Zambia's Integrated Antimicrobial Resistance Surveillance Framework

Presentation at

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Taj Pamodzi

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Presentation Outline

- Background
- Approach to development of Zambia's integrated antimicrobial resistance surveillance framework
- Zambia's integrated antimicrobial resistance surveillance framework
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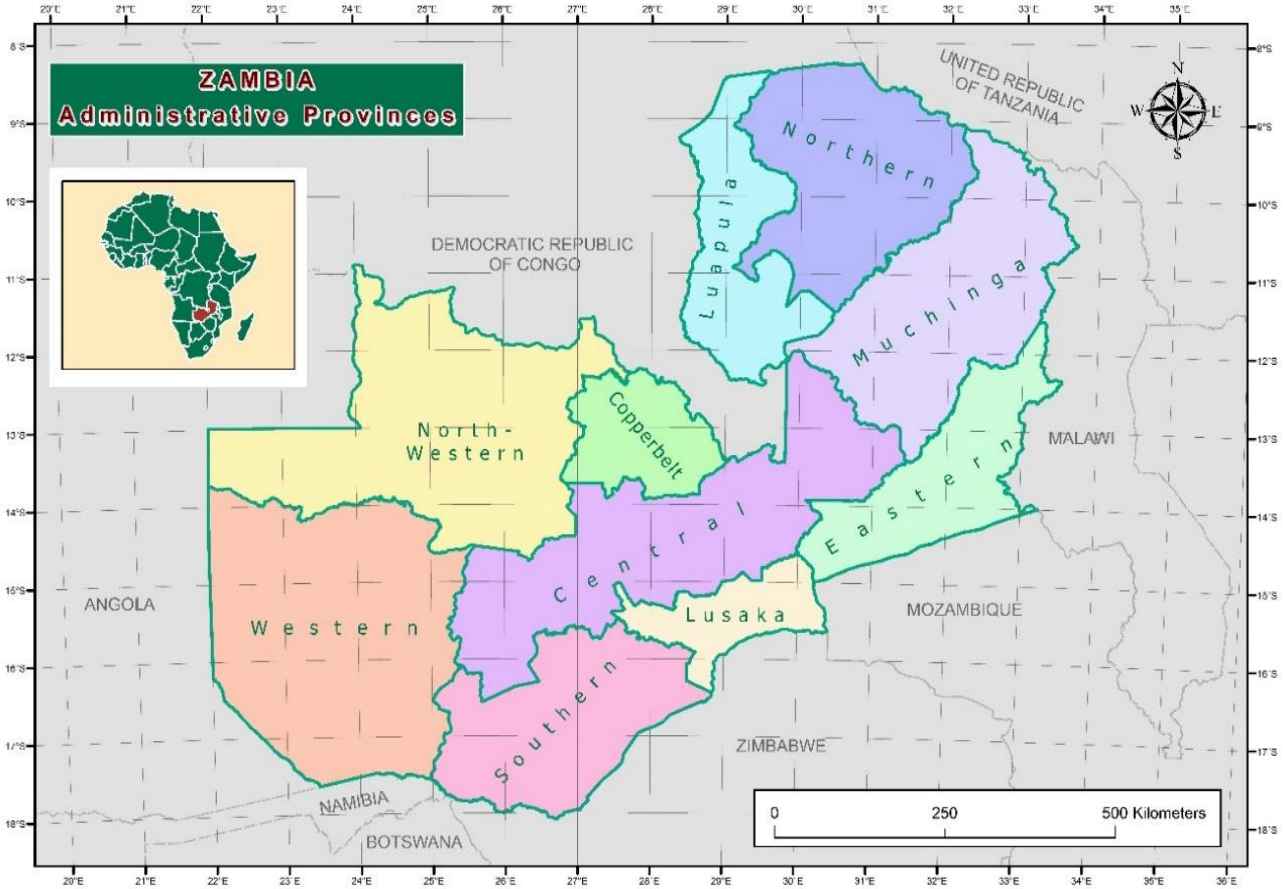
  - Surveillance of antibiotic residues in meat from cattle
  - Surveillance of antibiotic resistance in broiler and layer poultry
  - Surveillance of antibiotic residues in broiler and layer poultry

