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Conducting a Surveillance Data Quality Audit in Grand Bassa County, Liberia, November 2015

Joseph Asamoah Frimpong, Maame Pokuah Amo-Addae, Peter Adebayo Adewuyi, Casey Daniel Hall Meeyoung Mattie Park, and Thomas Knue Nagbe

African Case Studies in Public Health

Participants' Guide

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PanAfrican Medical Journal

Conducting a Surveillance Data Quality Audit in Grand Bassa County, Liberia, November 2015

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Abstract

Public health officials depend on timely, complete, and accurate surveillance data for decision making. The quality of data generated from surveillance is highly dependent on external and internal factors which may either impede or enhance surveillance activities. One way of identifying challenges affecting the quality of data generated is to conduct a data quality audit. This case study, based on an audit conducted by residents of the Liberia Frontline Field Epidemiology Training Program, was designed to be a classroom simulation of a data quality audit in a health facility. It is suited to enforce theoretical lectures in surveillance data quality and auditing. The target group is public health trainees, who should be able to complete this exercise in approximately 2 hours and 30 minutes.

How to Use the Case Study

General instructions: A class of up to 20 trainees is ideal for a training sessions using this case study. The instructor facilitating the session should direct a participant to read a paragraph out loud, going around the room to give each participant a chance to read. Based on the type of question, the instructor may decide to divide the class into small groups for exercises, randomly identify a trainee to respond to the question, or engage the class in a group discussion of the answer. The aim of the interaction is to allow participants to learn from each other and not just from the instructor. Specific instructor's notes are included with each question in the instructor's version of this case study.

Audience: Residents in Frontline Field Epidemiology Training Programs (FETP-Frontline), Field Epidemiology and Laboratory Training Programs (FELTPs), and others who are interested in this topic.

Prerequisites: For this case study, trainees should have received lectures on data quality, data quality auditing, and SWOT analysis.

Materials needed: Flipchart or white board with markers

Level of training and associated public health activity: Novice – Data Quality Auditing

Time required: Approximately 2-3 hours

Language: English

Participant's Guide

Goal of Case Study: To simulate data quality auditing in a health facility

Learning Objectives - After completion of this case study, the participants should be able to:

1. Describe the purpose of data quality audits
2. Prepare for a data quality audit
3. Use a data quality audit tool
4. Identify strengths, weakness, opportunities and threats in a surveillance system
5. Make recommendations based on data quality audit
6. Share findings and recommendations with stakeholders
7. Develop a data quality audit report

Introduction

In 2014, Liberia experienced an outbreak of Ebola virus disease (EVD) which claimed the lives of many locals [1]. The Ministry of Health (MoH) realised, in attempting to rapidly assess and effectively manage the outbreak, that there were major gaps in their surveillance and response system. In reaction, the Ministry of Health developed an Investment Plan for Building a Resilient Health System (2015-2021) to outline the strategy for developing a health system "that is able to anticipate, detect early, respond to and quickly recover from health emergencies" [2]. To help the MoH achieve its objectives, 92 district surveillance officers (DSOs) were recruited and trained to serve as supervisors at the district and community level. As part of their training, they were enrolled in a Frontline Field Epidemiology Training Program (FETP-Frontline) to equip them with the necessary skills for their work.

The newly trained DSO for District A appreciated the importance of collecting quality data to support effective surveillance. She recognised that although surveillance had been ongoing in her district over the years, the quality of data was a pressing concern. She therefore made it her mandate to improve the quality of data from her district by applying new skills learned in FETP-Frontline training [3]. To achieve this, the DSO conducted a data quality audit in District A to identify existing gaps in surveillance activities and take action based on findings [3].

Question 1. What is data quality in surveillance?

Question 2. What are some of the data quality issues in public health surveillance? Discuss.

Question 3. What are some of the common sources of errors in data collection and entry? Discuss.

Question 4. What initial preparations should be made before conducting a data quality audit in a facility?

