patient.

- Communicable disease/disease investigation staff should review the initial disease report in CDRSS, the CDS investigation chapter, and the disease-specific form or worksheet (if available) to use BEFORE initiating an investigation.

- Investigation steps may vary by disease, but often include collecting information from the patient's health care provider and/or hospital infection preventionist; interviewing the patient or the patient's family member, and in some circumstances, identifying and following up with exposed contacts.

- All investigation information should be entered into CDRSS. CDS staff will work with the LHD for additional information needs.

- Once the investigation is complete, the LHD should review the case definition for that disease and classify and close the case in CDRSS.

CDS website and reportable diseases

- From the main NJDOH webpage https://www.state.nj.us/health/, click on the Public Health tab, then the Communicable Disease link. From here, there are several menu options, that include:
  - Diseases & Health Topics A-Z List – quickest way to get to a particular disease
  - Statistics, Reports, and Publications – includes annual communicable disease statistics, animal rabies statistics, surveillance reports for influenza and vector-borne disease

- From the Diseases & Health Topics A-Z list, select a disease. Most disease pages have a similar format and sections:
  - Reporting timeframe
  - Brief summary of disease
  - Disease reporting
  - Alerts – for relevant outbreaks, investigations, or recalls
  - Education materials
  - Laboratory information and guidance
  - Resources and references

- Some programs have landing pages, like food-borne illness and vector-borne disease, which provide information and resources applicable to groups of diseases.

- Locating disease chapters

- After selecting a disease, under the Disease Reporting section, there will be a Communicable Disease Manual Chapter. Disease-specific forms and worksheets are usually listed here as well underneath the chapter.
- If a disease you are investigating doesn't have a chapter, contact the regional epidemiologist for guidance.

Public health partners during a communicable disease investigation

- Partners may vary by the disease under investigation, the setting where the patient was exposed, or one in which the patient may have exposed others.

- Partners may include: healthcare providers, hospitals, and other health care facilities; schools or child care facilities; long-term care facilities; correctional and other residential facilities; public transportation conveyors; food service providers; recreational water parks and pools; vector control agencies, etc.

- Partners may be located in other jurisdictions, for example if a patient in jurisdiction A was exposed at a child care facility in jurisdiction B. When multiple jurisdictions are involved, CDS will coordinate the response.

Public health investigations are HIPAA exempt

- Public health reporting is mandated by law and is not affected by the Health Insurance Portability and Accountability Act (HIPAA). HIPAA specifically provides for public health reporting without a patient's authorization or consent.

- Some healthcare providers will request a letter from the LHD before releasing patient information. CDS has a template letter that you can use for this purpose. Contact your regional epidemiologist for this template.

- It is not acceptable, however, for a healthcare provider to delay in providing information needed for a public health investigation, particularly in response to an immediately reportable disease or condition. LHDs should notify CDS for assistance should there be a resistant healthcare provider.

24/7 responsibilities and Red Book

- Per regulation, LHDs must be available 24/7 to receive reports of immediately notifiable diseases (by telephone and through monitoring CDRSS) and to initiate investigation, as per the CDS guidelines for investigation timeframes.

- OLPH asks LHDs to maintain after-hours contact information in the "Red Book", which is housed in Hippocrates. The Red Book should be updated at least annually, and when there are changes. Often, several persons are listed by the LHD in the Red Book who do not work on communicable disease investigations (i.e. Hazmat or other environmental health staff). It is important for the staff listed in the Red Book to be able to reach whoever at the LHD is responsible for CD follow-up.

- Per OLPH protocol, if CDS is notified directly of an immediately notifiable disease or condition, CDS will call the LHD using the Red Book, starting with the person at the top (calling all numbers), and then moving down the list.

Video 1: Test Your Knowledge!

Below are some key concepts from video 1. Read each question and see how well you recall the information!

1. This is the NJDOH web-based reporting and surveillance system used by disease investigators:
   A. CDS
   B. CDRSS
   C. REP
   D. VPDP

   Answer: B. The Communicable Disease Reporting and Surveillance System is a web-based tool for tracking, identifying, and documenting reportable communicable diseases and the public health investigation.

