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AMR
Antimicrobial Resistance Knowledge Hub

THE GLOBAL HEALTH NETWORK AFRICA

World Antimicrobial Awareness Week (WAAW) 2025 Webinar Series

One Health in Action: African strategies to tackle AMR across human, animal, and environmental health

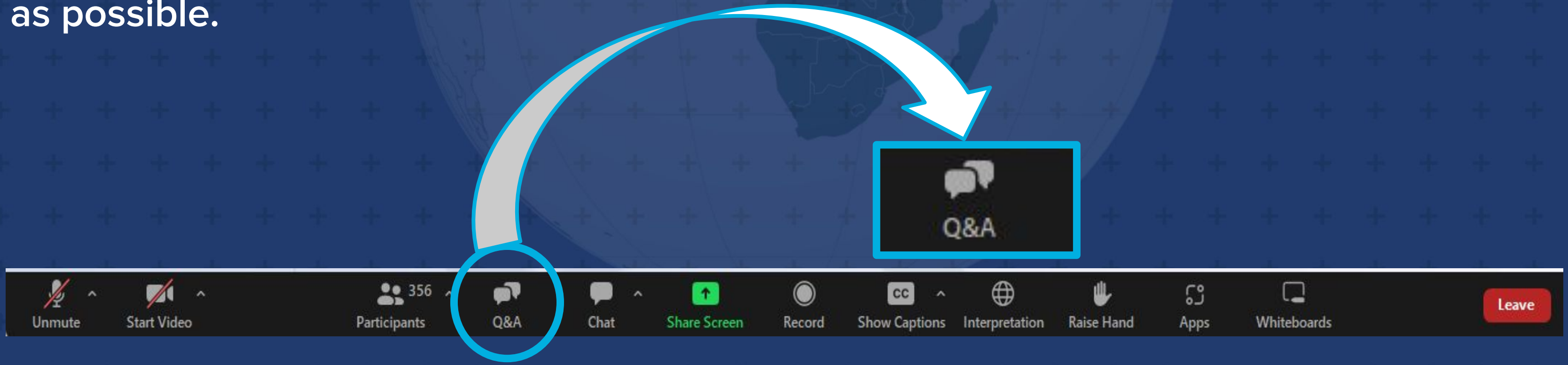
When: **18th November 2025**

Time: **09:00 GMT**

WORLD AMR AWARENESS WEEK
18-24 NOVEMBER

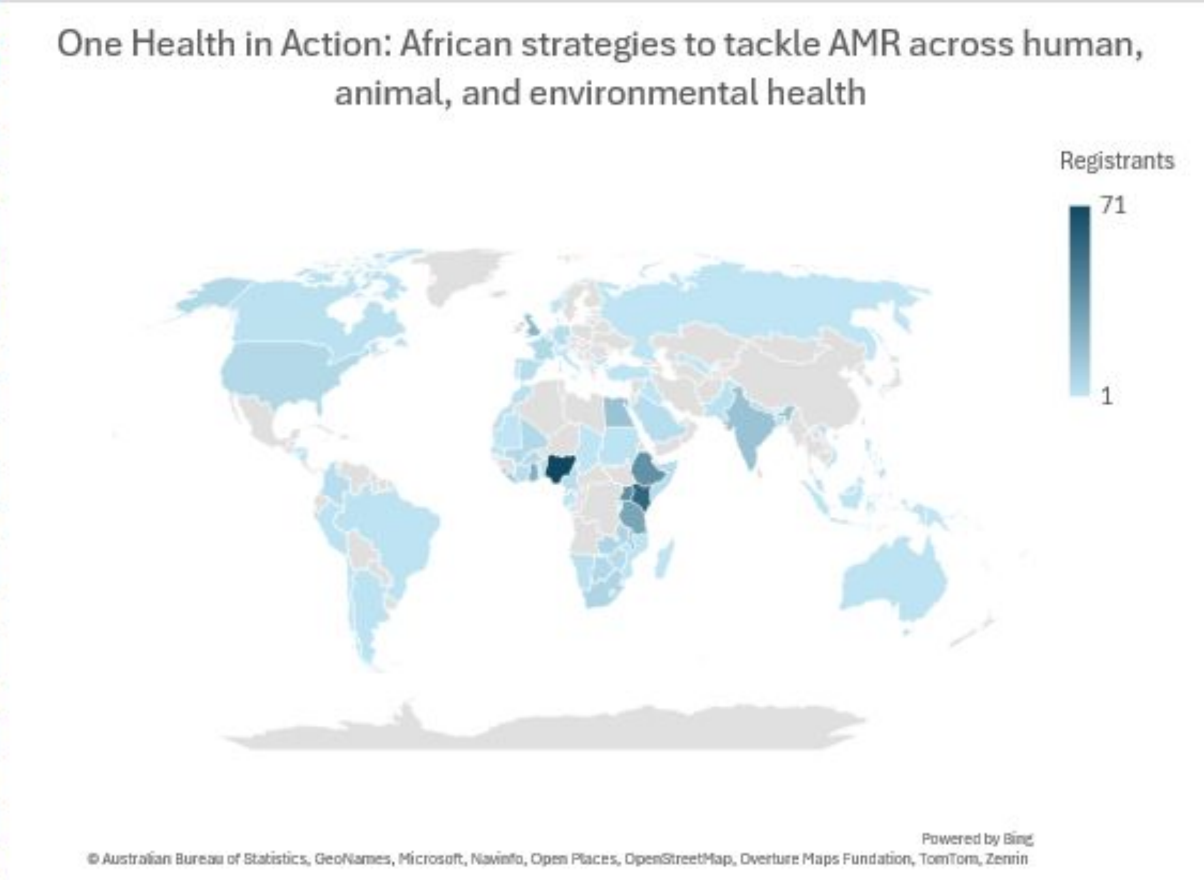
Housekeeping

- This webinar is being recorded and will be shared on The Global Health Network.
- Due to the number of participants your camera and microphone are disabled.
- Please use the *Chat* feature for any technical issues.
- Please use the ***Q&A*** feature to post your questions. You can post anonymously.
- We have dedicated time allocated for Q&A so we'll try to get through as many questions as possible.



Registered for today's webinar - Thank you!

Country	Registrants
Nigeria	71
Kenya	57
Uganda	40
Ethiopia	38
Tanzania	29
Ghana	24
Malawi	24
United Kingdom	23
Liberia	18
Egypt	16
India	16
DRC	12
Rwanda	8
South Africa	8
Zambia	8
Benin	7
Botswana	6
Burkina Faso	6
France	6
Mali	6



Panel & Agenda

Chair: Godwin Pius Ohemu - Graduate Assistant, AMR Knowledge Hub and CoP, The Global Health Network, University of Oxford, UK

Welcome/Opening Remark: Adam Dale - Knowledge Exchange Lead, The Global Health Network, University of Oxford, UK

Antimicrobial resistance drivers in Africa and plans for actions at the One Health interface - **Dr. Babafela Awosile**, Assistant Professor, Texas Tech University, USA

The impact of operational research as a tool to tackle anti-microbial resistance with a one health approach - **Dr. Robert Terry**, Manager of Research Policy, TDR, WHO

Breaking the Resistance: How Diagnostics Empower Africa's Fight Against AMR - **Dr. Kiplangat Sigei**, Medical Affairs Manager, Anglophone Africa, bioMérieux

Q&A - Dr. Babafela Awosile, Dr. Robert Terry and Dr. Sigei Kiplangat

Closing Remark - **Godwin Pius Ohemu** - Graduate Assistant, AMR Knowledge Hub and CoP, The Global Health Network, University of Oxford, UK

Scribe - **Chinenye Chukwu-Mba**, AfOx Ubuntu Fellow

Antimicrobial Resistance Drivers in Africa and Plans for Actions at the One Health Interface

Dr. Babafela Awosile

Assistant Professor of Epidemiology,
School of Veterinary Medicine,
Texas Tech University, USA.