Part 1

Following approval by the County Health Officer and District Health Officer, the data quality audit was carried out by the District A DSO from 19-21 November 2015 in the three health facilities (Clinics A, B and C) which provided healthcare to the district. The DSO conducted interviews with key staff in the facilities and completed a data quality audit worksheet (see Appendix 1) based on direct observations. The worksheet included questions regarding data collection, reporting, analysis, interpretation, public health action, and evaluation conducted by the health facility [3].

Question 5. In relation to surveillance, whom will you consider as key staff in your health facilities and why?

Question 6. Review the data quality worksheet below. Indicate how you will verify information provided by facility staff under each activity during the audit.

Activity	#	Question	Method of Verification
1a. Data Collection – General	1	Is there an information flow for reporting to the district level (diagram or description)?	
	2	How frequently do you review and collect data (e.g. daily, weekly, monthly)?	
	3	Is there a list of the country's notifiable diseases?	
	4	Is there a list of immediately reportable diseases (IRD)?	
	5	For each IRD, does this facility have case definitions for suspect and confirmed cases? (e.g. polio, TB, Ebola, yellow fever)	

1b. Data Collection – Case Report or Line Item Form	1	Are immediately reportable diseases recorded on a case form or line item form?	
	2	Is the case form or line item form paper-based or electronic?	
	3	If paper, do you have an adequate supply of case report or line item forms?	
	4	Is your facility using them?	
	5	Do you get feedback about the final diagnosis?	
1c. Data Collection – Register Cases	1	For suspected cases, what material is reviewed to determine suspected cases (e.g. patient chart, facility record, case form, line list)?	
	2	For suspected cases, how was diagnosis assessed (e.g. laboratory confirmatory tests, patient's signs and/or symptoms, patient history, or consultation)?	
	3	Are IRD recorded in the clinic register or facility line list according to the country-specific case definition?	
2a. Report	1	Who is responsible to report IRD (health care provider, laboratory, institution)?	
	2	When was the last time a supervisor made a site visit to your facility?	
	3	How often do you report information to the next level?	

	4	Is there a standard method for reporting each reportable disease?	
	5	Is there a standard method for reporting each immediately reportable disease?	
	6	Is there a standard method of reporting an outbreak?	
	7	Is the report case-based or aggregate format?	
	8	Is the reporting protocol process mapped out or summarised in narrative format and readily visible in the facility (e.g. on the wall)?	
	9	For notifiable diseases, are "0" cases recorded and reported?	
	10	For immediately reportable diseases such as Ebola, are "0" cases recorded and reported?	
	11	Are each of the IRD consistently reported in a timely manner (e.g. polio, TB, Ebola, yellow fever)?	
3a. Analyse and Interpret	1	Does your facility regularly provide graphics that illustrate your facility's data for priority diseases?	
	2	If so, where are the graphics/images posted (e.g. book, wall, computer file)?	
	3	Are trend lines up-to date for this/these IRDs?	

	4	Is the distribution of suspected or confirmed cases plotted on a district map?	
	5	Does your facility regularly compare your data with similar facilities in the district?	
4a. Action	1	How quickly were IRD, either suspected or confirmed, reported to the district office (e.g. within x hours)?	
	2	Is there a laboratory in this facility to identify IRDs?	
	3	Is there a protocol/plan for submitting suspected specimens to laboratory for disease confirmation?	
	4	Is there a method to explicitly record laboratory-confirmed cases?	
	5	Are there supplies appropriate (rapid test kits, swabs, laboratory medium) for identifying the IRDs?	
	6	Do you have the name and complete contact information (e.g. phone number, email, fax) for the District supervisor?	
5a. Evaluation	1	Is the facility aware of the monitoring indicators?	
	2	Do facilities regularly receive feedback about their performance?	
	3	Does the facility have a process to check the accuracy of their data?	

Question 7. Form three groups with each group representing a facility. Select one member from each group who will role play as the DSO for District A. The remaining group members will serve as key staff in the facilities. The person playing the role of the DSO will complete the DQA worksheet (see Appendix 1) based on information provided by those playing the role of key staff (see Appendix 2).