2. How does CDS receive reports of immediately reportable diseases from LHDs?
   A. By fax
   B. By phone
   C. By email
   D. All of the above

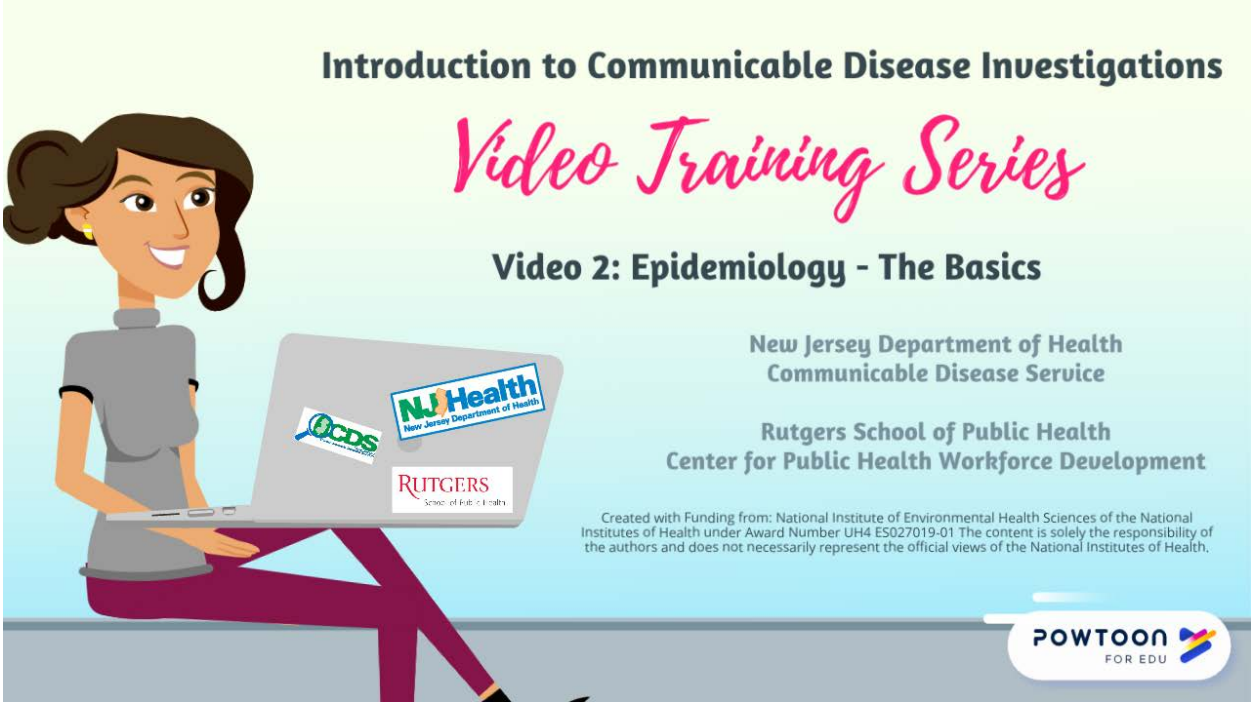
   Answer: B. Immediately reportable diseases must be reported as soon as possible by the LHD by phone. LHD staff should contact CDS with information. This may include reporting to their REP or CDS SME. Fax and email are unacceptable methods to report immediately reportable diseases, as these diseases require immediate public health action.

3. What is the name of the regulation that gives public health agencies the authority to investigate cases of disease?
   A. NJAC 8:25
   B. NJAC 8:39
   C. NJAC 8:57
   D. NJAC 8:99

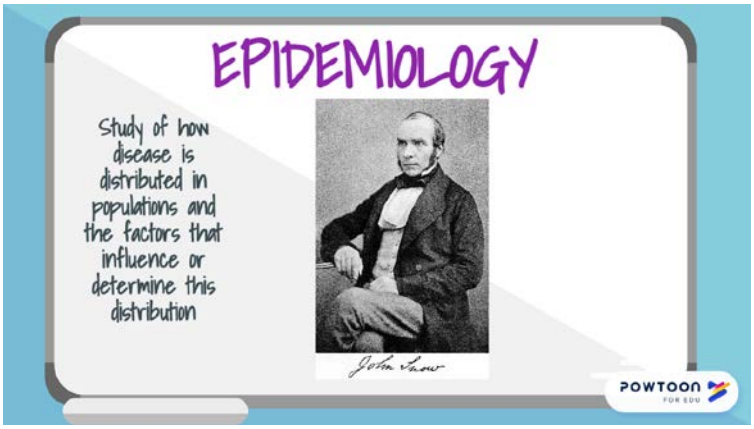
Answer: C. New Jersey Administrative Code 8:57 is the regulation that give authority to HDs and the NJDOH to investigate cases of disease to protect the health of the public. It also allows these agencies to implement control measures.

4. Public health investigations are HIPAA exempt?
   A. True
   B. False

   Answer: True. HIPAA is legislation that provides data privacy and security provisions to protect personal health information. Public health investigations are exempt from HIPAA rules. CDS has a letter for providers who will not cooperate with disease investigations. Contact your REP to get a copy of this document.

