

Assessment on Animal Health Surveillance Data Quality: The Case Study in Guchi Woreda, Borena Zone, Ethiopia 2022

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Abstract: High-quality surveillance data provide valid and useful evidence for decision-making and rapid response. Data is pieces of information; it can be defined as the elements of measurements recorded during data collection. Data quality is a measure of data condition based on factors such as accuracy, completeness, reliability, and whether it's up-to-date. There is no enough research in Ethiopia that describes the quality of animal health surveillance data reports. Therefore, the objective of the study is to analysis the animal health surveillance data of the woreda and to comment on identified problem. Retrospective case study was conducted in Guchi woreda of Borena zone, Oromia regional state. The district 2021 DOVAR report format was examined for timeliness, correctness, and completeness. To ascertain the reporting rates and quality issues, Microsoft Excel was employed. Using previously created structured interview questions, the woreda's overall data quality and associated problems were evaluated. Based on this study's evaluation of the DOVAR report, 77% of outbreaks were reported in the district last year; the remaining 22.2% of reports were zero reports. Nine reports were examined, and 66.6 % were inaccurate, while 44.4% had a timeliness issue. On the other hand, there is a problem with completeness in 77.7% of the reports. The surveillance data of the woreda have the problem of accuracy, completeness and timeliness. The woreda's goals for gathering surveillance data are well known. However, due to the high data quality issues in their DOVARs, the woreda should establish clear objectives for the data that is required, create a plan for the best way to collect the data, use standardized formats to capture the necessary data, train staff on how to collect accurate and reliable data, and store and retain data.

Keywords: Data Quality, Surveillance Data, Accuracy, Completeness, Timeliness

1. Introduction

High-quality surveillance data provide valid and useful evidence for decision-making and rapid response [7]. Data is pieces of information; it can be defined as the elements of measurements recorded during data collection [3]. "Data helps people or the office make informed decisions, which significantly increases the chances of success. In all respects, that seems to indicate that more data is a good thing. However, this is not always the case. Sometimes the data is incomplete, inaccurate, irrelevant, or not applicable to the user's needs" [11].

Data quality is usually defined as the completeness and validity of the data recorded in a health surveillance system [2, 4]. Data quality is a measure of data condition based on

factors such as accuracy, completeness, reliability, and whether it's up-to-date [9]. Data quality indicates how the data is and how useful it is for the task at hand and also refers to planning, implementing, and controlling the activities that apply the needed quality management practices and techniques required to ensure that it is actionable and valuable to the data consumer [6]. "Evidence data can be used to support good decision-making, which is one of the goals of surveillance systems. "To ensure that high-quality data are collected and stored, several factors are needed, including robust information systems that promote reliable data collection, adequate [1]. And clear methods for data collection and integration from different sources, as well as strategic data curation procedures" [11].

There are numerous techniques available to evaluate the

data quality of systems, identify strengths and weaknesses, and create improvement plans. The Data Quality Audit Tool is solely concerned with evaluating the underlying data management and reporting systems and verifying the quality of reported data [12]. The low data quality of surveillance systems has been a matter of concern worldwide. The reason is that the quality of the produced data and information directly impacts the quality of the processes that generate them.

The study was conducted in Guchi district of Borena Zone oromia regional state, Ethiopia. The district is located about 800 km south from Addis-Ababa, capital of Ethiopia, according to agricultural office total livestock population in 2014 E. C; Cattle 69,297, Goat 83,337, Sheep 39,411, Camel 39,589, Equine 36,037 and poultry 132 [8]. The woreda has one “C” type and three “D” type veterinary clinics/posts. There is four private veterinary pharmacy in the woreda. Veterinary workforce of the woreda is 1 DVM, 1 BVS and 23 animal health assistance. There is no enough research in Ethiopia that describes the quality of animal health surveillance data reports. Therefore, it is necessary to assess the quality of surveillance data reports. This study was carried out to evaluate the woreda's animal health surveillance data quality and to offer new, substantial recommendations that will aid to apply basic principles of ensuring data quality. This will finally enable the improvement of prior procedures and the generation of high-quality data that can be used as input by other stakeholders.

