Guidelines for the Epidemiological Investigation and Control of Gastroenteritis Outbreaks (including Norovirus)

Maryland Department of Health
Infectious Disease Epidemiology and Outbreak Response Bureau
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Introduction

Gastroenteritis (GE) is a major cause of illness in Maryland and throughout the country, with approximately 179 million cases occurring in the United States each year (1). Gastroenteritis is a condition that causes irritation and inflammation of the stomach and intestines (the gastrointestinal tract) and symptoms including diarrhea, vomiting, and abdominal pain. Most people with gastroenteritis recover with no treatment, but it can lead to more serious illnesses and complications, such as dehydration, hospitalization, and death (2).

In 2018, nearly one-third (31%) of outbreaks reported in Maryland were gastroenteritis outbreaks (3). Over half of gastroenteritis outbreaks in Maryland occur in healthcare settings such as nursing homes and assisted living facilities (4). The elderly and persons who are immunocompromised or have medical comorbidities are more likely to have longer illnesses and severe outcomes (2).

The symptoms, course, treatment, and control measures for gastroenteritis outbreaks will vary depending on whether the agent is viral or bacterial. Viruses, such as norovirus (previously known as "Norwalk-like viruses"), are the most common agents causing outbreaks of gastroenteritis and account for 60% of all acute gastroenteritis cases (5). Bacterial gastroenteritis is commonly caused by *Salmonella, Campylobacter, Escherichia coli, Shigella,* and other enteric pathogens. The bacteria *Clostridioides difficile* is becoming a significant cause of illness and outbreaks in long term care facilities (6).

This document provides recommendations and general guidance on the investigation of gastroenteritis cases and outbreaks in Maryland. Any case of a reportable disease such as *Salmonella* and *Campylobacter* needs to be reported to the local health department (LHD) (7). All incidents that meet outbreak definitions must be reported to the LHD. Consult LHD staff to determine the appropriate steps for prevention and control.

It should be noted that COVID-19 can present as gastroenteritis. Individuals with symptoms consistent with COVID-19 should be tested for COVID-19. Guidance for responding to COVID-19 outbreaks can be found at: https://phpa.health.maryland.gov/Pages/guidelines.aspx. Both this document and COVID-19 guidance documents apply for cases and outbreaks of GE when COVID-19 is suspected or confirmed in addition to another pathogen.

Questions regarding this document can be directed to:
Maryland Department of Health (MDH)

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Disease Description

Modes of Transmission

Gastroenteritis is usually spread through:

- Direct or indirect contact with an infected individual;
- Direct or indirect contact with an infected animal or their environment;
- Contact with contaminated surfaces; or
- Eating or drinking contaminated food or water.

GE is easily spread in settings such as households, health care settings, schools and day care centers. If hands have not been thoroughly washed with soap and water, illness can be easily spread during food preparation from an infected food handler (8,9).

Clinical Characteristics

Diarrhea and/or vomiting are typical symptoms of GE illness. Additional symptoms may include nausea, abdominal pain, headache, muscle ache, and fever (2). See Table 1 below for symptoms usually caused by selected GE agents.

Incubation Period and Duration

Incubation periods and illness duration for GE illnesses vary based on the causative agent. See Table 1 below for selected GE agents.

Table 1. Incubation period, symptoms and duration of GE causative agents (8,10).

Causative Agent	Usual Incubation Period	Typical Symptoms	Usual Illness Duration
Norovirus	12-48 hours	Diarrhea & Vomiting	1-2 days
Salmonella	12-36 hours	Diarrhea	2-7 days
Campylobacter	2-5 days	Diarrhea	2-10 days
Shiga toxin-producing E. coli	1-8 days	Bloody Diarrhea	5-10 days
Shigella	24-72 hours	Diarrhea	4-7 days

Treatment

Some individuals with GE illness require supportive care, such as fluid replacement (9). Gastroenteritis illness caused by bacteria (such as *Salmonella* or *Shigella*) may be treated with antibiotics when clinically indicated; however, most GE infections usually resolve within a couple days without antibiotic treatment (8). Antibiotics do not treat viral infections (such as norovirus) and will not help symptoms (8).

Prevention

Washing hands with soap and water thoroughly and frequently is the best way to reduce the number of microbes on hands in most situations. If soap and water is not available, use an alcohol-based hand sanitizer that contains at least 60% alcohol (11).

