

Section: UTMB On-line Documentation	01.10 - Policy
Subject: Infection Control & Healthcare Epidemiology Policies and Procedures	2.20.2025-Revised
Topic: 01.10 – Standard Operating Procedure – Epidemiologic Investigation	07.19.18 - Author

01.10 – Standard Operating Procedure – Epidemiologic Investigation

Purpose To define the process to investigate an outbreak of healthcare-associated infections (HAI) or single instances of healthcare-associated infections with public health or other epidemiologic significance.

Policy Infection Control & Healthcare Epidemiology (ICHE) will conduct investigations of outbreaks and cluster of infections that appear to be linked.

Some HAIs require investigation even with a single incidence. Examples include, but are not limited to the following HAIs:

- Legionellosis
- Tuberculosis
- SARS-COV-2 (COVID-19)
- Extremely drug-resistant organism (XDRO), including Candida auris
- Hepatitis C post-procedure or infusion

Definitions **Case Definition:** specifies the clinical, laboratory, and epidemiologic characteristics of a disease or condition and provides criteria for determining whether a patient under investigation has the specific infections disease of interest.

Outbreak or Cluster: The occurrence of more cases of disease than expected in a given area or among a specific group of people over a particular period of time. Cluster/outbreak will be referred to as outbreak throughout this policy.

Line List: A list used to record confirmed cases of an infectious disease that organizes demographic data, clinical risk factors, host information, date of symptom onset and other relevant factors.

Procedure **Outbreak investigation**

- 1) Notify ICHE Director of possible outbreak and develop the plan for the investigation.
- 2) Designate an Infection Preventionist (IP) to lead the investigation.
- 3) Initial evaluation
 - a) Verify the diagnosis of reported cases.
 - i) Review clinical, laboratory and epidemiologic findings
 - ii) If the reported outbreak is based on a syndrome (e.g., outbreak of diarrheal illness), identify the causative agent if possible.
 - b) Develop a case definition
 - i) Determine epidemiologic, clinical and laboratory data to identify cases and classify as confirmed and possible.
 - ii) Determine severity of the problem (e.g., colonization or infection)
 - iii) Define time frame
 - c) Review clinical and laboratory findings to determine if cases are colonized or infected and determine if the cases represent pseudoinfection (i.e., contaminated cultures or false-positive tests).
- 4) Implement any control measures (e.g. isolation) needed immediately

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- 5) Plan investigation
 - a) Verify the existence of an outbreak
 - i) Review data prior to the outbreak period to verify an increase in infections
 - ii) Review data collection to determine if the increase is due to a change in methodology (i.e., an artifact).
 - iii) Identify a prospective surveillance system to identify future cases
 - iv) Consult Microbiology Laboratory
 - (1) Determine if a change in laboratory procedures might have caused an apparent increase in cases (e.g., switch from toxin assay to PCR)
 - (2) Request that isolates and/or specimens be saved from existing and future cases.
 - b) Develop a line list of cases.
 - c) Search literature for similar outbreaks of nosocomial infections for:
 - i) Identified risk factors, sources, reservoirs, modes of transmission
 - ii) Control measures
 - d) Identify resources needed for investigation
 - i) Time
 - ii) Additional data sources (e.g. EPIC reports, environmental assessment, assessment of clinical practices)
 - iii) Additional laboratory tests that might be needed (e.g. surveillance cultures, environmental cultures or strain typing). Collaborate with Microbiology Laboratory.
 - iv) Assistance for analysis
 - e) Determine the type of study (descriptive, case-control, or cohort) and identify the selection of control cases if applicable
 - f) Develop a data collection tool
 - g) Notify clinical leadership of area(s) affected.
- 6) Conduct investigation
 - a) Collect data
 - i) Descriptive epidemiology: describe events in terms of person, place, and time
 - ii) Control data if needed for case-control or cohort study
 - iii) Draw an epidemic curve
 - b) Evaluate the event
 - i) Identify any possible linkage (e.g. patients in adjacent rooms, patients identified serially to the same room, or patients who underwent the same procedure)
 - ii) Analyze initial data
 - iii) Determine if additional data or laboratory tests are needed.
 - c) Develop a hypothesis for possible source

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- d) Collect any additional data needed
- e) Analyze data and interpret results: revise hypothesis if necessary
- 7) Communicate with clinical leadership throughout the investigation
- 8) Develop and implement interventions based on
 - a) Analysis: risk factors associated with infections
 - b) Literature search for best practices
 - c) Collaborate with clinical leadership
- 9) Assess effectiveness of interventions and revise as necessary
- 10) Summarize and present findings

Investigation of an epidemiologically significant infection:

- 1) Notify ICHE Director of case and plan an investigation
- 2) Verify the diagnosis and potential association with the healthcare facility (hospital, procedure area, or ambulatory care location)
- 3) Report infection to public health as required (e.g., TB, legionellosis)
- 4) Plan investigation
 - a) Develop a case definition
 - b) Review data prior to the outbreak period
 - i. Search for additional cases that might not have been recognized as healthcare-associated
 - ii. If the disease is spread person-to-person, look for an index patient
 - iii. Identify a prospective surveillance system to identify future cases
 - c) Consult Microbiology Laboratory: Request that isolates or specimens be saved for additional testing, if needed
 - d) Search literature for similar instances of nosocomial infections for:
 - i. Identified risk factors, sources, reservoirs, modes of transmission
 - ii. Identify resources needed for investigation
 - iii. Time
 - iv. Additional data sources (e.g. EPIC reports, environmental assessment, assessment of clinical practices)
 - v. Additional laboratory tests that might be needed (e.g. surveillance cultures, environmental cultures or strain typing). Collaborate with Microbiology Laboratory.
 - e) Develop a data collection tool
 - f) Notify clinical leadership of area(s) affected
- 5) Conduct investigation
 - a) Collect data
 - b) Descriptive epidemiology: describe event in terms of person, place and time
- 6) Evaluate the event
 - a) Identify any possible linkage with the index case (if known) or potential source

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- b) Develop a hypothesis for possible source
 - c) Communicate with appropriate leadership (e.g., BOF if an environmental source is suspected).
- 7) Collect any specimens or additional data needed
- 8) Analyze data and interpret results: revise hypothesis if necessary
- 9) Communicate with clinical leadership throughout the investigation
- 10) Develop and implement interventions to prevent additional cases based on:
 - a) Analysis: risk factors associated with infection
 - b) Literature search for best practices
 - c) Input from clinical leadership
- 11) Assess effectiveness of interventions and revise as necessary
- 12) Summarize and present findings

- References
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 3. OYong K, Coelho L, Bancroft E, Terashita D. Health Care–Associated Infection Outbreak Investigations in Outpatient Settings, Los Angeles County, California, USA, 2000–2012. Emerg Infect Dis. 2015;21(8):1317-1321.
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