Cholera surveillance



# for health authorities



# AL TASK FORCE ON DERACONTROL

# Cholera surveillance for health authorities

# Early detection of outbreaks



# With case studies

# Get ready for this module

### Before taking this module, complete Module 2 'Core functions'



# Cholera surveillance for health authorities





## What will you learn?

- **Surveillance strategies** for the early detection of cholera outbreaks
- How health authorities
  - **Monitor** that these strategies are **effectively implemented**
  - **Analyze, verify, and interpret** data to detect a potential outbreak
  - Investigate, disseminate findings, and coordinate rapid response if an outbreak is detected

## Get ready to practice



### Case studies

- **Based on fictional scenarios**
- To deepen your understanding of how health • authorities detect cholera outbreaks

### Use the GTFCC Surveillance Guidance



https://tinyurl.com/cholerasurv2024

# Surveillance for early detection

### Where

In surveillance units where there is **NO probable or confirmed outbreak** 



### How

► In accordance with this module



### To detect a cholera outbreak early

### For **response measures** to contain its spread to be **implemented rapidly**



Reporting and testing strategies

Photo adapted from: WHO / Mulugeta Ayene

## Case definition



Various diseases can cause AWD, especially in young children

Criteria on age & severe dehydration

- Avoid triggering frequent false alarms
- Make surveillance and testing for **early detection more efficient**





Suspected cholera cases reported to the health authority within 24 hours

Reporting within a day is essential not to delay the detection of an outbreak



If on a given week, no suspected cholera case was seen

Absence of suspected cases reported to the health authority weekly 

• Zero reporting

Health facility-based surveillance and community-based surveillance Ο





### **ALL** suspected cholera cases are tested

### Screening by RDT

### If RDTs ARE available

On ALL suspected cases •

### **Confirmatory testing**

### ■ If RDTs ARE available

On ALL suspected cases RDT+ •

### If RDTs NOT available

- On ALL suspected cases
- By culture (incl seroagglutination) and/or PCR

### On first sample culture+ and/or PCR+

- •
- - unit(s)
  - and
- $\bigcirc$

### **Additional tests**

### Antimicrobial susceptibility testing

### **Testing for toxigenicity**

if no confirmed outbreak in other surveillance

no epidemiological link to a confirmed case or source of exposure in another country

Oversight of reporting & testing by health authorities



Photo adapted from: WHO / Genna Print

# Oversight



### Awareness and capacity building

- Health authorities ensure that
  - All reporting sites and laboratories in the surveillance unit
  - Are aware and in capacity to implement reporting and testing in 0 accordance with applicable strategies



### Monitoring

- Health authorities monitor surveillance performance indicators
  - At least on a **weekly** basis 0
  - Take supportive measures as needed Ο

# Let's pratice

# .00 Oversight of reporting & testing by health authorities





You are a local health authority officer in a surveillance unit with no cholera outbreak

### It's Monday, on week 4 You review surveillance performance indicators for the previous week

| Surveillance performance indicators            | Target | Week 1 | Week 2      | Week 3      |
|--|--------|--------|-------------|-------------|
| Reporting - Health facility-based surveillance |        |        |             |             |
| Completeness                                   | 80%    | 95%    | <b>90</b> % | <b>95</b> % |
| Timeliness                                     | 80%    | 90%    | 85%         | <b>90</b> % |
| Reporting - Community-based surveillance       |        |        |             |             |
| Completeness                                   | 80%    | 90%    | <b>95</b> % | <b>70</b> % |
| Timeliness                                     | 80%    | 85%    | <b>95%</b>  | <b>69</b> % |
| Testing  |        |        |             |             |
| Testing by RDT                                 | 0%     | 0%     | 0%          | 0%          |
| Testing by culture or PCR                      |        | 100%   | 100%        | 100%        |
| Timeliness of sample receipt at laboratory     | 80%    | 85%    | <b>90</b> % | <b>90</b> % |



- 1) Do you have any concern regarding how reporting and testing have been implemented on week 3?
- 2) If so, what would do next?

