West Virginia Bureau for Public Health

Office of Epidemiology and Prevention Services

Quick Surveillance Guide for Local Health Departments

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Purpose of this document:

This document shall serve as a roadmap for conducting infectious disease investigation, surveillance, and evaluation. This document is not intended to replace specific disease protocols. Processes unique to each disease are addressed in the respective disease protocol found at OEPS A to Z List.

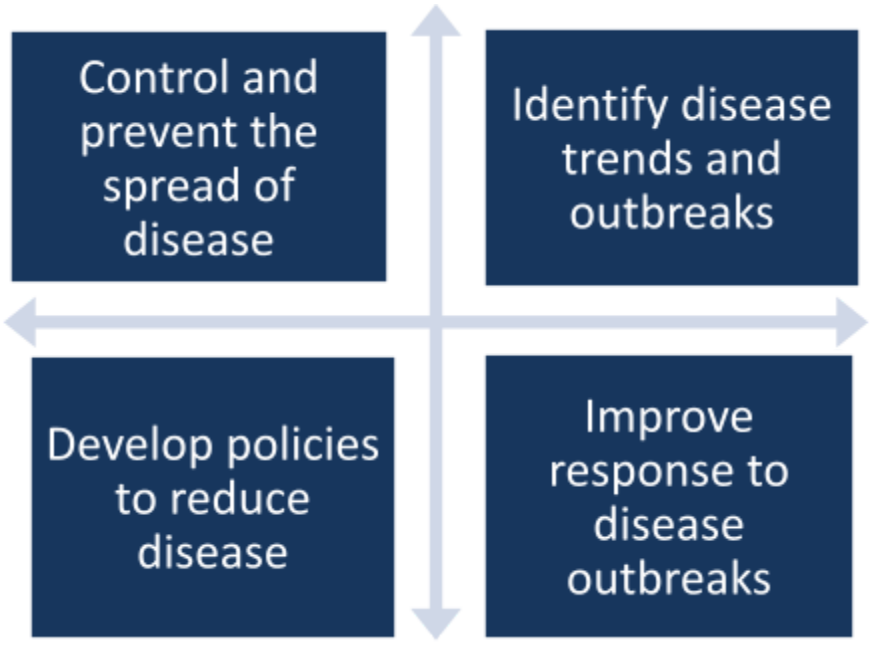
What is disease surveillance?

Disease surveillance is the systematic collection, analysis, and interpretation of health data to monitor and control the spread of disease. Data is used to track diseases, define priorities, and evaluate intervention programs. It aids in defining the situation by identifying the population being affected (*who*), the nature of the event (*what*), the timeframe (*when*), and the location and mechanism (*where* and *how*).

Why are some diseases reportable?

Reportable diseases are considered a public health concern due to their:

- Contagiousness
- Severity
- Frequency



What is the reportable disease rule?

The West Virginia reportable disease establishes **WHAT, WHEN** and **HOW** diseases are reported to the West Virginia Bureau for Public Health.

The reportable disease rule WV64CSR7 establishes procedures governing the reporting of certain diseases and conditions, unusual health events, and clusters or outbreaks of diseases to the West Virginia Bureau for Public Health. It also establishes responsibility for individuals and facilities in controlling communicable diseases.

What diseases are reportable?

- Providers Reporting List
- Laboratory Reporting List
- Electronic Reporting Laboratories

What is my responsibility?

Upon receipt of a disease report (e.g. provider or laboratory report, case opened in the West Virginia Electronic Disease Surveillance System (WVEDSS), the local health department (LHD) shall:

1. Determine disease reportability using the color-coded provider and laboratory reporting list (listed on page 3).
   a. Is this a reportable disease?
   b. If reportable, how soon does it need to be reported?

2. For diseases that are **reportable IMMEDIATELY and WITHIN 24 HOURS**, notify the Office of Epidemiology and Prevention Services (OEPS) by **telephone notification** to the Epi on-call at (304) 558-5358.

3. Open WVEDSS and perform a *search**
   a. Within 24 hours, create an investigation in the West Virginia Electronic Disease Surveillance System (WVEDSS) and fax the laboratory report to OEPS at (304) 558-8736 or add the lab as an attachment to the investigation. After reporting the laboratory report, the report should be manually entered into the case investigation, if it has not already been uploaded electronically by the reporting facility.
   b. Perform a search and determine if there is already a patient profile in WVEDSS. If the case is in the system, update the information as necessary. If the case has not been entered in the system, 'create an investigation' and enter all the information you have available.

   *A *search* is necessary to avoid duplication of information. Searching by *Date of Birth* and the first three letters of the first and last name can help avoid misspelled names.

4. **Determine the county and state of residence of the case-patient**. If the county of residence is not indicated on the report, contact any of the following entities and request information:
   a. Ordering facility – if this is a hospital or healthcare facility, possible sources of information are medical records, laboratory, or infection control. The LHD should have established good rapport with the facility to facilitate information exchange.
   b. Doctor's office who ordered the test.
   c. Laboratory who performed the test.

d. Cases should be assigned by the jurisdiction of the case's "usual residence" at the time of disease onset. Usual residence is defined as the place where the person lives and sleeps most of the time. For specific guidelines for determining usual residence at time of symptom onset use CDC: Determining Residency for Disease Notification.
e. If the case resides in your jurisdiction, continue with the investigation.
f. If the case does **NOT reside** in your jurisdiction, but is a **WV resident**, you can notify the receiving LHD and contact your regional epidemiologist or OEPS epidemiologist to transfer the investigation in the WVEDSS.
g. If the case is **NOT** a **WV resident**, you can forward the information to the appropriate health department and contact your regional epidemiologist or OEPS epidemiologist to transfer the investigation in the WVEDSS.

5. **Complete disease investigation.** Disease investigations and reports include investigating the source, identifying contacts, looking for unreported cases, and implementing prevention and control methods. Investigations are to be completed by LHD staff (including regional epidemiologists) within three weeks of receiving notification. Each disease has their own case report form and protocol that serves as a guide for interviewing the case-patient. These can be found on the OEPS websites A to Z List. Data should be entered in WVEDSS and sent to the respective regional epidemiologist for review. The regional epidemiologist then has one week to review each case.