Part 2

After successful completion of the audit at each health facility, the DSO used the opportunity to sensitise the health workers on diseases of high priority, as well as the importance of careful and regular case reporting. On return from her visit, she decided to perform a SWOT analysis of her findings [3].

Question 8. What is a SWOT analysis?

Question 9. What is the difference between strengths and opportunities in a SWOT analysis?

Question 10. What is the difference between weaknesses and threats in a SWOT analysis?

Question 11. Using the information gathered from the mock interview, conduct a SWOT analysis of your findings.

The DSO prepared her recommendation based on SWOT findings. A summary report was developed and shared with all stakeholders for prompt action to be taken. The DSO decided to focus on actions that were within her control and to follow up on other stakeholders to ensure that other outstanding recommendations were implemented [3].

Question 12. If you were the DSO, what recommendations would you give regarding this delegation process? Outline the problems/challenges, recommendations, and person responsible.

Question 13. Who might be considered a stakeholder in surveillance for District A?

International	National	Local

Question 14. How will you disseminate your findings?

A month after the District A DSO conducted the data quality audit, her supervisor, the County Surveillance Officer (CSO), conducted an assessment to measure any improvement in surveillance activities at the facilities. From his assessment, he observed that facilities started drawing crude spot maps for priority diseases in their catchment area based on training they received from the DSO. The health facilities also monitored the trend of priority diseases using a line graph. The CSO also observed that Officer in Charge of the facility was now routinely verifying surveillance data captured at the facility [3].

Question 15. Prepare a summary report for the data quality audit as per this case study. *Hint: Your report should have the following sections with headings: Introduction, Methods, Results (SWOT analysis), Recommendation, and Conclusion*

Conclusion

The data quality audit helped the District A DSO to identify key factors influencing surveillance data quality in the district. In action taken after the quality audit, there was remarkable improvement in the accuracy and completeness of the data produced.

A strong surveillance system needs to have an effective way of systematically collecting, analysing, and interpreting quality surveillance data to inform public health action. To ensure early detection and response to diseases of concern as well as to maintain a healthy population, a strong surveillance at the lowest level is the first point of call. However, health care workers are often faced with major constraints which hinders their ability to carry out their duties effectively, thereby affecting the timeliness and quality of data reported. Monitoring and evaluation of surveillance activities at the facility and community level will help to sustain the efforts made in improving data quality as well as build a strong partnership among districts and communities for early disease detection and effective response.

Background Reading

Food Security and Nutrition Network. *Data Quality Audit (DQA) tools. 2007.* *http://www.fsnnetwork.org/sites/default/files/data_quality_audit_tool.pdf*

Acknowledgements

We wish to thank African Field Epidemiology Network and Emory University for supporting African-based case study development. We acknowledge residents of the Liberia Field Epidemiology Training Program and Ministry of Health, Liberia for allowing us to use their data for this case study.

Appendix 1

Officer Name: _____	**X District**	Facility Name: _____
Date of Visit: _____	**Data Quality Audit**	

Persons Met

Name	Title

ACTIVITY	#	In this facility…	Notes
1a. Data Collection – General	1	Is there an information flow for reporting to the district level (diagram or description)?	
	2	How frequently do you review and collect data (e.g. daily, weekly, monthly)?	
	3	Is there a list of the country's notifiable diseases?	
	4	Is there a list of immediately reportable diseases (IRD)?	
	5	For each IRD, does this facility have case definitions for suspect and confirmed cases?	
1b. Data Collection – Case Report or Line Item Form	1	Are immediately reportable diseases recorded on a case form or line item form?	
	2	Is the case form or line item form paper-based or electronic?	
	3	If paper, do you have an adequate supply of case report or line item forms?	
	4	Is your facility using them?	
	5	Do you get feedback about the final diagnosis?	
1c. Data Collection – Register Cases	6	For suspected cases, what material is reviewed to determine suspected cases (e.g. patient chart, facility record, case form, line list)?	
	7	For suspected cases, how was diagnosis assessed (e.g. laboratory confirmatory tests, patient's signs and/or symptoms, patient history, or consultation)?	