Contaminated surfaces (toilets, bedpans, soiled beds, etc.) and high-touch areas (bedrails, light switches, door knobs, etc.) should be promptly disinfected. If the cause of illness is thought to be viral, cleaning with a 1:10 bleach solution is recommended. Prompt washing of soiled articles of clothing is also recommended (5).

Fruits and vegetables should be washed thoroughly, and meats should be cooked thoroughly before eating. Eliminate cross-contamination from raw foods to cooked ones by thoroughly washing cutting boards and other food surfaces, utensils, and hands. Hands should be washed before and after handling food as well as before eating. If food or water is thought to be contaminated, it should be avoided or discarded (12).

Definitions

Case Definition

A case of GE is defined as a person with vomiting and/or diarrhea, where:

- Diarrhea is defined as 2 or more loose stools or an unexplained increase in the number of loose bowel movements within 24 hours.
- Vomiting is defined as 1 or more episodes that cannot be attributed or explained by any other cause.

Outbreak Definition

An outbreak of GE is defined as:

- Long -Term Care Facility (LTCF) and Assisted Living Facility: Three or more cases within a 7-day period among residents and/or staff from a single ward or unit.
- Daycare:

    A. A cluster (generally defined as >25%) of GE cases in a single class or other school-associated group; **OR**

B. When the proportion of GE visits to the health room is ≥10% of all visits

- School (i.e., kindergarten-grade 12):

  A. 25% of students in a classroom in 7 days meet the GE case definition; **OR**

  B. A doubling of the baseline absenteeism rate on one day AND 5 cases of GE seen in the school health room on the same day; **OR**

  C. 3 cases of GE from the same single classroom seen in the health room on the same day; **OR**

  D. An unusual occurrence or important situation reported by the school to the LHD, including:

     1. GE cases in special situations/groupings of students (such as special needs, high risk or immunocompromised);
     2. Other signs of GE as assessed by school health professional

- University or College:

  A. When the proportion of GE visits to the student health center ≥ 10% of all visits to the health center; OR

  B. Recognized cluster in a defined population, such as a dorm, team sorority/fraternity houses (≥25% GE cases in a defined population)

- Prisons: Three or more cases within a 7-day period among inmates and/or staff in a single ward or unit.

- Hospital:

  A. Three or more cases within a 7-day period among patients and/or staff in a single ward or unit; **OR**

  B. 3% or more of the entire facility who develop diarrhea and/or vomiting within a 7 day period.

OR: An increase in the number of infections over the baseline rate usually found in that facility.

In addition, a **Foodborne Outbreak** is defined as two or more epidemiologically-related cases of similar illness following consumption of a common food or food items in people who do not live in the same household. If you suspect a foodborne outbreak, contact your LHD.

Resolution of Outbreak

In general, a GE outbreak is considered resolved and all control measures may be lifted when there are no new onsets for 4 consecutive days, or as directed by your LHD.

If the cause of a GE outbreak is known, such as a bacteria or parasite, restrictions may need to be in place longer, typically until after at least 2 incubation periods of the known pathogen have passed without a new onset.

Single Case Management

A case of a reportable GE agent (e.g., *Salmonella*) should be reported to the appropriate LHD. Conditions to report and reporting guidance is available online at https://phpa.health.maryland.gov/Pages/disease-conditions-case-report-forms.aspx. All reportable cases should be interviewed by the LHD using the MDH GE Case Report Form (CRF), which can also be found online at https://phpa.health.maryland.gov/Pages/disease-conditions-case-report-forms.aspx. Cases should be educated about the disease symptoms, modes of transmission, and prevention. Emphasize that diligent and thorough hand washing is the most important preventive measure. If the case works in a high risk occupation (e.g., food service, healthcare, childcare) or attends childcare, exclusion from work or childcare might be required. Exclusion guidance for food service, healthcare, and childcare workers are outlined in COMAR 10.06.01.06 (7), which can be found online at http://www.dsd.state.md.us/comar/comarhtml/10/10.06.01.06.htm. Any additional questions about case investigation and management can be directed to your LHD or MDH's Division of Infectious Disease Surveillance at 410-767-6700.