# Answers

### **Concerns on week 3** 1)

### **Completeness and timeliness of community-based reporting**

Dropped below the target on week 3 

| Surveillance performance indicators            | Target | Week 1 | Week 2       | Week 3      |
|--|--------|--------|--------------|-------------|
| Reporting - Health facility-based surveillance |        |        |              |             |
| Completeness                                   | 80%    | 95%    | <b>90</b> %  | 95%         |
| Timeliness                                     | 80%    | 90%    | 85%          | <b>90</b> % |
| Reporting - Community-based surveillance       |        |        |              |             |
| Completeness                                   | 80%    | 90%    | <b>95</b> %  | <b>70</b> % |
| Timeliness                                     | 80%    | 85%    | 95%          | 69%         |
| Testing  |        |        |              |             |
| Testing by RDT                                 | 0%     | 0%     | 0%           | 0%          |
| Testing by culture or PCR                      | 80%    | 100%   | <b>100</b> % | 100%        |
| Timeliness of sample receipt at laboratory     | 80%    | 85%    | <b>90</b> %  | <b>90</b> % |

- For other performance indicators, minimum performance targets have been reached
  - Overall health facility-based reporting and testing performed according to applicable strategies Ο
- Absence of testing by RDT does not raise concerns
  - Target for RDT testing is 0: RDT testing not implemented in the surveillance unit Ο

# Answers

### 2) What to do

### Break down the indicators of concern at a finer geographic scale

- To better assess where the issue might be
- Will help investigate the issue to resolve it

End of case study (hypothetical scenario)

- 4 geographic areas in the surveillance unit
- Indicators of concern for each geographic area

| Reporting - Community-based surveillance | Week 3 |
|--|--------|
| Completeness                             |        |
| Area A                                   | 90%    |
| Area B                                   | 5%     |
| Area C                                   | 95%    |
| Area D                                   | 90%    |
| Timeliness                               |        |
| Area A                                   | 90%    |
| Area B                                   | 1%     |
| Area C                                   | 95%    |
| Area D                                   | 90%    |

- **Issue:** In Area B
- - 0
  - Ο



### **Area B contacted by health authority** Most volunteers had their phone stolen

Reporting performed by text messages

**Next step:** Volunteers rapidly **reequipped** 

# Data analysis and interpretation

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Photo adapted from: WHO / NOOR / Alixandra Fazzina



### Health authorities immediately analyze and interpret the data to detect a potential suspected, probable, or confirmed outbreak



Learn about outbreak definitions in Module 2

### Data considered



- Data reported by **health facility-based surveillance**
- Data reported by **community-based surveillance**
- Test results reported by **laboratories** •
- Signals from event-based surveillance

# Verification & notification

As soon as a potential suspected, probable, or confirmed cholera outbreak is detected, health authorities undertake verification and immediate notification



### **Immediate notification**

**Immediately notify** next upper level

Verified suspected, probable, or confirmed cholera outbreak

# Let's pratice



Analyze and interpret surveillance data to detect a suspected cholera outbreak





You are a local health authority officer in a surveillance unit with no cholera outbreak so far

**RDTs: Not available in your surveillance unit** On 10 October, you have received 2 cholera case report forms from one hospital **First suspected cases reported in October** 

### **Key information from case report forms**





- What is your interpretation of the cholera situation? 1)
- 2) What would you do next?

### **Case B**

Sex: Female Age: 43 years old **Date of onset: 09 October Dehydration:** Some

# Answers

### 1) Cholera situation



### Unclear

- Two patients have been reported as suspected cholera cases
  - May correspond to a suspected cholera outbreak  $\bigcirc$
- **Insufficient information** to assess if they match the suspected case definition
  - Age of case A?  $\bigcirc$
  - Dehydration level of case B? Ο

**Premature** to conclude that there is a suspected outbreak

**Imprudent** to conclude that there is no suspected outbreak

### 2) What to do next

**Contact the hospital** reporting focal point

- To learn more and better assess the situation
- Verification





Continuation of scenario

### The hospital reporting focal point provided additional information

### **Additional information**



Is there a verified suspected cholera outbreak?
 What are your key messages to the reporting focal point?