Immediately Reportable Diseases

IRD (example)	Suspect	Confirmed
Polio		
TB		
VHF (e.g., Ebola)		
Yellow Fever		
Other, specify:		

<table>
<tr><th>ACTIVITY</th><th>#</th><th>In this facility…</th><th>Notes</th></tr>
<tr><td></td><td>8</td><td>Are IRD recorded in the clinic register or facility line list according to the country-specific case definition?</td><td></td></tr>
<tr><td rowspan="2">1d. Thoughts on Data Collection</td><td colspan="2">List possible causes of omissions or problems</td><td></td></tr>
<tr><td colspan="2">List recommended solutions, including target date and persons responsible</td><td></td></tr>
<tr><td rowspan="12">2a. Report</td><td>1</td><td>Who is responsible to report IRD (health care provider, laboratory, institution)?</td><td></td></tr>
<tr><td>2</td><td>When was the last time a supervisor made a site visit to your facility?</td><td></td></tr>
<tr><td>3</td><td>How often do you report information to the next level?</td><td></td></tr>
<tr><td>4</td><td>Is there a standard method for reporting each reportable disease?</td><td></td></tr>
<tr><td>5</td><td>Is there a standard method for reporting each immediately reportable disease?</td><td></td></tr>
<tr><td>6</td><td>Is there a standard method of reporting an outbreak?</td><td></td></tr>
<tr><td>7</td><td>Is the report case-based or aggregate format?</td><td></td></tr>
<tr><td>8</td><td>Is the reporting protocol process mapped out or summarised in narrative format and readily visible in the facility (e.g. on the wall)?</td><td></td></tr>
<tr><td>9</td><td>For notifiable diseases, are "0" cases recorded and reported?</td><td></td></tr>
<tr><td>10</td><td>For immediately reportable diseases such as Ebola, are "0" cases recorded and reported?</td><td></td></tr>
<tr><td>11</td><td>Are each of the IRD consistently reported in a timely manner?
<table>
<tr><th colspan="3">Immediately Reportable Diseases</th></tr>
<tr><th>IRD (example)</th><th>Yes</th><th>No</th></tr>
<tr><td>Polio</td><td></td><td></td></tr>
<tr><td>TB</td><td></td><td></td></tr>
<tr><td>VHF (e.g., Ebola)</td><td></td><td></td></tr>
<tr><td>Yellow Fever</td><td></td><td></td></tr>
<tr><td>Other, specify:</td><td></td><td></td></tr>
</table></td><td></td></tr>
<tr><td rowspan="2">2b. Thoughts on Report</td><td colspan="2">List possible causes or omissions or problems</td><td></td></tr>
<tr><td colspan="2">List recommended solutions, including target date and person responsible</td><td></td></tr>
<tr><td rowspan="3">3a. Analyse and Interpret</td><td>1</td><td>Does your facility regularly provide graphics that illustrate your facility's data for priority diseases?</td><td></td></tr>
<tr><td>2</td><td>If so, where are the graphics/images posted (e.g. book, wall, computer file)?</td><td></td></tr>
<tr><td>3</td><td>Are trend lines up-to date for this/these IRDs?</td><td></td></tr>
</table>

ACTIVITY	#	In this facility…	Notes
	4	Is the distribution of suspected or confirmed cases plotted on a district map?	
	5	Does your facility regularly compare your data with similar facilities in the district?	
3b. Thoughts on Analyse and Interpret	List possible causes or omissions or problems		
	List recommended solutions, including target date and person responsible		
4a. Action	1	How quickly were IRD, either suspected or confirmed, reported to the district office (e.g. within x hours)?	
	2	Is there a laboratory in this facility to identify IRDs?	
	3	Is there a protocol/plan for submitting suspected specimens to laboratory for disease confirmation?	
	4	Is there a method to explicitly record laboratory-confirmed cases?	
	5	Are there supplies appropriate (rapid test kits, swabs, laboratory medium) for identifying the IRDs?	
	6	Do you have the name and complete contact information (e.g. phone number, email, fax) for the District supervisor?	
4b. Thoughts on Action	List possible causes or omissions or problems		
	List recommended solutions, including target date and person responsible		
5a. Evaluation	1	Is the facility aware of the monitoring indicators?	
	2	Do facilities regularly receive feedback about their performance?	
	3	Does the facility have a process to check the accuracy of their data?	
5b. Thoughts on Evaluation	List possible causes or omissions or problems		
	List recommended solutions, including target date and person responsible		
Additional Information/Comments			