6. **Perform record keeping.** The WVEDSS is the repository of information for many reportable diseases. In addition, your LHD may opt to keep paper copies of records submitted in WVEDSS. In this situation, your agency should follow your jurisdiction's (county) established policies on securing patient health information and record retention.

Lost to Follow Up (LTFU) Cases

Lost to follow up is defined as a patient who cannot be located or contacted by disease investigators to provide disease education or preventative intervention. A case investigation can be deemed "Lost to Follow Up" by LHD staff after:

- The LHD has made three unsuccessful contact attempts* to the patient. Contact attempts must be documented in WVEDSS General Comments.
- Documentation of LTFU status must be completed within 30 days of the investigation start date.

** Avenues of contact the LHD can consider are phone call, text message, email, in person visit or speaking with a medical power of attorney. For best practice, contact attempts can be made on three different days and times.*

- Deceased cases should not be marked LTFU

No Public Health Action

Defined as a case investigation with no activity/documentation in WVEDSS at the local level for 60 days. State health department staff will administratively close investigations with no activity/documentation in WVEDSS that have reached 60 days post the case investigation start date.

What are surveillance indicators?

Surveillance indicators are information required to be collected by LHDs during the case investigation process for reportable diseases.

LHDs in accordance with 64CSR73 Basic Public Health Service Standards for Local Boards of Health, will be evaluated on completeness of surveillance indicators and timeliness of public health response.

Required Surveillance Indicator Information*:

- Demographics
- Clinical Information
- Treatment
- Vaccination
- Risk Factors
- Public Health Action

*Please refer to the OEPS website and specific disease protocols for surveillance indicator requirements at www.oeps.wv.gov.

BOTULISM (INFANT, FOODBORNE, OR WOUND)

WHEN TO REPORT? IMMEDIATELY

SURVEILLANCE INDICATORS

1. Proportion of cases with complete demographic information.
2. Proportion of cases with complete clinical information (i.e., symptoms, hospitalization, and death).
3. Proportion of cases with treatment information (administration of antitoxin).
4. Proportion of cases with complete exposure information.
5. Proportion of cases with specimens submitted for laboratory confirmation.
6. Proportion of cases with a suspected or confirmed vehicle/source identified.

PERTINENT LABORATORY TESTS

1. Detection of botulinum toxin in serum, stool, or other clinical specimen.
2. Detection of botulinum toxin from food.
3. Isolation of *Clostridium botulinum* from stool, wound, or other clinical specimen.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. For all cases of botulism, regardless of the type, the most urgent need is the administration of antitoxin. For suspected infant botulism cases, confirm that the healthcare provider contacted the Infant Botulism Treatment and Prevention Program (IBTPP) at 510-231-7600 for a case consultation and to release BabyBig® anti-toxin treatment. For suspected cases of botulism in people ≥1 year old, confirm that the healthcare provider contacted the CDC's Clinical Botulism Service at 770-488-7100 for a case consultation and to release anti-toxin treatment.
2. Immediately notify OEPS of any suspected case of botulism.
3. Coordinate specimen collection and testing between the healthcare provider, OEPS, and Office of Laboratory Services (OLS). Laboratory specimens should be collected prior to the administration of anti-toxin treatment.
4. For cases of foodborne botulism, quickly identify the possible source so it can be removed or discarded. Immediately notify OEPS if a commercial food product is the suspected source.
5. Provide disease prevention and control education to providers, cases, and the community.

*Note: Treatment with antitoxin **should not** be delayed while laboratory testing is completed. The decision to administer treatment must be made based on the clinical presentation and should be made as soon as botulism is suspected.*

CANDIDA AURIS

WHEN TO REPORT? WITHIN 24 HOURS

SURVEILLANCE INDICATORS

1. Proportion of investigations with complete demographic information.
2. Proportion of investigations with complete species identification.
3. Proportion of investigations with complete information on long-term care facility (LTCF) residence.
4. Proportion of LTCFs that were provided education on *C. auris*.

PERTINENT LABORATORY TESTS

1. Detection in a swab obtained for the purpose of colonization screening using either culture or validated culture-independent test (e.g., nucleic acid amplification test [NAAT]).
2. Detection in a clinical specimen obtained during the normal course of care for diagnostic or treatment purposes using either culture or a validated culture-independent test (e.g., nucleic acid amplification test [NAAT]).

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Healthcare Facilities and Providers:
   a. Implement strict and thorough hand hygiene policies and procedures.
   b. Utilize transmission-based precautions.
   c. Ensure proper cleaning and disinfection using products proven to be effective against *C. auris* according to the Environmental Protection Agency (EPA).
   d. Perform active patient screening.
   e. Communicate patient status during transfers to other levels of care.
2. General Public:
   a. Perform thorough hand hygiene before eating, after using the bathroom, after coughing or sneezing, and after contact with wound drainage or other body fluids.
   b. Inform all healthcare providers of your colonization or infection status.

CARBAPENEMASE -PRODUCING ORGANISMS (CPO)

WHEN TO REPORT? ONE WEEK TO LOCAL HEALTH

SURVEILLANCE INDICATORS

1. Proportion of investigations with complete demographic information.
2. Proportion of investigations with complete antimicrobial sensitivity information.
3. Proportion of confirmed lab results of carbapenemase-producing organisms (CPO).
4. Proportion of investigations with complete information on LTCF residence.
5. Proportion of LTCFs that were provided education.

PERTINENT LABORATORY TESTS

1. Positive phenotypic tests such as the modified Hodge test (MHT) or Carba NP test.
2. Positive molecular tests detecting specific genes (like KPC, NDM, OXA-24 (or other), VIM) using PCR or next-generation sequencing (NGS).

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Healthcare Facilities and Providers:
   a. Implement strict and thorough hand hygiene policies and procedures.
   b. Utilize transmission-based precautions.
   c. Ensure proper cleaning and disinfection using products proven to be effective against specific pathogens according to EPA guidelines.
   d. Perform active patient screening.
   e. Communicate patient status during transfers to other levels of care.
   f. Enforce antimicrobial stewardship by minimizing carbapenem use.