When a case of gastroenteritis is recognized in a facility, the following measures should be implemented (5,13):

- Restrict case to a designated area (e.g., patient room, cell, etc.). Suspend participation in group activities until 2 days after the last episode of diarrhea or vomiting. Place in private room if possible or cohort with others who are similarly ill.
- Contact and Standard Precautions is recommended for individuals entering the patient care area (i.e., gowns and gloves upon entry) to reduce the likelihood of exposure to infectious vomitus or fecal material.
- Use a surgical or procedure mask and eye protection or a full face shield if there is an anticipated risk of splashes to the face during the care of patients, particularly among those who are vomiting.
- Wear disposable gloves, gown and a mask when handling feces or soiled articles or equipment (e.g., cleaning feces or vomitus from bed, bedpan or crib, etc.).
- Dispose of feces or vomit in the sanitary sewer (toilet), and soiled disposable material in plastic bags according to your facility's standard waste procedures.
- Clean environmental surfaces (toilets, bedpans, cribs, and bedrails etc.) with cleaning products and procedures normally used by the facility. If illness is thought to be norovirus or other viral illness, use 1:10 bleach solution for cleaning. If bleach cannot be used on environmental surfaces, use an EPA Registered Antimicrobial Product Effective Against Norovirus. Make sure to follow the manufacturer's instructions regarding contact time. Product list available here: https://www.epa.gov/sites/production/files/2018-04/documents/list_g_disinfectant_list_3_15_18.pdf

- **WASH HANDS** carefully with soap and water after contact with any feces or fecally-soiled material even if wearing gloves.
- Educate staff on hand washing, cleaning, isolation, and exclusion policies. For healthcare settings, educate staff on appropriate use of personal protective equipment (PPE).
- If case is an employee, exclude until 2 days after the resolution of diarrhea and/or vomiting. If salmonellosis, shigellosis or STEC infection is diagnosed consult with the local health department regarding exclusion measures.
- Non-punitive, flexible sick leave policies should be in place to encourage ill employees to stay home and prevent spreading gastroenteritis and other infectious diseases in the facility.

Outbreak Management

The Code of Maryland Regulations (COMAR) 10.06.01.03 and 10.06.01.04 [http://www.dsd.state.md.us/comar/SubtitleSearch.aspx?search=10.06.01.*] requires healthcare providers, school and childcare facility personnel, masters of vessels or aircraft, medical laboratory personnel, and the owner/operator of a food establishment to report all gastroenteritis outbreaks to the LHD immediately.

During an outbreak, implement the following general control measures (5):

- Actively promote adherence to hand hygiene with soap and water. Important opportunities for hand washing include before eating, after toileting or changing diapers, and before and after participating in group activities.
- Use soap and water for hand hygiene after providing care or having contact with an individual with suspected or confirmed viral gastroenteritis.
- Exclude ill employees from work for a minimum of 48 hours after resolution of diarrhea and vomiting. Exclusions for longer than 48 hours after the resolution may be considered if new onsets continue.
- Non-punitive, flexible sick leave policies should be in place to prevent ill employees from coming to work when sick and potentially spreading gastroenteritis and other infectious diseases in the facility.
- Clean environmental surfaces (toilets, bedpans, cribs, and bedrails etc.) with cleaning products and procedures normally used by the facility. If illness is thought to be norovirus or other viral illness, use 1:10 bleach solution for cleaning. If bleach cannot be used on environmental surfaces, use an EPA Registered Antimicrobial Product Effective Against Norovirus. Make sure to follow the manufacturer's instructions regarding contact time. Product list available here: https://www.epa.gov/sites/production/files/2018-04/documents/list_g_disinfectant_list_3_15_18.pdf

- Increase the frequency of cleaning and disinfection of patient care areas and frequently touched surfaces during outbreaks of norovirus (e.g., increase ward/unit level cleaning to twice daily to maintain cleanliness, with frequently touched surfaces cleaned and disinfected three times daily using EPA-approved products)

Outbreak Control Measures for Special Settings

In GE investigations, the setting plays a key role in determining the course of action. In addition to following the outbreak actions described above, the following GE control measures should be implemented for a single case as well as outbreaks occurring in settings where GE illnesses can be easily transmitted.