Appendix 2

Officer Name: _____	**X District**	Facility Name: Health Facility A
Date of Visit: _____	**Data Quality Audit**	

Persons Met

Name	Title

ACTIVITY	#	In this facility…	Notes
1a. Data Collection – General	1	Is there an information flow for reporting to the district level (diagram or description)?	Diagram available, but not on wall
	2	How frequently do you review and collect data (e.g. daily, weekly, monthly)?	Data is collected daily, but review is not done at facility level
	3	Is there a list of the country's notifiable diseases?	There is a list of the country's notifiable diseases but not on wall due to renovation
	4	Is there a list of immediately reportable diseases (IRD)?	There is a list of immediately reportable diseases but not on wall due to renovation
	5	For each IRD, does this facility have case definitions for suspect and confirmed cases?	Standard case definition charts available at the facility but not posted on wall due to renovation of health facility
1b. Data Collection – Case Report or Line Item Form	1	Are immediately reportable diseases recorded on a case form or line item form?	Case-based form is used but not filled for all cases due to shortage
	2	Is the case form or line item form paper-based or electronic?	Paper-based case form
	3	If paper, do you have an adequate supply of case report or line item forms?	Supply of case form is inadequate
	4	Is your facility using them?	Facility uses forms when available
	5	Do you get feedback about the final diagnosis?	No feedback is received

Immediately Reportable Diseases

IRD (example)	Suspect	Confirmed
Polio		
TB		
VHF (e.g., Ebola)		
Yellow Fever		
Other, specify:		

ACTIVITY	#	In this facility…	Notes
1c. Data Collection – Register Cases	6	For suspected cases, what material is reviewed to determine suspected cases (e.g. patient chart, facility record, case form, line list)?	Patient chart, facility record and case form
	7	For suspected cases, how was diagnosis assessed (e.g., laboratory confirmatory tests, patient's signs and/or symptoms, patient history, or consultation)?	Patient signs and/or symptoms
	8	Are IRD recorded in the clinic register or facility line list according to the country-specific case definition?	Yes
1d. Thoughts on Data Collection	List possible causes of omissions or problems		
	List recommended solutions, including target date and persons responsible		
2a. Report	1	Who is responsible to report IRD (health care provider, laboratory, institution)?	Surveillance focal person
	2	When was the last time a supervisor made a site visit to your facility?	7 days ago
	3	How often do you report information to the next level?	Daily, weekly, and monthly
	4	Is there a standard method for reporting each reportable disease?	Yes, but not displayed on wall
	5	Is there a standard method for reporting each immediately reportable disease?	Yes, but not displayed on wall
	6	Is there a standard method of reporting an outbreak?	Yes, but not displayed on wall. Response initiated at local level
	7	Is the report case-based or aggregate format?	Initial report is by alert notification using a case-based form. A line list is then prepared for all identified cases
	8	Is the reporting protocol process mapped out or summarised in narrative format and readily visible in the facility (e.g. on the wall)?	Reporting protocol is mapped out but not readily visible on wall
	9	For notifiable diseases, are "0" cases recorded and reported?	Zero cases are reported and recorded in the IDSR ledger
	10	For immediately reportable diseases such as Ebola, are "0" cases recorded and reported?	Zero cases are reported and recorded in the IDSR ledger