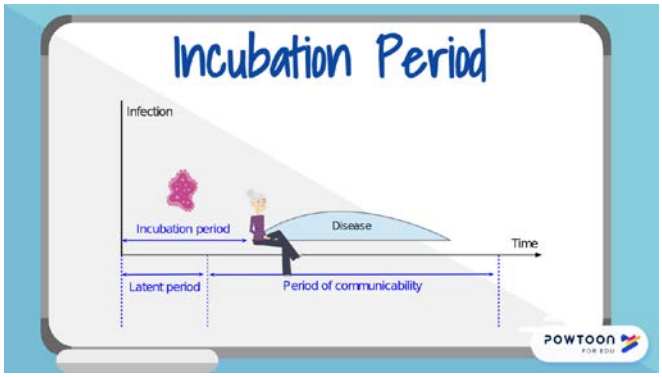


Epidemiology terms that are used throughout the video and during disease investigations are listed below. If you are a new disease investigator, you should be aware of these terms as you will use them when collecting information from cases and for inputting into CDRSS. It is recommended that all disease investigators learn more about basic epidemiology, as it will help with the public health investigation. Each county in New Jersey is covered by a regional epidemiologist.

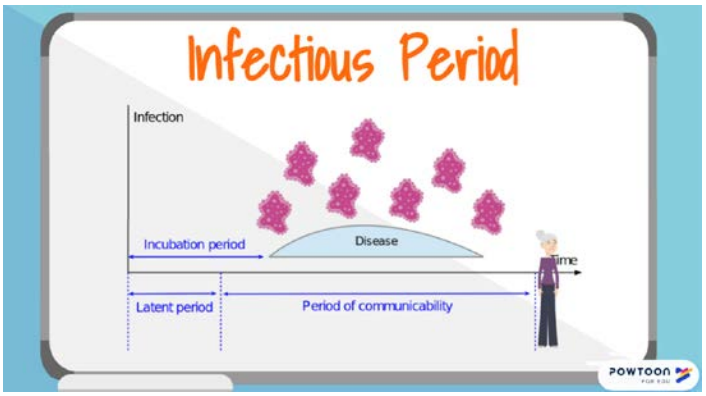


- **Disease onset**
    - Time when the individual began to feel ill – often associated with the first symptom of illness (e.g., fever, diarrhea, rash)
    - It's important to remember that people can carry a disease without feeling ill (asymptomatic) and still be able to transmit the disease (carrier)

- **Incubation period**
    - Time period from when an individual is exposed to a germ (e.g., bacteria, virus) to when the individual develop symptoms
    - This time period varies for each disease. Some diseases have a short incubation period – like norovirus (as short as 12 hours) and some diseases have a long incubation period like scabies (can be 8 weeks).
    - This time period is important to know as it can help determine when the exposure occurred and eliminate/remove/reduce exposure so others do not become ill.



- **Infectious period/shedding**
    - The infectious period is the time period when an individual is capable of passing a virus on to another individual
    - This period can be long or short and varies depending on the particular virus, patient age, severity of illness, comorbidities, and immune status.



- **Active vs. passive surveillance**

Public health surveillance is the ongoing, systematic collection, analysis, and interpretation of health-related data essential to planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those responsible for prevention and control. Information that is provided can be used for health action by public health personnel and government leaders. Surveillance can be either passive, or active.

- Passive surveillance is the regular reporting of disease data by all institutions that see patients and are part of a reporting network. Passive surveillance relies on the cooperation of health care providers, laboratories, hospitals and private practitioners to report the occurrence of a disease (World Health Organization).
    - Initiated by a health care provider or laboratory
    - Reports come directly to public health without prompting, but are often backed by public health law or regulation which requires these entities to report
    - Useful for large numbers of common events
    - Under reporting can be an issue
    - Example: reporting of salmonella positive cases to LHD/NJDOH
- Active surveillance is when public health agencies contact health providers seeking reports of a particular condition.
    - Initiated by public health community
    - Developed when information is needed faster than passive surveillance can produce or when additional information, not often collected by passive surveillance, is needed.
    - Useful for a small number of rare events
    - Requires additional resources – viable for only short period of time
    - Example: Staff check in with emergency departments every hour for any cases with symptoms associated with chemical exposure

- Enhanced passive surveillance
    - Similar to passive surveillance, but information is sought in a rapid fashion or additional information is being requested
    - Helpful in outbreak situations when information about a case is needed to guide outbreak investigation/response
    - Term often used is “A call for cases”

