



## Frequently used antimicrobials in Tanzania's commercial Poultry Production

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### Background

High incidences of diseases in poultry production systems are often caused by inadequate vaccination and other biosecurity measures, which fail to prevent the introduction and spread of diseases in poultry farms.

Consequently, high incidence of diseases is associated with increased use of antimicrobials to treat sick chicken. The use of antimicrobials serves as a selective pressure for the emergence of antimicrobial resistance (AMR).

This project explores the potential contribution of IPC in reduction of AMR by optimizing current practices of vaccination, and biosecurity regimes in commercial poultry production.

### Methods and Materials

Baseline study was conducted to review existing knowledge, practices related to chicken health and antimicrobial use to identify potential areas of interventions.

Total of 3208 cumulative reports from all regions of Tanzania mainland which were submitted to the Ministry of Livestock and Fisheries between 2020 and 2021 were studied to identify types of diseases reported, and antimicrobials used for treatment of the respective diseases.

On farm situational analysis was conducted in 2023 through farm visits, observations and administration of questionnaire to respondents (n=205) covering Morogoro, and Dar es Salaam in Tanzania mainland, and Zanzibar.

Reports with missing information and duplicates were removed. Counts and descriptive charts were prepared in Microsoft excel

### Results

Study of secondary data submitted from various regions of Tanzania mainland shows that, bacterial and parasitic diseases occur more frequently than viral diseases (Fig.1A) (n=3208, n: number of reports).

Results from an on-farm baseline study (n=205) show that diarrhoea was the most frequently observed sign in sick chickens, followed by sneezing and coughing (Fig. 1B). Other signs were mentioned fewer than 10 times (not shown). Additionally, the vaccination rate against Newcastle and Gumboro diseases was observed to be over 95%.

Evaluation of secondary data (n=3028) (Fig. 2) and observations at the farms (n=205) (Fig. 3) revealed that tetracyclines and sulphonomides are the most frequently used antimicrobial groups.

In addition, none of the farmers observed post-treatment withdrawal time for economic reasons (not shown)