<table>
<tr><th>ACTIVITY</th><th>#</th><th>In this facility…</th><th>Notes</th></tr>
<tr><td></td><td>11</td><td>Are each of the IRD consistently reported in a timely manner?
<table>
<tr><th colspan="3">Immediately Reportable Diseases</th></tr>
<tr><th>IRD (example)</th><th>Yes</th><th>No</th></tr>
<tr><td>Polio</td><td></td><td></td></tr>
<tr><td>TB</td><td></td><td></td></tr>
<tr><td>VHF (e.g., Ebola)</td><td></td><td></td></tr>
<tr><td>Yellow Fever</td><td></td><td></td></tr>
<tr><td>Other, specify:</td><td></td><td></td></tr>
</table></td><td>More than 80% of the reports are received on time</td></tr>
<tr><td rowspan="2">2b. Thoughts on Report</td><td colspan="2">List possible causes or omissions or problems</td><td></td></tr>
<tr><td colspan="2">List recommended solutions, including target date and person responsible</td><td></td></tr>
<tr><td rowspan="5">3a. Analyse and Interpret</td><td>1</td><td>Does your facility regularly provide graphics that illustrate your facility's data for priority diseases?</td><td>Yes – Graphs and tables are produced in monthly aggregates</td></tr>
<tr><td>2</td><td>If so, where are the graphics/images posted (e.g., book, wall, computer file)?</td><td>wall</td></tr>
<tr><td>3</td><td>Are trend lines up-to date for this/these IRDs?</td><td>Yes</td></tr>
<tr><td>4</td><td>Is the distribution of suspected or confirmed cases plotted on a district map?</td><td>Only suspected cases. Results are not received from the laboratory and therefore confirmed cases cannot be plotted</td></tr>
<tr><td>5</td><td>Does your facility regularly compare your data with similar facilities in the district?</td><td>Not done</td></tr>
<tr><td rowspan="2">3b. Thoughts on Analyse and Interpret</td><td colspan="2">List possible causes or omissions or problems</td><td></td></tr>
<tr><td colspan="2">List recommended solutions, including target date and person responsible</td><td></td></tr>
<tr><td>4a. Action</td><td>1</td><td>How quickly were IRD, either suspected or confirmed, reported to the district office (e.g. within x hours)?</td><td>Within an hour. Need to walk up the hill to get mobile network connection to make phone calls</td></tr>
<tr><td></td><td>2</td><td>Is there a laboratory in this facility to identify IRDs?</td><td>No. Lab can only perform basic lab test such as malaria RDT</td></tr>
<tr><td></td><td>3</td><td>Is there a protocol/plan for submitting suspected specimens to laboratory for disease confirmation?</td><td>Yes</td></tr>
<tr><td></td><td>4</td><td>Is there a method to explicitly record laboratory-confirmed cases?</td><td>Yes</td></tr>
<tr><td></td><td>5</td><td>Are there supplies appropriate (rapid test kits, swabs, laboratory medium) for identifying the IRDs?</td><td>Irregular supply, based on availability at county level</td></tr>
<tr><td></td><td>6</td><td>Do you have the name and complete contact information (e.g. phone number, email, fax) for the District supervisor?</td><td>Yes</td></tr>
</table>

ACTIVITY	#	In this facility…	Notes
4b. Thoughts on Action	List possible causes or omissions or problems		
	List recommended solutions, including target date and person responsible		
5a. Evaluation	1	Is the facility aware of the monitoring indicators?	Not all indicators
	2	Do facilities regularly receive feedback about their performance?	Only timeliness of reporting
	3	Does the facility have a process to check the accuracy of their data?	No
5b. Thoughts on Evaluation	List possible causes or omissions or problems		
	List recommended solutions, including target date and person responsible		
Additional Information/Comments			
• The facility is currently under renovation by IOM. • Training of health workforce in IDSR and Safe Quality Service is ongoing • District health officer is making arrangement to provide facility with high frequency radio. • Although the facility has a motorbike, the bad nature of the roads pose a great challenge during field visits especially in the rainy season.			

References

1. WHO. *Ebola Situation Report*. 2016. Geneva, Switzerland. http://apps.who.int/iris/bitstream/10665/161976/1/roadmapsitrep_15Apr2015_eng.pdf?ua=1&ua=1

2. Ministry of Health (Liberia). Investment Plan for Building a Resilient Health System: 2015-2021. 2015; (May): 1–60

3. Liberia Field Epidemiology Training Program. Data Quality Audit in District 3C of Grand Bassa County. 2016