1) Long Term Care Facilities (LTCF) including Nursing Homes, Assisted Living Facilities and other Health Care Settings (except for hospitals)

- **Implement all general outbreak control measures listed above.**
- Restrict symptomatic residents from leaving their rooms until 48 hours after diarrhea and vomiting end, unless it is for essential care or treatment.
- Restrict symptomatic residents from group activities. If the outbreak affects a large number of residents, consider suspending activities, including group dining, for ALL residents on the affected unit(s). Activities throughout the facility should be restricted to the smallest group possible. Contact between residents of the affected unit(s) and residents of unaffected units should be avoided.
- Actively promote adherence to hand hygiene with soap and water, among personnel, residents, and visitors. Important opportunities for resident hand washing include before eating, after toileting, and before and after participating in group activities.
- If norovirus infection is suspected, adherence to PPE use according to Contact and Standard Precautions is recommended for individuals entering the patient care areas (i.e. gowns and gloves upon entry) (5).
- Use soap and water for hand hygiene after providing care or having contact with a resident with suspected or confirmed viral gastroenteritis.
- If the outbreak is restricted to one unit, close the affected unit to new admissions or transfers. If cases are dispersed throughout the facility the entire facility should be closed to new admissions. If the facility cannot cohort staff or if it is necessary to walk through affected units to get to unaffected units, or at the discretion of the LHD, admissions may be stopped to the entire facility. A resident hospitalized during the outbreak is allowed to be re-admitted to the facility and is not considered a new admission.
- Residents should not be moved between affected and unaffected units.

- Use standard precautions for handling soiled resident items.
- Dedicate equipment and objects to be used for the case(s). Clean and disinfect with a 1:10 bleach solution before allowing others to use them.
- Cohort staff. Staff should be assigned to either ill or well residents. If possible, do not have staff move between units.
- Post signs alerting visitors of the outbreak.
- Screen visitors for signs of illness before they enter the facility. People who travel from room to room and have contact with multiple residents may transmit illness. Visitors should be instructed to limit their movements within the facility. Require that visitors wash hands and use PPE where indicated.
- Conduct in-services for staff on outbreak control measures, including hand hygiene, PPE, and cleaning.
- On all shifts, a supervisor on duty should be responsible for monitoring adherence to all of the control measures, especially hand washing, PPE use, cleaning, and surveillance for new cases.
- Staff should use contact and standard precautions for cases.
- Place cases in private rooms. If private rooms are not available, place cases together and exposed roommates together. Do NOT move residents between units.

2) Childcare Facilities

- **Implement all general outbreak control measures listed above.**
- Actively promote adherence to hand hygiene among personnel and attendees. Assist young children with hand washing.
- Clean and disinfect toys using a bleach solution or place in a dishwasher or washing machine for cleaning. Any toys that cannot be thoroughly cleaned and disinfected or dedicated to a single child should be removed until the outbreak resolves. Consider removing them permanently and replacing with toys that are easily cleaned and disinfected.
- Isolate ill attendees until they can be removed from facility.
- Send out letter informing parents of the outbreak.
- If there is a staff shortage, consider closure of the facility until required staff–to-attendee ratio can be met.

3) Schools/Universities

- **Implement all general outbreak control measures listed above.**

- Actively promote adherence to hand hygiene among personnel and students, especially after using the bathroom and before eating.
- Send out letter informing parents of the outbreak. If the outbreak is at a university, send notification to students and faculty.

4) Food Service Facilities

- **Implement all general outbreak control measures listed above.**
- Actively promote adherence to hand hygiene and proper food handling practices.
- Maintain cleanliness of surfaces and food preparation areas using cleaning products and procedures normally used.
- If an employee vomits or has diarrhea, immediately clean and disinfect contaminated surfaces. Use a chlorine bleach solution with a concentration of 1000-5000 ppm or other disinfectant registered as effective against norovirus by the EPA, which you can find here: https://www.epa.gov/sites/production/files/2018-04/documents/list_g_disinfectant_list_3_15_18.pdf (14).
- Discard any ready-to-eat food items that may have been contaminated by employees while symptomatic (15).
- If other areas of the facility, such as the dining room or bathrooms might have been contaminated by ill patrons or employees, clean with bleach solution.

5) Correctional Facilities

- **Implement all general outbreak control measures listed above.**
- Cohort symptomatic inmates in an empty unit/ward, when possible. If not possible, keep inmates in their cells or dorms. Ill inmates should remain isolated until at least 48 hours after diarrhea and vomiting resolve.
- Suspend group activities (e.g., dining events).
- Actively promote adherence to hand hygiene among inmates, personnel and visitors.
- When possible, close off affected wards and stop new intakes or transfers.
- If transferring ill or potentially exposed inmates to another institution, notify the institution.
- Cohort staff and do not have staff move between affected and unaffected units/wards.
- Post signs alerting visitors of outbreak.
- Consider restricting visitors.
- If outbreak affects a large number of the inmates, consider confining all inmates to their cell, known as “institutional isolation” or “lockdown”.