Conclusion

Background - Zambia

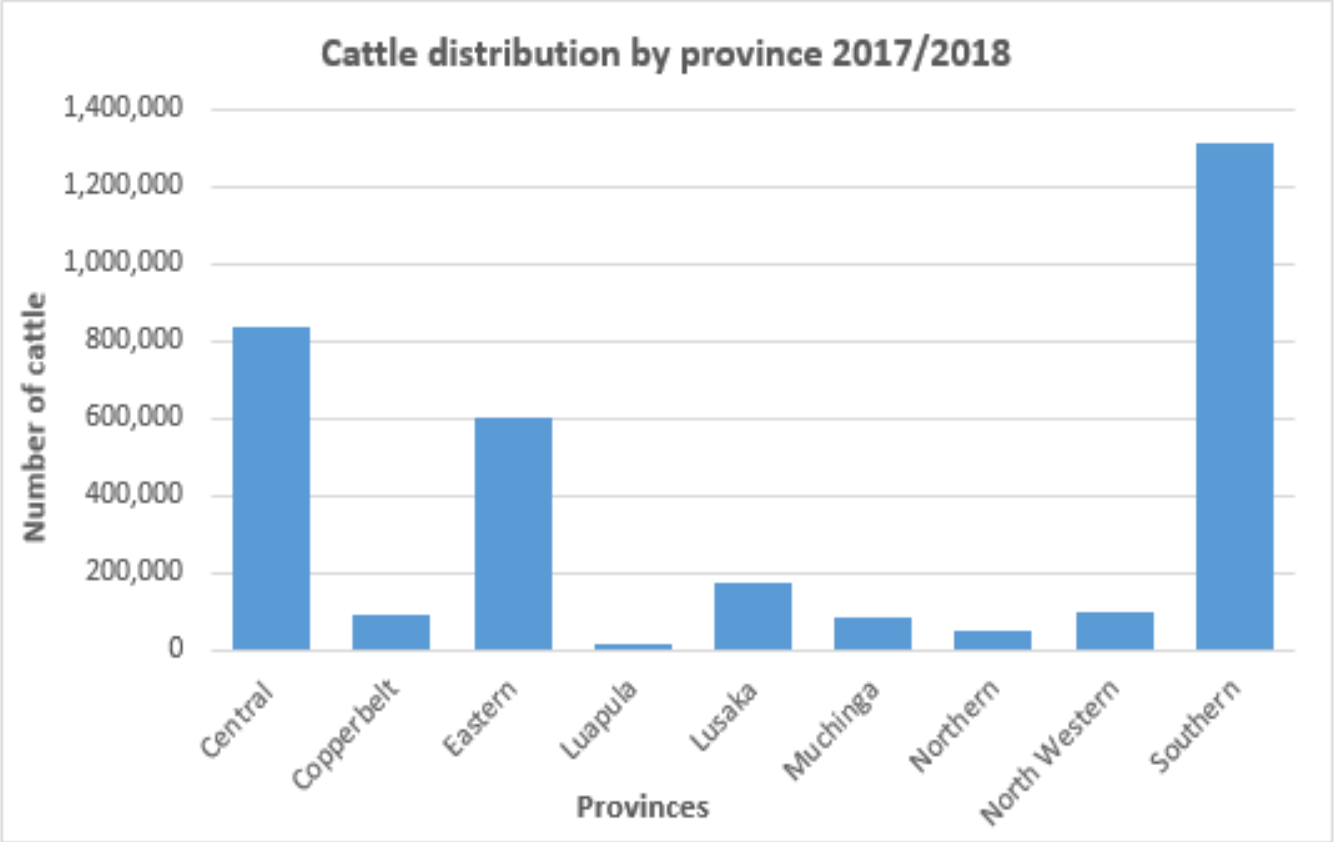
- **Land size**: 754,600 sq. Kilometers
- **Population**: 17 million people
- **Administratively**: 10 provinces , 116 districts



Background ….continued

Animal Populations 2017/2018

- **Cattle: 3,714,667**
- **Goats and sheep :** 3,753,958
- **Pigs:** 1,082,765
- **Broiler/Layer chickens:** approx. 50,000,000
- **Local chickens:** 15,313,780
- **Dogs:** 968,372
- **Rabbits:** 550,790