2. General Public:
   a. Perform thorough hand hygiene before eating, after using the bathroom, after coughing or sneezing, after contact with wound drainage or other body fluids.
   b. Inform all healthcare providers of your colonization or infection status.

CARBAPENEM-RESISTANT ORGANISMS (CRO)

WHEN TO REPORT? ONE WEEK TO LOCAL HEALTH

SURVEILLANCE INDICATORS

1. Proportion of investigations with complete demographic information.
2. Proportion of investigations with complete antimicrobial sensitivity information.
3. Proportion of confirmed lab results of carbapenemase-producing organisms (CPO).
4. Proportion of investigations with complete information on LTCF residence.
5. Proportion of LTCFs that were provided education.

PERTINENT LABORATORY TESTS

1. Resistance to any carbapenem (minimum inhibitory concentrations of ≥4 mcg/ml for meropenem, imipenem, and doripenem or ≥ 2 mcg/ml for ertapenem).

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Healthcare Facilities and Providers:
   a. Implement strict and thorough hand hygiene policies and procedures.
   b. Utilize transmission-based precautions.
   c. Ensure proper cleaning and disinfection using products proven to be effective against specific pathogens according to EPA guidelines.
   d. Perform active patient screening.
   e. Communicate patient status during transfers to other levels of care.
   f. Enforce antimicrobial stewardship by minimizing carbapenem use.

2. General Public:
   a. Perform thorough hand hygiene before eating, after using the bathroom, after coughing or sneezing, and after contact with wound drainage or other body fluids
   b. Inform all healthcare providers of your colonization or infection status.

CRYPTOSPORIDIOSIS

WHEN TO REPORT? **WITHIN 72 HOURS**

SURVEILLANCE INDICATORS

1. Proportion of cases with complete demographic information.
2. Proportion of investigations with complete information on high-risk occupations.
3. Proportion of cases with complete clinical severity information (i.e., hospitalization and death).
4. Proportion of cases with complete exposure information.

PERTINENT LABORATORY TESTS

1. Positive for *Cryptosporidium* organisms or DNA in stool, intestinal fluid, tissue samples, biopsy specimens, or other biological sample by direct fluorescent antibody (DFA) test, polymerase chain reaction (PCR), enzyme immunoassay (EIA), or light microscopy of stained specimen.
2. Positive for *Cryptosporidium* antigen by a screening test method, such as immunochromatographic card/rapid card test; or a laboratory test of unknown method.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Provide disease prevention and control education to providers, cases, and the community.
2. Collect exposure history for the 10 days prior to the case's illness onset.
3. Identify and investigate symptomatic contacts of confirmed cases.
4. Identify cases that work in or attend sensitive settings and institute control measures based on setting type.

Note: Any symptomatic contact that is epidemiologically linked to a confirmed case is considered a probable case and should be investigated and entered into WVEDSS using the Enteric Case Report Form.

CYCLOSPORIASIS

WHEN TO REPORT? **WITHIN 72 HOURS**

SURVEILLANCE INDICATORS

1. Proportion of cases with complete demographic information.
2. Proportion of cases with complete clinical severity information (i.e., symptoms, hospitalization, and death).
3. Proportion of cases with complete exposure information including:
   a. Fresh produce consumption
   b. Travel history

PERTINENT LABORATORY TESTS

1. Detection of *Cyclospora* organisms or DNA in stool, intestinal fluid/aspirate, or intestinal biopsy specimens.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Provide disease prevention and control education to the case and family.
2. Collect a complete food and travel history.
3. Identify and investigate symptomatic contacts of confirmed cases.

Note: Any symptomatic contact epidemiologically linked to a confirmed case is considered a probable case and should be investigated and entered into WVEDSS using the CDC's Cyclospora National Hypothesis Generating Questionnaire.

GIARDIASIS

WHEN TO REPORT? **WITHIN 72 HOURS**

SURVEILLANCE INDICATORS

1. Proportion of cases with complete demographic information.
2. Proportion of cases with complete clinical information (i.e., symptoms, hospitalization and death).
3. Proportion of cases with complete exposure information.

PERTINENT LABORATORY TESTS

1. Detection of *Giardia* organisms, antigen, or DNA in stool, intestinal fluid, tissue samples, biopsy specimens or other biological samples.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Provide disease prevention and control education to providers, cases, and the community.
2. Collect complete exposure information.
3. Identify and investigate symptomatic contacts of confirmed cases.
4. Identify cases that work in or attend sensitive settings and institute control measures based on setting type.

Note: Any symptomatic contact that is epidemiologically linked to a confirmed case is considered a probable case and should be investigated and entered into WVEDSS using the Enteric Case Report Form.

HEPATITIS A

WHEN TO REPORT? WITHIN 24 HOURS

SURVEILLANCE INDICATORS

1. Proportion of cases with complete demographic information
2. Proportion of cases with complete clinical severity information (i.e., hospitalization and death)
3. Proportion of cases with high risk or sensitive occupation (e.g., food handler, healthcare worker)
4. Proportion of cases with complete exposure information including:
   a. Travel history
   b. Sexual history
   c. Contact of a confirmed or suspected hepatitis A case
   d. History of drug use (IV and/or non-IV)
   e. Homelessness or unstable housing
5. Proportion of cases with date of public health action (disease education) recorded
6. Proportion of investigations that identify contacts
7. Proportion of investigations with vaccination data

PERTINENT LABORATORY TESTS

1. Positive IgM for hepatitis A (HAV) antibodies in serum
   a. Positivity can indicate infection with supporting liver function tests and symptoms
2. Positive HAV RNA
   a. Positivity indicates confirmed infection
3. Positive IgG for HAV antibodies in serum
   a. Positivity can indicate past infection or vaccination, not useful for case ascertainment

IMPORTANT PUBLIC HEALTH ACTION(S)

1. If case is a food handler:
   a. Contact OEPS immediately to complete a risk assessment and address the need for notification of patrons.
   b. Provide post exposure prophylaxis (PEP) for all other food handlers at the food establishment.
2. Conduct contact tracing for household and close contacts to provide PEP as needed. PEP must be administered within 14 days of last exposure to the case.
3. Provide disease prevention and control education to the case and family.