### Case B

**Respiratory distress at admission** 

# Answers

### 1) Is there a verified suspected cholera outbreak?

- Case A is  $\geq$  2-year-old
- Case B had one danger sign indicating severe dehydration
- Suspected cholera case definition met

Verified suspected cholera outbreak

### Severe dehydration

### One or more danger signs

- Lethargic or unconscious
- Absent or weak pulse
- Respiratory distress

### OR at least two of the following

- Sunken eyes
- Not able to drink or drinks poorly
- Skin pinch goes back very slowly

# Answers

### 2) Key messages to reporting focal point

### **Congratulate on**

Cholera case report forms sent to local health authorities in a **timely** manner 

### Sensitize on

- Criteria to assess the level of dehydration
- How to **fill cholera case report forms** in a comprehensive manner



### **Check whether**

- Patients rehydrated by IV considering severe dehydration
- Samples collected and sent to a **laboratory for testing**

# Let's pratice



Analyze and interpret surveillance data to detect a probable cholera outbreak





You are a local health authority officer in a surveillance unit with no probable or confirmed cholera outbreak so far

### **Today is 16 November**

You review the data reported in the last 14 days (data was verified)

| Period             | Date        | Number of suspected cases | Number of<br>suspected cases<br>tested by RDT | Number of<br>suspected cases<br>tested RDT + |
|--------------------|-------------|---------------------------|---|--|
| Last<br>14<br>days | 03 November | 0                         | 0   | 0  |
|                    | 04 November | 0                         | 0   | 0  |
|                    | 05 November | 0                         | 0   | 0  |
|                    | 06 November | 0                         | 0   | 0  |
|                    | 07 November | 0                         | 0   | 0  |
|                    | 08 November | 0                         | 0   | 0  |
|                    | 10 November | 0                         | 0   | 0  |
|                    | 09 November | 0                         | 0   | 0  |
|                    | 11 November | 1                         | 1   | 1  |
|                    | 12 November | 0                         | 0   | 0  |
|                    | 13 November | 0                         | 0   | 0  |
|                    | 14 November | 0                         | 0   | 0  |
|                    | 15 November | 0                         | 0   | 0  |
|                    | 16 November | 3                         | 3   | 2  |

### 1) What is the cholera situation as of 16 November?

# Answers

### 1) Cholera situation as of 16 November

| Pro | hah | threa |  |
|-----|-----|-------|--|
|     |     | Ulea  |  |

| <pre># of suspected   cases tested</pre>      | # of RDT+  |
|---|--|
| <b>3-7</b><br>8-10<br>11-14<br>15-17<br>18-21 | <ul> <li>≥ 3 RDT+</li> <li>≥ 4 RDT+</li> <li>≥ 5 RDT+</li> <li>≥ 6 RDT+</li> <li>≥ 7 RDT+</li> </ul> |

- In the past 14 days
  - Ο
  - 3 tested **positive by RDT**

### There is a probable cholera outbreak

# 4 suspected cases tested by RDT

Threshold for a probable outbreak reached

Make sure that samples were collected for confirmatory testing

Respond without waiting for laboratory results

# Investigation



Photo adapted from: WHO / NOOR / Alixandra Fazzina

# Case investigation

### As soon as a verified (suspected, probable, or confirmed) cholera outbreak is detected, health authorities conduct case investigation on ALL suspected cases within 24 hours



### Classify suspected cases by origin of infection

- Locally acquired
- Imported
  - Domestically or internationally

### Rapidly orient **field investigation**

# Field investigation

If

- Verified (suspected, probable, or confirmed) cholera outbreak detected and
- Case investigations did not conclude that all cases were imported

Multisectoral field investigation within 24 hours





• Source(s) of contamination Context of transmission

**Risk factors for spread** 

# Let's pratice



Use the findings of case investigations to classify cases by origin of infection





You are a local health authority officer in a surveillance unit with a verified suspected cholera outbreak

