

Cholera Outbreak Investigation in Homa Bay County, Kenya (2015)

Group B

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Question 1: What is Public Health Surveillance?

Answer: Public health surveillance is the continuous, systematic collection, analysis, and interpretation of health data to help inform decision-making. In this case, the Integrated Disease Surveillance Response (IDSR) in Kenya was used to monitor disease patterns and detect potential outbreaks of cholera.

Question 2: Should the Disease Surveillance Coordinator Report?

Answer: Yes, the county disease surveillance coordinator should report the outbreak. Given the increase in acute watery diarrhoea cases and the severe clinical symptoms, this could be indicative of a cholera outbreak. Reporting it immediately to the Ministry of Health ensures that appropriate resources and measures can be mobilized for investigation and control. Early detection and response are critical in preventing further spread of cholera.

Question 3a: What Samples Should Be Collected?

Answer: Stool samples from suspected cholera patients should be collected for laboratory testing. This is the most common sample type used for cholera diagnosis. The laboratory should test for **Vibrio cholerae**, specifically serotype 01 Ogawa and Inaba, which was confirmed in the Nairobi outbreak.

Question 3b: Recommendations for Sample Collection, Transportation, and Testing

Answer:

- **Collection:** Stool samples should be collected in clean, sterile containers, well-labeled with name, age, location, gender, and date/time of collection.
- **Transportation:** Samples should be transported to the laboratory as quickly as possible (preferably within 6 hours). If transportation is delayed, they should be kept cool (4°C) and sealed to avoid contamination.
- **Testing:** Use selective media (TCBS agar) for culture testing, and PCR for confirmation of **Vibrio cholerae**.

Question 4: What Role Does the Laboratory Play?

Answer: The laboratory plays a crucial role in confirming the presence of **Vibrio cholerae**, identifying the strain (e.g., Ogawa or Inaba), and ensuring accurate identification of the outbreak. It is essential for guiding control measures and informing treatment or vaccination strategies.

Question 5a: What is the Definition of an Outbreak?

Answer: An outbreak is the occurrence of cases of a disease in a population or geographic area greater than what is normally expected. This cholera outbreak exceeded the usual number of diarrhoeal cases in Homa Bay County, making it an outbreak.

Question 5b: Number of Confirmed Cases Required to Declare an Outbreak

Answer: According to the Kenya Ministry of Health guidelines, a cholera outbreak is typically declared when there are two or more confirmed cases. In this case, five confirmed cases were enough to declare the outbreak and initiate a response.

Question 6: What Preparations Should Be Made?

Answer:

- **Scientific:** Finalize case definitions, ensure lab testing, gather data collection tools (forms for case listings, surveys).
- **Administrative:** Coordinate logistics (transport, safety protocols), communicate with stakeholders (Ministry of Health), and secure funding/resources.

Question 7: Steps of an Outbreak Investigation

Answer:

- 1. Confirm the Outbreak:** Verify the increase in cases through data analysis.
- 2. Define the Case:** Create a standard case definition.
- 3. Describe the Epidemiology:** Analyze cases by time, place, and person.
- 4. Formulate Hypotheses:** Identify potential sources (e.g., contaminated water).
- 5. Test the Hypothesis:** Conduct cohort studies or case-control studies.
- 6. Implement Control Measures:** Apply interventions like chlorination and hygiene education.
- 7. Communicate Findings:** Share results with stakeholders and the public.
- 8. Monitor and Evaluate:** Assess the effectiveness of interventions.

Question 8: What is a Case Definition?

Answer: A case definition includes clinical, epidemiological, and laboratory criteria used to classify individuals as suspected, probable, or confirmed cases. This ensures consistent identification of cases during an outbreak investigation.

Question 9a: Active vs Passive Surveillance

Answer:

- **Active Surveillance:** Public health authorities actively search for cases (house-to-house visits, health facility checks).
- **Passive Surveillance:** Health facilities report cases as they occur.
- **Active Surveillance** is **more effective** during an outbreak to ensure no cases are missed and timely interventions are made.

Question 9c: Suggested Case Definitions for Cholera

Answer:

- **Suspected Case:** Acute watery diarrhoea with exposure to cholera risk factors (e.g., contaminated water).
- **Probable Case:** Acute watery diarrhoea with severe dehydration, vomiting, or muscular cramps.
- **Confirmed Case:** Stool test positive for **Vibrio cholerae** serogroup O1.

Question 10: Where to Look for Additional Cases?

