

Evaluation of Laboratory-Based Surveillance System for Animal Health Antimicrobial Resistance in Kenya, 2023-2024

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BACKGROUND

- Globally, antimicrobial resistance (AMR) is projected to cause up to 10 million deaths by 2050.
- Kenya's situational analysis in 2011 showed AMR trends without exact burden due to lack of systematic surveillance.
- In 2017, Kenya commenced implementing veterinary laboratory-based AMR surveillance using Sistema Laboratorio (SiLAB)
- We evaluated SiLAB to assess its performance and effectiveness as an AMR surveillance system.

OBJECTIVE:

- To evaluate performance, attributes and effectiveness of SiLAB as an AMR Surveillance system in animal health.

METHODOLOGY:

- A cross-sectional descriptive design using records review, key informant interview and updated CDC guidelines for surveillance system evaluation.

STUDY AREA:

- Eight national veterinary investigation laboratories (NVILs) implementing SiLAB in Kenya

STUDY DESIGN AND SAMPLING

- Surveillance data for 2023 and 2024 was extracted SiLAB .
- Semi-structured questionnaires were administered to Key informant system users.
- Purposive sampling for key informants was based on involvement in AMR surveillance activities.

STATISTICAL ANALYSIS:

- Analysis was done using R software for descriptive statistics summarized in counts and proportions.

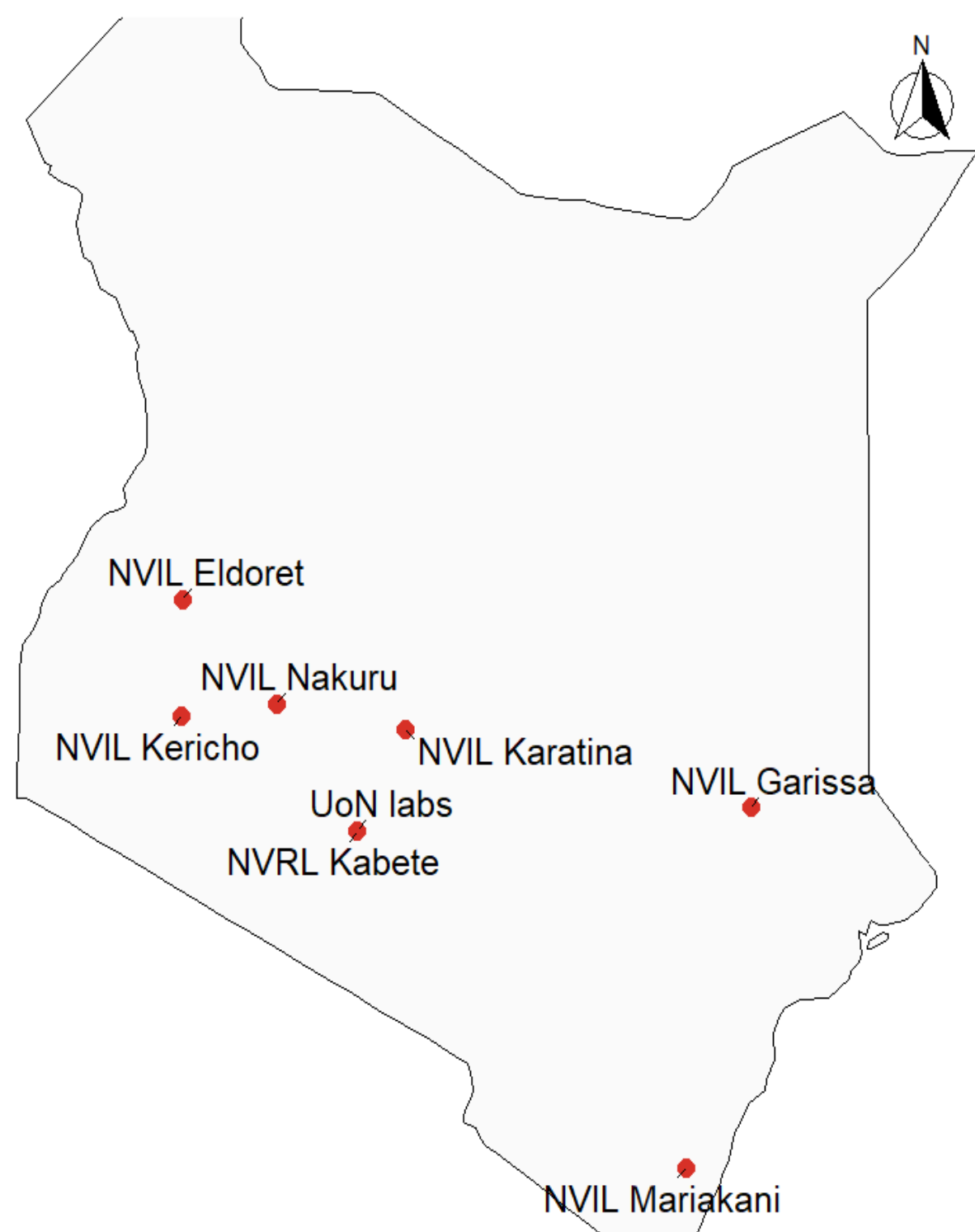


Figure 1: Spatial distribution of National Veterinary Investigation Laboratories (NVILs) implementing SiLAB in Kenya

