Highlighting the AMR/U Problem in Malawi

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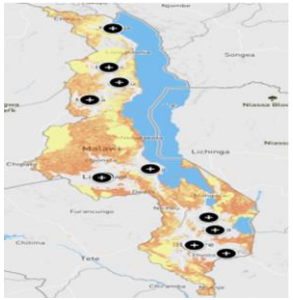
Outline of presentation

1. Malawi baseline laboratory characteristics
2. Baseline AMR findings (HH & AH)
3. Baseline AMC findings (HH)
4. AMR and AMC correlation
5. Summary

Malawi laboratory infrastructure (HH)



Policy indicators*

- **National Action Plan on AMR (NAP) published** ✓
- **National AMR coordinating committee** ✓
- **System to report AMR data to national authorities** ✓
- **Enrollment in Global Antimicrobial Resistance & Use Surveillance System (GLASS)** ✓

National laboratory network

1026

Number of laboratories serving Malawian population

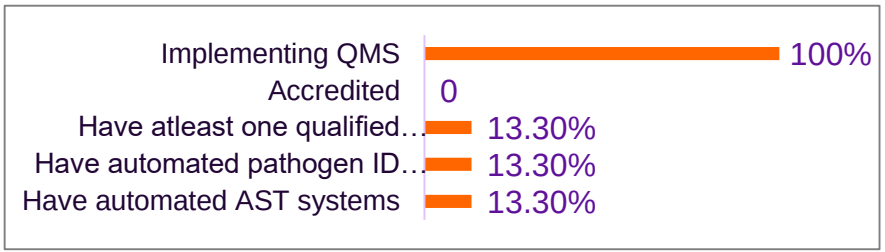
27

Number of bacteriological laboratories in the national network

15

Number of AST laboratories in the national network

Profile of the selected laboratories

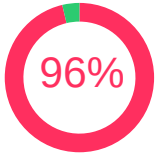
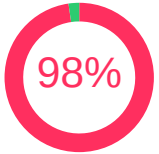
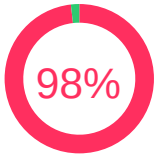
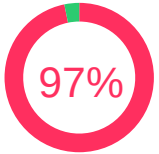
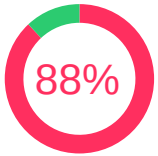
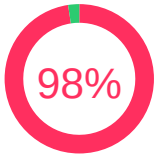


Data summary

	Total valid cultures	18448	19705	27545
	Negative cultures	16373	16875	24330
	Positive cultures without AST results	323	211	390
	Positive cultures with AST results	1752	2619	2825

Antimicrobial Resistance baseline findings (HH)

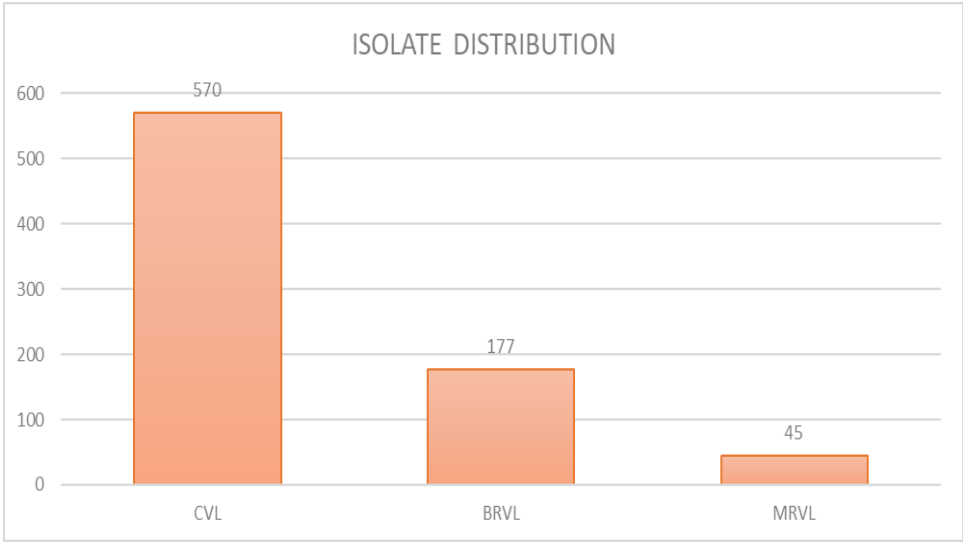
Top 3 resistant bug-drug combinations

2016	2017	2018
		
Phenicol resistant *S. typhi*	**Cephalosporin (2nd gen) resistant P. *mirabilis***	**Phenicol resistant *S. typhi***
		