Approach to development of Zambia's integrated antimicrobial resistance surveillance framework

Identification of thematic areas

- Surveillance of antibiotic resistance in human-health sector
- Surveillance of antibiotic resistance and antibiotic residues in food-animal sector
    - Surveillance of **antibiotic resistance** in cattle for meat
    - Surveillance of **antibiotic residues** in cattle for meat
    - Surveillance of antibiotic resistance in broiler and layer poultry
    - Surveillance of antibiotic residues in broiler and layer poultry
- Surveillance of antibiotic resistance and antibiotic residues in environment

Approach to development of Zambia's integrated antimicrobial resistance surveillance framework

A phased approach for surveillance - the timeframe considered is as follows:

- Phase 1 (0-3 years; short term)
- Phase 2 (4-5 years; medium term)
- Phase 3 (>5 years; long term)

General key elements of the surveillance- coverage (starting with **key food-animal** producing and **high consuming provinces** in phase 1 extending to all provinces in phase 3)

Approach to development of Zambia's integrated **antimicrobial resistance** and **residue** surveillance framework

Key elements

Antimicrobial resistance and residues Framework

Animal species	• Cattle, Poultry • Other species in future versions
Sampling strategy*	• Sites, sample sizes, frequency of sampling, sample type
Microorganisms*	• Bacteria, Parasites, Fungi
Antimicrobials/Residues*	• Antibiotics
Resistance testing*	• Phenotypes, progressively to molecular
Laboratory network	• Starting with reference laboratory • Building up based on capacities
Human resource development	• Training requirements for effective surveillance

Zambia's integrated antimicrobial resistance surveillance framework

Surveillance of antibiotic **resistance** in meat from cattle

	Phase 1 (0-3 years)	Phase 2 (4-5 years)	Phase 3 (>5 years)
Sampling strategy			
Sample type	Carcass swab	Carcass swab	Carcass swab
sites	Abattoirs/farms*,processing plants,	Abattoirs, meat processing plants, butcheries	Abattoirs, meat processing plants, butcheries

Zambia's integrated antimicrobial resistance surveillance framework

Surveillance of antibiotic **resistance** in meat from cattle

	Phase 1 (0-3 years)	Phase 2 (4-5 years)	Phase 3 (>5 years)
Microorganism			
Bacteria for AST	▪ Salmonella spp. ▪ Escherichia coli (commensal and pathogenic) ▪ Enterococcus faecalis	▪ Salmonella spp. ▪ Escherichia coli (commensal and pathogenic) ▪ Enterococcus faecalis ▪ Campylobacter spp. ▪ Staphylococcus aureus	▪ Salmonella spp. ▪ Escherichia coli (commensal and pathogenic) ▪ Enterococcus faecalis ▪ Campylobacter spp. ▪ Staphylococcus aureus
Antimicrobials			
Antibiotics for AST	**Salmonella spp. and *Escherichia coli**: Ampicillin, Cefataxime, Ciprofloxacin, Colistin, Gentamicin, Tetracycline, Trimethoprime-sulfamethoxazole **Enterococcus faecalis :** Ampicillin, Enrofloxacin, Erythromycin, Gentamicin, Tetracycline, Tylosin, Vancomycin **Campylobacter spp.:** Ampicillin, Ciprofloxacin, Erythromycin, Tetracycline **Staphylocccus aureus:** Amoxicillin, Cefoxitin, Erythromycin, Gentamicin, Lincomycin, Oxacillin, Tetracycline,		