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Antimicrobial resistance drivers in Africa and plans for actions at the One Health interface

Babafela Awosile **(DVM, MVSc, GradCert(One Health), PhD, DACVPM(Epi)**

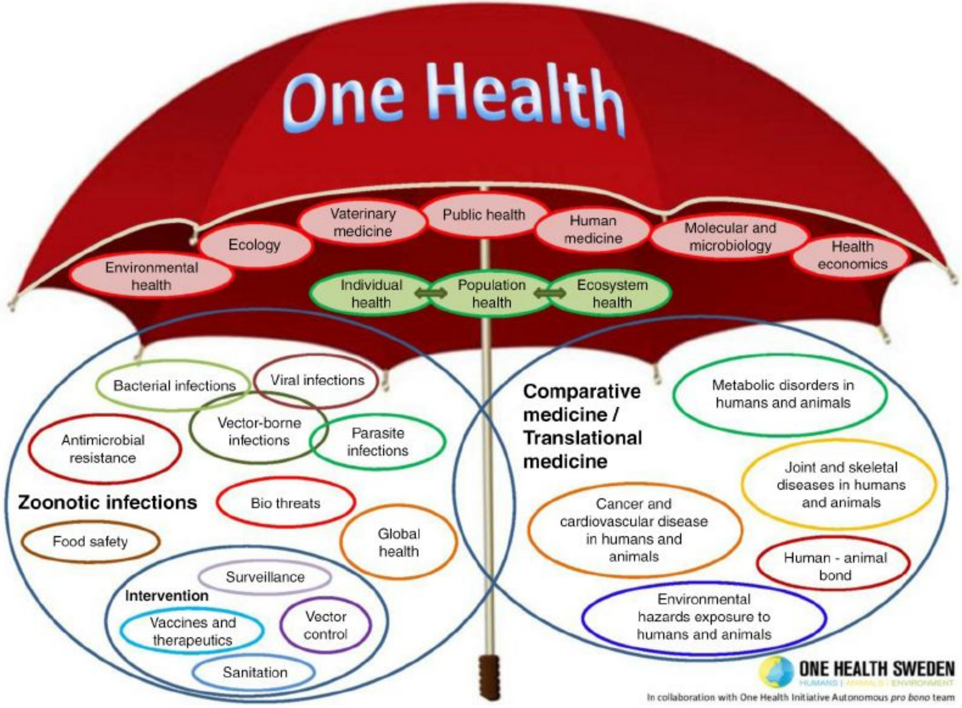
Assistant Professor of Epidemiology
School of Veterinary Medicine, Texas Tech University, USA

Outline of the presentation

- Explain antimicrobial resistance within the context of One Health in Africa.
- Identify factors driving antimicrobial resistance across the One Health interface in Africa and around the world.
- Identify action plans for mitigating the development of antimicrobial resistance in Africa across the One Health interface.
- Summary

One Health challenges: New paradigm

- Challenges of the modern era:
  - Zoonotic diseases
  - Cancer/Chronic diseases
  - Cardiovascular Diseases
  - Metabolic Diseases
  - Neurological Diseases
  - Degenerative Diseases and Injuries
  - Social and psychological disorders
  - Controlled drug abuse
  - Natural disaster and response
  - Mental health and suicide
  - Environmental degradation
  - Educational
  - Climate change
  - Diagnostic techniques
  - Vector-borne diseases
  - Food Safety and Security
  - **Antimicrobial resistance**
  - Inadequate workforce
  - Human-animal bond

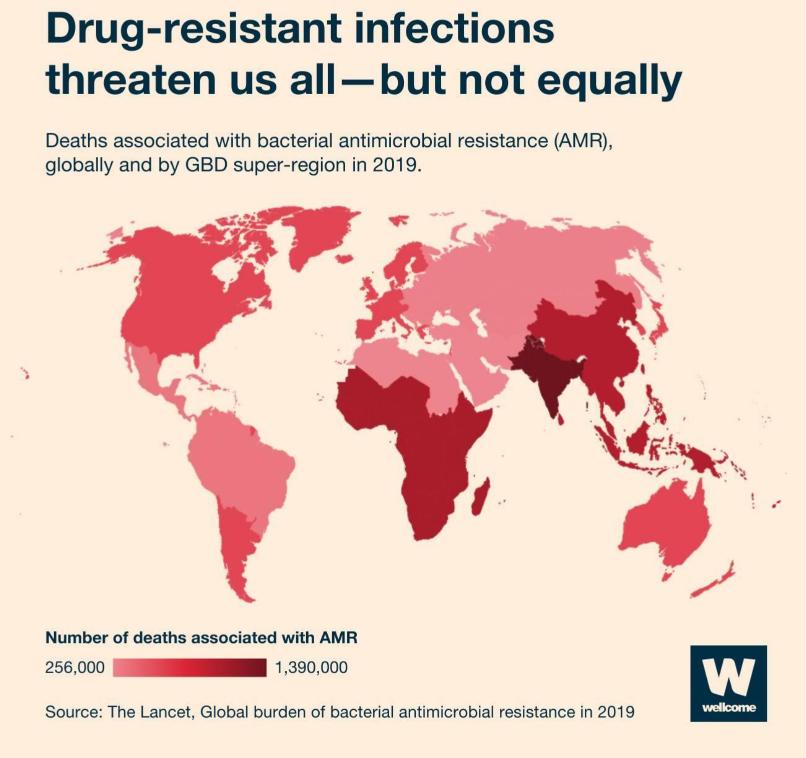


Antimicrobial resistance and One Health

Antimicrobial resistance (AMR):

- Microbes evolve mechanisms that protect them from the effects of antimicrobials
- Indiscriminate use of antimicrobials
- Dissemination or resistance genes between bacteria

Antimicrobial resistance threats



Urgent Threats

- Carbapenem-resistant *Acinetobacter*
- *Candida auris*
- *Clostridioides difficile*
- Carbapenem-resistant Enterobacteriaceae
- Drug-resistant *Neisseria gonorrhoeae*

Serious Threats

- Drug-resistant *Campylobacter*
- Drug-resistant *Candida*
- ESBL-producing Enterobacteriaceae
- Vancomycin-resistant *Enterococci*
- Multidrug-resistant *Pseudomonas aeruginosa*
- Drug-resistant nontyphoidal *Salmonella*
- Drug-resistant *Salmonella* serotype Typhi
- Drug-resistant *Shigella*
- Methicillin-resistant *Staphylococcus aureus*
- Drug-resistant *Streptococcus pneumoniae*
- Drug-resistant Tuberculosis

Concerning Threats

- Erythromycin-resistant group A *Streptococcus*
- Clindamycin-resistant group B *Streptococcus*