Phenicol resistant *E. cloacae*	**Tetracycline resistant *N. gonorrhoeae***	**Tetracycline resistant N. gonorrhoeae**
		
Cephalosporin (3rd gen) resistant *K. pneumoniae*	**Penicillin resistant *N. gonorrhoeae***	**Beta lactam combinations resistant *P. aeruginosa***

MAAP Mapping AMR & AMU Partnership

Animal Health AMR Baseline surveillance findings

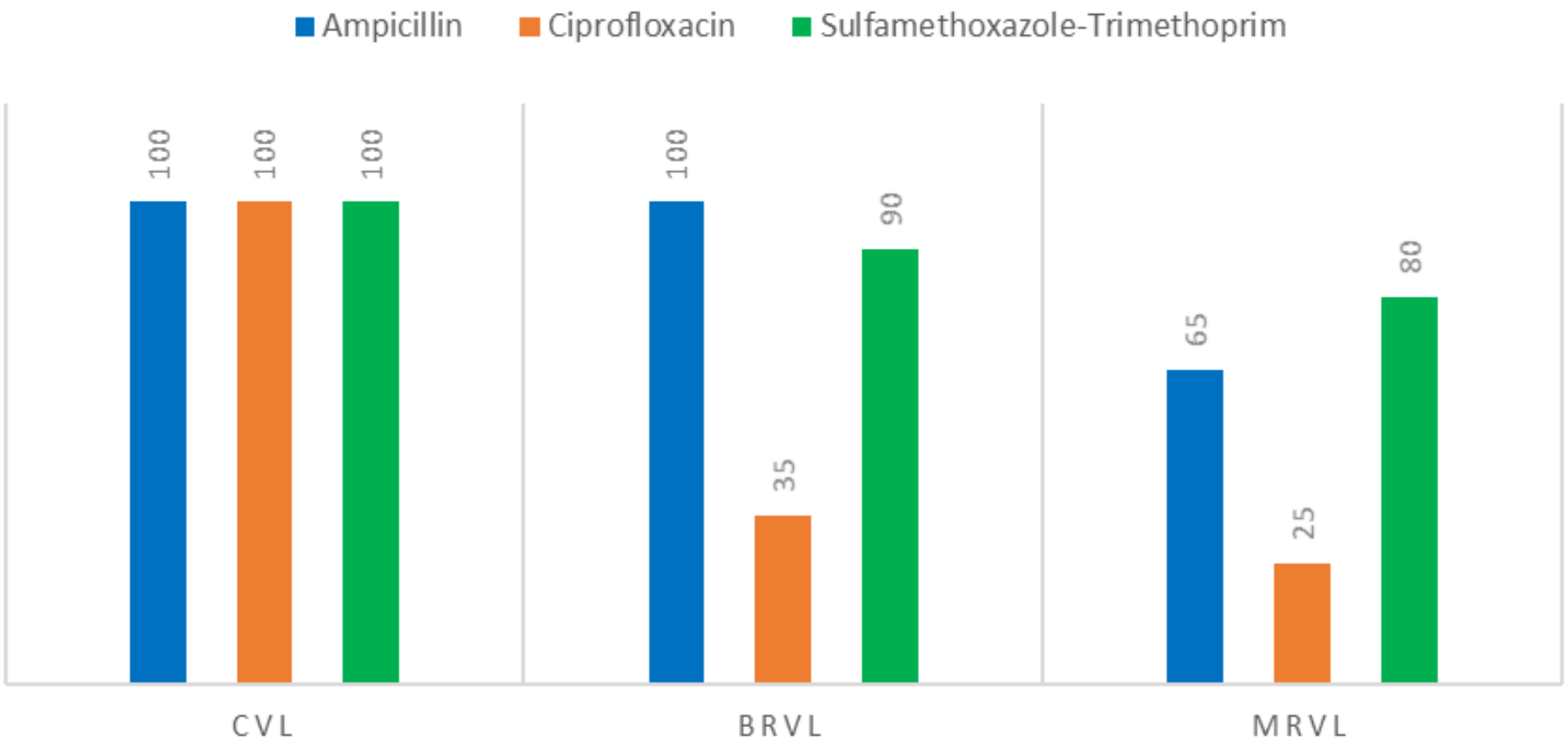
Poultry surveillance: 2021-2023



Malawi priority pathogen list for surveillance in Animals (As recommended by World Organization for Animal Health-WOAH)