1.1. General Objective

The study's main goal was to evaluate, describe, and offer recommendations for the Guchi woreda Borena zone, Oromia

regional state of Ethiopia's surveillance data quality and related deficiencies.

1.2. Specific Objective

- 1) To assess the woreda's methods for gathering and managing data.
- 2) To assess the flow of information and surveillance data.
- 3) To Examine 2021 DOVAR reports to judge the accuracy of the information.
- 4) To Identify the stakeholders' level of data use awareness.
- 5) To examine the relationship between laboratory and woreda.

2. Methods

2.1. Study Area

The study was conducted in Guchi district Borena zone, Oromia regional state, Ethiopia. The woreda is located 800 km from Addis Ababa in the south direction. There are nineteen kebele in the District. Elevation rises from an about 1040 and 1150 meters above sea level. The climate of the area is characterized by arid to semi-arid climate and with recurrent drought. The average minimum and maximum temperature of areas are 24 and 32°C respectively. District record indicate that total livestock population in 2014 E. C; Cattle 69,297, Goat 83,337, Sheep 39,411, Camel 39,589, Equine 36,037 and poultry 132. Guchi type “C” veterinary clinic is selected for the study.

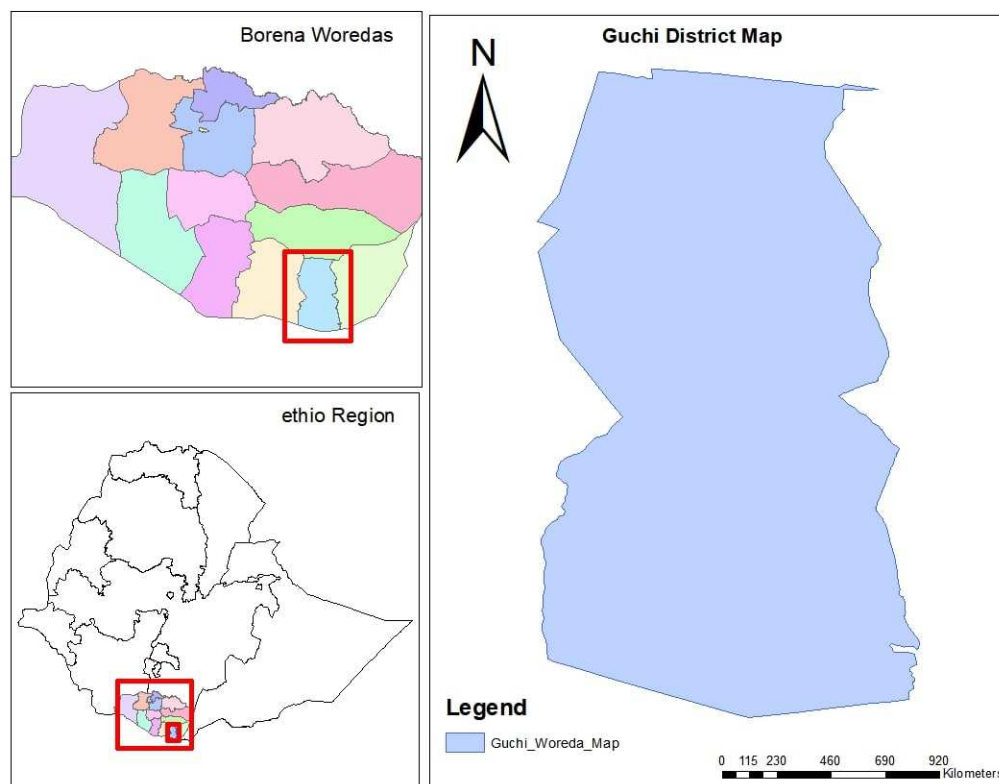


Figure 1. Study Area.