Watch List

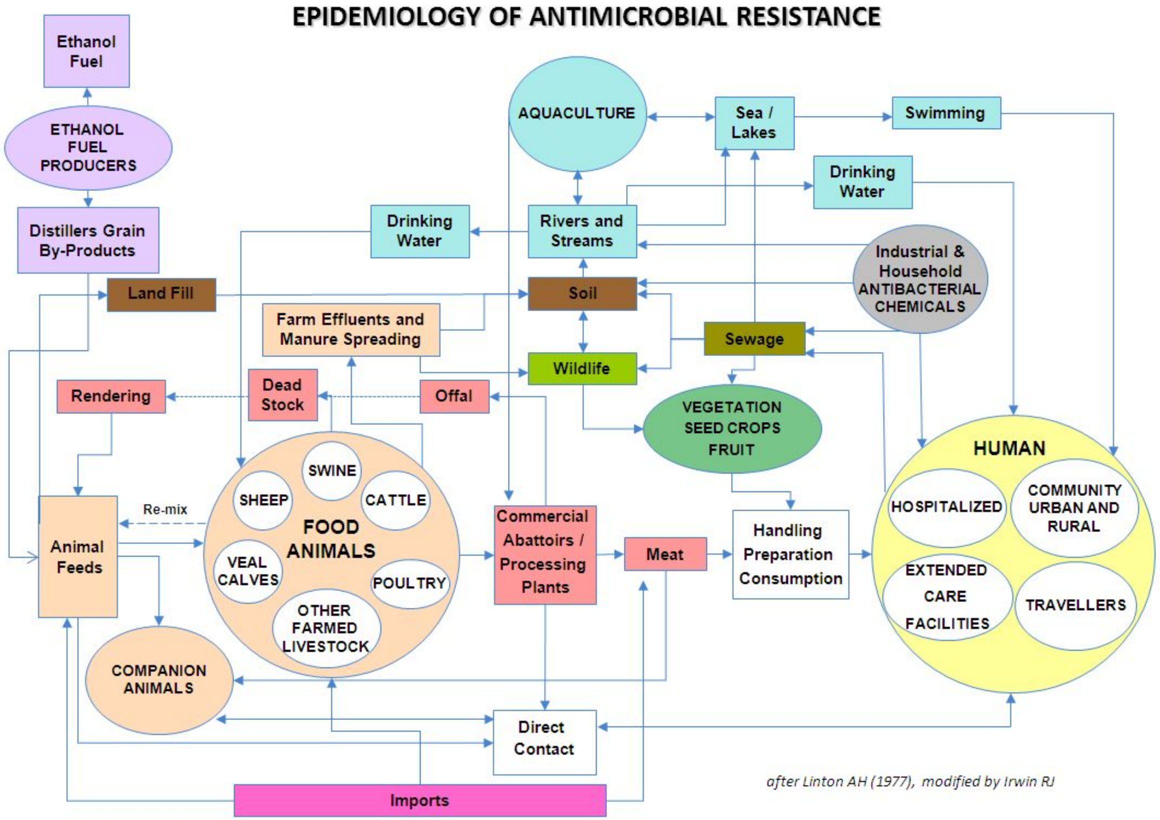
- Azole-resistant *Aspergillus fumigatus*
- Drug-resistant *Mycoplasma genitalium*
- Drug-resistant *Bordetella pertussis*

U.S. Centers for Disease Control and Prevention

The Lancet Global burden of bacterial antimicrobial resistance in 2019
https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)02724-0/fulltext

CDC 2019. Antibiotic resistance threats in the United States, .
http://www.cdc.gov/drugresistance/threat-report-2019/index.html.

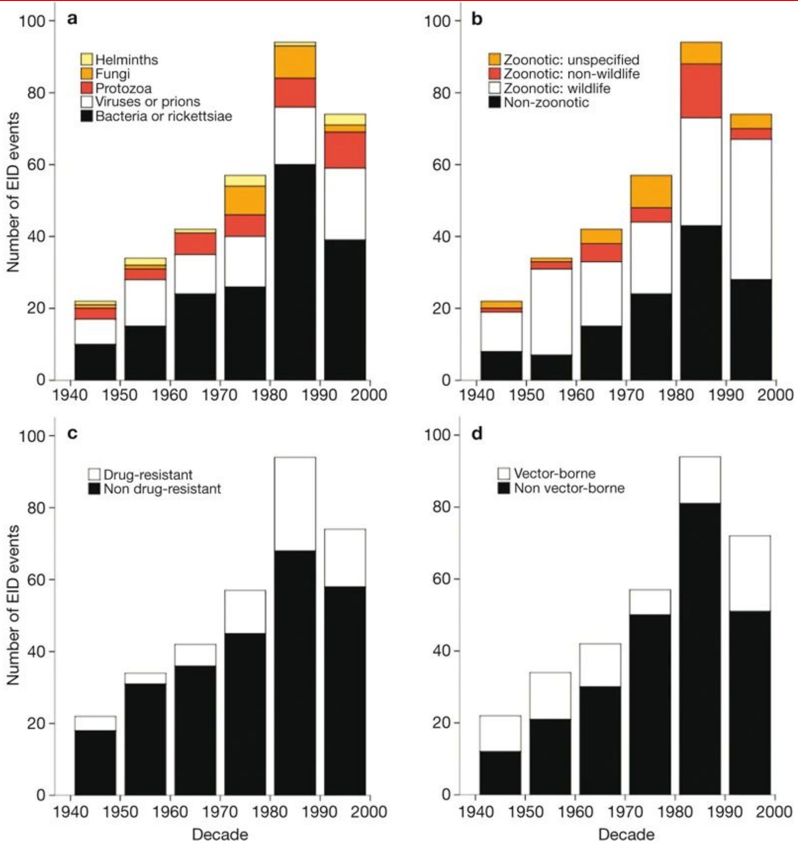
Antimicrobial resistance at the One Health interface



Emerging Infectious Diseases: Drug-resistant microbes

- Emerging Infectious Disease (EID)
  - An infectious disease that has newly appeared in a population or is rapidly increasing in incidence or geographic range

- 335 emerging infectious diseases identified between 1940 and 2004
  - 60.3% were **zoonoses**
  - 71.8% of these **originated in wildlife**
  - 20.9% of the EID events are caused by **drug-resistant microbes**



Jones, Patel, Levy, et. al. *Nature*, 2008 Feb. 21; 451 (7181):990-3

EID and AMR-bacteria

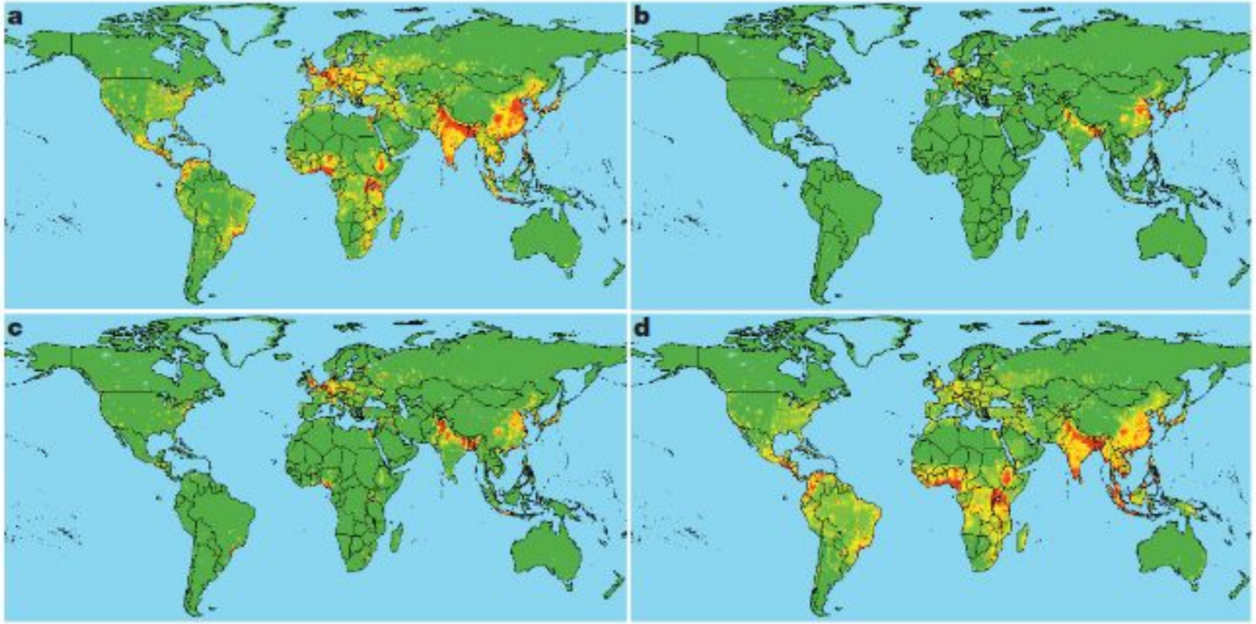


Figure 3 | Global distribution of relative risk of an EID event. Maps are derived for EID events caused by **a**, zoonotic pathogens from wildlife, **b**, zoonotic pathogens from non-wildlife, **c**, drug-resistant pathogens and **d**, vector-borne pathogens. The relative risk is calculated from regression coefficients and variable values in Table 1 (omitting the variable measuring reporting effort), categorized by standard deviations from the mean and mapped on a linear scale from green (lower values) to red (higher values).