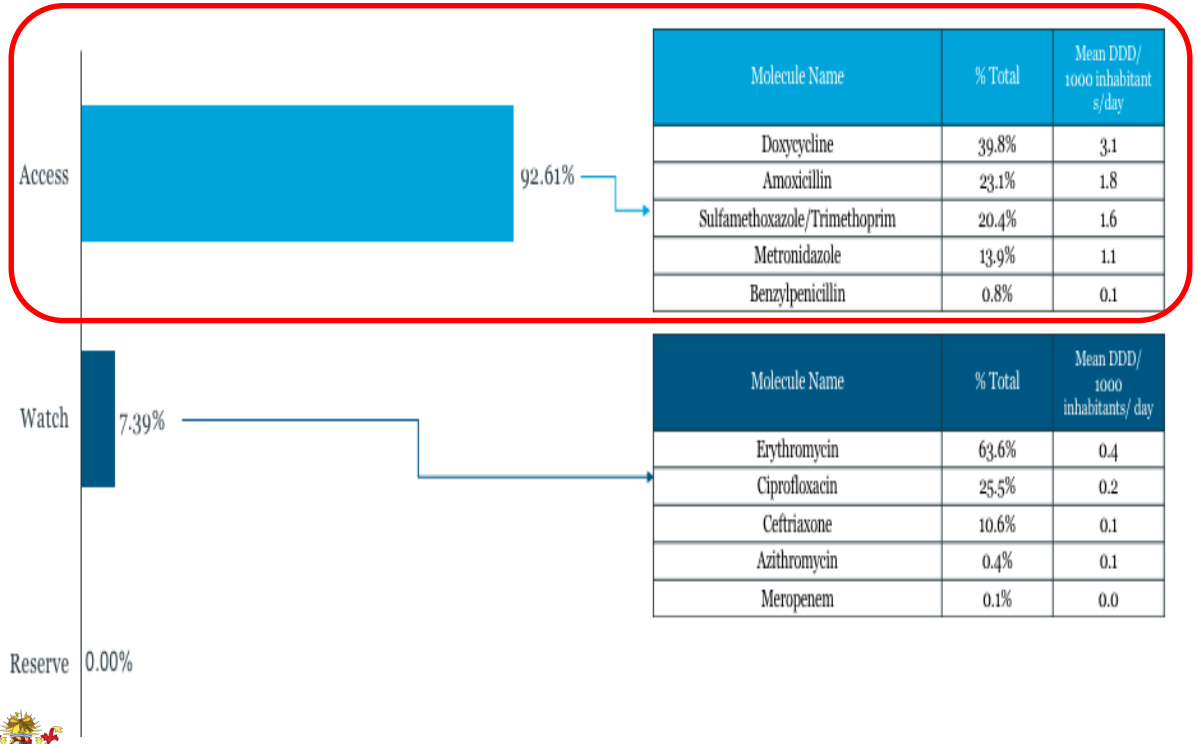
1. ***Salmonella spp***
2. ***Escherichia coli***
3. ***Enterococcus spp***
4. ***Campylobacter spp***