LEGIONELLOSIS

WHEN TO REPORT? **WITHIN ONE WEEK TO LOCAL HEALTH**

SURVEILLANCE INDICATORS

1. Proportion of cases with complete demographic information.
2. Proportion of cases with complete clinical severity information (hospitalization and death).
3. Proportion of cases with complete travel history and high-risk activities (10 days prior to onset).
4. Proportion of cases with complete healthcare exposure information (14 days prior to onset).

PERTINENT LABORATORY TESTS

1. Positive urine antigen for *Legionella* serogroup 1.
2. Isolation of *Legionella* species from lower respiratory specimens.
3. Acute and Convalescent serum specimens indicating a four-fold rise in titer to *Legionella* species
   a. *L. pneumophila* serogroup 1 indicates confirmed case
   b. *L. pneumophila* other serogroups or multiple species from pooled antigen indicates suspect case
4. Positive Direct Fluorescent Antibody (DFA) or Immunohistochemistry (IHC).
5. Positive PCR.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Inquire about travel or healthcare exposure in the 14 days prior to onset.
2. Immediately notify OEPS of any possible travel or healthcare associated cases, and gather details for travel or healthcare associated cases (e.x: floors, rooms, any water sources they could have encountered, etc.)
3. Provide disease prevention and control education to the case and family.

Note: it is not recommended to conduct an environmental assessment/investigation for a single sporadic case of Legionellosis.

LISTERIOSIS

SURVEILLANCE INDICATORS

1. Proportion of cases with complete demographic information.
2. Proportion of cases with complete clinical severity information (i.e., hospitalization and death).
3. Proportion of cases with complete exposure history.
4. Proportion of cases with CDC Listeria Initiative Questionnaire completed.
5. Proportion of cases investigations with complete information on high-risk occupations.
6. Proportion of cases with a suspected or confirmed vehicle/source identified.
7. Proportion of cases with clinical specimens submitted to WV OLS for laboratory confirmation.

PERTINENT LABORATORY TESTS

1. Positive culture for *Listeria monocytogene*s from a normally sterile site.*
2. Positive culture for *Listeria monocytogene*s from products of conception in the setting of pregnancy, pregnancy loss, intrauterine fetal demise, or birth.
3. Positive culture for *Listeria monocytogenes* from a non-sterile neonatal specimen collected within 48 hours of delivery in the setting of a live birth.
4. Detection of *Listeria monocytogenes* by culture-independent diagnostic testing from a specimen collected from a normally sterile site.
5. Detection of *Listeria monocytogenes* by culture-independent diagnostic testing from products of conception in the setting of pregnancy, pregnancy loss, intrauterine fetal demise, or birth.
6. Detection of *Listeria monocytogenes* by culture-independent diagnostic testing from a non-sterile neonatal specimen collected within 48 hours of delivery in the setting of a live birth.
7. Isolation of *Listeria monocytogenes* from a non-invasive clinical specimen (e.g., stool, urine, wound).

   *e.g., blood or cerebrospinal fluid or, less commonly: pleural, peritoneal, pericardial, hepatobiliary, or vitreous fluid; orthopedic site such as bone, bone marrow, or joint; or other sterile sites including organs such as spleen, liver, and heart.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Provide disease prevention and control education to providers, cases, and the community.
2. Collect a complete exposure history for the three to 70 days prior to onset.
3. Determine pregnancy status and identify mother and neonate cases.
4. Ensure specimens are submitted to WV OLS.
5. Identify suspected food vehicles/sources. Notify OEPS of any implicated commercially distributed food vehicles/sources.

SALMONELLOSIS

WHEN TO REPORT? **WITHIN 72 HOURS**

SURVEILLANCE INDICATORS

1. Proportion of cases with complete demographic information.
2. Proportion of cases with complete clinical severity information (i.e., hospitalization and death).
3. Proportion of cases with complete exposure information.
4. Proportion of cases with complete food history.
5. Proportion of cases with complete high risk or sensitive occupation.
6. Proportion of cases with specimens sent to OLS for serotyping.
7. Proportion of cases with antibiotic susceptibility results.
8. Proportion of cases with a suspected or confirmed vehicle/source.

PERTINENT LABORATORY TESTS

1. Positive culture for *Salmonella* species from a clinical specimen.
2. Detection of *Salmonella* species from a clinical specimen using a culture-independent diagnostic test.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Provide disease prevention and control education to providers, cases, and the community.
2. Ensure specimens are submitted to OLS.
3. Collect a complete exposure and food history.
4. Identify and investigate symptomatic contacts with an epidemiologic linkage.
5. Identify cases that work in or attend sensitive settings and institute control measures based on setting type.
6. Identify suspected food vehicles/sources. Notify OEPS of any implicated commercially distributed food vehicles/sources.

Note: Any symptomatic contact that is epidemiologically linked to a case that meets supportive or confirmatory laboratory criteria is considered a probable case and should be investigated and entered into the WVEDSS using Enteric Case Report Form.

SHIGA TOXIN-PRODUCING E.COLI (STEC)

WHEN TO REPORT? WITHIN 24 HOURS

SURVEILLANCE INDICATORS

1. Proportion of cases with complete demographic information.
2. Proportion of cases with complete clinical information (i.e., symptoms, hospitalization, and death).
3. Proportion of cases with complete exposure information.
4. Proportion of cases with specimens submitted to OLS.
5. Proportion of cases with a suspected or confirmed vehicle/source.

