Centers for Disease Control and Prevention
National Center for Emerging and Zoonotic Infectious Diseases

Public health surveillance for cholera

GTFCC Guidance Document 2024

Maryann Turnsek, CDC
Atlanta Georgia USA
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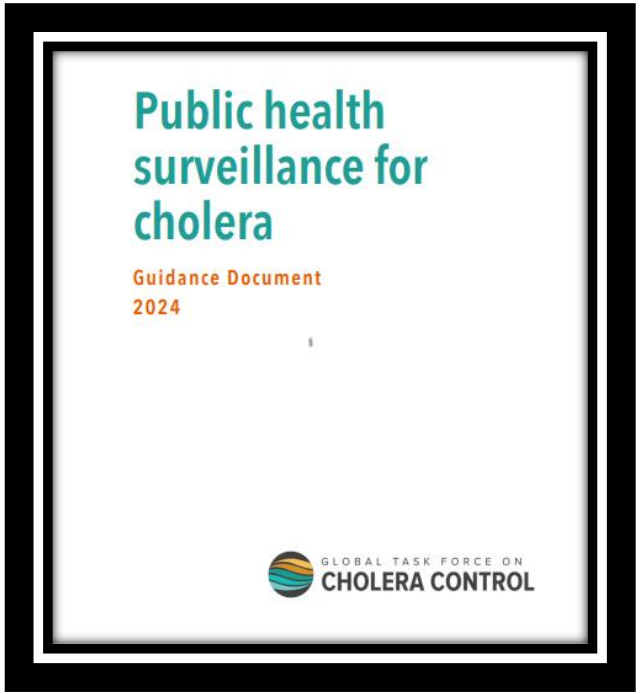
Outline

- Brief statement on the target audience and intended use
- Highlight
  - new content and improvements
  - core functions for cholera surveillance
  - cholera surveillance strategies
- Compare the descriptions and objectives for the different cholera situations
- Highlight recommendations on laboratory capacity, test decentralization, operational considerations, and performance monitoring
- Describe in detail the recommendations for testing and reporting for the different cholera situations

Public health surveillance for cholera 2024 Guidance

- Provides the **minimum recommendations** for Ministries of Health, local public health professionals, public health institutes, WHO Country Offices, and partners to implement adaptive, **fit-for-purpose surveillance** to support cholera control and elimination.
- Addresses commonly encountered cholera **transmission scenarios**, and how key surveillance strategies can be adapted to those situations.
- Recommendations should be adapted in country to ensure their effective and sustainable operationalization as part of an integrated surveillance system
  - Not a surveillance protocol
  - May need to be tailored to local contexts



What's new?

- Cholera situations for adaptive surveillance
  - Absence vs presence of a **probable or** confirmed cholera outbreak
  - **Cluster transmission**
- Revised structure
  - Section 1: Cholera surveillance core functions
  - Section 2: Cholera surveillance strategies
  - Appendices and supporting material

What's new?

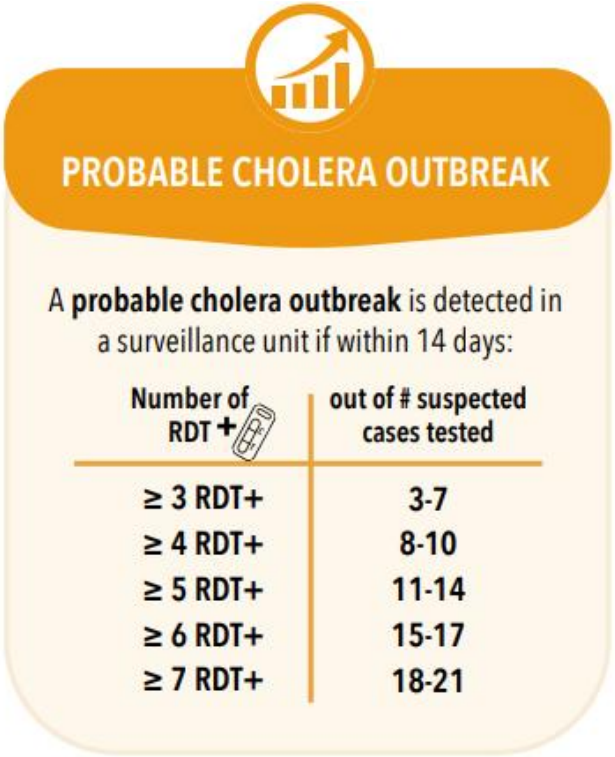
- Performance monitoring ***NEW CORE FUNCTION***
- Numerous additions and clarifications to the definitions used for detecting suspected and confirmed cholera cases and outbreaks
- Refined the standard case-based dataset for health facility-based surveillance ***NEW CASE INVESTIGATION FORM***
- Added clarifications on response measures to a suspected vs probable vs confirmed cholera outbreak

What's new?