Answer:

- **Health Facilities:** Visit all health facilities, especially smaller centers.
- **Community-Level Surveillance:** Conduct house-to-house surveys.
- **Water Sources and Public Places:** Investigate water sources and public gatherings like markets and schools.
- **Migratory Populations:** Focus on mobile populations (e.g., travelers, traders).

Question 11a: Distribution of Cholera Cases by Age and Sex

Age Group	Male	Female	Total	M Frequency (%)	F Frequency (%)	Unknown (%)
< 5	7	9	16	1.97%	2.54%	0.00%
5–14	12	26	38	3.38%	7.32%	0.00%
15–24	24	42	66	6.76%	11.83%	0.00%
25–49	50	84	134	14.08%	23.66%	0.00%
≥ 50	35	60	95	9.86%	16.90%	0.00%
Missing Age	1	5	6	0.28%	1.41%	0.00%
Total	129	226	355	36.34%	63.66%	0.00%

Table: Distribution of cholera cases by age and sex, Homa Bay County, Kenya, February–April 2015

Question 11b: Who Was More Affected, Males or Females?

Answer:

- **Females were more affected** than males. Females made up **62.24%** of the total cholera cases, while males made up **36.17%**.
- **Why?** Females may have higher exposure to cholera due to caregiving roles, food handling, and water collection responsibilities.

Question 12: Case Fatality Rate (CFR)

Answer:

- **CFR Calculation:** $\text{CFR} = \left(\frac{5 \text{ deaths}}{355 \text{ total cases}} \right) \times 100$ - **CFR = 1.41%** for this outbreak.

Question 13: Epidemic Curve Interpretation

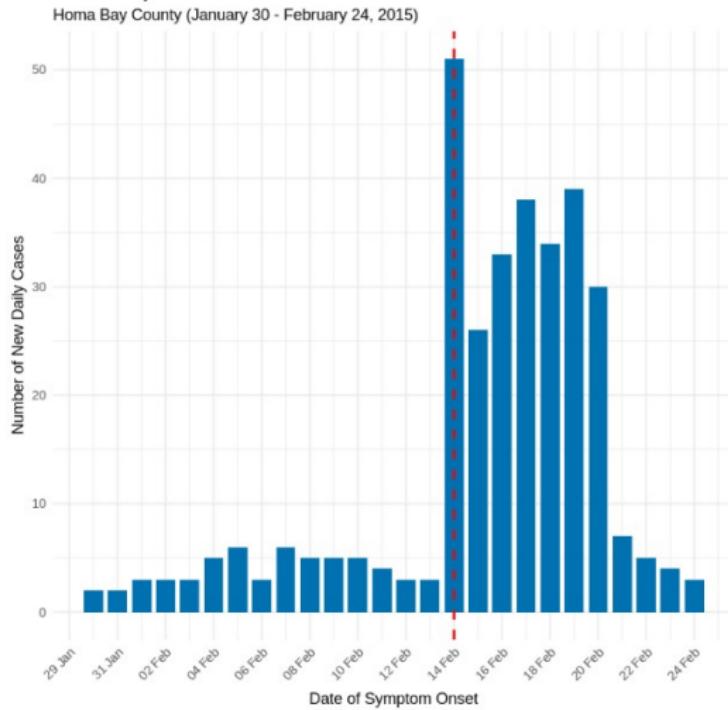


Figure: Epidemic curve of cholera cases in Homa Bay County (Jan 30 - Feb 24, 2015)

Interpretation of the Curve

Interpretation:

The graph shows a sudden big increase in cases around mid-February, suggesting a major exposure. After that, cases stayed high for a short time and then slowly decreased.

Question 14: Control and Prevention Measures

Answer:

- **Water Safety:** Stop using River Riana, provide safe water sources, and treat water.
- **Sanitation:** Increase latrine coverage, improve waste disposal, and reduce open defecation.
- **Hygiene:** Educate on handwashing and safe food practices.
- **Case Management:** Equip health facilities and maintain active surveillance.

Question 15: Community Engagement

Answer:

- **Health Education:** Conduct campaigns on cholera prevention.
- **Community Leaders:** Involve local leaders and health workers in spreading awareness.
- **Local Solutions:** Involve communities in latrine construction and water treatment demonstrations.

Question 16: Sharing Findings

Answer:

- **Reports & Bulletins:** Prepare and distribute written reports to stakeholders.
- **Meetings:** Hold regular stakeholder meetings to review findings and coordinate actions.
- **Media:** Use community radio and press releases for public awareness.