RESULTS

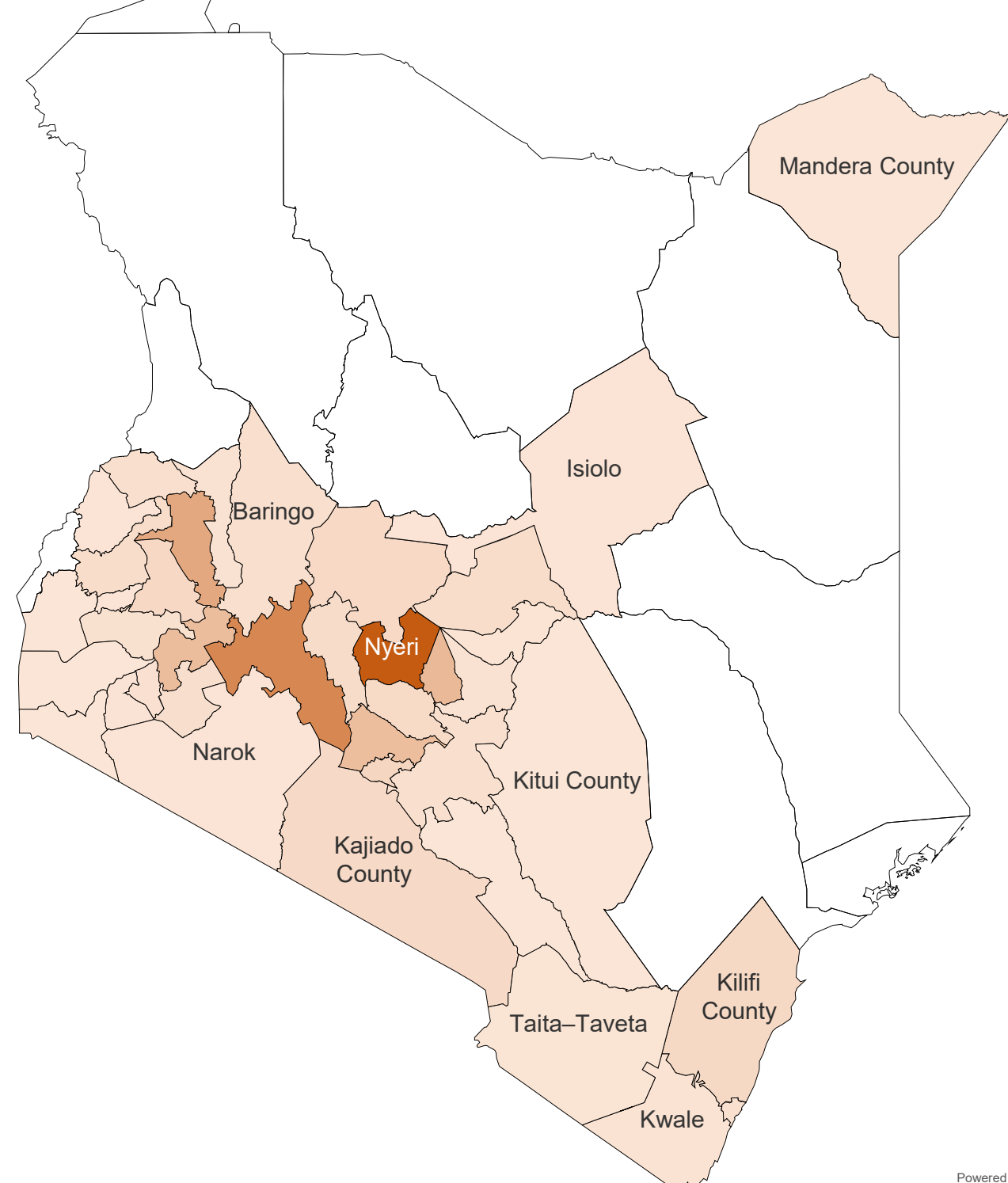


Figure 2: Map showing spatial distribution of antimicrobial resistance cases reported by SiLAB, 2023 - 2024