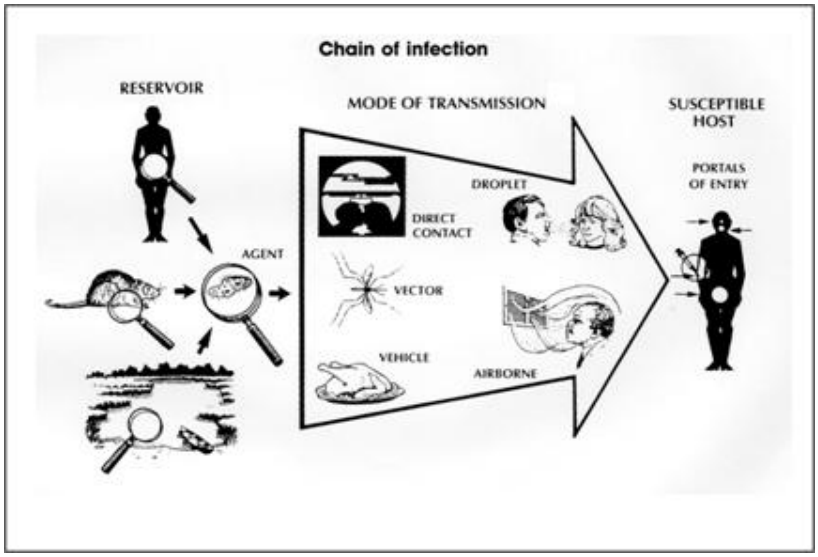
- **Line list**
    - List of persons who may be ill
    - Includes basic information about the individuals (e.g., basic demographics, symptoms onset, symptoms, testing)
    - Useful to categorize if individuals are part of outbreak or not

Case #	Name	Sex	Age	Onset	Diarrhea	Fever	Fatigue	Status
1	J. Copeland	M	41	1-Dec	yes	no	no	Confirmed
2	P. Jacobs	F	73	2-Dec	yes	no	no	Confirmed
3	K. Wallace	M	14	3-Dec	yes	yes	no	Confirmed
4	C. Evans	F	69	3-Dec	yes	yes	yes	Confirmed
5	R. Hughes	M	17	3-Dec	yes	no	yes	Confirmed
6	D. Collins	F	70	4-Dec	yes	yes	no	Confirmed
7	L. Butler	M	49	4-Dec	yes	yes	no	Confirmed
8	W. Davis	F	68	5-Dec	yes	no	yes	Suspected
9	M. Turner	M	30	6-Dec	yes	yes	no	Suspected
10	B. Martin	F	50	7-Dec	yes	no	no	Suspected

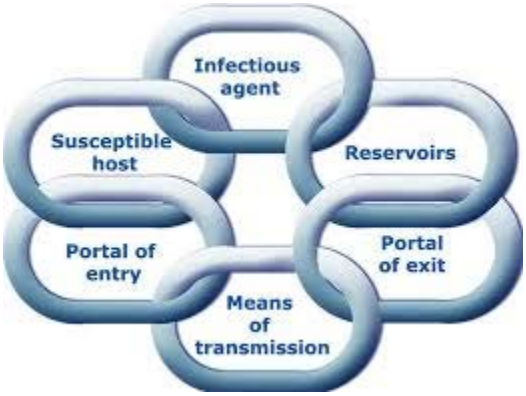
- **Epi curve**
    - Visual display of the onset of illness among cases associated with an outbreak
    - X-axis (horizontal) is the date of illness onset; Y-axis (vertical) is the count of cases which occurred on each date
    - The distribution of cases over time can help determine the incubation period, how the illness is being spread, and the peak of the outbreak

- **Case definition**
    - A definition developed to characterize individual cases associated with an outbreak
    - Typically includes date and place component along with clinical and laboratory information
    - Ensures standardization – everyone is being counted the same
    - Outbreak case definition can be different than individual case definition used for disease surveillance

- **Modes of transmission**



  - Pathogens normally reside in a reservoir. Reservoirs can be living (humans/animals) or nonliving (soil/environment) sites. The pathogen can enter the host (human) in different ways – this is called the **mode of transmission**.
  - **Direct**: includes person-to-person, skin-to-skin, kissing, intercourse, droplet (small infectious droplets/aerosols in the air or on surfaces/environment)
  - **Indirect**: airborne (infectious residue from dried droplets or dust), vehicles (fomites) and vector



- **Chain of infection**
  - Infectious agent, reservoir, portal of exit, mode of transmission, portal of entry, susceptible host
  - Public health's goal is to break the chain of infection to reduce disease transmission

- **Clusters vs. outbreak**
    - **Epidemic** refers to an increase, often sudden, in the number of cases of a disease above what is normally expected in that population in that area.
    - **Outbreak** carries the same definition of epidemic, but is often used for a more limited geographic area
    - **Cluster** refers to an aggregation of cases grouped in place and time that are suspected to be greater than the number expected, even though the expected number may not be known

- **Situations of public health importance (SOPHI)**
    - Refers to a single suspected or confirmed case of an immediately reportable disease or other significant event that may pose a threat to the public's health and requires an increased public health response. This could include: an occurrence of a single case of disease, a disease occurring in an unusual location or setting, or a situation in which the number of ill cases is small, but where a large number of contacts need to be followed thus requiring an extensive investigation.