2.2. Study Design and Data Collection Technique

The study is conducted retrospectively using both quantitative and qualitative methods. To pinpoint all problems with data collection, reporting, analysis, and utilization, a data quality audit (DQA) was conducted. The accuracy, completeness, and timeliness of the data were analyzed in order to evaluate the quality of the retained 2021 DOVAR according to data quality guidelines. Key informant interviews were conducted as part of this study, and the responsible woreda animal health surveillance professionals were questioned using a pre-designed data gathering checklist. The indications and results of the data quality were counted and entered into a Microsoft Excel sheet.

2.3. Data Analysis

Microsoft Excel was used to analyze the captured data and create graphs to display it. The answers to the interviewee's questions were assessed in accordance with the data quality guidelines.

3. Result

3.1. Information Obtained from the Interview

The veterinary officer working on the kebele collects reports of diseases outbreak from the livestock owner and community animal health workers then reports to the district veterinarian by telephone. The focal Person in the district filled the outbreak in DOVAR format and after putting the office seal on the report, snapped a picture of the report, and sent it via telegram to the Yabello regional veterinary laboratory and zonal agricultural office. The woreda retain these data in their office as permanent document. However there are deficiencies in analyze the report in relation to

animal- place-time.

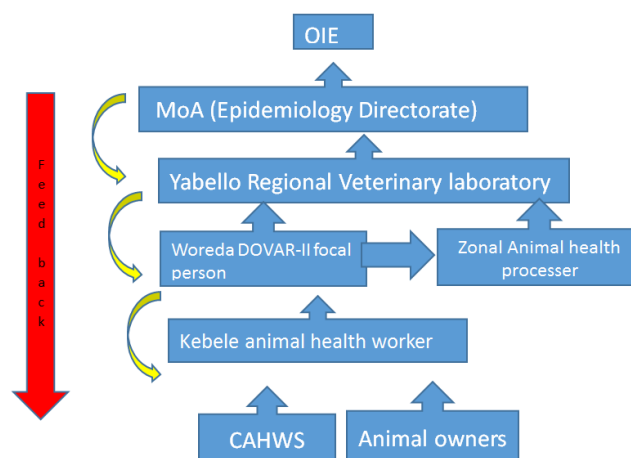


Figure 2. Animal health surveillance data flow in Guchi district.

This year we did not take any samples because it is the responsibility of yabello regional veterinary laboratory but the diseases that appear as outbreaks in this area are endemic so there were not reported to the laboratory. However, our relationship is great.

3.2. Assessments of DOVAR

Total of 12 monthly DOVAR reports expected to be sent annually in 2021 only 9 (75%) reports were received. Based on these available reports were assessed against the key data quality indicators. Only 77% (7/9) outbreaks were recorded in the district last year the rest of the reports (22.2%) are zero reports. Out of nine reviewed reports 66.6% (6/9) have inaccuracy while 44.4% (4/9) have a problem of timeliness. On the other hand 77.7% (7/9) of reports have a problem of completeness.