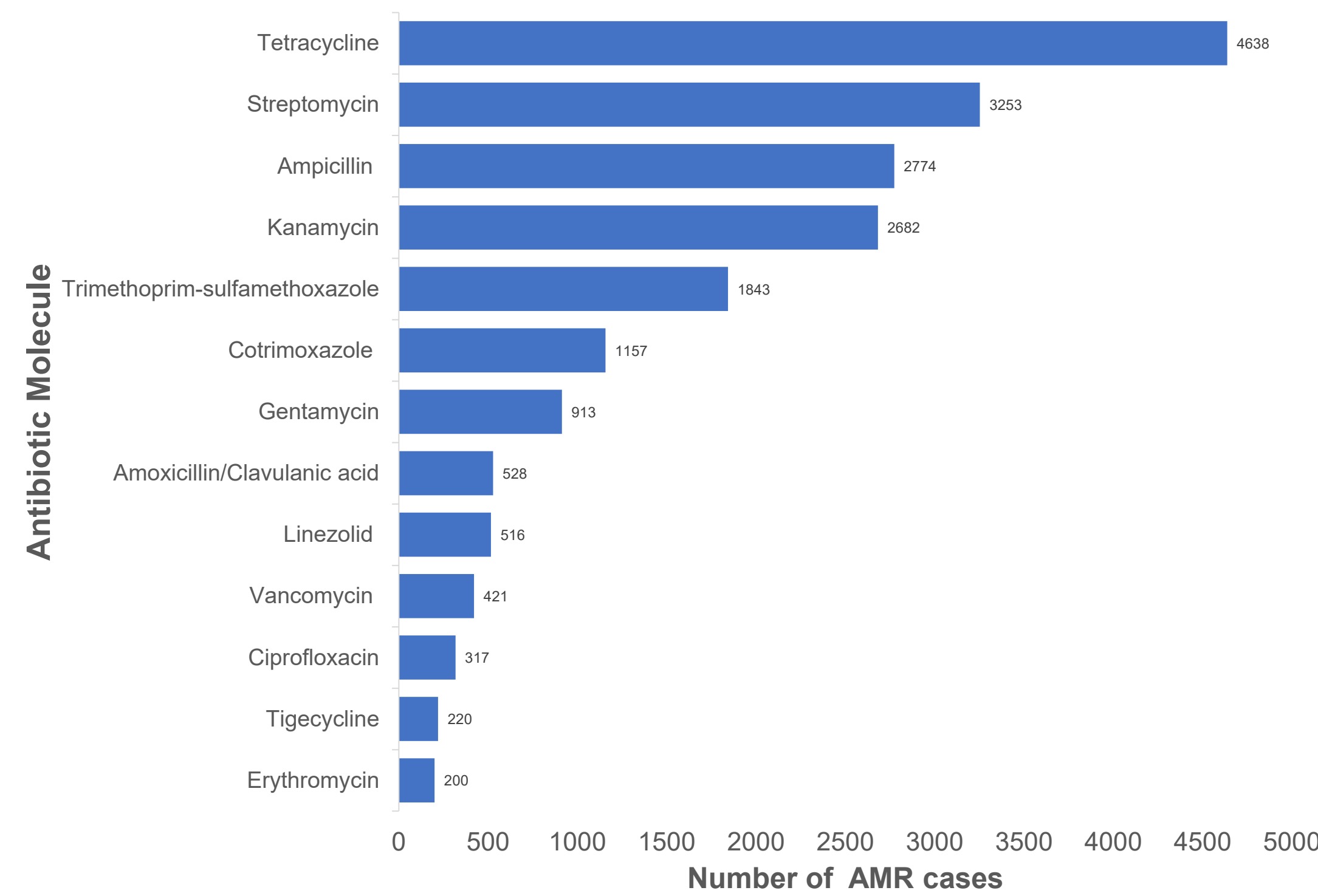


Figure 3: Graph showing number of antimicrobial resistance cases reported in various antibiotic molecules monitored by SiLAB 2023-2024