Video 2: Test Your Knowledge!

Below are some key concepts from video 2. Read each question and see how well you recall the information!

1. A case definition is:
   A. Used to characterize each case of an outbreak to ensure they are all counted the same way
   B. Exactly the same as what is used for disease surveillance
   C. Is not important – the health care provider will tell public health if this is a case or not
   D. All of the above

   Answer: A. Case definitions are used to ensure that everyone, across the country, is counting cases using the same criteria to have a true disease burden. It is important to know that surveillance case definitions are not the same as outbreak case definitions. Outbreak case definitions are situation-specific and may be refined as the outbreak evolves.

2. A long-term care facility thinks they have an outbreak. They fax over a line list they acquired from the NJDOH website to the local health department. Everyone who is placed on the line list should be counted as part of the outbreak since the facility put these individuals on there.

   A. True

   B. False

   Answer: False. A line list is simply a list of all individuals who have been exposed to an infectious agent. Line lists may be used to determine if individuals are a part of the outbreak or not.

What is disease surveillance?

Disease surveillance is the systematic collection and analysis of data and the provision of information which leads to action being taken to prevent and control a disease, usually one of an infectious nature. One of the tools the NJDOH uses to conduct disease surveillance is the Communicable Disease Reporting and Surveillance System (CDRSS).

CDRSS is a secure, web-enabled system which is used to track information associated with reportable disease in NJ (i.e., disease registry). Public health partners statewide can instantly report and track incidences of communicable diseases to generate official disease counts. The CDRSS has a wide user base including LHDs, NJDOH, health care facilities, and laboratories.

CDRSS training and access:

CDRSS is a secure system that is accessible only by authorized users working in a public health function, after receiving training. New users requesting training and access should follow these steps:

1. Register for CDRSS General User Training.
    - The training will be interactive via webinar with poll questions and a live Q&A at the end.
    - Select your preferred date of training from the drop down list.
2. Complete the User Agreement and send it to CDRSS Admin team.
    - The preferred option is to scan the signed User Agreement and send via email to cdrstrain@doh.nj.gov.
    - Alternatively, it can be faxed to 609-826-4750.
3. After the webinar, within two hours, you will be emailed a link to complete an online post-test.
    - Your access to CDRSS will then be contingent on obtaining a satisfactory score on the post-test.
    - If you fail to obtain a satisfactory score, next steps will be determined by CDRSS Admins who will work with you to help you obtain access.

The Frequently Asked Questions (FAQs) document contains a list of the most commonly asked questions and answers for CDRSS. For any additional questions regarding CDRSS, please contact the CDRSS Help Desk.

On the next pages, a few items for disease investigators to keep in mind when gathering information during investigations. CDRSS is a great tool, but not all portions of the patient page, including critical fields, may be completed. Disease investigators should be sure that each case of disease has all information that may be needed for a thorough investigation!!

Remember that disease investigators only see cases in their jurisdictions. If you have any questions about cases in other jurisdictions that may be related to a disease in your jurisdiction, please contact your regional epidemiologist.

- Demographics sections
    - Series of sections (examples – disease information, address, laboratory, signs/symptoms)
        - The sections appearing for each disease depend on the requirement for that disease. For example, if a vaccine is not available for a disease, the immunization section will not appear

- Addresses and viewing cases/privileges
    - Jurisdiction assigned by where the person lives, where they sought health care or where their exposure took place
    - Other addresses can be added in the system to open up access to other jurisdictions

- Case definition and case closeout
    - Each disease has its own case definition. This is the criteria by which a case is assigned a status (e.g., confirmed, probable, not a case). Case definitions are developed at the national level and are used to compare disease burden from state to state
    - Assigning an individual case report a status of "not a case" does not mean the person did not have the disease – it simply means they did not meet the case definition
    - Strict adherence to case definitions helps to ensure we are counting individuals accurately and in the same manner
    - LHDs should strive to close cases in a timely fashion – see priority disease listing

- Critical fields
    - Some fields are required denoted by a red asterisk – you cannot create a case without entering something into these fields
    - Others are important and denoted by a blue asterisk and should be completed if the information is known
    - Each disease has sections which will automatically appear, and these are critical to complete
    - Critical fields include the following variables: demographics, signs/symptoms, clinical status, laboratory information, patient location, and risk factors appropriate for disease investigating

- Completing all case info including race, risk factors
    - Completing all the information – especially race, ethnicity and risk factors is important, even if it's not readily available in the initial report

- How can CDRSS data be used?
    - Aside from tracking individual cases, CDRSS can be used to determine if unusual disease activity (i.e., outbreak) is occurring
    - Running disease statistics can help determine if there is unusual activity by comparing in similar time period in the past

- Why completed fields are important
    - If a field exists, it is better to select from that drop down or click on the radio button rather than placing the information in comments
    - Doing this allows for data analysis of that information – otherwise information generated may get lost in the comments as these are not analyzable

Video 3: Test Your Knowledge!