6) Hospitals

- **Implement all general outbreak control measures listed above.**
- Restrict symptomatic and recovering patients from leaving their rooms unless it is for essential care or treatment until 48 hours after diarrhea and vomiting have resolved.
- Suspend group activities and gatherings for patients and/or staff.
- Actively promote adherence to hand hygiene among healthcare personnel, patients and visitors in patient care areas.
- If norovirus infection is suspected, adherence to PPE use according to Contact and Standard Precautions is recommended for individuals entering the patient care areas (i.e. gowns and gloves upon entry) (5).
- If possible, place new admissions on unaffected units. Closure of affected wards to new admissions or transfers might be necessary in certain situations.
- When an ill or potentially exposed person is being transferred to another facility, notify the receiving facility of the outbreak.
- Use standard precautions for handling soiled patient-service items.
- Change privacy curtains when visibly soiled and upon patient discharge or transfer (5).
- Cohort staff to care for either ill or well patients only. Staff should not move between units.
- Avoid moving patients between affected and unaffected units.
- Exclude non-essential staff, students and volunteers from working in affected area.
- Screen visitors for signs of illness before they enter the facility. Visitors should be instructed to limit their movement within the facility.

Specimen Collection

Bacterial pathogens

In all outbreaks of gastroenteritis, specimen collection for bacterial enteric pathogens should be done to rule out *Salmonella, Campylobacter, E. coli* and *Shigella* as causative agents. Stool specimens of approximately 3-5 cases should be collected, unless otherwise specified by the LHD. Process specimens through a commercial laboratory following their instructions, or submit specimens to the MDH state public health lab, adhering to their guidelines, found here https://health.maryland.gov/laboratories/docs/Guide_to_PH_Lab_Serv_v2_0_9_2018_Guide_Updated_12-2018_Final.pdf. See page 57, "Enteric Culture, Routine (*Salmonella*, *Shigella*, *Campylobacter*, and Shiga toxin-producing *E.coli*)". In outbreaks of salmonellosis, campylobacteriosis, shigellosis, or *E. coli* infection, additional specimens might be needed.

Norovirus and other viral pathogens

In addition to routine bacterial specimens, stool should also be collected and submitted for norovirus testing. All stool samples submitted for norovirus testing should be submitted in an empty sterile container without media. A minimum of 3 stool specimens MUST be submitted for testing. See the MDH laboratory guidelines, found here https://health.maryland.gov/laboratories/docs/Guide_to_PH_Lab_Serv_v2_0_9_2018_Guide_Updated_12-2018_Final.pdf. See page 115, "Virus Culture" for details. If testing for norovirus is negative, the MDH laboratory can test for other viral pathogens.

Short incubation foodborne bacterial pathogens

If a foodborne pathogen such as *Bacillus cereus, Clostridium perfringens* or *Staph aureus* is suspected, collect and submit additional stool specimens and adhere to the MDH laboratory guidelines, found here: https://health.maryland.gov/laboratories/docs/Guide_to_PH_Lab_Serv_v2_0_9_2018_Guide_Updated_12-2018_Final.pdf. See page 58, "Foodborne Pathogens (*Bacillus cereus*, *Clostridium perfringens*, *Staph aureus*)."

Submission of Food Samples

When suspect food remnants are still available, it may be possible to test them for bacterial or short incubation foodborne pathogens. MDHLA and MDH Division of Outbreak Investigation approval are required before any food samples may be submitted. Food should be collected under Chain of Custody. Guidelines for collection of samples can be found here, https://health.maryland.gov/laboratories/docs/SOP%20for%20Enviroguide%207-2019%20signed.pdf, starting on page 26.

Data Collection and Summary Report

Line lists and epidemic curves ("epi curve") are key components of an epidemiological investigation. Once an outbreak has been identified, cases should be placed on a line list (see Appendix 1 for line list template). The line list should be updated daily by the facility and faxed or sent via secure email to the LHD. Epi curves are useful tools to track the progress of the outbreak and are helpful in determining what the mode of transmission is. Epi curves can be created by plotting the number of cases by date of onset (see Appendix 2 for sample epi curve).