PERTINENT LABORATORY TESTS

1. Positive *E. coli* O157:H7 culture from a clinical specimen.
2. Positive *E. coli* culture from a clinical specimen with detection of Shiga toxin or Shiga toxin genes.
3. Positive *E. coli* O157:H7 culture from a clinical specimen without confirmation of the H antigen, detection of Shiga toxin, or detection of Shiga toxin genes.
4. Elevated antibody titer against a known Shiga toxin-producing serogroup of *E. coli*.
5. Detection of Shiga toxin or Shiga toxin genes from a clinical specimen using culture-independent diagnostic test without isolation of *Shigella* from a clinical specimen.
6. Detection of *E. coli* O157 or STEC/Enterohemorrhagic *E. coli* (EHEC) in a clinical specimen using culture-independent diagnostic tests.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Provide disease prevention and control education to providers, cases, and the community.
2. Collect a complete exposure history.
3. Identify and investigate symptomatic contacts with an epidemiologic linkage.
4. Identify cases that work in or attend sensitive settings and institute control measures based on setting type.
5. Immediately notify OEPS of any daycare associated cases or clusters.
6. Identify cases that develop hemolytic uremic syndrome (HUS) and investigate as a HUS case.
7. Ensure specimens are submitted to OLS.

Note: Any symptomatic contact that is epidemiologically linked to a confirmed or probable case or that is a member of a risk group during an outbreak is considered a probable case and should be investigated and entered into WVEDSS using the Enteric Case Report Form.

SHIGELLOSIS

WHEN TO REPORT? **WITHIN 72 HOURS**

SURVEILLANCE INDICATORS

1. Proportion of cases with complete demographic information.
2. Proportion of cases with complete clinical severity information (i.e., hospitalization and death).
3. Proportion of cases with complete exposure information for the seven days prior to illness onset.
4. Proportion of cases with complete information on attendance or employment in a sensitive setting.
5. Proportion of cases with specimens submitted to OLS.
6. Proportion of cases with antibiotic susceptibility testing results.

PERTINENT LABORATORY TESTS

1. Positive culture for *Shigella* species from a clinical specimen.
2. Detection of *Shigella* species or *Shigella*/enteroinvasive *E. coli* (EIEC) in a clinical specimen using a culture-independent diagnostic test.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Provide disease prevention and control education to providers, cases, and the community.
2. Identify and investigate symptomatic contacts with an epidemiologic linkage.
3. Identify cases that work in or attend sensitive settings and institute control measures based on setting type.
4. If a reported case is a child of daycare or school age, immediately determine if the case attends daycare and complete active surveillance at the daycare or school to identify additional cases.
5. Ensure specimens are submitted to OLS.

Note: Any symptomatic contact that is epidemiologically linked to a case that meets supportive or confirmatory laboratory criteria for diagnosis is considered a probable case and should be investigated and entered into WVEDSS using the Enteric Case Report Form.

WHEN TO REPORT? WITHIN 72 HOURS

SURVEILLANCE INDICATORS

1. Proportion of cases with complete demographic information.
2. Proportion of cases with complete clinical information (i.e., symptoms, hospitalization and death).
3. Proportion of cases with complete exposure information.
4. Proportion of cases with complete travel history for the seven days prior to illness onset.
5. Proportion of cases with specimens submitted to OLS.

PERTINENT LABORATORY TESTS

1. Positive culture for *Vibrio* species (other than *Vibrio cholerae*) from a clinical specimen.
2. Detection of *Vibrio* species (other than *Vibrio cholerae*) from a clinical specimen using a culture-independent diagnostic test.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Provide disease prevention and control education to providers, cases, and the community.
2. Notify OEPS of seafood/shellfish consumption outside of West Virginia.
3. Collect a complete exposure history including food and travel information.
4. Collect shellfish tags from food establishments for shellfish bought/consumed in West Virginia.
5. Ensure specimens are submitted to OLS.

Note: The above applies to all *Vibrio* species except toxigenic *Vibrio cholerae* O1 or O139. If you receive a report for *Vibrio cholerae*, or suspected Cholera infection, immediately contact OEPS.
Any symptomatic contact that is epidemiologically linked to a case that meets supportive or confirmatory laboratory criteria for diagnosis is considered a probable case and should be investigated and entered into WVEDSS using the Cholera and other Vibrio Illness Surveillance (COVIS) Report Form.

HEPATITIS B

WHEN TO REPORT? WITHIN 24 HOURS

SURVEILLANCE INDICATORS

1. Proportion of acute cases with complete demographic information.
2. Proportion of acute cases with complete clinical information.
3. Proportion of acute cases with complete risk factor/exposure information.
4. Proportion of acute cases with complete vaccination history.
5. Proportion of acute cases that have received education.
6. Proportion of acute cases reported to public health within the required timeframe.
7. Proportion of acute and chronic cases with completed pregnancy status for all childbearing aged* females.

PERTINENT LABORATORY TESTS

1. HBsAg – Hepatitis B surface antigen
   a. Presence indicates either an acute or chronic infection and is a marker of infectivity
2. IgM anti-HBc – IgM antibody to the hepatitis B core antigen
   a. Positivity indicates recent infection with HBV (< 6 months)
3. HBeAg – Hepatitis B "e" antigen
   a. It is a marker of a high degree of infectivity and a high level of viral replication
4. HBV-DNA – HBV Deoxyribonucleic acid
   a. It is a marker of viral replication

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Provide disease prevention and control education and identify close contacts
2. Provide post-exposure prophylaxis and testing to contacts:
   a. Sexual contacts – within 14 days of last sexual exposure
   b. Needle sharing contacts– within seven days of last exposure
   c. Household contacts with known exposure – within 14 days
3. Identify HBsAg pregnant women to ensure infants receive hepatitis B immune globulin (HBIG) and hepatitis B vaccine within 12 hours of birth.
5. A single case of possible healthcare associated acute hepatitis B infection** is considered an outbreak and should be investigated. Notify OEPS of any suspected outbreaks immediately.

** Childbearing age includes females aged 13 to 50 years*

***Case patient with invasive medical procedure(s) reported during the two weeks to six months prior to onset of symptoms or positive test result collection date and no other risk factors identified through interview or medical records review.*

HEPATITIS C

WHEN TO REPORT? **WITHIN ONE WEEK TO OEPS**

SURVEILLANCE INDICATORS

1. Proportion of acute cases of hepatitis C with complete demographic information.
2. Proportion of acute cases of hepatitis C with complete risk factor information.
3. Proportion of acute cases of hepatitis C who have been educated.
4. Proportion of acute cases of hepatitis C that have been educated and have linkage to care information documented.
5. Proportion of acute and chronic cases with completed pregnancy status for all childbearing aged* females.