Below are some key concepts from video 3. Read each question and see how well you recall the information!

1. In CDRSS, you see a case that belongs in another jurisdiction – what should you do?
   A. Nothing, CDRSS staff will take care of it
   B. Try to change the address so the case is correctly assigned
   C. Investigate the case and record information as you would if it was in your jurisdictions
   D. None of the above

   Answer: B. Adding the correct address for the patient will automatically place the case with the correct local health department.

2. When should an investigation into a communicable disease begin?
   A. As soon as it's entered into CDRSS
   B. It depends on the disease
   C. Within one week of it being entered into CDRSS
   D. There is no set time for which to begin an investigation

   Answer: B. It depends on the disease, whether it is immediately reportable, or is part of an outbreak.

3. Which of the following is TRUE about electronic laboratory reports (ELR):
   A. ELR is the only way that cases are reported
   B. ELR means that positive lab tests are sent directly to CDRSS
   C. ELRs are paper-based reports and are mailed to the health department.

   Answer: B. With ELRs, individuals who have positive laboratory tests are sent automatically to CDRSS where disease investigators can see the cases when they log onto the system. ELR is not the only way that cases are reported. Some laboratories that do not have ELR will manually enter positive lab tests directly into CDRSS. Paper lab reports are sometimes sent via fax or mail, which would then need to be entered into CDRSS by the investigator.

Immediately Reportable Diseases

In the state of New Jersey, a number of diseases must be reported to state health officials. Information about disease reporting and supporting materials can be found at https://www.nj.gov/health/cd/reporting/. Timely reporting of diseases ensures that cases of communicable disease can be investigated quickly and public health control measures can be implemented to prevent further disease spread. It also allows public health agencies to understand the burden of disease among New Jersey residents and assists public health agencies in developing appropriate education, guidance, and infection control recommendations based on disease trends.

How to find a list of reportable diseases

Diseases that are reportable by statute in the state of New Jersey can be found at https://www.nj.gov/health/cd/reporting/when/. The "Quick Reference: Reporting Requirements for Communicable Diseases and Work-Related Conditions" contains a complete list of diseases and conditions that are immediately reportable and those that are reportable within 24 hours.

Another way to distinguish the reporting timeframe for a particular disease is to go to the Diseases & Health Topics A-Z List at https://www.nj.gov/health/cd/topics/, select a disease, and you will see on the disease webpage the reporting timeframe for that particular disease. For example, below is how the information appears on the anthrax webpage:

Anthrax

Report Confirmed or Suspect Cases Immediately to the Local Health Department.

Anthrax is a serious disease caused by bacteria. These bacteria form spores which are dormant, but may come to life with the right conditions. Anthrax can infect the skin (if the bacteria are touched), digestive tract (if the bacteria are swallowed), or lungs (if the bacteria are breathed in). Anthrax does not spread from person to person. Antibiotics are used to treat all three types of anthrax, but early identification is important. Success depends on the type of anthrax and how soon treatment begins.

- NJAC 8:57 – NJLMN link: https://njlmn2.njlincs.net/sites/default/files/NJAC-8-57-CommunicableDiseases.pdf
- NJDOH communicable disease reporting: https://www.nj.gov/health/cd/reporting/when/

- Contacting NJDOH about an immediately reportable diseases
  - Who reports?
    - See video 1 for reporting entities. Reporting entities report to the LHD where the patient resides, or if unknown to the LHD where the entity is located
    - Health Officers report to CDS
    - Immediately reportable diseases and conditions are reported immediately by telephone upon suspicion, not waiting for confirmation
  - After hours contact
    - See video 1 for after hours
    - LHDs need to ensure that reporting entities in their jurisdiction have their contact information during and after business hours and a procedure for reporting

        - LHDs can contact CDS after hours at 609-392-2020 for emergencies to speak with on-call epi
    - Prioritizing case investigations
        - See video 1 for disease prioritization guidelines

Non-immediately Reportable Communicable Diseases in NJ

- How to find the list of reportable diseases
    - NJAC 8:57 – New Jersey Learning Management Network (NJLMN) link: https://njlmn2.njlincs.net/sites/default/files/NJAC-8-57-CommunicableDiseases.pdf
    - NJDOH communicable disease reporting: https://www.nj.gov/health/cd/reporting/when/
    - Magnet https://www.nj.gov/health/cd/documents/reportable_disease_magnet.pdf
    - Also listed in disease prioritization timeframes document
- Contacting NJDOH about a reportable disease
    - Reporting through CDRSS
    - Contact regional epidemiologist for assistance
- After hours contact
    - In general, routine communicable disease investigations and questions can wait until the next working day, unless there is a suspected outbreak, or there are special circumstances, which would be immediately notifiable

Video 4: Test Your Knowledge!