At the conclusion of the outbreak, the LHD investigator should complete an Outbreak Summary Report form, found on the MDH website here: https://phpa.health.maryland.gov/Pages/disease-conditions-case-report-forms.aspx. Include a copy of the final epi curve with the form, which should be submitted to MDH within 60 days of the day the outbreak was reported.

Local Health Department actions during an outbreak

1) LHD staff should inform the Division of Outbreak Investigation of a GE outbreak within 24 hours by telephone:

- During normal business hours, Monday through Friday, 8:00 a.m. to 5:00 p.m. call Division of Outbreak Investigation at 410-767-6700; or
- During weekends, holidays, or after-hours, contact the on-call epidemiologist through the MDH after-hours service at 410-795-7365.

2) Determine the person(s) who will serve as lead investigator.

- This designated LHD staff member is responsible for establishing, maintaining, and implementing a relationship with the facility lead in order to manage and control the current outbreak as well as prevent future infections.
- This person is also responsible for updating the designated MDH investigator with any new outbreak information (e.g. additional cases, specimen collection, and termination of outbreak).

3) Assist with and provide guidance on the following:

- Infection control and environmental control measures.
- Management, collection, and analysis of epidemiological data (e.g. line list).
- Proper submittal of stool for laboratory testing.

4) Oversee the management and control of the outbreak.

- Check in with the facility as needed (ideally daily) to obtain pertinent information such as newly identified cases and specimen collection status.

5) If foodborne transmission is suspected:

- Contact your environmental health division to request an environmental health specialist inspect the kitchen or food establishment.
- Ensure coordination between communicable disease and environmental health.
- Collect food histories, food handler questionnaires, and food samples, as needed.
- All inspections should be conducted within 24 hours of outbreak reporting.

6) Ensure the facility conducts enhanced surveillance until the termination of the outbreak.

- The facility lead should surveil for additional cases and track them using a line list.
- Generally, outbreak control measures can be lifted when no new cases have occurred for 4 consecutive days, **or** the time specified by the LHD.

State Health Department (SHD) actions during an outbreak

Outbreak Management

- At the time an outbreak is determined provide an outbreak number to the LHD.
- Provide guidance to LHD on the management and analysis of epidemiological data, infection control practices, and environmental control procedures as needed.
- Act as liaison to the MDH Laboratory Administration on inquiries about laboratory submission, testing procedures, and results.
- Become the lead investigator for multi-jurisdictional outbreaks.
- Notify other state and federal agencies if necessary.
- Find additional information and materials to assist in investigation.
- Assist the LHD and facility IP in the management and control of the outbreak if requested. This may include onsite assistance as approved by the Chief of the Division of Outbreak Investigation.

Activation and Deactivation of Emergency Response Operations

The Infections Disease Epidemiology and Outbreak Response Bureau (IDEORB), in consultation with the Director and Deputy Director of the Prevention and Health Promotion Administration, will activate emergency response operations when one or more of the following criteria are met:

- Existing staffing is inadequate to assign responsibilities to maintain critical operations for more than three operational periods
- Resources (financial or material or operational) required to mount and/or sustain an ongoing emergency response are needed from outside of the Bureau or Administration
- A non-infectious disease event substantially disrupts critical operations of the unit

IDEORB, in consultation with the Director and Deputy Director of the Prevention and Health Promotion, will deactivate emergency response operations when one or more of the following criteria are met:

- Public health problem is contained or resolved

- Emergency response is incorporated into normal operations and adequate resources are available to sustain all ongoing responses
- Non-infectious event is over and disruption impacting critical operations no longer exists

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Appendix 1: Sample Line List