E. Coli resistance in poultry



Antimicrobial Consumption Baseline findings

Overall AMC by WHO AWaRe Category share & top 5 molecules in each category

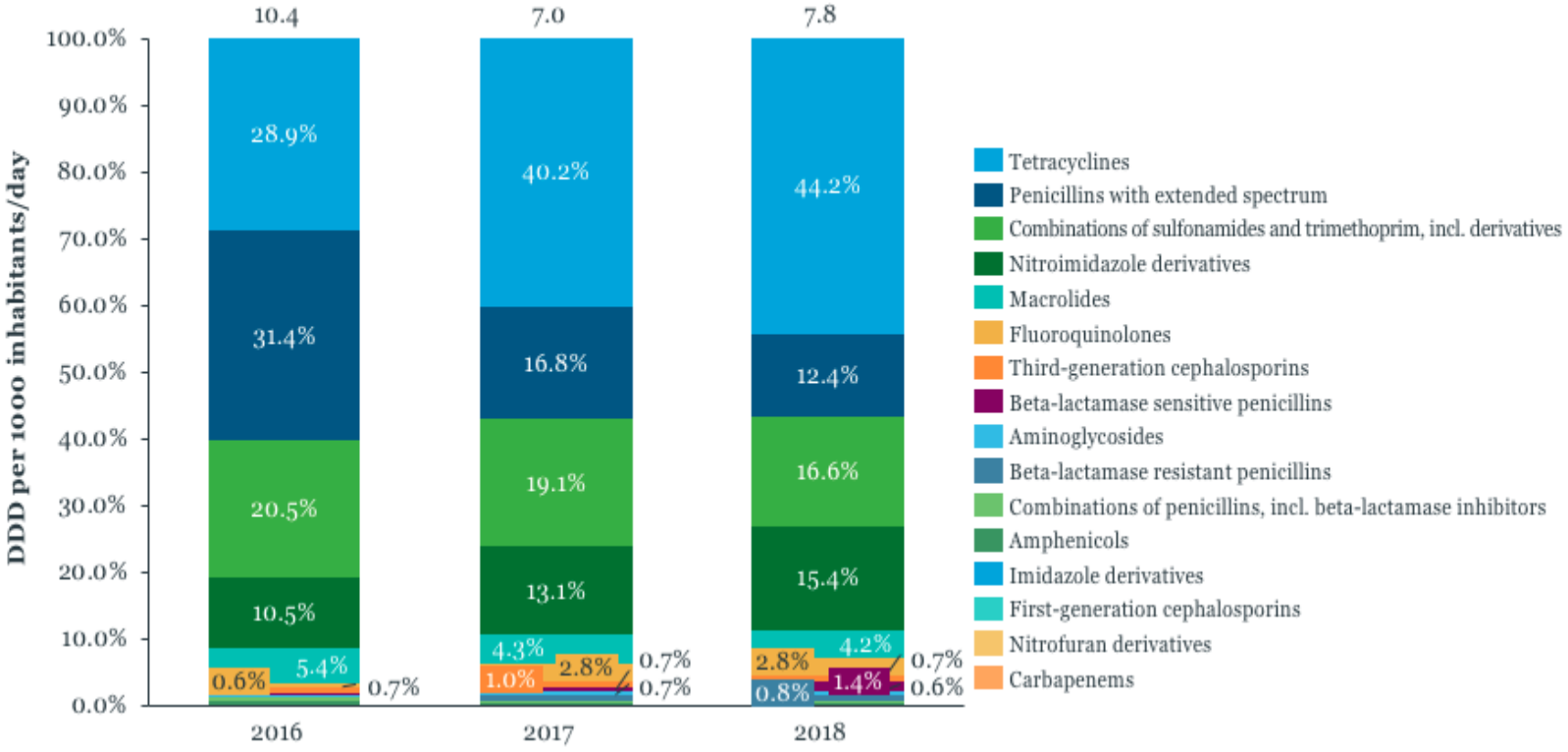


Molecule Name	% Total	Mean DDD/ 1000 inhabitants/day
Doxycycline	39.8%	3.1
Amoxicillin	23.1%	1.8
Sulfamethoxazole/Trimethoprim	20.4%	1.6
Metronidazole	13.9%	1.1
Benzylpenicillin	0.8%	0.1