- **EID origins are significantly correlated** with:
  - Socio-economic,
  - Human population density,
  - Antimicrobial use,
  - Agricultural practices

Morens, D., Folkers, G. & Fauci, A.*Nature* **430,** 242–249 (2004). https://doi.org/10.1038/nature02759
Jones, Patel, Levy, et. al. *Nature*, 2008 Feb. 21; 451 (7181):990-3

Antimicrobial use at the One Health interface

Antimicrobial non-judicious use is contributing to resistance

https://doi.org/10.1038/s41598-020-78849-3

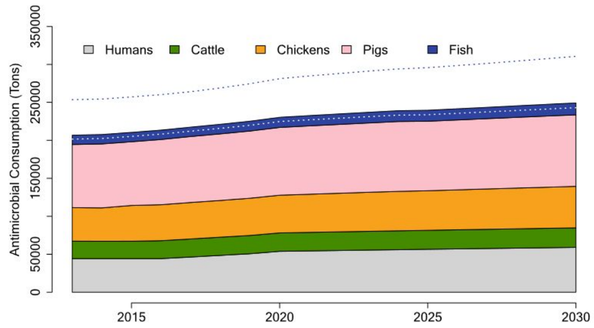


Figure 3. Global antimicrobial consumption, 2013–2030. Dotted lines represent the 95% uncertainty interval for fish.

PLOS GLOBAL PUBLIC HEALTH

Global trends in antimicrobial use in animals in 2020 and 2030

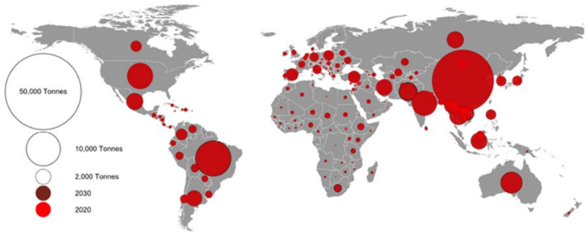
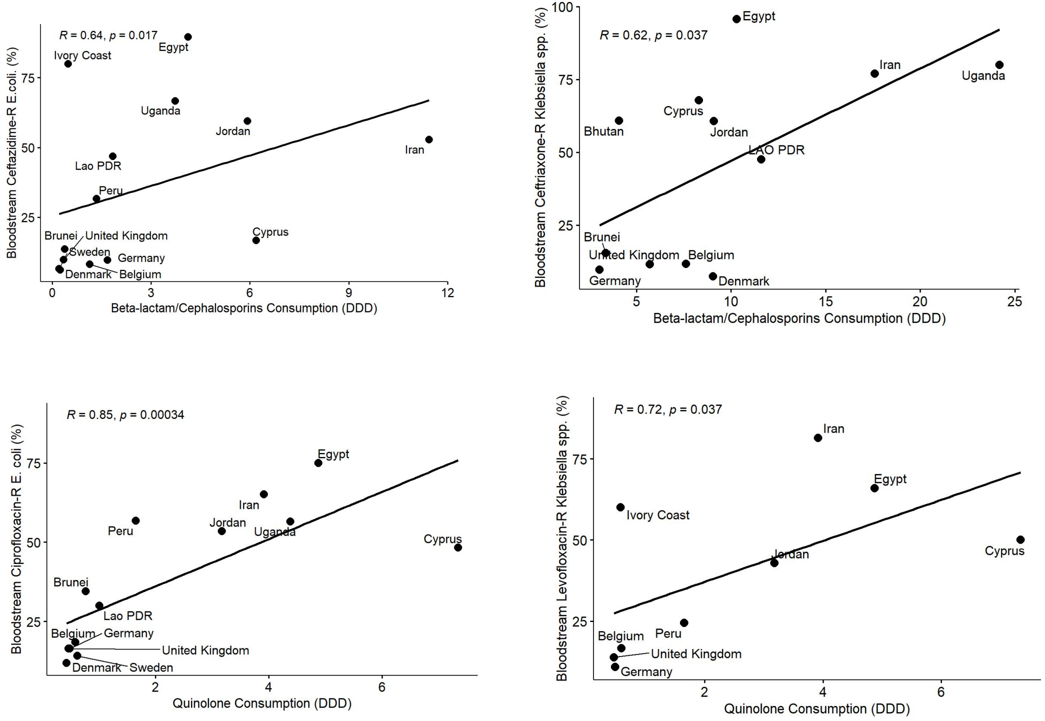


Fig 2. Antimicrobial consumption per country in 2020 and 2030. Circles are proportional to quantity of antimicrobials used. Red circles correspond to the quantity used in 2020, and outer dark red ring corresponds to the projected increase in consumption in 2030. Country boundaries were obtained from GADM (https://gadm.org/download_world40.html).

https://doi.org/10.1371/journal.pgph.0001305.g002

Geographical hotspots of antimicrobial use



https://doi.org/10.1371/journal.pone.0297921

Global burden of bacterial AMR 1990–2021

- At the regional level, we estimated the all-age death rate attributable to resistance to be highest in the western sub-Saharan Africa, at **27·3 deaths per 100 000 (20·9–35·3),** and lowest in Australasia, at 6·5 deaths (4·3–9·4) per 100 000.

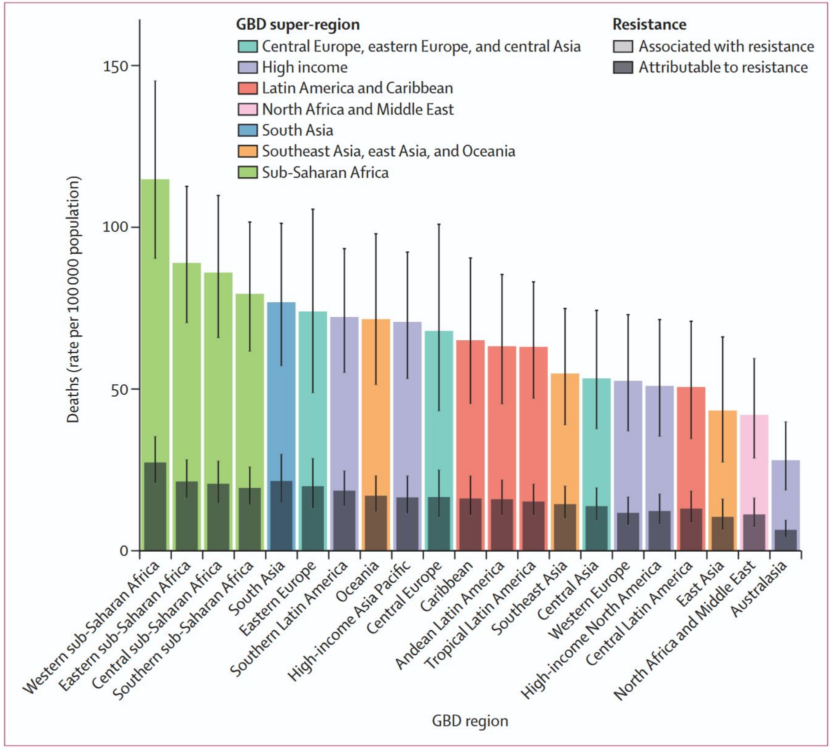
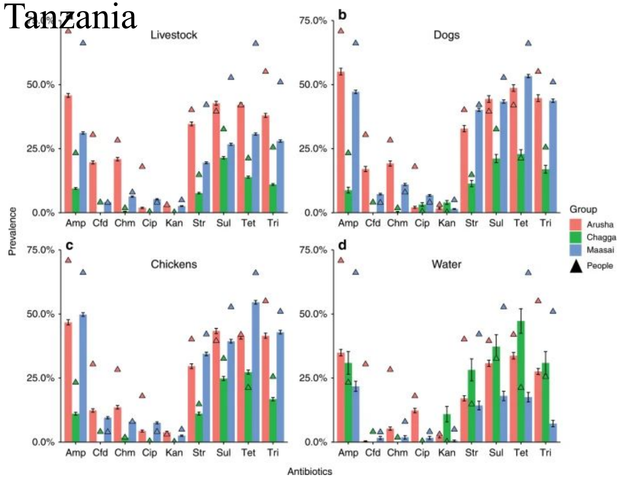