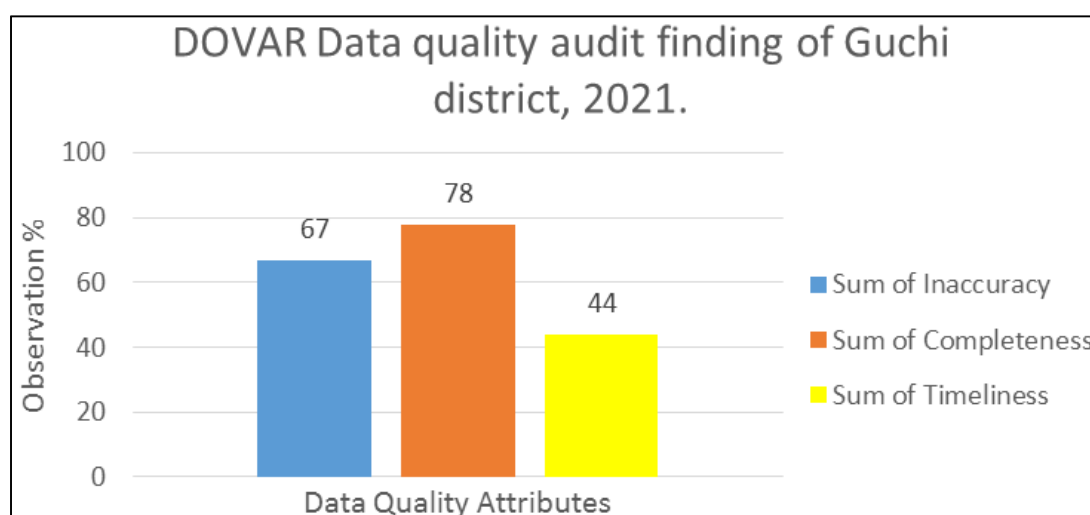


Figure 3. Data quality audit findings from DOVAR of Guchi District.

From the total completeness counted, 28.5% (2/7), 28.5% (2/7), 14% (1/7) 14% (1/7) and 14% (1/7) is related to type of unit, phone number of the reporting person, diagnosis type, outbreak reference number and disease status at the end of month respectively.

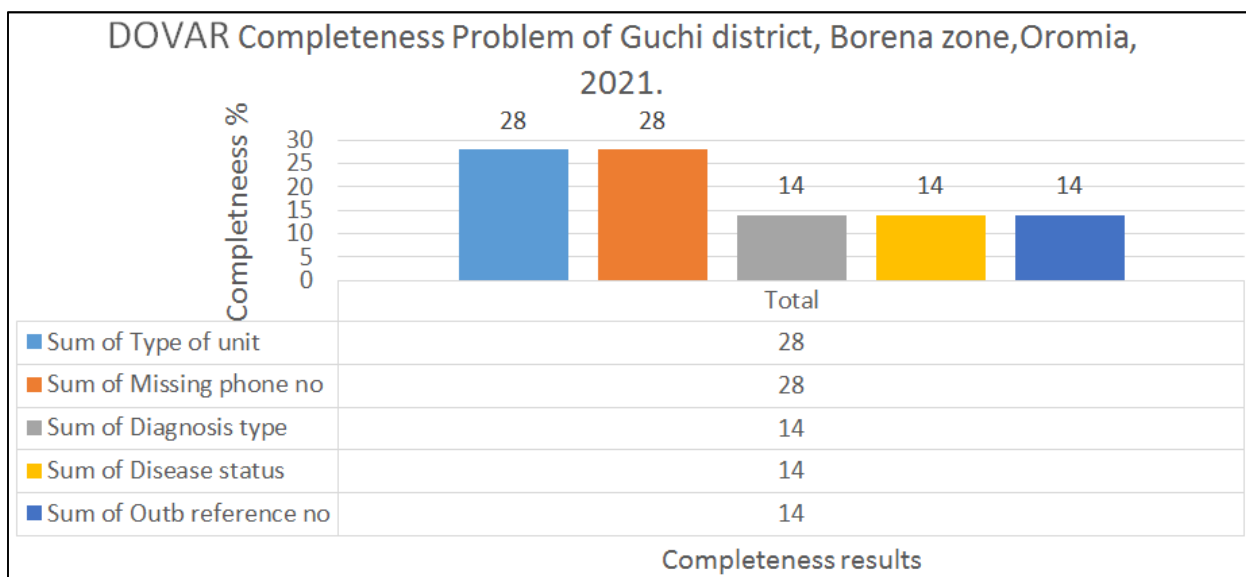


Figure 4. Data Completeness findings from DOVAR of Guchi District.