1 suspected cholera case reported and tested positive by RDT No other suspected cholera case reported so far **Case investigation performed** 

### **Case report form**

- **Gender:** Female
- Age: 39 years old
- **Date of onset: 25 July**
- **Date of visit: 28 July**
- **Deydration:** Severe
- **RDT result:** Positive O1
- **Specimen for testing:** Yes (result pending)

- Dates of travel: 10-27 July
- **Destination:** Village with cholera outbreak in a neighboring surveillance unit (same country)
- **Comments:** Purpose of travel, attend funeral of a relative who died from cholera



### 1) What is the geographic origin of infection of this case?

2) If this case is laboratory confirmed, will there be a confirmed cholera outbreak in your surveillance unit?

### **Case investigation**

Travel in the 5 days before onset: Yes



### 1) Classification of geographic origin of infection

### **Domestically imported**



### 2) Cholera situation if this case is confirmed

No confirmed cholera outbreak in this surveillance unit

Confirmed cholera outbreak if a confirmed case was locally acquired in the surveillance unit considered 

### **Domestically imported**

Did not travel abroad • Infected in another surveillance unit

# Let's pratice



# Use the findings of case investigation to orient field investigation





You are a local health authority officer in a surveillance unit with no outbreak so far

### Today is 27 March, 3 suspected cholera cases have just been reported (verified)

### **Suspected case 1**

- **Reporting facility: Hospital A**
- **Gender:** Male
- Age: 21 years old
- Place of residence: Village 1
- Date of onset: 25 March
- Date of visit: 27 March
- **Deydration:** Severe
- **RDT result:** Positive O1
- **Specimen for testing: Yes**

### **Suspected case 2**

- **Reporting facility: Clinic B**
- **Gender:** Female
- Age: 32 years old
- Place of residence: City 2
- Date of onset: 26 March
- Date of visit: 27 March
- **Deydration:** Severe
- **RDT result:** Positive O1
- **Specimen for testing: Yes**
- 1) What is the current cholera situation in your surveillance unit?
- 2) What would you do to better characterize the situation?
- 3) In which locality the field investigation team should go first?

### **Suspected case 3**

- **Reporting facility: Clinic C**
- **Gender:** Female
- Age: 17 years old
- Place of residence: Village 3
- Date of onset: 25 March
- Date of visit: 27 March •
- **Deydration:** Severe
- **RDT result:** Not performed
- **Specimen for testing: Yes**

# Answers

### **Current cholera situation** 1)



- $\geq$  2 suspected cases reported within 7 days
- $\geq$  1 suspected case tested RDT+ (but probable outbreak threshold not met)

### **To better characterize the situation** 2)



**Determine whether there is a probable outbreak** 

- Contact clinic C to follow up on RDT testing
- Determine if any suspected case is locally acquired
- Perform case investigations
- **Determine if there is confirmed cholera outbreak**
- Follow up on results of confirmatory testing



### 3) Locality the field investigation team should go to first

### No solid recommendation can be made

Case investigations are required to orient the field investigation

### Continuation of previous scenario

### You performed case investigations

### **Suspected case 1**

Practice

•Travel history: Village 3 (19 – 22 March) •Occupation: Seller at principal market of Village 3 •Main source of drinking water: Piped into dwelling •Other source: Water kiosk at Village 3 market

•Travel history: Village 3 (17 – 21 March)

### **Suspected case 3**

•Travel history: None (stayed in Village 3) •Main source of drinking water: Piped into dwelling •Other source : Water kiosk at Village 3 market •Comment: Visited the principal market on 22 March

1) In which locality the field investigation team should go first?

2) Which location of this locality the team should pay attention to?