PERTINENT LABORATORY TESTS

1. Hepatitis C antibody (Anti-HCV): HCV antibodies are produced when an individual is exposed to HCV and usually remain present for life regardless of infection status.
2. Hepatitis C Virus Ribonucleic Acid (HCV RNA): HCV RNA may be reported as a qualitative or quantitative result. The presence of HCV RNA indicates a current HCV infection. A non-detectable HCV RNA test result indicates no current HCV infection.
3. Hepatitis C Genotype (HCV genotype): HCV infections may be identified by type through the use of a genotype test. Identifying the strain of HCV may help healthcare providers select the most effective treatment.
4. Alanine transaminase (ALT) and serum glutamic-pyruvic transaminase (SGPT): Enzymes produced by the liver that when 'elevated' indicate liver damage.
5. Bilirubin (total, direct, indirect): A bilirubin test measures the level of bilirubin in a person's blood, total bilirubin is used for case ascertainment.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Provide disease prevention and control education.
2. Identify close contacts.
3. A single case of possible healthcare associated acute hepatitis C infection** is considered an outbreak and should be investigated. Notify OEPS of any suspected outbreaks immediately.

** Childbearing age includes females aged 13 to 50 years*

**Case patient with invasive medical procedure(s) reported during the two weeks to six months prior to onset of symptoms or positive test result collection date and no other risk factors identified through interview or medical records review*

HAEMOPHILIS INFLUENZAE

WHEN TO REPORT? **WITHIN 24 HOURS**

SURVEILLANCE INDICATORS

1. Proportion of *H. influenzae* cases reported with complete information (clinical, demographic, specimen type, vaccine history, and serotype testing).
2. Proportion of *H. influenzae* cases among children younger than 5 years of age with complete vaccination history.
3. Proportion of *H. influenzae* cases among children younger than 5 years of age with serotyped isolate.
4. Proportion of cases reported to public health within the required timeframe.

PERTINENT LABORATORY TESTS

1. Bacterial culture: Isolation of *H. influenzae* from a normally sterile site (e.g., blood or cerebrospinal fluid [CSF] or, less commonly, joint, pleural, or pericardial fluid).
2. Detection of *Haemophilus influenzae* type b antigen in cerebrospinal fluid [CSF].
3. Detection of *H. influenzae*-specific nucleic acid in a specimen obtained from a normally sterile body site (e.g., blood, CSF, joint fluid, pleural fluid, pericardial fluid), using a validated polymerase chain reaction (PCR) assay.
4. Subtyping: *H. influenzae* isolates should be subtyped to determine need for chemoprophylaxis.
5. Antimicrobial susceptibility: All *H. influenzae* isolates should be tested for antimicrobial susceptibility.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Rapidly identify at-risk contacts of invasive Hib cases to ensure early administration of chemoprophylaxis and Hib vaccine, if needed, to household and childcare classroom contacts of case.
2. Forward isolates of *H. influenzae* from normally sterile sites to OLS for serotyping.

Note: *H. influenzae* type b-specific antigen in CSF by latex agglutination can only be used as evidence of a probable case. Positive antigen detection test results from urine or serum samples are unreliable.

MEASLES

WHEN TO REPORT? IMMEDIATELY

If measles is suspected, the case must present with acute illness with:

1. Generalized, maculopapular rash lasting ≥ three days; **and**
2. Temperature ≥101°F or 38.3°C; **and**
3. Cough, coryza, or conjunctivitis.

SURVEILLANCE INDICATORS

1. The proportion of confirmed cases reported to CDC (NNDSS) with complete information (clinical case definition, hospitalization, laboratory testing, vaccination history, date reported to health department, transmission setting, outbreak related, epidemiologic linkage, date of birth, and onset date).
2. Median days between rash onset date and the date reported to public health.
3. The proportion of confirmed cases that are laboratory confirmed.
4. The proportion of cases that have an imported source.
5. The proportion of cases for which at least one clinical specimen for virus isolation was submitted to CDC.

PERTINENT LABORATORY TESTS

1. Isolation of measles virus from a clinical specimen.
2. Detection of measles-virus specific nucleic acid from a clinical specimen using PCR.
3. IgG seroconversion or a significant rise in measles immunoglobulin G antibody using any evaluated and validated method.
4. A positive serologic test for measles immunoglobulin M antibody.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Collect serum, nasopharyngeal (NP) swab and urine for testing through OLS.
2. Identify people exposed to the case during the case's infectious period and provide post-exposure prophylaxis (PEP) to anyone who cannot show proof of immunity, absent contraindications.
3. Immunization is the intervention of choice and MMR should be given within 72 hours of exposure. Immune globulin (IG) can be given up to 6 days after exposure and is indicated for susceptible contacts (particularly contacts younger than 1 year of age, pregnant women & immunocompromised individuals).

MUMPS

WHEN TO REPORT? **WITHIN 24 HOURS**

SURVEILLANCE INDICATORS

1. The proportion of cases with complete information for the following: Clinical case definition, hospitalization, laboratory testing, vaccination history, date reported to health department, transmission setting, outbreak related, epidemiologic linkage, date of birth, and onset date.
2. Proportion of cases with complete demographic data.
3. Proportion of mumps cases for which appropriate clinical specimens were obtained and submitted to OLS.
4. The proportion of confirmed cases that are laboratory confirmed.
5. The interval between the date of symptom onset and the date of public health notification.
6. Proportions of reports with timely initiation of control measures.
7. The proportion of cases that have an imported source.