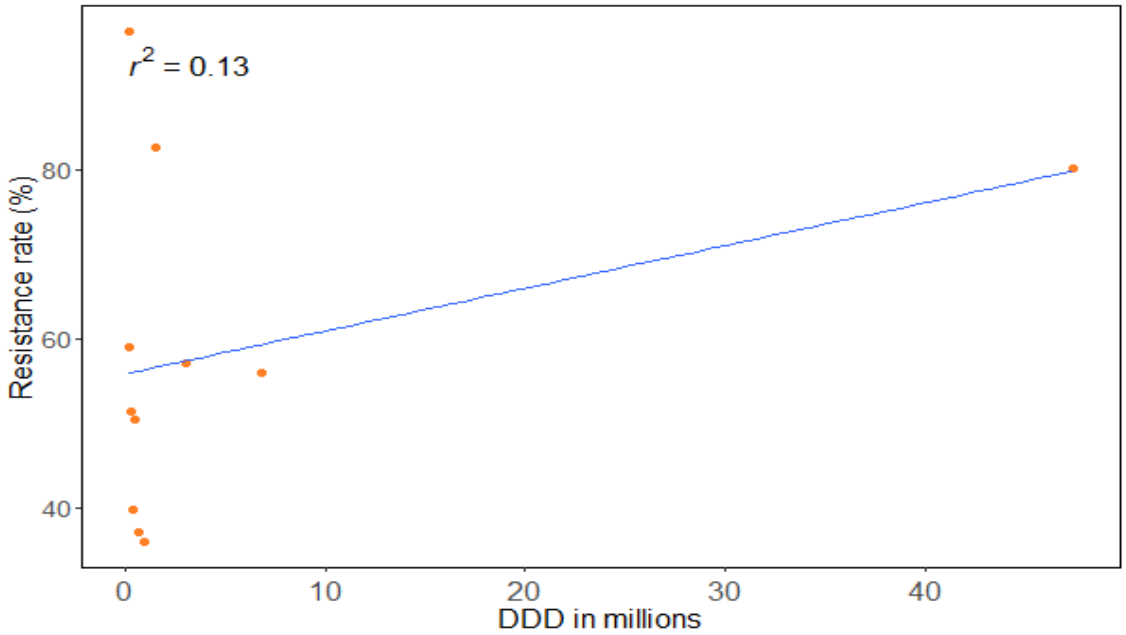
Molecule Name	% Total	Mean DDD/ 1000 inhabitants/ day
Erythromycin	63.6%	0.4
Ciprofloxacin	25.5%	0.2
Ceftriaxone	10.6%	0.1
Azithromycin	0.4%	0.1
Meropenem	0.1%	0.0

- Overall Access category usage across 2016-2018 was above the WHO-defined threshold of 60%
- Top five Access group antibiotics accounted for 98% of the AMC within the Access Group
  - Amoxicillin accounted for 47.2% of the Access group consumption
- Top five of Watch group antibiotics accounted for 100% of the AMC within the Watch group
  - Erythromycin accounted for 64% of Watch group consumption

Overall AMC by ATC Class



AMR/ AMC Correlation



Antibiotic class	DDD in millions	Resistance rate (%)
Folate pathway inhibitors	47.41	80.2
Tetracyclines	6.82	56.0
Macrolides	3.03	57.0
Aminopenicillins	1.48	82.6
Fluoroquinolones	0.94	35.9
Cephalosporins (3rd generation)	0.70	37.1
Penicillins	0.48	50.4
Methicillin	0.35	39.9
Beta-lactam combinations	0.27	51.4
Cephalosporins (2nd generation)	0.23	96.3
Aminoglycosides	0.15	59.0

The moderate positive correlation between AMR and AMC (Pearson's r^2=0.13) implies that AMC is a potential driver of AMR in Malawi.

Importance of Malawi's surveillance system

1. To highlight national priorities for policy decisions on emerging DRIs
2. Monitoring AMR trends: both national and regional (GLASS)
3. Monitoring the effectiveness of interventions (AMS/ IPC)

When asked what attracted us to the Fleming Fund Fellowship in AMR Surveillance?

- Not enough epidemiologically trained personnel are focused on minimizing DRI
- Malawi has moved from having **limited** data to having a lot of data on AMR
- Datasets are complex (One Health)- robust skills are needed

Summary

- Drug-resistant Infections are of concern in Malawi (HH/AH)
- Baseline findings demonstrate how our AMC pattern is driving this rise
- AMR Surveillance Fellowships have been critical in helping Malawi leverage this AMR data
- Moving forward: **We need to strengthen the environmental surveillance + AMU surveillance**

Questions?