- RDT testing additions and clarifications
  - RDTs can be used to rule out suspected cholera
  - More flexibility is given to customize the testing scheme by RDTs for the purpose of outbreak monitoring
  - No recommendation to encourage the use of RDTs as part of community-based surveillance
  - Considerations for RDT supply planning

What's new?

- Clarifications for the expanded use of RDTs to support early outbreak detection and monitoring
- Added definition and example of a probable cholera outbreak



Section 1: Cholera surveillance core functions

- Functions that should be continuously performed in order for surveillance to effectively serve its purpose. Applicable in any cholera situation.
  - **Detection** of suspected cholera cases
  - **Testing** of suspected cholera cases
  - **Routine collection and reporting** of epidemiological and laboratory data
  - **Immediate notification and verification** of suspected, probable, and confirmed cholera outbreaks
  - **Case and field investigation**
  - **Analysis and interpretation** if epidemiological and laboratory data
  - **Dissemination of findings** to inform public health interventions
  - **Monitoring of surveillance performance**

Section 2: Cholera surveillance strategies

- Adaptive surveillance strategies are defined as changes in how **surveillance core functions** are performed **at the surveillance-unit level** depending on the **prevailing cholera situation**.
- Adaptive strategies include
  - Case definitions
  - Testing strategies
  - Reporting timelines
  - Frequency of data analysis and interpretation
  - Case investigation strategies
  - Performance indicator definitions

Surveillance units

Surveillance unit

The lowest administrative level at which: i) decisions are made to trigger cholera prevention and control measures; and ii) surveillance findings are used to inform local public health interventions.

The corresponding administrative level is country specific. It should be no bigger than the scale of geographic operational units defined in a country's National Cholera Plan (NCP) (typically administrative levels two or three).

Cholera surveillance: situational descriptions at the surveillance unit level

CHOLERA SITUATION	DESCRIPTION
Absence of a probable or confirmed cholera outbreak	Possible occurrence of suspected cholera cases(s), confirmed imported cholera case(s), or a suspected cholera outbreak
Presence of a probable or confirmed cholera outbreak	
➢ **Community transmission**	A probable or confirmed cholera outbreak in which confirmed cholera cases are not all epidemiological linked, or the documentation of epi links was not undertaken
➢ **Clustered transmission**	A confirmed cholera outbreak for which it has been demonstrated (based on the finding of case investigations) that all confirmed cholera cases are epidemiologically linked (i.e., no community transmission)

Cholera surveillance: situational objectives at the surveillance unit level

CHOLERA SITUATION	DESCRIPTION	OBJECTIVES
Absence of a probable or confirmed cholera outbreak	Possible occurrence of suspected cholera cases(s), confirmed imported cholera case(s), or a suspected cholera outbreak	Rapidly detect, investigate, and respond to any suspected, probable, or confirmed cholera outbreak to contain its spread
Presence of a probable or confirmed cholera outbreak		
➢ **Community transmission**	A probable or confirmed cholera outbreak in which confirmed cholera cases are not all epidemiological linked, or the documentation of epi links was not undertaken	Monitor the morbidity, mortality, and case fatality ration in affected populations to guide interventions to mitigate the impact and spread of the outbreak
➢ **Clustered transmission**	A confirmed cholera outbreak for which it has been demonstrated (based on the finding of case investigations) that all confirmed cholera cases are epidemiologically linked (i.e., no community transmission)	Rapidly detect, confirm, investigate, and respond to cluster(s) of cholera cases to interrupt transmission and prevent the onset of community transmission

Laboratory testing, reporting, and monitoring performance

Minimum testing capacity

- Laboratory capacity should be strengthened across all levels of the health system to accurately confirm *Vibrio cholerae* as the causative agent, to monitor outbreaks, and to allow testing for antimicrobial susceptibility and the characterization of strains through genotyping, if warranted.