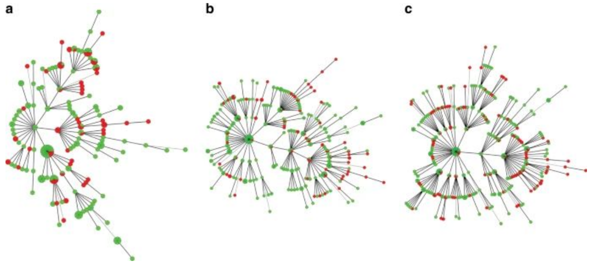
Figure 2: **All-age rate of deaths attributable to and associated with bacterial antimicrobial resistance by GBD region, 2019**
Estimates were aggregated across drugs, accounting for the co-occurrence of resistance to multiple drugs. Error bars show 95% uncertainty intervals. GBD=Global Burden of Diseases, Injuries, and Risk Factors Study.

https://doi.org/10.1016/S0140-6736(24)01867-1

AMR at One Health Interface: Case-studies

Similar AMR pattern and no evidence of host-specific clustering of *E. coli* in Tanzania





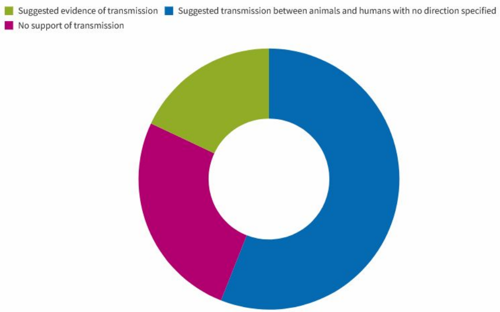
Subbiah, *et al.* Antimicrobial resistant enteric bacteria are widely distributed amongst people, animals and the environment in Tanzania. https://doi.org/10.1038/s41467-019-13995-5

TABLE 2. Key evidence for transfer of antibiotic resistance from animals to humans

Transfer type	Species tracked	Animal host(s)	Recipient host(s)	Resistance transferred	Evidence	Reference
Human colonization via direct or indirect animal contact	*E. coli*	U.S. chickens	Animal caretakers, farm family	Tetracycline	Following introduction of tetracycline on a farm, resistant *E. coli* strains with transferable plasmids were found in caretakers' gut floras, with subsequent spread to the farm family	111
	S. aureus, *Streptococcus* spp., *E. coli* and other enterobacteria	French swine	Swine farmers	Erythromycin, penicillins, nalidixic acid, chloramphenicol, tetracycline, streptomycin, cotrimoxazole	Phenotypic antibiotic resistance was significantly higher in the commensal floras (nasal, pharyngeal, and fecal) of swine farmers than in those of nonfarmers	16
	E. coli	U.S. chickens	Poultry workers	Gentamicin	Increase in phenotypic gentamicin resistance in workers through direct contact with chickens receiving gentamicin prophylactically	126
	E. coli	Chinese swine and chickens	Farm workers	Apramycin (not used in human medicine)	Detection of *aac(3)-IV* apramycin resistance gene in humans, with 99.3% homology to that in animal strains	164
	MRSA ST398	Dutch veal calves	Veal farmers	MDR	Human nasal carriage of the *mecA* gene was strongly associated with (i) greater intensity of animal contact and (ii) the number of MRSA-positive animals; animal carriage was related to animal antibiotic treatment	78
Human infection via direct or indirect animal contact	*Salmonella* Newport	Beef cattle (ground beef) receiving chlortetracycline AGP	*Salmonella*-infected patients with diarrhea	Ampicillin, carbenicillin, tetracycline	Direct genetic tracking of resistance plasmid from hamburger meat to infected patients	87
	E. coli	German swine (ill)	Swine farmers, family members, community members, UTI patients	Streptothricin	Identification of transferable resistance plasmids found only in human gut and UTI bacteria when nourseothricin was used as swine AGP	90
	E. coli, *Salmonella enterica* (serovar Typhimurium)	Belgian cattle (ill)	Hospital inpatients	Apramycin, gentamicin	Plasmid-based transfer of *aac(3)-IV* gene bearing resistance to a drug used only in animals (apramycin)	42
	Enterococcus faecium	Danish swine and chickens	Hospital patients with diarrhea	Vancomycin	Clonal spread of *E. faecium* and horizontal transmission of the *vanA* gene cluster (Tn*1546*) found between animals and humans	80
	E. coli	Spanish chickens (slaughtered)	Bacteremic hospital patients	Ciprofloxacin	Multiple molecular and epidemiological typing modalities demonstrated avian source of resistant *E. coli*	95

0893-8512/11/$12.00 doi:10.1128/CMR.00002-11

Evidence of AMR transmission between farm animals and humans (in % of the studies reviewed).



https://www.allaboutfeed.net/animal-feed/feed-processing/amr-spreading-from-animal-to-human-enough-proof/

AMR at One Health Interface: Case-studies

- **<u>Unidirectional significant associations</u>** were identified between **animal antimicrobial consumption** and **AMR in food-producing animals** (OR 1·05 [95% CI 1·01–1·10]; p=0·013), and between **human antimicrobial consumption** and **AMR WHO critical priority** (1·06 [1·00–1·12]; p=0·035) and **high priority** (1·22 [1·09–1·37]; p<0·0001) **pathogens**.

- **<u>Bidirectional associations at One Health interface</u>**: **animal antibiotic consumption** was positively linked with **AMR in human pathogens** (1·07 [1·01–1·13]; p=0·020) and **human antibiotic consumption** was positively linked with **animal AMR** (1·05 [1·01–1·09]; p=0·010)

Global antimicrobial-resistance drivers: an ecological country-level study at the human–animal interface

Kasim Allel, Lucy Day, Alisa Hamilton, Leesa Lin, Luis Furuya-Kanamori, Catrin E Moore, Thomas Van Boeckel, Ramanan Laxminarayan, Laith Yakob

Summary

Background Antimicrobial resistance (AMR) is a pressing, holistic, and multisectoral challenge facing contemporary global health. In this study we assessed the associations between socioeconomic, anthropogenic, and environmental indicators and country-level rates of AMR in humans and food-producing animals.

Methods In this modelling study, we obtained data on Carbapenem-resistant *Acinetobacter baumanii* and *Pseudomonas aeruginosa*, third generation cephalosporins-resistant *Escherichia coli* and *Klebsiella pneumoniae*, oxacillin-resistant *Staphylococcus aureus* and vancomycin-resistant *Enterococcus faecium* AMR in humans and food-producing animals from publicly available sources, including WHO, World Bank, and Center for Disease Dynamics Economics and Policy. AMR in food-producing animals presented a combined prevalence of AMR exposure in cattle, pigs, and chickens. We used multivariable β regression models to determine the adjusted association between human and food-producing animal AMR rates and an array of ecological country-level indicators. Human AMR rates were classified according to the WHO priority pathogens list and antibiotic–bacterium pairs.

Findings Significant associations were identified between animal antimicrobial consumption and AMR in food-producing animals (OR 1·05 [95% CI 1·01–1·10]; p=0·013), and between human antimicrobial consumption and AMR specifically in WHO critical priority (1·06 [1·00–1·12]; p=0·035) and high priority (1·22 [1·09–1·37]; p<0·0001) pathogens. Bidirectional associations were also found: animal antibiotic consumption was positively linked with resistance in critical priority human pathogens (1·07 [1·01–1·13]; p=0·020) and human antibiotic consumption was positively linked with animal AMR (1·05 [1·01–1·09]; p=0·010). Carbapenem-resistant *Acinetobacter baumanii*, third generation cephalosporins-resistant *Escherichia coli*, and oxacillin-resistant *Staphylococcus aureus* all had significant associations with animal antibiotic consumption. Analyses also suggested significant roles of socioeconomics, including governance on AMR rates in humans and animals.