3. DETAILS OF EACH OUTBREAK REPORTED IN SUMMARY TABLE:

| Disease name and / or Sero-type of agent if known | Outbreak Reference Number | Specific Location PA/Village | Status at | Date of | In Reported Month | | | During Outbreak | | | | Population at Risk (PAR) | |
|---|---------------------------|------------------------------|-----------|---------|-------------------|---------------|--------------------|--------------------|---------------------|--------------------------|--------------------|-----------------------------|--------------|
| | | | | | No. of Cases | No. of Deaths | No. of Slaughtered | Total No. of Cases | Total No. of Deaths | Total No. of Slaughtered | Age group affected | Total no. in infected Units | Type of Unit |
| CCPP | 1 | Wolaita | | | | | | 13 | 14 | 15 | 16 | 17 | |
| CAMAL | 2 | Wolaita | | | | | | 23 | — | 1-2 | 2800 | | |
| | | | | | | | | | | 1-2 | 3800 | | |

Missing data (outbreak reference number)

Figure 5. Evidence of missing data (outbreak reference number).

Missing data
(Diagnosis and
status at the

Epidemiology Unit

Page 3

EACH OUTBREAK REPORTED IN SUMMARY TABLE:

| Disease name and / or Sero-type of agent if known | Outbreak Reference Number | Specific Location PA/Village | Status at End of Month **C or **E | Date Reported | Date of First Case | Spp | In Reported Month | | | During Outbreak | | | | Population at Risk (PAR) | | |
|---|---------------------------|------------------------------|--------------------------------------|---------------|--------------------|-----|-------------------|---------------|--------------------|--------------------|---------------------|--------------------------|--------------------|-----------------------------|--------------|----|
| | | | | | | | No. of Cases | No. of Deaths | No. of Slaughtered | Total No. of Cases | Total No. of Deaths | Total No. of Slaughtered | Age group affected | Total no. in infected Units | Type of Unit | |
| | | Lat. | | | | | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | |
| CCPP | 1 | Wolaita | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| CAMAL | 2 | Wolaita | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
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Figure 6. Evidence of missing data (Diagnosis and status at the end of month).

Figure 7 shows two pages of a report form from the Epidemiology Unit. The top page is a checklist for various diseases, and the bottom page is a detailed outbreak report table. A green box highlights missing data in the table.

Top Page: Disease Checklist

| | |
|--|-----|
| Foot & Mouth Disease | Box |
| Bluetongue | Box |
| P.P.R. | Box |
| CBPP | Box |
| Lumpy Skin Disease | Box |
| Sheep & Goat Pox | Box |
| African Horse Sickness | Box |
| Newcastle disease | Box |
| Avian Influenza | Box |
| Rabies | Box |
| Haemorrhagic Septicaemia (Pasteurella) | Box |
| Blackquarter | Box |
| Streptococcus | Box |

Bottom Page: 3. DETAILS OF EACH OUTBREAK REPORTED IN SUMMARY TABLE:

| Disease name and / or Serotype of agent if known | Outbreak Reference Number | Specific Location PA/Village | | Diagnosis is *C or *S | Status at End of Month **C or **E | Date Reported | Date of First Case | Spp | In Reported Month | | | During Outbreak | | | | Population at Risk (PAR) | |
|--|---------------------------|------------------------------|----------|-----------------------|-----------------------------------|---------------|--------------------|---------|-------------------|---------------|--------------------|--------------------|---------------------|--------------------------|--------------------|-----------------------------|--------------|
| | | Log | Lat | | | | | | No. of Cases | No. of Deaths | No. of Slaughtered | Total No. of Cases | Total No. of Deaths | Total No. of Slaughtered | Age group affected | Total no. in infected Units | Type of Unit |
| CCPP | 01/2021 | 11/11/21 | 11/11/21 | *S | **C | 19/11/21 | 11/11/21 | Cervine | 290 | 50 | - | 290 | 50 | - | all age | 3650 | Pasture |

Missing data: (phone number of the person who filled out this report is not registered on the report)

Legend:
 *C = Confirmed by laboratory
 *S = Suspected
 Log = Longitude
 Lat = Latitude

Signature and Date:
 Signed: [Signature]
 Name: Dube, Huka
 Designation: BVSc (DVM, AHA, AHT)
 Date: 26/09/2021

Figure 7. Evidence of missing data (phone number of the person who filled out this report is not registered on the report).