Below are some key concepts from video 4. Read each question and see how well you recall the information!

1. Entities required to report diseases should report to:
   A. The hospital where the patient was diagnosed
   B. The local health department where the patient resides
   C. The local health department of the town where the patient was diagnosed

   Answer: B. Those who are required to report diseases should report to the local health department where the patient resides. If the patient residence is unknown, report to the local health department where the providers is located.

2. The main difference between a reportable disease and an immediately reportable disease is:
   A. Local health departments only need to know about immediately reportable diseases
   B. Immediately reportable diseases are related to bioterrorism
   C. Immediately reportable diseases require an immediate public health response to prevent the further spread of the disease

   Answer: C. Immediately reportable diseases are designated as such because they require an immediate public health response, such as providing medication, a vaccine to prevent illness, or breaking the chain of infection to prevent further spread of the disease.

3. If the local health department cannot be reached in the event of an immediately reportable disease:
   A. Call the New Jersey Department of Health
   B. Call the physician who diagnosed the disease
   C. Wait until the next business day to report the disease

   Answer: A. In cases of immediately reportable diseases and other emergencies, if the local health department cannot be reached, contact the NJDOH during business hours, after hours, even on weekends and holidays.

4. The Red Book is where to find:
   A. A list of all vaccine preventable diseases
   B. The procedures to follow in the event of an immediately reportable disease
   C. 24/7 contact information for local health departments

   Answer: C. The Red Book contains after-hours contact information and ensures that state and local health departments can contact each other after hours.

5. Which of the following are resources to assist with disease investigations:
   A. Disease-specific questionnaires
   B. Contact tracing forms
   C. Both A & B are investigation resources

   Answer: A & B. There are various forms and worksheets that are designed to assist disease investigators in gathering all of the necessary information for the organism/disease of concern.

An outbreak is considered an occurrence of disease that exceeds what is normal for the area. Outbreaks typically involve two or more cases; can vary in magnitude and complexity (e.g., small local cluster or large multi-state)

This video looks at the steps for disease investigators to follow in the event of an outbreak.

During an outbreak, disease investigators will work closely with their regional epidemiologist. This coordinated effort provides technical assistance and guidance, such determine who was exposed, other possible cases/contacts and creating line list and epidemiologist curve.

See below for information about steps that are followed during an outbreak investigation. Of note is that some of the steps may be implemented at the same time.

In the event a patient notification is recommended, the regional epidemiologist will work as the NJDOH liaison to assist with crafting the notification letter and strategy for distribution.

Investigation steps

- Make required notifications
  - As soon as a suspected outbreak comes to your attention, NJDOH must be notified no matter the time of day
  - As soon as possible, share info with other relevant individuals such as health officers and regional epidemiologists.
- Brief the team/prepare for fieldwork
  - Research the disease, determine post-exposure prophylaxis (medicine given after on has been exposed to a reportable disease to prevent infection) needed.
  - Chose a team leader, develop an action plan
  - If there is a possibility of media attention or multiple LHD involvement, reach out to the health educator/risk communicator (HERC; one HERC in each LINCS agency) for talking points and other related communication plans and materials, as appropriate.
- Confirm the suspected outbreak
  - What were case counts in previous weeks/months/years?
  - Determine what other possible reasons may exist for the increase in cases (e.g., changes in reporting, revised case definition, new diagnostics, heightened awareness)
- Verify the diagnosis
  - Ensure that lab samples are collected and results are obtained

    - Be sure that the correct test was ordered!
- Declare an outbreak
    - Notify NJDOH that a suspected outbreak has been confirmed
    - Prioritize the response and delegate duties
- Develop a preliminary hypothesis
    - This may be revised as more information is uncovered during the investigation
    - The case definition is based on the nature of the disease, source of the agent, mode of transmission, potential exposures

- Implement initial control and prevention measures
    - Do not wait!
    - Measures vary by host susceptibility, mode of transmission, and reservoir
    - Be flexible, these may change over the course of the investigation