Fig. 1A

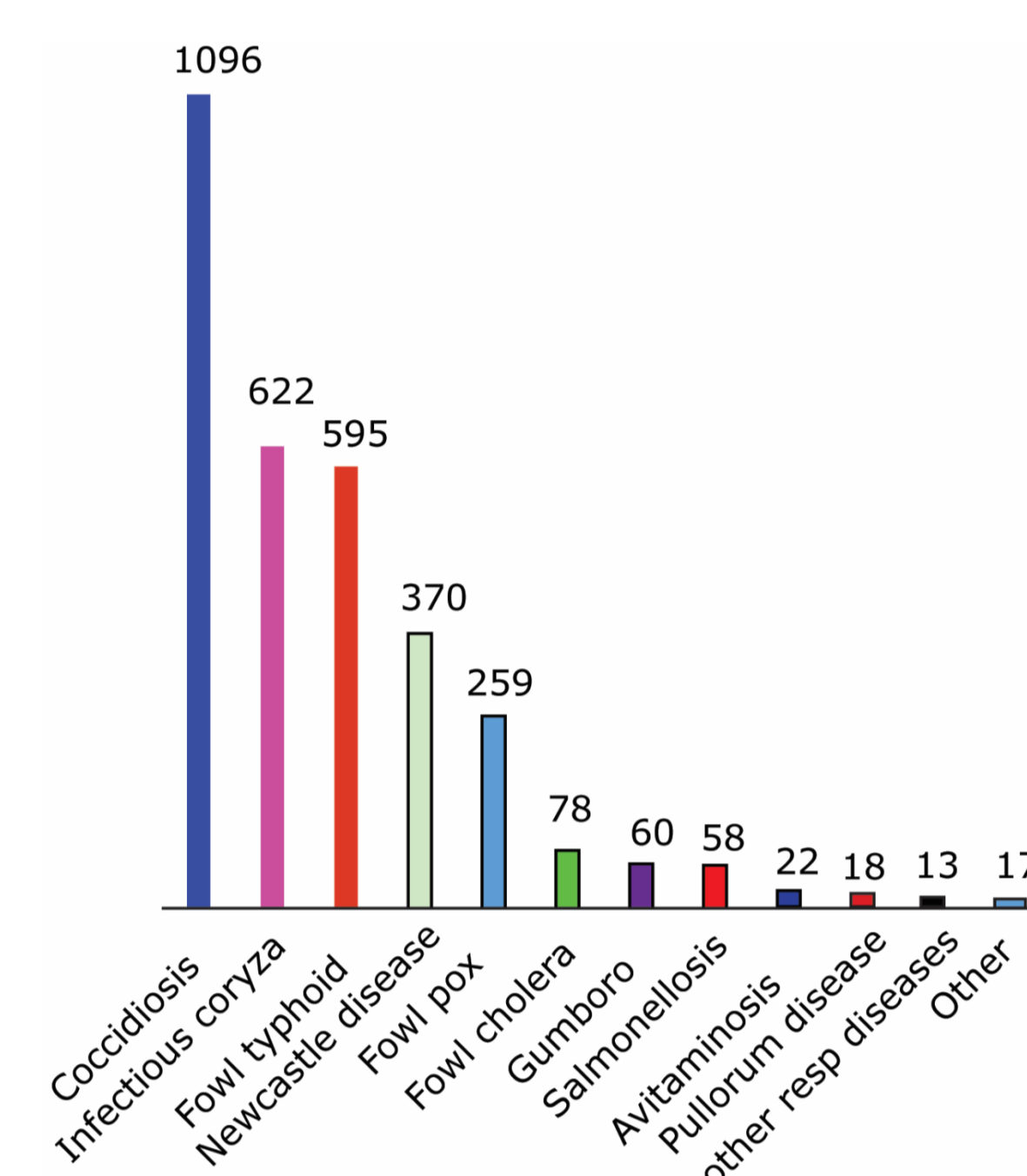


Fig. 1B

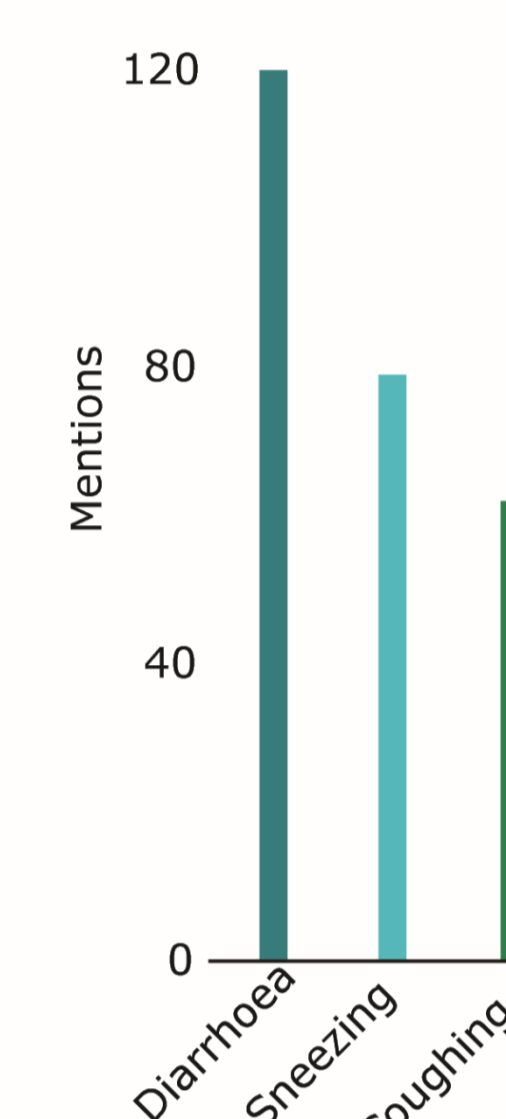