### **Suspected case 2**

•Occupation: Seller at principal market of Village 3 •Main source of drinking water: Piped to neighbor •Other source: Water kiosk at Village 3 market

# Answers

### 1) Locality the field investigation team should go to first



### Village 3

- All suspected cases have been in Village 3
- One suspected case has only been in Village 3

### 2) Location the field investigation team should pay attention to



Village 3 market, including water kiosk

39

# Dissemination of outcomes and response

Photo adapted from: WHO / NOOR / Billy Miaron

# Inform stakeholders

### As soon as a (suspected, probable, or confirmed) cholera outbreak is detected all stakeholders immediately informed

**Essential to trigger prompt actions** to rapidly respond to the outbreak



### **Stakeholders**

- Upper-level health authority
- Multisectoral stakeholders, partners, agencies involved in responding to cholera
- Etc



Health professionals, community health workers / volunteers

## Response to a suspected outbreak

### **Suspected cholera outbreak**

### Immediate public health measures for acute diarrhoeal diseases without waiting for laboratory confirmation



### Not specific to cholera

- Raising awareness on rehydration protocols
- Promoting handwashing with soap
- Raising awareness on food hygiene
- Education about how diarrhoeal infections spread
- Etc



# Response to a probable or confirmed outbreak

**Probable or confirmed cholera outbreak** 

### Rapid, comprehensive, and multisectoral cholera outbreak response

Triggered without waiting for laboratory confirmation if it is a probable outbreak



- Including
  - Case management
  - Surveillance

  - WaSH
  - Vaccination



Community engagement

# Adaptive surveillance

### **Suspected outbreak**

### **No change in surveillance strategies**

**Increase awareness of surveillance** stakeholders on surveillance strategies

### Surveillance stakeholders

- Health facilities
- Community health workers / volunteers
- Laboratories



### Surveillance strategies

Case definition Data collection Reporting timelines Testing strategy

# Adaptive surveillance

### **Probable or confirmed outbreak**

### Surveillance strategies adapted



### **Inform and train** surveillance stakeholders

- Health facility workers
- Community health workers / volunteers
- Laboratories



### Learn about surveillance strategies in Modules 4 & 5

Wrap up





Respond

Coordinate rapid response





## **Question 1**



### When the surveillance objective is to detect a cholera outbreak, health authorities review surveillance performance indicators to monitor that: Select all that apply

- a) Suspected cholera cases are reported within 24 hours
- b) Suspected cholera cases are reported on a weekly basis
- c) The absence of suspected cholera cases is reported within 24 hours
- d) The absence of suspected cholera cases is reported on a weekly basis
- e) All suspected cholera cases are tested for cholera
- f) A subset of suspected cholera cases selected according to a systematic sampling scheme are tested for cholera

## Question 1 – Answers



### When the surveillance objective is to detect a cholera outbreak, health authorities review surveillance performance indicators to monitor that:

### a) Suspected cholera cases are reported within 24 hours

- b) Suspected cholera cases are reported on a weekly basis
- c) The absence of suspected cholera cases is reported within 24 hours
- e) All suspected cholera cases are tested for cholera
- **f**) sampling scheme are tested for cholera

### d) The absence of suspected cholera cases is reported on a weekly basis

A subset of suspected cholera cases selected according to a systematic

### Question 2



### When the surveillance objective is to detect a cholera outbreak, health authorities:

immediately to detect a suspected, probable, or confirmed cholera outbreak

to interpret the disease situation in a robust manner

- a) Analyze, verify, and interpret reports of suspected cholera cases and test results
- b) Compile and analyze reports of suspected cholera cases and test results weekly

## Question 2 – Answer



When the surveillance objective is to detect a cholera outbreak, health authorities:

### a) Analyze, verify, and interpret reports of suspected cholera cases and test results immediately to detect a suspected, probable, or confirmed cholera outbreak

b) Compile and analyze reports of suspected cholera cases and test results weekly to interpret the disease situation in a robust manner

## **Question 3**



### At the onset of a verified suspected, probable, or confirmed cholera outbreak, health authorities perform case investigation:

- a) On all suspected cholera cases
- b) On all confirmed cholera cases
- c) On a subset of suspected cholera cases

### Question 3 – Answer



### At the onset of a verified suspected, probable, or confirmed cholera outbreak, health authorities perform case investigation:

### a) On all suspected cholera cases

- b) On all confirmed cholera cases
- c) On a subset of suspected cholera cases

# Together we can #Endcholera



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