



High levels of resistance against critically important antibiotics from fresh poultry excreta in Sierra Leone

This is a policy brief whose aim is to communicate, in simple language, the results of operational research on antimicrobial resistance under various scenarios.

¹Reference:

Mansaray, A.H.D.; Yankson, D.P.Y.; Johnson, R.A.B.; Moses, F.L.; Kanu, J.S.; Kamara, I.F.; Zachariah, R.; Kumar, A.M.V.; Selvaraj, K. Bacterial Isolates and Antibiotic Resistance of *Escherichia coli* Isolated from Fresh Poultry Excreta Used for Vegetable Farming in Freetown, Sierra Leone. *Int. J. Environ. Res. Public Health* 2022, 19, 5405. <https://doi.org/10.3390/ijerph19095405>

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Key Messages:

- There are recent emerging evidences on transfer of antimicrobial resistance (AMR) from livestock to humans.
- Recent study from four poultries in Sierra Leone showed ubiquitous presence of *E coli* (93%) and to some extent Salmonella bacteria (8%) in fresh poultry excreta.
- *E coli* strains had complete resistance to some of the critically important antibiotics such as erythromycin, cefoxitin and streptomycin.
- More than 95% of these *E coli* strains not responding to more than four types of antibiotics in the Essential Drug List for human use is a cause for concern
- As fresh untreated poultry excreta are widely used as manure, there could be a potential risk of passing antimicrobial resistance from these birds to humans.
- We recommend :
 - Establish and expand the routine AMR surveillance to monitor antibiotic resistance in poultry.
 - Build multi-sectoral partnership among One Health stakeholders for regular monitoring of AMR status.
 - Monitor and regulate the use of antibiotics for mass prophylaxis and growth promotion in poultry.

What is the problem and why is it important?

- Antibiotics in minimum concentration in the poultry feeds are used for growth promotion. In developing countries, these antibiotics containing poultry feeds are still in use as there is no ban on these products yet. Sierra Leone is not an exception to this.
- The use of antibiotics in livestock and farming plays a major role in increasing AMR.
- Poultry excreta being cheaper and widely used manure, carries the potential risk of AMR transfer from livestock to humans.
- Research studies from African countries had shown the widespread AMR in poultry excreta. This study assessed the magnitude of AMR in poultry excreta in Sierra Leone.

How did we measure it?

Bacteria isolated from excreta, if they are not responding to three or more types of drugs is called as Multi Drug Resistance (MDR).

The WHO AWaRe drug categorization classified antibiotics into three groups, Access, Watch and Reserve.

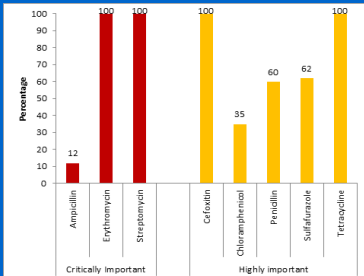


Fig 1. Antibiotic resistance as per disaggregated by the WHO AWaRe* classification for *E.coli* isolated from poultry excreta in Free Town, Sierra Leone 2021

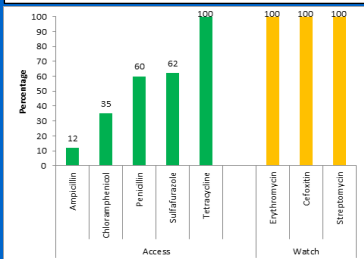


Fig 2. Antibiotic resistance disaggregated by as per WHO Critically important* classification for *E.coli* isolated from poultry excreta in Free Town, Sierra Leone 2021

- In this study fresh poultry excreta was collected from four poultries located in Freetown, Sierra Leone.
- During June to September 2021, 100 fresh poultry excreta samples were collected.
- We transferred the packed excreta samples to the regional certified lab on the same day to test the presence of any bacteria and its response to various antibiotics (antibiotic resistance).
- The laboratory procedures to investigate antibiotic resistance were carried as out as per standard methods.
- In cases where the bacteria is not responding to the antibiotics, we further investigated to know whether they are not responding to limited drugs or more than three drugs (Multi-drug Resistance).

What did we find?

- Out of 100 poultry excreta samples tested, 93 showed the presence of *E.coli* and 8 showed salmonella bacteria.
- Invariably, all bacterial samples had resistance to at least one of these eight antibiotics.
- Some of the important antibiotics such as erythromycin, Streptomycin, cefoxitin, and tetracycline were 100% resistant.
- More than 95% of the bacterial samples did not respond to more than three antibiotics which is being widely reported as Multi Drug Resistance.

Implications

In conclusion, there is widespread presence of *E. coli* (93%) in poultry excreta, with some excreta showing Salmonella as well. Most of the *E.coli* isolates were resistance to more than three antibiotics. Possible reasons for this could be (i). Use of antibiotics for mass prophylaxis in poultry; and (ii). Regular use of poultry feeds containing antibiotics.

We recommend that:

- Establish and expand the routine surveillance to monitor antibiotic resistance in poultry.
- Build multi-sectoral partnership among One Health stakeholders for regular monitoring of AMR status
- Educate farmers on using poultry excreta as manure only after treatment
- Monitor and regulate the use of antibiotics for mass prophylaxis and growth promotion in poultry feeds.