PERTINENT LABORATORY TESTS

1. Isolation of *mumps virus* from a clinical specimen.
2. Detection of mumps nucleic acid (e.g., standard or real time RT-PCR assays).
3. Detection of mumps immunoglobulin M (IgM) antibody.
4. Demonstration of specific mumps antibody response in absence of recent vaccination, either a four-fold increase in immunoglobulin G (IgG) titer as measured by quantitative assays, or a seroconversion from negative to positive using a standard serologic assay of paired acute and convalescent serum specimens.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Collect a buccal swab or NP swab (within one to three days of symptom onset) for testing through OLS.
2. Ensure the case is placed in droplet isolation until five days after the onset of parotitis.
3. Identify close contacts and vaccinate persons without evidence of immunity, absent contraindications.

NIESSERIA MENINGITDIS, INVASIVE

WHEN TO REPORT? WITHIN 24 HOURS

SURVEILLANCE INDICATORS

1. Proportion of meningococcal cases with complete information (age and event date).
2. Proportion of meningococcal cases with clinical and exposure information.
3. Proportion of meningococcal cases with complete vaccine history (with/without manufacturer name).
4. Proportion of meningococcal cases with known serogroup.
5. Proportion of cases with isolates submitted to CDC.
6. Percent of isolates shipped to CDC during assigned submission schedule.
7. Proportion of cases with known outcome.
8. Proportion of meningococcal cases reported in a timely manner.
9. Proportion of meningococcal cases with timely initiation of control measures.
10. Number of confirmed cases.

PERTINENT LABORATORY TESTS

1. Gram-negative diplococci, not yet identified, isolated from a normally sterile body site
2. Detection of *N. meningitidis*-specific nucleic acid in a specimen obtained from a normally sterile body site (e.g. blood or CSF), using a validated polymerase chain reaction (PCR) assay;
3. Detection of *N. meningitidis* antigen:
   a. in formalin-fixed tissue by immunohistochemistry (IHC); or
   b. in CSF by latex agglutination
4. Isolation of *Neisseria meningitidis*:
   a. from a normally sterile body site (e.g., blood or cerebrospinal fluid; or less commonly, synovial, pleural, or pericardial fluid); or
   b. from purpuric lesions.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Forward isolates of *N. meningitidis* from normally sterile sites to OLS for serotyping.
2. Identify close contacts who were exposed to the case at any time during seven days before the case's onset of symptoms and provide chemoprophylaxis.
   If an outbreak of vaccine strain invasive meningococcal disease occurs, consider offering a meningococcal vaccine.

PERTUSSIS

WHEN TO REPORT? WITHIN 24 HOURS

SURVEILLANCE INDICATORS

1. Proportion of investigations with complete demographic information (name, date of birth, address, sex, race, ethnicity).
2. Proportion of cases with complete information (clinical, complications, antibiotic treatment, laboratory testing, vaccination history, and epidemiologic data).
3. Proportion of cases from which clinical specimens are obtained.
4. Proportion of probable and confirmed cases meeting the clinical case definition that are laboratory confirmed.
5. Proportion of cases confirmed by isolation of *B. pertussis* by culture.
6. Proportion of cases reported to public health within 24 hours.
7. Proportion of cases for which control measure was initiated within the appropriate timeframe.

   Suggested additional indicators to monitor:
   - Proportion of probable cases that did not meet the clinical case definition because the cough duration was less than 14 days and the patient was coughing at follow-up.
   - Median interval between onset of cough and notification of state or local public health authorities in probable and confirmed cases.

PERTINENT LABORATORY TESTS

1. Isolation of *B. pertussis* from a clinical specimen (pertussis culture).
2. Positive PCR for pertussis.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Collect NP swabs for testing through OLS (obtain before initiation of treatment with antibiotics).
2. Identify close contacts exposed during the case's infectious period and provide chemoprophylaxis regardless of vaccination status.
3. Ensure the case is placed in droplet isolation or excluded from work or childcare until five days after the start of antimicrobial treatment.
4. Offer Tdap to contacts if indicated.

STREPTOCOCCUS PNEUMONIAE, INVASIVE

WHEN TO REPORT? **WITHIN ONE WEEK TO LOCAL HEALTH**

SURVEILLANCE INDICATORS

1. Proportion of children under 5 years of age who have *invasive pneumococcal disease* with*:*
   a. Complete vaccination history
   b. Isolates serotyped
   c. Isolates tested for antimicrobial resistance
2. The proportion of confirmed cases with complete information (clinical case definition, species, specimen type, serotype testing, vaccine history).
3. The proportion of confirmed cases with complete vaccination history (with/without manufacturer name).
4. The proportion of confirmed cases with serotype testing.
5. Proportion of cases with antimicrobial susceptibility test results.
6. The proportion of investigations reported in a timely manner (1week).

PERTINENT LABORATORY TESTS

1. Isolation of *S. pneumoniae* from a normally sterile body site (e.g., blood, cerebrospinal fluid, or, less commonly, joint, pleural or pericardial fluid).
2. Identification of *S. pneumoniae* from a normally sterile body site by a CIDT without isolation of the bacteria.
3. Subtyping: *S. pneumoniae* isolates should be subtyped to determine serotype.
4. Antimicrobial susceptibility: Test *S. pneumoniae* isolates for antimicrobial susceptibility.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Forward isolates of *S. pneumoniae* from normally sterile sites to OLS for serotyping and susceptibility testing.
2. Educate providers and the general public about the conjugate and polysaccharide pneumococcal vaccines.

ANAPLASMOSIS/EHRLICHIOSIS

WHEN TO REPORT? **WITHIN ONE WEEK TO LOCAL HEALTH**

SURVEILLANCE INDICATORS

1. Proportion of cases with complete clinical information (i.e. presence of fever and other clinical signs meeting clinical criteria of case definition).
2. Proportion of probable or confirmed cases with complete demographic information (name, date of birth, ethnicity, race, address including county of residence).
3. Proportion of cases with risk factor information (i.e. history of potential tick exposure through recreational or occupational activities).

PERTINENT LABORATORY TESTS

Supportive:

1. Serological evidence of elevated IgG antibody reactive with *Anaplasma phagocytophilum*/*Ehrlichia* spp. by IFA, ELISA, or dot-ELISA.
2. Identification of morulae in the cytoplasm of leukocytes by microscopic examination.