Interpretation Reduced rates of antibiotic consumption alone will not be sufficient to combat the rising worldwide prevalence of AMR. Control methods should focus on poverty reduction and aim to prevent AMR transmission across different One Health domains while accounting for domain-specific risk factors. The levelling up of livestock surveillance systems to better match those reporting on human AMR, and, strengthening all surveillance efforts, particularly in low-income and middle-income countries, are pressing priorities.

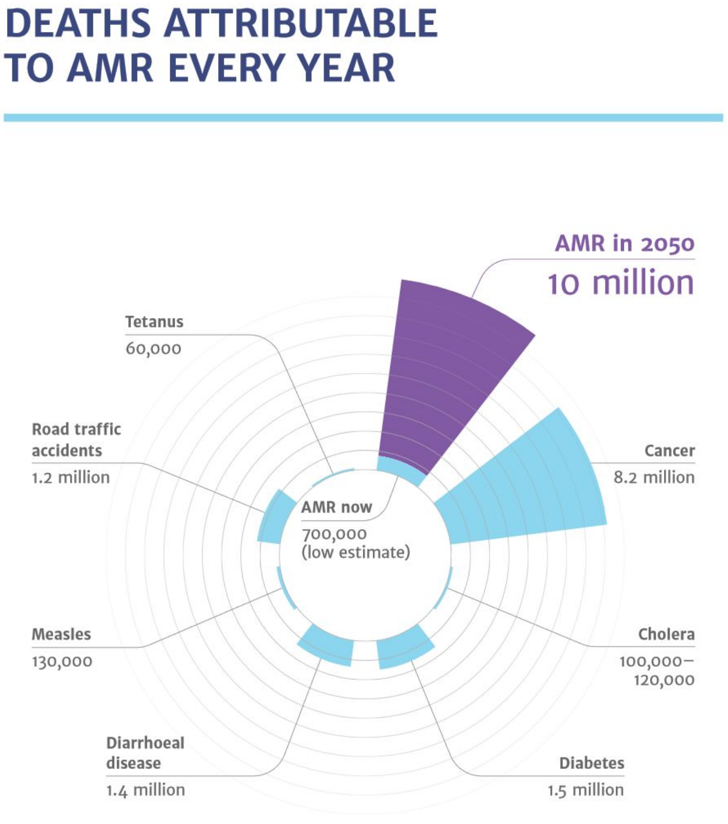
https://www.thelancet.com/action/showPdf?pii=S2542-5196%2823%2900026-8

AMR Impact: Jim O'Neil's report

"Based on scenarios of rising drug resistance for six pathogens to 2050, we estimated that unless action is taken, the burden of deaths from AMR could balloon to **10 million lives each year by 2050**, at a cumulative cost to global economic output of **100 trillion USD**"

https://amr-review.org/sites/default/files/160518_Final%20paper_with%20cover.pdf

- Increased risk of therapeutic failures
- Increased veterinary/human health-care costs
- Prolonged hospitalization
- Zoonotic transmission potential of AMR in humans
- Illnesses and mortality
- Economic burden



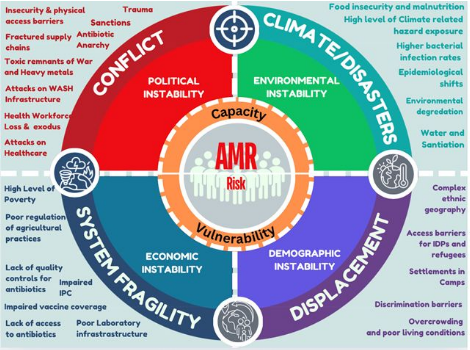
Drivers: Human interface

- **Global population ↑ :**
  - 7 billion and growing 1.2%/year
  - Developing countries ↑
  - EID events caused by drug-resistant microbes are affected by human population density and growth

	Number of AMR-associated deaths
AMR-associated deaths, 1990	4 770 000
Factors driving changes in AMR deaths between 1990 and 2019	
Population growth	+1 740 000
Age structure	+792 000
Sepsis death rate	−3 090 000
Proportion of sepsis deaths associated with AMR syndromes	−181 000
Proportion of AMR syndrome deaths associated with AMR bacteria	+227 000
Proportion of AMR bacteria deaths associated with resistance	+675 000
Net change	163 000
AMR-associated deaths, 2019	4 940 000

Human Migration, Tourism, Conflict, and Travel

- 1 billion people cross borders each year
- Accelerated and increased in human, animal, and animal product interactions
- Traveler's diarrhea
- War, terrorism, & conflict



https://doi.org/10.1016/ S0140-6736(24)01867-1

Drivers: Human interface

- **Growing population with greater susceptibility to infectious diseases**
  - **Community-acquired, Livestock-acquired, hospital-acquired bacterial infections:** LA/CA MRSA, MDR-*Escherichia coli,* MDR-ESKAPE pathogens
  - **Comorbidity and immune status:** Seniors and other immunocompromised individuals –cancer patients, organ transplant patients, HIV/AIDS, etc
  - **Poverty and social inequality:** One of the major factors in determining health – Low SES, homelessness, drug abuse epidemic, etc

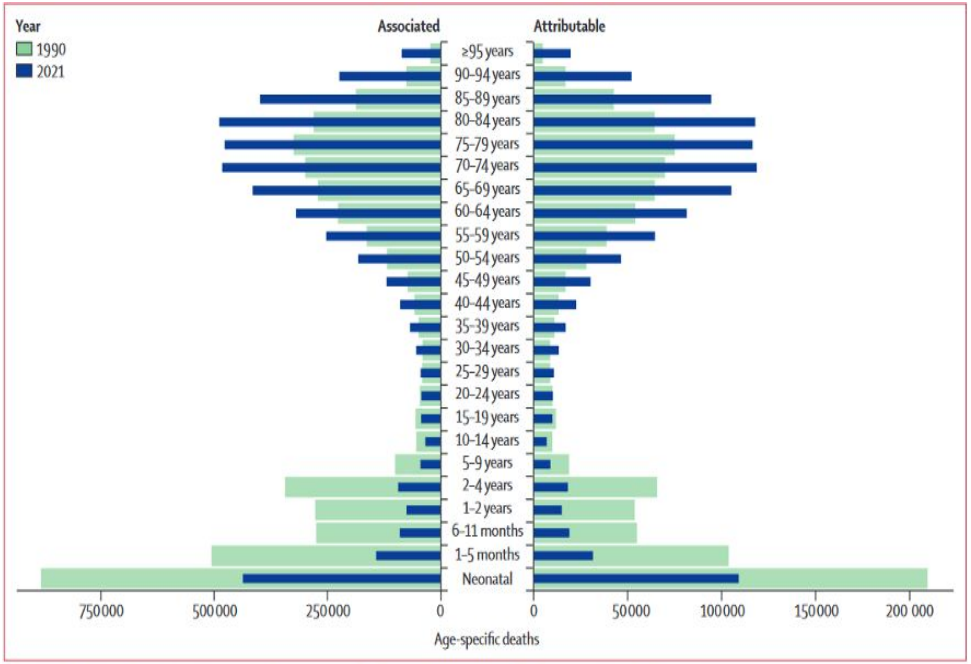
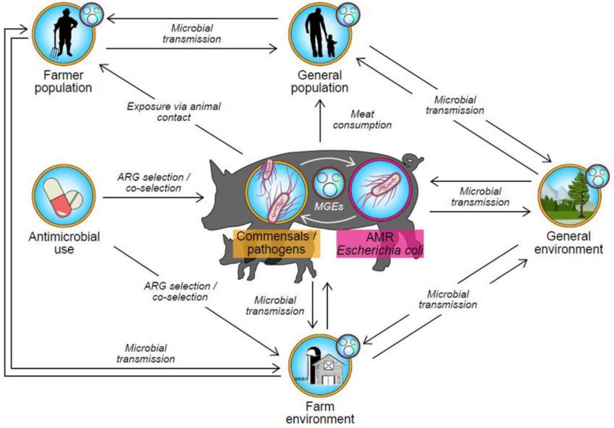