Line Listing for Gastroenteritis (GE) Outbreaks

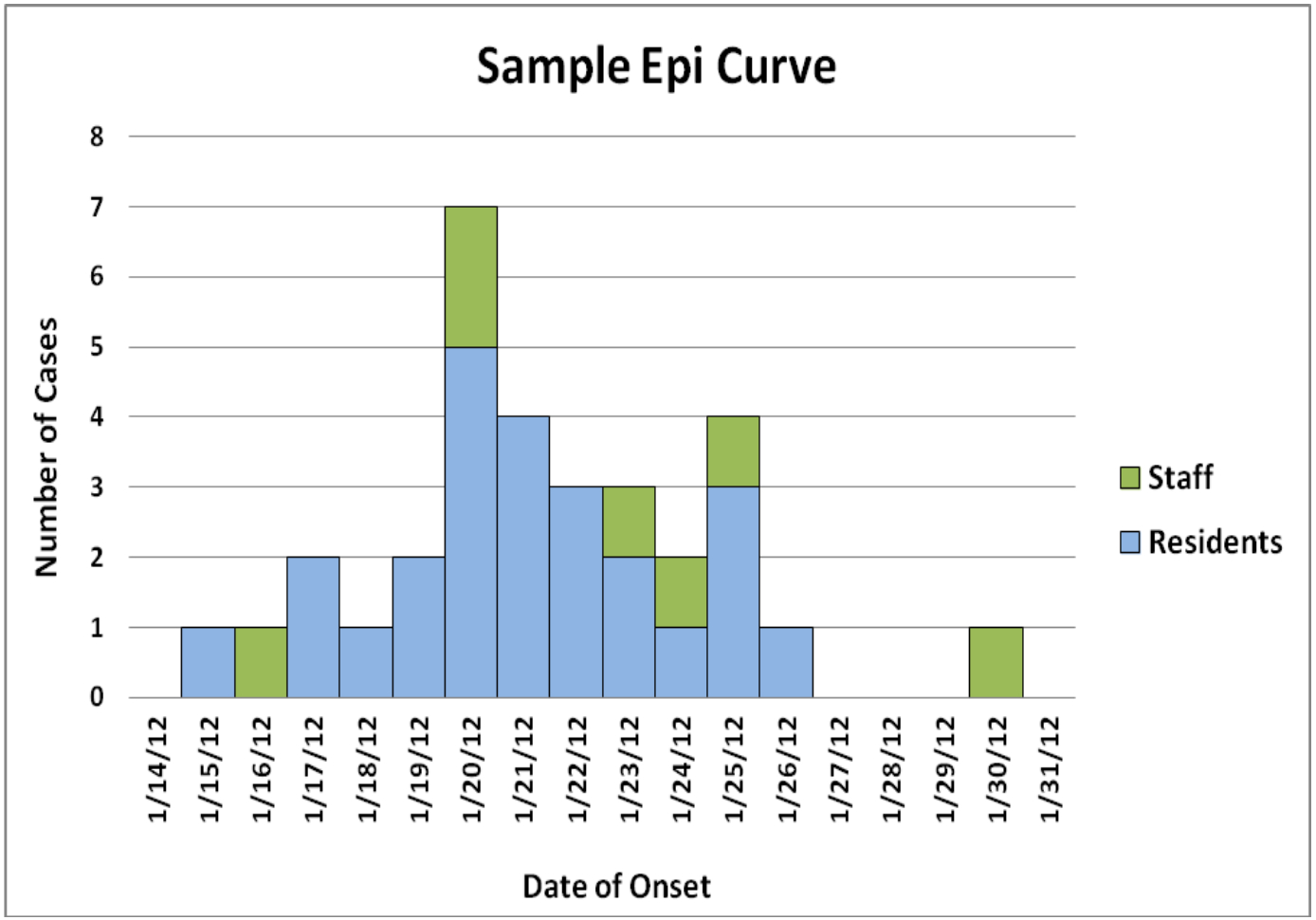
(Please select: ☐ Non-employee ☐ Employee)

Facility Name: _____ **Address:** _____

Contact Person: _____ **Telephone:** _____

				Onset and Timing of Diarrhea or Vomiting				Signs and Symptoms												Laboratory Results (if applicable)	
Name	Age	Sex	Room No. or Shift & Unit	Date of Onset	Time of Onset	Date/Time of last Episode	Duration of Illness	Diarrhea	Vomiting	Abdominal Cramps	Nausea	Fever (highest temp.)	Blood in Stool	Muscle Aches	Headache	Chills	Hospitalization (Y/N)	Admission Date	Death (Y/N)	Stool Collection Date	Bacterial Stool Results	Viral Stool Result

Appendix 2: Sample Epidemic (Epi) Curve for Gastroenteritis (GE) Outbreaks



CDC's Quick Learn tutorial for creating Epidemic Curves can be found here: https://www.cdc.gov/training/quicklearns/createepi/