From the total 66.6% accuracy problem found 50% (3/6) of the reports have writing the general information on page 1 in Number and small letter which was expected to be written in capital letter. On the other hand 50% (3/6) of the reports typing error. As regards to the timeliness 44.4% (4/9) of reports were received lately.

Epidemiology Unit

Page 3

3. DETAILS OF EACH OUTBREAK REPORTED IN SUMMARY TABLE:

| Disease name and / or Sero-type of agent if known | Outbreak Reference Number | Specific Location PA/Village | Diagnosis is *C or *S | Status at End of | Date of | In Reported Month | During Outbreak | Population at Risk (PAR) |
|---|---------------------------|------------------------------|-----------------------|------------------|---------|-------------------|-----------------|--------------------------|
| CCPP | 2 | W. J. J. J. | *S | | 16/4/21 | 11/4/21 | CCPP | 19 - 21 |
| CCPP | 1 | M. J. J. J. | *S | | 16/4/21 | 11/4/21 | CCPP | 19 - 21 |

*C = Confirmed by laboratory
*S = Suspected

**C = Continuing

Inaccurate data (Outbreak reference number should be written in this way CCPP/01/2021)

Epidemiology Unit

Page 3

3. DETAILS OF EACH OUTBREAK REPORTED IN SUMMARY TABLE:

| Disease name and / or Sero-type of agent if known | Outbreak Reference Number | Specific Location PA/Village | Diagnosis is *C or *S | Status at End of | Date of | In Reported Month | During Outbreak | Population at Risk (PAR) |
|---|---------------------------|------------------------------|-----------------------|------------------|----------|-------------------|-----------------|--------------------------|
| Rabies | 2 | J. J. J. J. | *S | | 22/12/20 | 11/12/20 | Rabies | 110 - 15 |
| Haemorrhagic Septicaemia (Pasteurella) | 1 | H. J. J. J. | *S | | 22/12/20 | 11/12/20 | HS | 110 - 15 |

Inaccurate data (the name of the disease or sero-type of agent should be written here, not the livestock species)

Figure 8. Evidence of Inaccurate data.

Epidemiology Unit

Page 3

3. DETAILS OF EACH OUTBREAK REPORTED IN SUMMARY TABLE:

| Disease name and / or Sero-type of agent if known | Outbreak Reference Number | Specific Location PA/Village | Diagnosis is *C or *S | Status at End of | Date of | In Reported Month | During Outbreak | Population at Risk (PAR) |
|---|---------------------------|------------------------------|-----------------------|------------------|----------|-------------------|-----------------|--------------------------|
| CCPP | 2 | K. J. J. J. | *S | | 11/12/20 | 11/12/20 | CCPP | 110 - 15 |

Inaccurate (lack of understanding)

MINISTRY OF AGRICULTURE & RURAL DEVELOPMENT
DEPARTMENT OF ANIMAL HEALTH
MONTHLY REPORT OF DISEASE OCCURRENCE AND VACCINATIONS

MONTH & YEAR 19 2021
REGION OROMIA
ZONE AA/AA

INTRODUCTION AND COMMENTS
Mention any factors which may have affected the health and productivity of livestock in the Wereda - eg shortage of feed extreme climatic conditions etc.
If necessary, give additional information regarding the disease outbreaks included in this report about the progress of disease control programmes etc.