Fig. 2

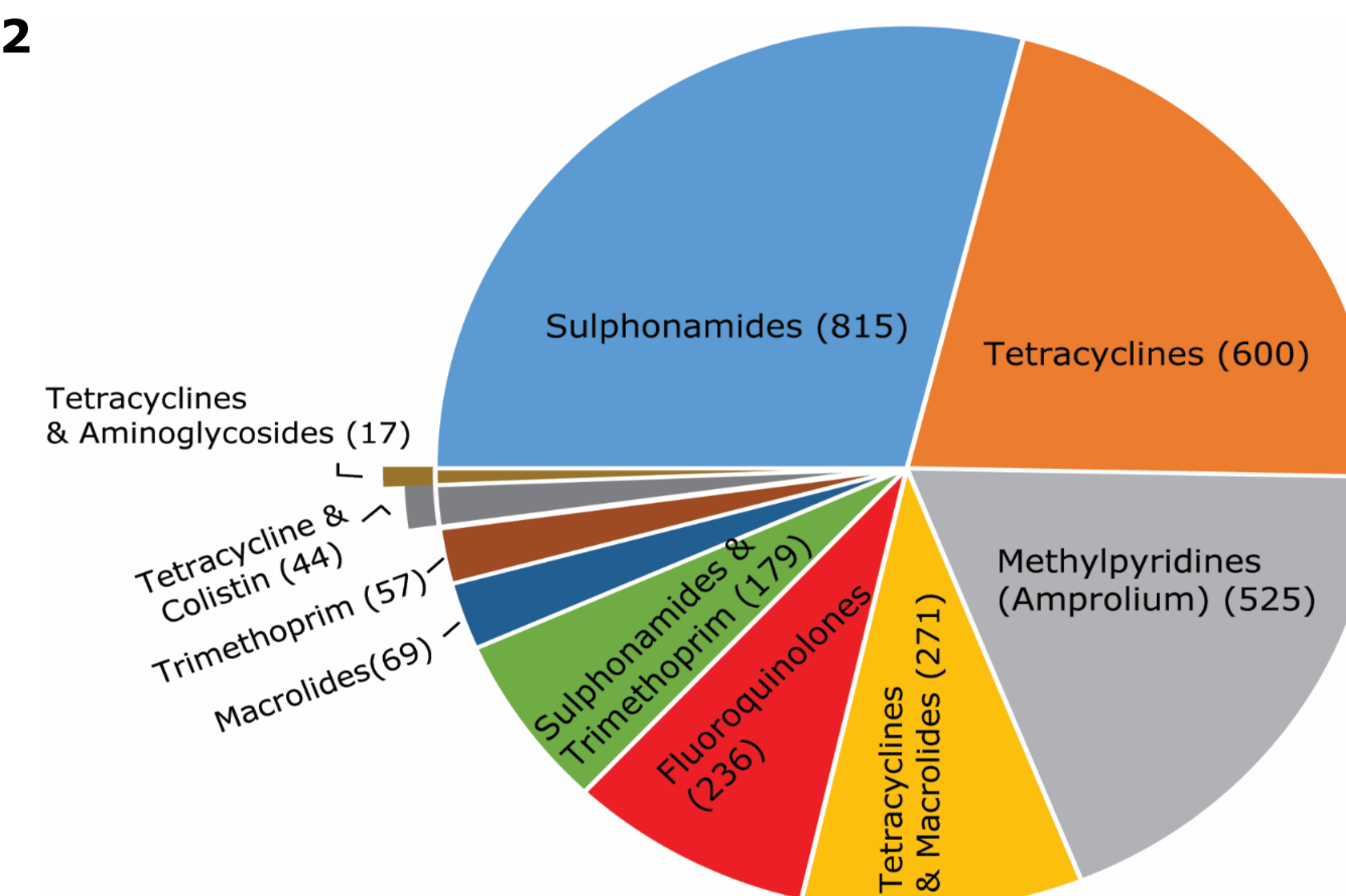
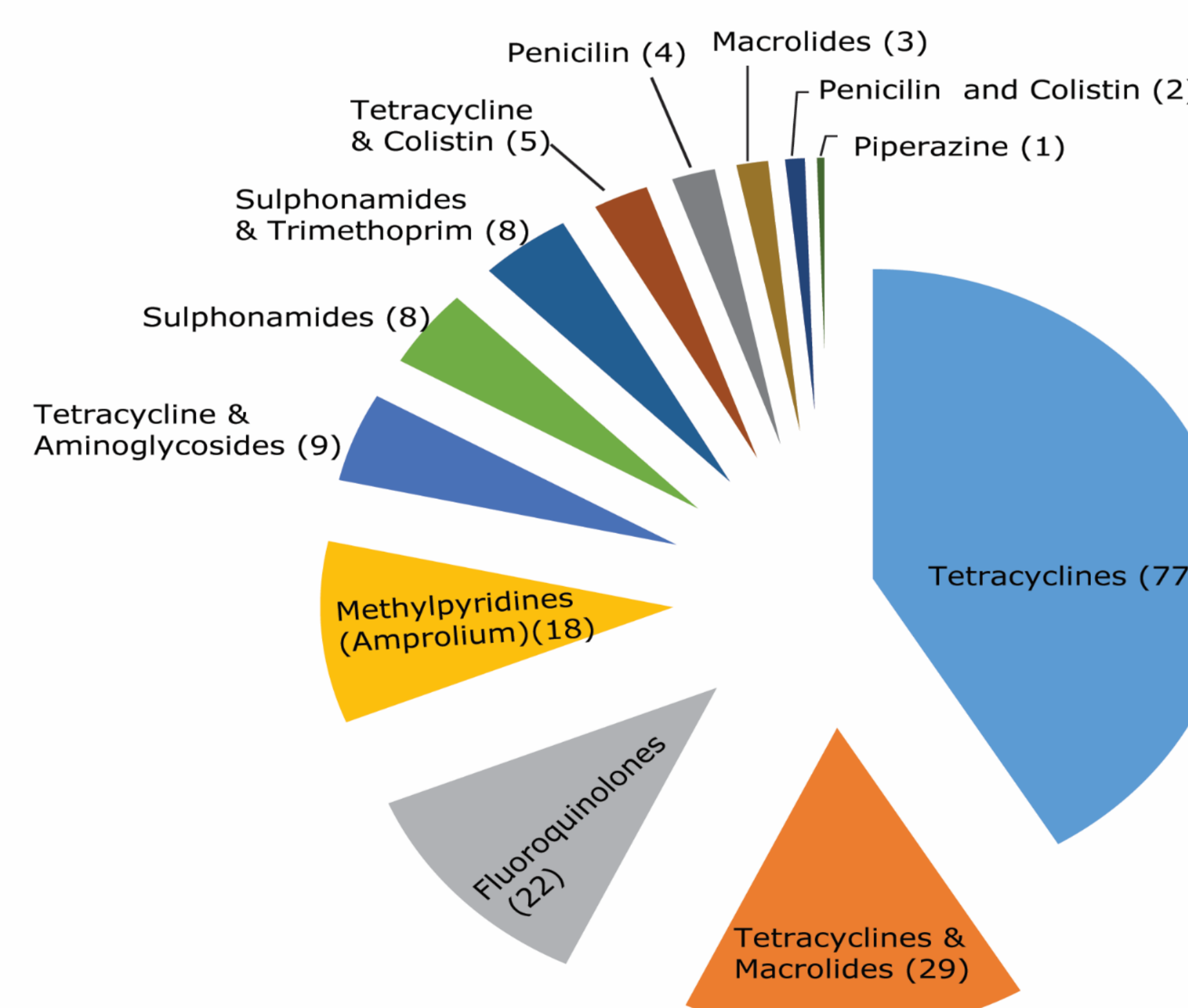