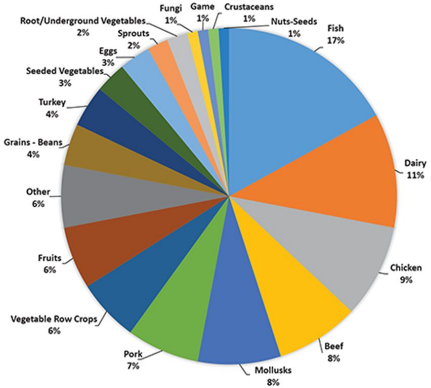
Figure 2: Deaths attributable and associated with antimicrobial resistance, by detailed age group, for 1990 and 2021

Drivers: Food, Farms, & Animals

TEXAS TECH UNIVERSITY SCHOOL OF VETERINARY MEDICINE ★ 2018 ★

- **Global food systems:**
  - International trade, transportation, and introduction of existing and new microbes with multidrug resistance potentials
- **Food safety:**
  - Produce is a growing vehicle for food-borne pathogens
  - Manure fertilizer application
  - Animal reservoirs of infectious diseases
  - Fecal contamination of green vegetables by wildlife
- **Pets/Occupational One Health exposures**
  - Colonization with livestock-associated Methicillin-resistant *Staphylococcus aureus* (LA-MRSA) among persons occupationally exposed to pigs, cattle, or poultry is persistent





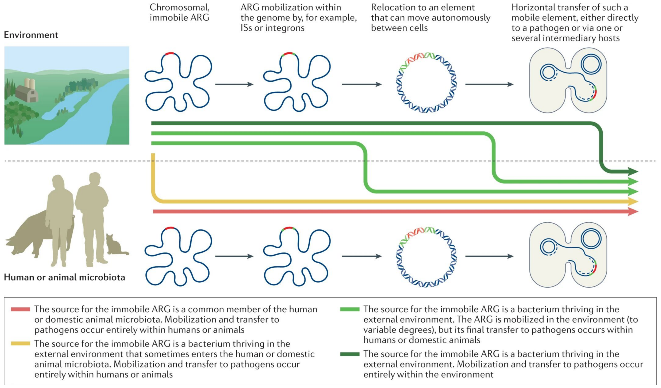
Source: CDC National Outbreak Reporting System, 2009–2016

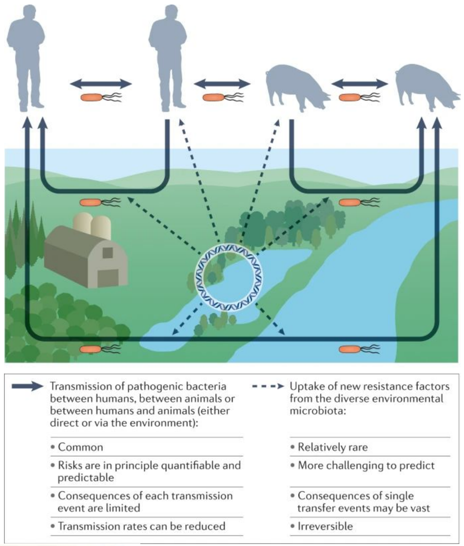
Drivers: Environmental interface

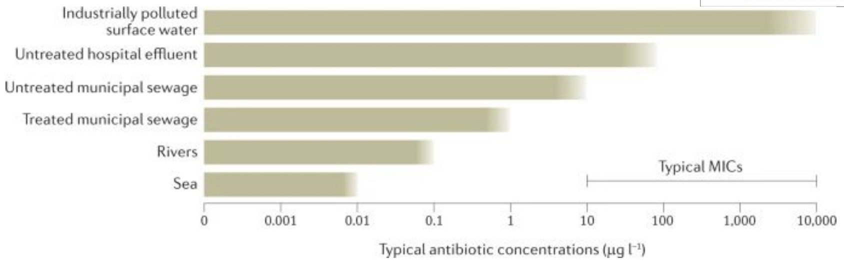
- Degrading ecosystem changes continue to occur, most are **anthropogenic** in origin, e.g., pollution, wastewater, etc
- **Livestock production waste**: Runoff into the aquatic environment

- Environmental **residues** of antimicrobials
- Environmental reservoir of **antimicrobial-resistant bacteria**

- Environmental reservoir of **antimicrobial-resistance genes**
- **Antimicrobial use** in plants and the environment
- **Wildlife as reservoirs** of AMR- even without antimicrobial exposures



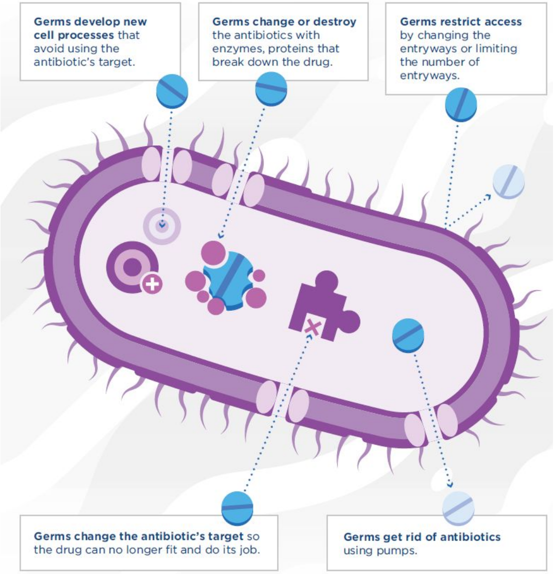


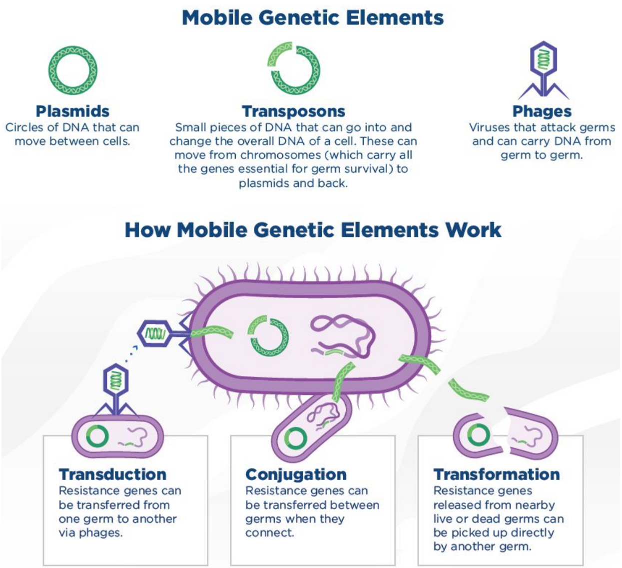


Larsson, D.G.J., Flach, CF. Antibiotic resistance in the environment. *Nat Rev Microbiol* **20**, 257–269 (2022). https://doi.org/10.1038/s41579-021-00649-x

Drivers: Microbial adaptation

- Survival of the fittest
- Change in bacterial attributes:
  - Infectivity, pathogenicity, virulence, multi-drug resistance
- Mobile genetic elements and horizontal gene transfer/dissemination
- Biofilm production