(Circular stamp: Ministry of Agriculture & Rural Development, Department of Animal Health, Office of Veterinary Services, Addis Ababa)

Incorrect data (month should be written in word)

| 1 | 2 | 3(a) | 3(b) | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|------|---------|---------|------|-----|----------|---------|---------|-----|----|----|-----|----|----|---------|------|------------|----|
| CCPP | 01/2021 | 11/1/21 | XS | XXC | 19/09/21 | 16/9/21 | Cervina | 290 | 50 | - | 290 | 50 | - | all age | 3650 | Post (x=1) | |

*C = Confirmed by laboratory **C = Continuing
*S = Suspected **E = Ended during month
Log = Longitude
Lat = Latitude

Signed [Signature] Name Daba Huka Designation BVS Date 26/09/2021
(DVM, AHA, AHT)

Epidemiology Unit

Past the due date for the report

Figure 9. Evidence of past the due date for the report and in correct data.

4. Discussion

The highest outbreaks 77% was recorded in 2021 this is because the diseases is widespread and recurrent in the district this finding is in agreement with studies conducted previously in the region. The outbreak is 77% higher than (Balcha & Dvm, 2022) who reported 6.7% in their study on Animal Health Surveillance Data Quality Assessment in Karsa Woreda, Jimma Zone, Oromia, Ethiopia, (unpublished, 2022) who reported (22.3%) in their study on Assessment of animal health surveillance data quality audit in Lume district, Oromia, Ethiopia.

The DOVAR quality audit study of Guchi district agricultural office shows that there is a problem of completeness, timeliness and inaccurate data. Most of which are data quality problems is completeness (77.7) in which the lack of recording type of unit (28.5) and phone number (28.5) is the biggest, on the other hand inaccurate data (66.6) is the highest problem this indicates lack of understanding during training and filling According to the guidelines of the DOVAR format. The DOVAR report should reach the laboratory within 18 to 19 days but the study found that (44.4) timelines which shows lack of attention to reporting and lack of knowledge of reporting results on time. This result is also higher than (Balcha & Dvm, 2022) who reported inaccurate data (42.8%) and problem of timeliness (31.6%) in their study on Animal Health Surveillance Data Quality Assessment in Karsa Woreda, Jimma Zone, Oromia, Ethiopia.

The animal health surveillance data of the District is collected from the community animal health worker and animal owners at kebele clinic level and shared to the District agricultural office then to Yabello regional veterinary laboratory, Oromia agricultural office and ministry of agriculture. The expert says that I have not trained this year but I have trained once before that so I will need repeated training. According to this study, the outbreak of the disease in the district is frequent and it is necessary to analyze the data they collect based on animal-time-place to take action against the diseases. The district has its own plan to provide animal health services and the professional should understand this and fill in the animal health information data in a quality manner.

5. Conclusion and Recommendation

In order to act appropriately for both the welfare and health of the animal and the general public, a powerful surveillance system must have a reliable method for gathering, analyzing, and interpreting high-quality surveillance data. At the most basic level, there should be a robust surveillance system in place to guarantee early identification and reaction to diseases of concern as well as to maintain the health of the animals. The woreda's surveillance data have a completeness, accuracy, and timeliness issue. The woreda make an effort to find missing information, mistakes, and report timeliness. In this study year, the data

collectors didn't undergo surveillance training. Because of this lack of training, the woreda's DOVARs have high data quality issue. So, I advise Guchi woreda agricultural office based on the foregoing conclusion.

- 1) Yabello regional veterinary laboratory should give priority to Guchi district when providing DOVAR training to districts.
- 2) The quality of surveillance data should be evaluated on a regular basis.
- 3) Regularly analyze woreda data and inform stakeholders so they can take appropriate action.
- 4) Have goals for obtaining animal health surveillance data that are clearly specified.
- 5) Create a detailed plan for collecting surveillance data.

Declaration of Interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethics Statement

This study did not complain with any ethical welfare and approved before conducting the research. Animal health officers were informed about the purpose of the study.

Author Contributions

GA are participated in data collection, gathering, assortment, analysis the data, wrote the manuscript and finally approved the manuscript.

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