Minimum testing capacity

At least on in-country reference laboratory should:

- ✓ Have the capacity to isolate and identify *Vibrio cholerae* by culture
- ✓ Have the capacity to perform PCR at least for toxin testing
- ✓ Have the capacity to perform AST
- ✓ Support the analysis, interpretation, and reporting of laboratory results at a national level
- ✓ Support sample collection and transport (e.g., through training of field staff)
- ✓ Ensure all labs under its supervision are provided with the necessary materials and supplies for sample collection, preparation, and transport, as well as the reagents and supplies needed for confirmation
- ✓ Ensure the initial training and ongoing competency of technicians
- ✓ Monitor laboratory testing quality

Decentralized testing

- Countries are encouraged to decentralize testing capacity.
  - Expands network of expertise
  - Improves turnaround times for test results
  - Reduces time / cost of sample transport
  - Mitigates risk of overwhelming national lab if concurrent outbreaks occur

Operational considerations

- Countries are encouraged to collaborate with international reference laboratories for external quality assurance, and to temporarily offset a lack of capacity for PCR toxin testing and/or WGS.
- Each lab is responsible to ensure that that supplies are verified before use (e.g., successfully pass visual inspection and QC testing)
- Supply planning and procurement:
  - Consider feasibility, cost-effectiveness, long-term sustainability, and risk of wasting stocks of key supplies
  - For example: Pre-position RDTs, specimen collection / transport supplies in a subset of health facilities or with surveillance authorities where they can be rapidly deployed

Adaptive testing strategies and methods

- Rapid detection and testing of suspected cholera cases should be routinely undertaken ***[Core Function]***
  - in accordance with systematic sampling schemes ***adapted*** to the prevailing cholera situation in the surveillance unit. ***[Adaptive strategy]***

Methods include:

- Rapid diagnostic tests (RDTs)
- Culture
- Polymerase Chain Reaction (PCR)
- Antimicrobial susceptibility testing (AST)
- Whole genome sequencing (WGS)

Recommended testing in absence of probable or confirmed outbreak

ABSENCE OF A PROBABLE OR CONFIRMED OUTBREAK: Testing strategy for confirmation of cases and characterisation of strains	
Testing strategy for confirmation of cases if RDTs are available	
RDT testing	Test all suspected cholera cases by RDT
Laboratory testing (culture or PCR)	**Test all suspected cholera cases with RDT+ results by culture and/or PCR** including, if warranted, testing for toxigenicity
Testing strategy for confirmation of cases if RDTs are unavailable	
Laboratory testing (culture or PCR)	**Test all suspected cholera cases by culture and/or PCR** including, if warranted, testing for toxigenicity*
Testing strategy for characterisation of strains in confirmed cases	
AST	**Perform AST** at minimum **on the index confirmed cholera case** (first confirmed case)
WGS	**WGS is encouraged for confirmed imported cholera case(s)** (when there is uncertainty about the origin of importation) but it is not required for public health interventions

Recommended testing in community transmission situation

PRESENCE OF A PROBABLE OR CONFIRMED OUTBREAK (COMMUNITY TRANSMISSION): Testing strategy for confirmation of cases and characterisation of strains	
Testing strategy for confirmation of cases if RDTs available	
RDT testing	Test the first 3 suspected cholera cases per day per health facility by RDT
Laboratory testing (culture or PCR)	Test 3 RDT+ per week per surveillance unit by culture and/or PCR
Alternative testing strategy for confirmation of cases if RDTs are unavailable	
Laboratory testing (culture or PCR)	Test the first 3 suspected cholera cases per week per health facility by culture and/or PCR
Testing strategy for characterisation of strains in confirmed cases	
AST	**Perform AST on first 5 confirmed cholera cases** per surveillance unit. **Then, perform AST on at least 3 confirmed cholera cases per surveillance unit per month.**
WGS	**Performing WGS on a subset of confirmed cholera cases is encouraged** (if access to WGS is available) but this is not required to support public health interventions.