Fig. 3



### Discussion

The study highlights relatively high frequency of diseases caused by bacteria compared to viruses. The reported clinical signs are non-specific but match with the diseases reported.

The cause of the high frequency of bacterial diseases and the low frequency of viral diseases is currently unknown. However, the high vaccination rate of over 95% against viral diseases, compared to less than 5% coverage for other diseases, could be a contributing factor.

Additionally, the widespread use of antimicrobials was expected due to the high frequency of disease challenges.

The relatively high use of tetracyclines and sulphonomides could be related to the broad spectrum nature of the respective drugs but the actual cause remains to be ascertained.

### Conclusions

The results highlights existing health challenges in poultry production, including wide spread use of different types of antimicrobials to mitigate production losses.

The implementation of withdrawal time after antimicrobial use is not feasible for economic reasons especially due to absence of compensation policy. Finding a way to minimize antimicrobial use is currently the most promising solution to ensure safety of poultry products and reduce the risk of AMR through excessive use of antimicrobials.

The current baseline results are expected to provide a benchmark for the planned intervention to improve biosecurity, including optimizing vaccination practices. These measures aim to reduce disease incidence and subsequently decrease antimicrobial use, thereby lowering the risk of AMR.

### Public Health Implications

The potential benefits of reduced antimicrobial use include

1. Reduced threat of AMR by minimizing the risks associated with:
  - Environmental contamination with antimicrobial residues through poultry manure
  - Consumption of poultry products with higher levels of antimicrobial residues in poultry products due to excessive usage of antimicrobials in poultry production
  - Consumption of short cycle vegetables fertilized using poultry manure laden with antimicrobial residues
2. Improved food security through improved health of chicken, and reduced mortality

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### References

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