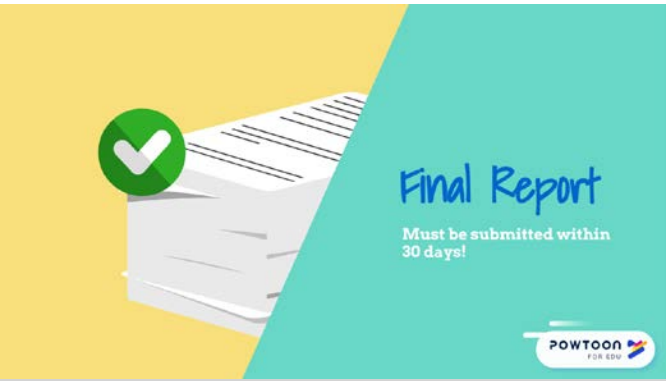
- Communicate with stakeholders
    - Keep in constant communication with key partners and stakeholders
    - Keep up-to-date case counts
- Define cases
    - Determine the case definition
    - An outbreak case definition is not the same as a surveillance case definition
    - The case definition may be refined as investigation goes on: confirmed, probable, suspect, not a case

- Identify and track cases
  - Tracking down potential cases: ask stakeholders to identify cases, review communicable disease registries, check with medical facilities and labs, conduct interviews within the population
- Interview cases
  - Information to collect should include: demographics, occupation, symptom onset (to help calculate incubation and infectious periods), symptom type, duration of illness, travel history, contacts, disease-specific risk factors
- Create line lists
  - Created to keep track of cases
  - Show example

Case #	Name	Sex	Age	Onset	Diarrhea	Fever	Fatigue	Status
1	J. Copeland	M	41	1-Dec	yes	no	no	Confirmed
2	P. Jacobs	F	73	2-Dec	yes	no	no	Confirmed
3	K. Wallace	M	14	3-Dec	yes	yes	no	Confirmed
4	C. Evans	F	69	3-Dec	yes	yes	yes	Confirmed
5	R. Hughes	M	17	3-Dec	yes	no	yes	Confirmed
6	D. Collins	F	70	4-Dec	yes	yes	no	Confirmed
7	L. Butler	M	49	4-Dec	yes	yes	no	Confirmed
8	W. Davis	F	68	5-Dec	yes	no	yes	Suspected
9	M. Turner	M	30	6-Dec	yes	yes	no	Suspected
10	B. Martin	F	50	7-Dec	yes	no	no	Suspected

- Describe the data
  - Person, place and time
  - Outbreak trend over time, geographic context and affected populations
- Evaluate the hypothesis
  - Test hypothesis through case-control or cohort studies
  - Use analytic epidemiology
- Adjust control and prevention measures
  - Fine tune prevention and control measures
  - Evaluate effectiveness through surveillance
- Declare outbreak over
  - An outbreak can be declared over when no new cases are reported within two incubation periods of disease
  - Incubation periods can vary greatly by disease
  - Allow for delays in reporting
- Report/communicate findings
  - Brief the outbreak team at the end of the outbreak
  - Written final report (submitted to NJDOH w/in 30 days)
- Review lessons learned
  - Conduct a review session and determine what worked well and what didn't

- There's a saying in epidemiology – "If you've seen one outbreak, you've seen one outbreak." Each one is unique and has its own characteristics.



Video 5: Test Your Knowledge!

Below are some key concepts from video 5. Read each question and see how well you recall the information!

1. All outbreaks of a particular disease are all very much the same.
   A. True
   B. False

   Answer: B. Although outbreaks of a particular disease may have many commonalities, each outbreak is unique and should be treated as such.

2. Outbreaks are reportable only when:
   A. They are caused by an immediately reportable disease
   B. They are caused by a reportable disease
   C. All outbreaks are reportable

   Answer: C. All outbreaks are reportable, regardless of reportability status.

3. The E-number is:
   A. A tracking number for outbreaks and investigations that require significant public health action
   B. A number that indicates that the lab report was sent electronically
   C. A number that you use to reach the epidemiologist

   Answer: A. The E number is a way to track investigations that require significant public health action. This means that all communications and responses for that outbreak event can be identified and kept together.

4. An outbreak can be declared over when no new cases are reported within:
   A. One incubation period of the disease
   B. Two incubation periods of the disease
   C. Three incubation periods of the disease

Answer: B. Generally, an outbreak is declared over once two incubation periods have passed with no new transmission occurring. However, diseases have different incubation periods and they vary greatly.

5. How long does the disease investigator have to submit a final report to the state once an outbreak is over?
   A. 30 days
   B. 60 days
   C. 90 days

   Answer: A. Once the outbreak is over, a final report must be submitted to the NJDOH within 30 days.