Zambia's integrated antimicrobial resistance surveillance framework

Surveillance of **residues** in meat from cattle

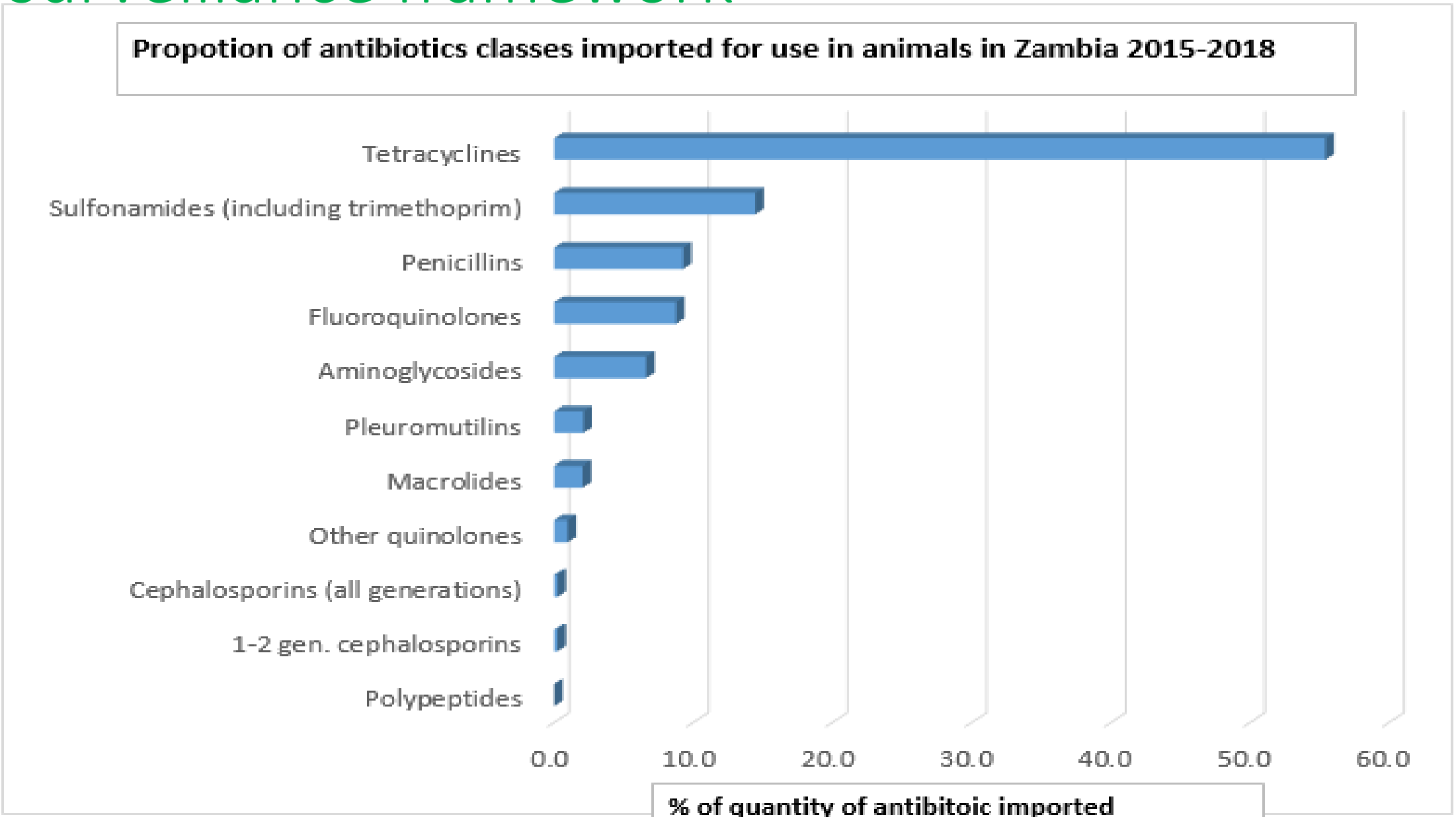
	Phase 1 (0-3 years)	Phase 2 (4-5 years)	Phase 3 (>5 years)
Residues			
Sample type	meat	Meat/Milk*	Meat/Milk*
sites	Abattoirs, meat processing plants	Abattoirs, meat processing plants, butcheries, retail shops, local markets/establishments*	Abattoirs, meat processing plants, butcheries, retail shops, local markets/establishments*
Residues			
Antibiotics for residue monitoring*	Ampicillin, Azithromycin, Ceftiofur, Ciprofloxacin, Cloxacillin, Colistin, Enrofloxacin, Erythromycin, Gentamicin, Neomycin, Penicillin, Streptomycin, Sulfonamides (commonly used), Tetracycline, Tylosin, Zinc Bacitracin		

Zambia's integrated antimicrobial resistance surveillance framework

Surveillance of **residues** in meat from cattle

	Phase 1 (0-3 years)	Phase 2 (4-5 years)	Phase 3 (>5 years)
Residues			
Frequency of sampling	Annual	Bi-annual	Quarterly