Confirmed:

1. Serological evidence of a four-fold change in IgG-specific antibody titer to *A. phagocytophilum*/*Ehrlichia* spp. by IFA by paired serum samples.
2. Demonstration of ehrlichial/anaplasmal antigen in a biopsy or autopsy sample by immunohistochemical methods.
3. Isolation of *A. phagocytophilum*/*Ehrlichia* spp. from a clinical specimen in cell culture with molecular confirmation.
4. Detection of *A. phagocytophilum*/*Ehrlichia chaffeensis*/*Ehrlichia ewingii* DNA in a clinical specimen via amplification of a specific target by PCR.

Note: For *species specific ehrlichiosis (ex. Ehrlichiosis chaffeensis, Ehrlichiosis ewingii)* , PCR is the only test that fulfills the laboratory criteria.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Recommend environmental measures to case/family to reduce risk of tickborne diseases around the home.
2. Provide disease control and prevention education to the case/family.

ARBOVIRAL INFECTION

WHEN TO REPORT? **WITHIN ONE WEEK TO LOCAL HEALTH**

Arboviral diseases (not including Dengue and Yellow Fever) include West Nile Virus, La Crosse encephalitis, St. Louis Encephalitis, Eastern Equine Encephalitis Virus, Western Equine Encephalitis Virus, and Chikungunya and Zika virus. Powassan Virus is also an arbovirus, but is transmitted by ticks (not mosquitoes).

SURVEILLANCE INDICATORS

1. Proportion of cases with complete clinical, laboratory, and epidemiological information including clinical symptoms, testing, and risk factor information (i.e. travel history, outdoor activities.).
2. Proportion of probable or confirmed cases with complete demographic information (name, date of birth, ethnicity, race, address including county of residence).

PERTINENT LABORATORY TESTS

1. Isolation of virus from, or demonstration of specific viral antigen or nucleic acid in, tissue, blood, CSF, or other body fluid.
2. Four-fold or greater change in virus-specific quantitative titers in paired sera.
3. Virus-specific IgM antibodies in serum with confirmatory virus-specific neutralizing antibodies.
4. Virus-specific IgM antibodies in CSF or serum.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Conduct an environmental assessment of the case's residence which includes the following.
    a) Collect GPS coordinates of the residence
    b) Check for artificial water holding containers
    c) Check for areas of standing water
    d) Check for poorly draining gutters
    e) Check for windows/door screens in disrepair
    f) Notify blood/tissue bank or other facility if case was a donor
    g) Notify the case's obstetrician if the case is pregnant
2. Notify blood/tissue bank or other facility if case was a donor.
3. Notify the case's obstetrician if the case is pregnant.
4. Recommend environmental measures to reduce the risk of arboviral infection around the home.
5. Provide disease control and prevention education to case/family/employee.

LYME DISEASE

WHEN TO REPORT? **WITHIN ONE WEEK TO LOCAL HEALTH**

SURVEILLANCE INDICATORS

1. Proportion of cases with complete demographic information.
1. Proportion of cases with appropriate laboratory testing (as defined by CDC case definition as "Laboratory Evidence") including copies of lab results submitted to the Division of Communicable Disease Epidemiology (DCDE).

PERTINENT LABORATORY TESTS

2. Isolation of *B. burgdorferi* sensu stricto or *B. mayonii* in culture.
3. Detection of *B. burgdorferi* sensu stricto or *B. mayonii* in a clinical specimen by a *B. burgdorferi* group-specific nucleic acid amplification test (NAAT) assay.
4. Detection of *B. burgdorferi* group-specific antigens by immunohistochemical assay on biopsy or autopsy tissues.
5. Two-tiered testing: EIA/IFA antibody screen, followed by IgM/IgG Western blot or secondary EIA/IFA.
6. Single-tier IgG Western blot.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Recommend environmental measures to case/family to reduce risk of tickborne diseases around the house.
2. Provide disease control and prevention education to the case/family.

SPOTTED FEVER RICKETTSIOSIS

WHEN TO REPORT? **WITHIN A WEEK TO LOCAL HEALTH**

SURVEILLANCE INDICATORS

1. Proportion of probable or confirmed cases where the case was completed and submitted to DIDE within 30 days of initial report date.
2. Proportion of probable or confirmed cases with onset date complete.
3. Proportion of probable or confirmed cases with county of residence complete.
4. Proportion of probable or confirmed cases with travel history documented.
5. Proportion of cases based upon confirmatory laboratory evidence.

PERTINENT LABORATORY TESTS

1. Serological evidence of elevated IgG with spotted fever group rickettsia antigen by IFA.
2. Serological evidence of elevated IgG with spotted fever group rickettsia antigen by IFA.
3. Detection of spotted fever group rickettisa nucleic acid in a clinical specimen via amplification of a specific target by PCR.
4. Demonstration of spotted fever group rickettsia antigen in a biopsy or autopsy specimen by IHC (immunohistochemistry).
5. Isolation of spotted fever group rickettisa from a clinical specimen in cell culture and by molecular confirmation.
6. Serological evidence of a fourfold increase in immunoglobulin G (IgG)-specific antibody titer reactive with spotted fever group rickettsia antigen.

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Recommend environmental measures to case/family to reduce risk of tickborne diseases around the home.
2. Provide disease control and prevention education to the case/family.

ANIMAL BITES

WHEN TO REPORT? **WITHIN 24 HOURS**

SURVEILLANCE INDICATORS

1. Proportion of confirmed cases with complete demographic information (name, date of birth, ethnicity, race, address including county of residence).
2. Proportion of animal bites reported in the health department in a timely manner.
3. Proportion of animal bite patients that completed a recommended rabies post-exposure prophylaxis administration.
4. Variables for performance evaluation will include completeness of the following variables:
    a. Demographic information
    b. Exposure information
    c. Species information
    d. Known outcomes for victim
    e. Known outcomes for exposing animal

IMPORTANT PUBLIC HEALTH ACTION(S)

1. Recommendations provided to animal bite victim after animal encounter.
2. Documentation of rabies PEP to animal bite victim following exposure to potential rabid animals.
3. Health status of dog/cat/ferret/livestock after rabies observation period.