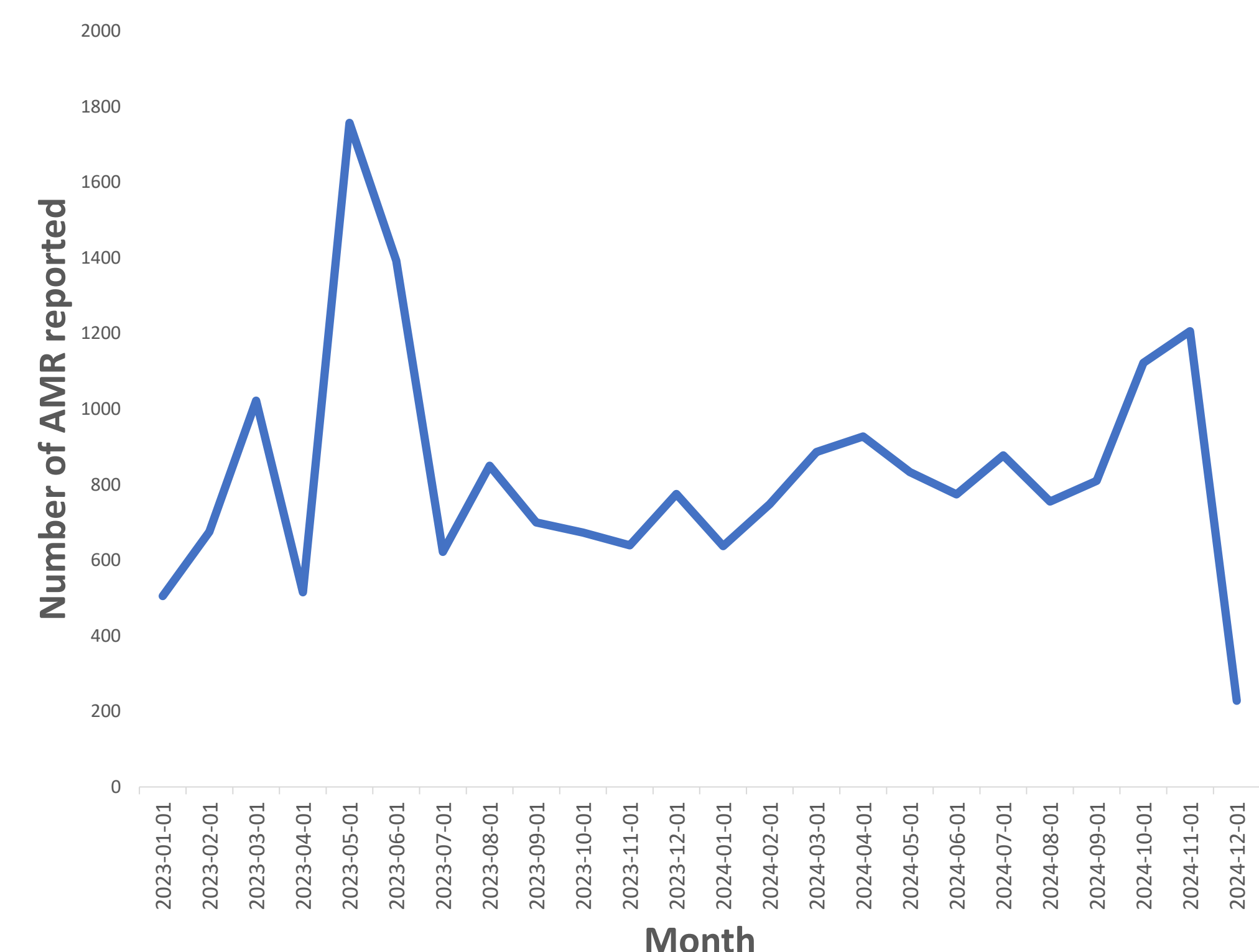


Figure 4: Graph showing trends of antimicrobial resistance reported through SiLAB in 2023 - 2024

Table 1: Summary of Animal health AMR Surveillance system evaluation

Attribute	Key Findings
Representativeness	<ul style="list-style-type: none"> 19.1% (9/47) of counties did not report any data Highest AMR data reported by Karatina NVIL 37.27% while Garissa NVIL did not report any System monitored 25 antimicrobial molecules Highest resistance reported in tetracycline 23.27%, streptomycin 16.32% and ampicillin 13.92%
Flexibility	<ul style="list-style-type: none"> System users 90.9% (10/11) reported ease of integrating new procedures to the system.
Timeliness	<ul style="list-style-type: none"> 65.9% of AMR results were reported within 7 days of receiving the sample
Stability	<ul style="list-style-type: none"> Active surveillance 4.54% depend on external funding.
Completeness	<ul style="list-style-type: none"> 41.7% (15/36) of variables collected by the system contained missing data upto 100% in some variables

DISCUSSION

- Poor data completeness, missing data and invalid entries may indicate weaknesses in data validation within SiLAB.
- High resistance in tetracyclines, Streptomycin and ampicillin may indicate poor stewardship, overuse or ease of access to these molecules
- Data clustering in few counties may indicate unequal access to laboratories and potential barriers in sample submission in pastoral systems.
- Results exceeding acceptable reporting window may be limiting rapid antimicrobial stewardship decisions

CONCLUSION

- The surveillance system generates data that moderately meet its objectives with sub-optimal turnaround time. There is need to strengthen structural and functional limitations that reduce epidemiologic utility of collected data. Additionally, promote stewardship of tetracyclines among other antibiotics.

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