Zambia's integrated antimicrobial resistance surveillance framework



Conclusion

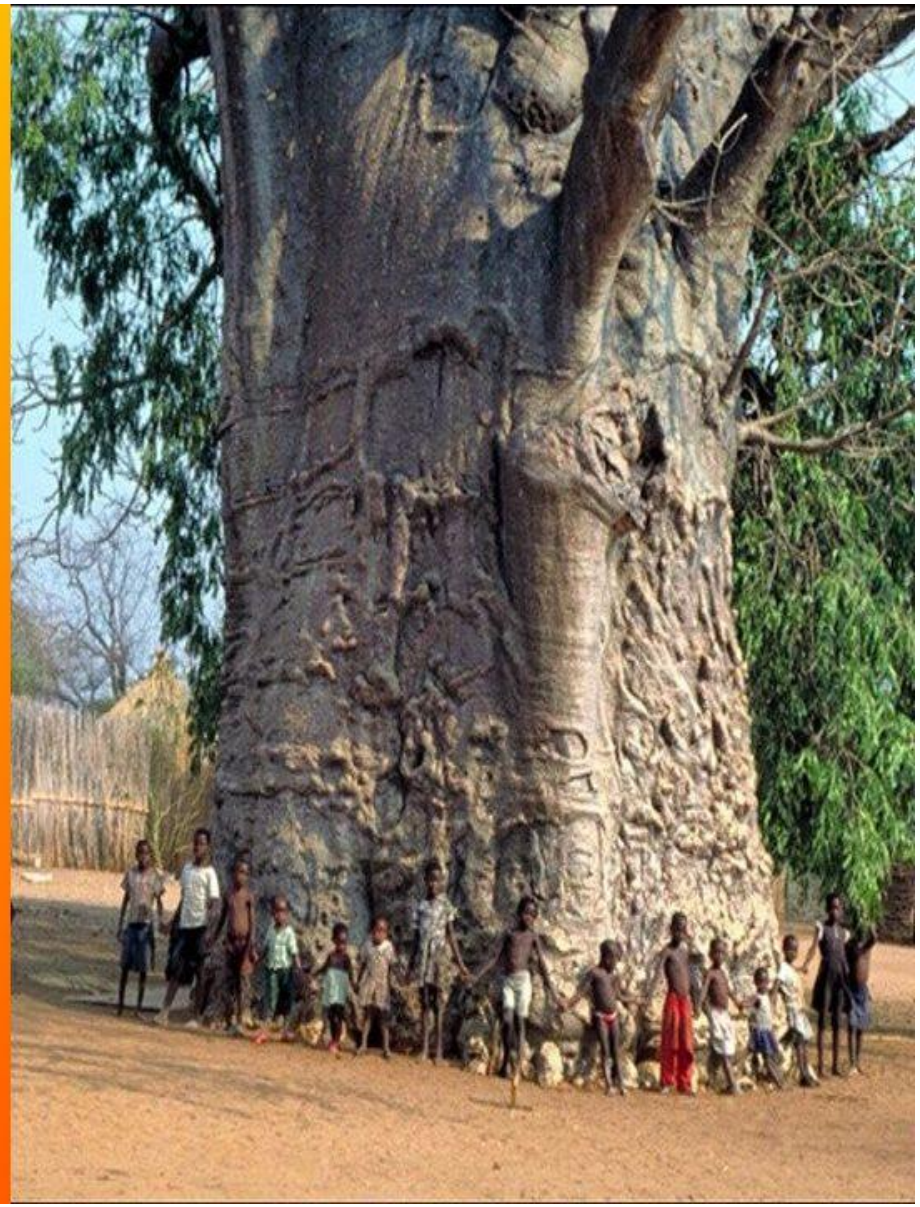
This Framework is linked to the country's antimicrobial resistance national action plan and our integrated AMR surveillance strategy.

It was developed with inputs from key stakeholders industry such as feed producers, Agro-vet shops, Academia, Medicines and Regulatory Authority, and international experts.

The Baobab Tree

"Wisdom is like baobab tree. No one individual can embrace it."

African Proverb



Thank You for your attention!