Recommended testing in clustered transmission situation

CLUSTERED CHOLERA TRANSMISSION: Testing strategy for confirmation of cases and characterisation of strains	
Testing strategy for confirmation of cases if RDTs are unavailable	
Laboratory testing (culture or PCR)	Test all suspected cholera cases by culture and/or PCR
Alternative testing strategy for confirmation of cases if RDTs are available	
Testing by RDTs	**Test all suspected cholera cases by RDT** **Test all suspected cholera cases with RDT+ results by culture and/or PCR**
Testing strategy for characterisation of strains in confirmed cases	
AST	**Perform AST** at minimum **on the index confirmed** (first confirmed) **cholera case**
WGS	If access to WGS is available, **performing WGS on at least one confirmed cholera case is encouraged** particularly if there is uncertainty about the origin of the cluster. However, WGS is not required for public health intervention.

Routine reporting

- Both epidemiological and laboratory data on suspected cholera cases should be routinely reported ***[Core function]***
  - The minimum frequency depends on the prevailing cholera situation ***[Adaptive strategy]***

CHOLERA SITUATION	OBJECTIVES	FREQUENCY OF REPORTING
Absence of a probable or confirmed cholera outbreak	➢ Rapidly detect, investigate, and respond to any suspected, probable, or confirmed cholera outbreak to contain its spread	***Daily reporting*** *of suspected cholera cases*
Presence of a probable or confirmed cholera outbreak		
➢ **Community transmission**	➢ Monitor the morbidity, mortality, and case fatality ration in affected populations to guide interventions to mitigate the impact and spread of the outbreak	***Weekly reporting*** *of suspected cholera cases*
➢ **Clustered transmission**	➢ Rapidly detect, confirm, investigate, and respond to cluster(s) of cholera cases to interrupt transmission and prevent the onset of community transmission	***Daily reporting*** *of suspected cholera cases*

Routine reporting

- Labs should report case-based data on samples received, tested, and the results (positive and negative) by type of test (e.g., RDT, culture / seroagglutination, PCR / toxigenicity) to local health authorities and to health facilities where samples were collected.
  - Results for culture / PCR should be available within a maximum of 4 days after specimen receipt at the laboratory.
  - Information regarding the antimicrobial susceptibility should also be reported, if available, to guide the treatment of patients.

3. CHOLERA TESTING			
Date of laboratory result	DATEOFLAB	If a specimen was sent to the laboratory for culture or PCR testing, date (yyyy-mm-dd) of laboratory result	
Culture and seroagglutination result	TESTEDCULTURE	What was the result of culture and seroagglutination?	Positive O1 Positive O139 Negative Inconclusive Not performed Pending
PCR result: serogroup	TESTEDPCR	What was the PCR result for the serogroup?	Positive O1 Positive O139 Negative Inconclusive Not performed Pending
PCR result: toxigenicity	VCTOXIGEN	What was the PCR result for toxigenicity?	Toxigenic Nontoxigenic Inconclusive Not performed Pending
Antimicrobial susceptibility testing (AST)	TESTEDAST	What were the results of the antimicrobial susceptibility testing?	Susceptibility to Azithromycin (AZ) Susceptibility to Ciprofloxacin (CIP) Susceptibility to Pefloxacin (PEF) Susceptibility to Tetracycline (TE) Susceptibility to Doxycycline (DO) Susceptibility to Erythromycin (EM) Not performed Pending

Performance monitoring

- Performance monitoring refers to the **weekly assessment** for surveillance performance, **focusing on the implementation of critical surveillance strategies** to assess whether they are performed according to established procedures and targets. ***[Core function]***
- Since some key cholera surveillance strategies are adaptive, **performance indicator definitions** should also be adaptive to serve their purpose. ***[Adaptive strategy]***
- Conducted at upper (e.g., national, provincial) and surveillance unit levels

Testing indicators

- At the surveillance unit level
  - Adherence to testing strategy (RDT, if applicable)
  - Adherence to testing strategy (culture and/or PCR)
  - Timeliness of sample receipt by the laboratory
- At upper levels (e.g., provincial, national)
  - Proportion of culture and/or PCR **results reported within 4 days of sample receipt** at the laboratory (timeliness of reporting lab results)
  - Proportion of suspected cases for which a samples was received at a laboratory for testing by culture and/or PCR with an associated laboratory result (i.e., not pending) recorded in a surveillance database (integrating epidemiological and laboratory data) (%)


thank you
danke
謝謝
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merci
obrigado
dziękuję
bedankt
teşekkür ederim
ngiyabonga
go raibh maith agat
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