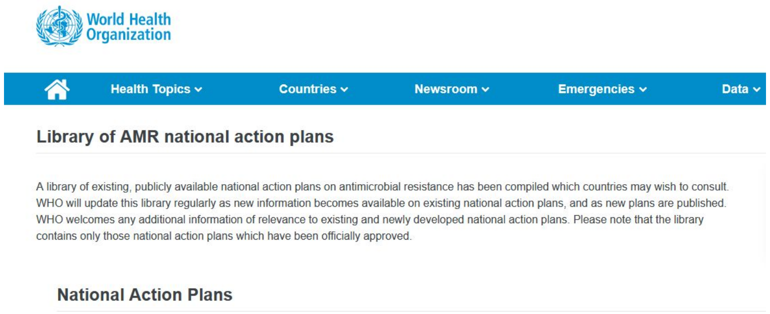


Suggested Action Plans for Africa to Address AMR

- Better policy/regulation of Antimicrobial use
- Local, regional, national, and international collaborations

- Supporting antibiotic development
- State-of-the-art diagnostics and surveillance

- Promotion of antimicrobial alternatives
- Educate and inform to change behaviors


World Health Organization

Health Topics Countries Newsroom Emergencies Data

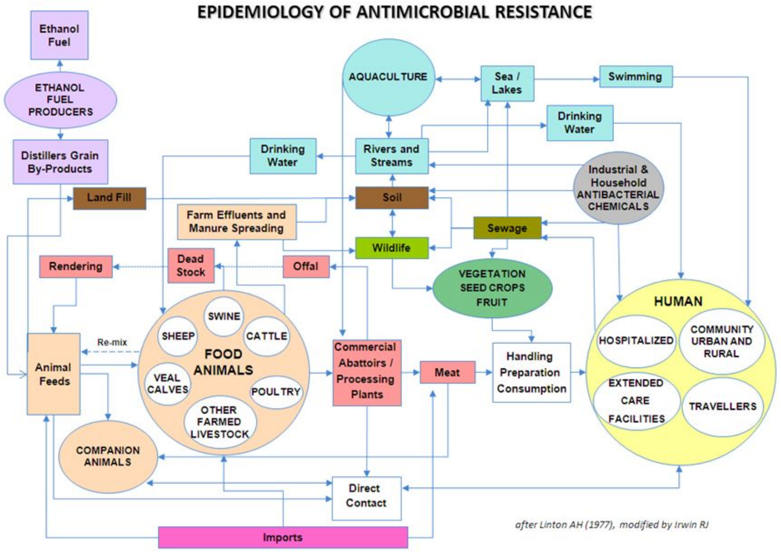
Library of AMR national action plans

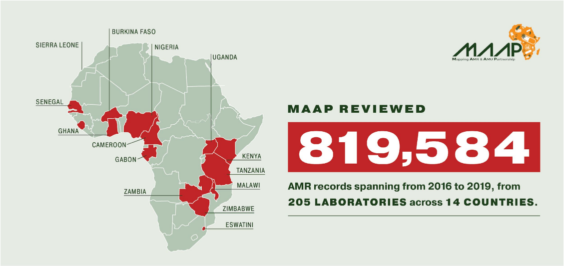
A library of existing, publicly available national action plans on antimicrobial resistance has been compiled which countries may wish to consult. WHO will update this library regularly as new information becomes available on existing national action plans, and as new plans are published. WHO welcomes any additional information of relevance to existing and newly developed national action plans. Please note that the library contains only those national action plans which have been officially approved.

National Action Plans

Integrated AMR Surveillance programs

- Coordinated sampling and testing of antimicrobial susceptibility of bacteria from food-producing animals, food products, companion animals, humans, wildlife, and environment
- **GLASS, CIPARS, NARMS, EFSA, DANMAP, EARS-Net, etc**



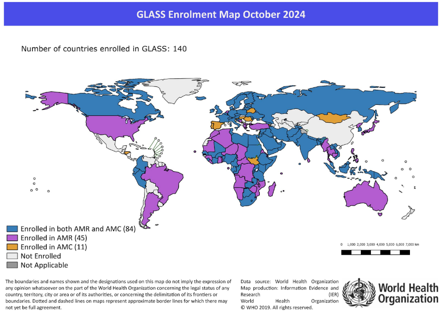


AfricaCDC
Centres for Disease Control and Prevention

Co-funded by the European Union

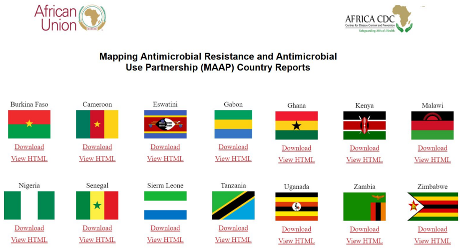
The Africa Pathogen Genomics Initiative (Africa PGI)

Integrated Genomic Surveillance and Data Sharing Platform (IGS)



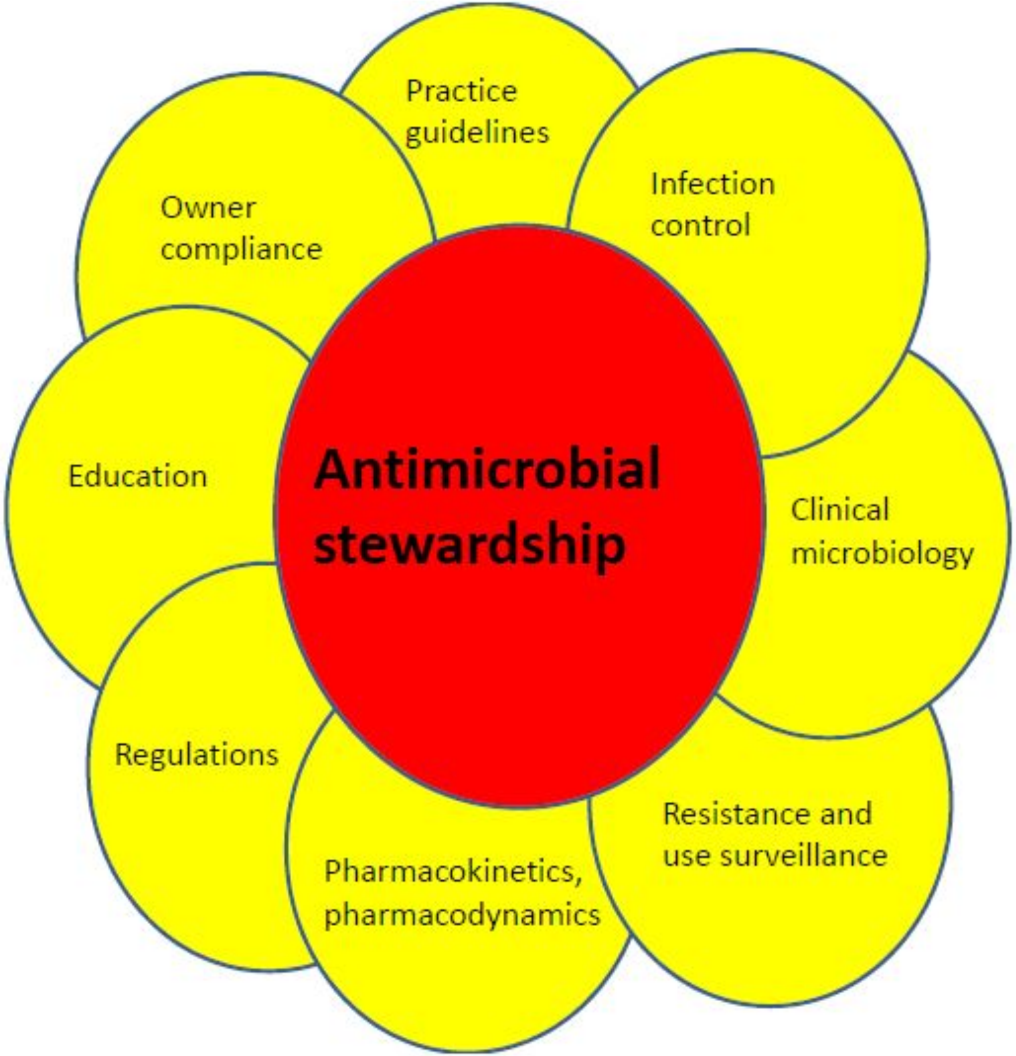
The Fleming Fund

UKaid
from the British people

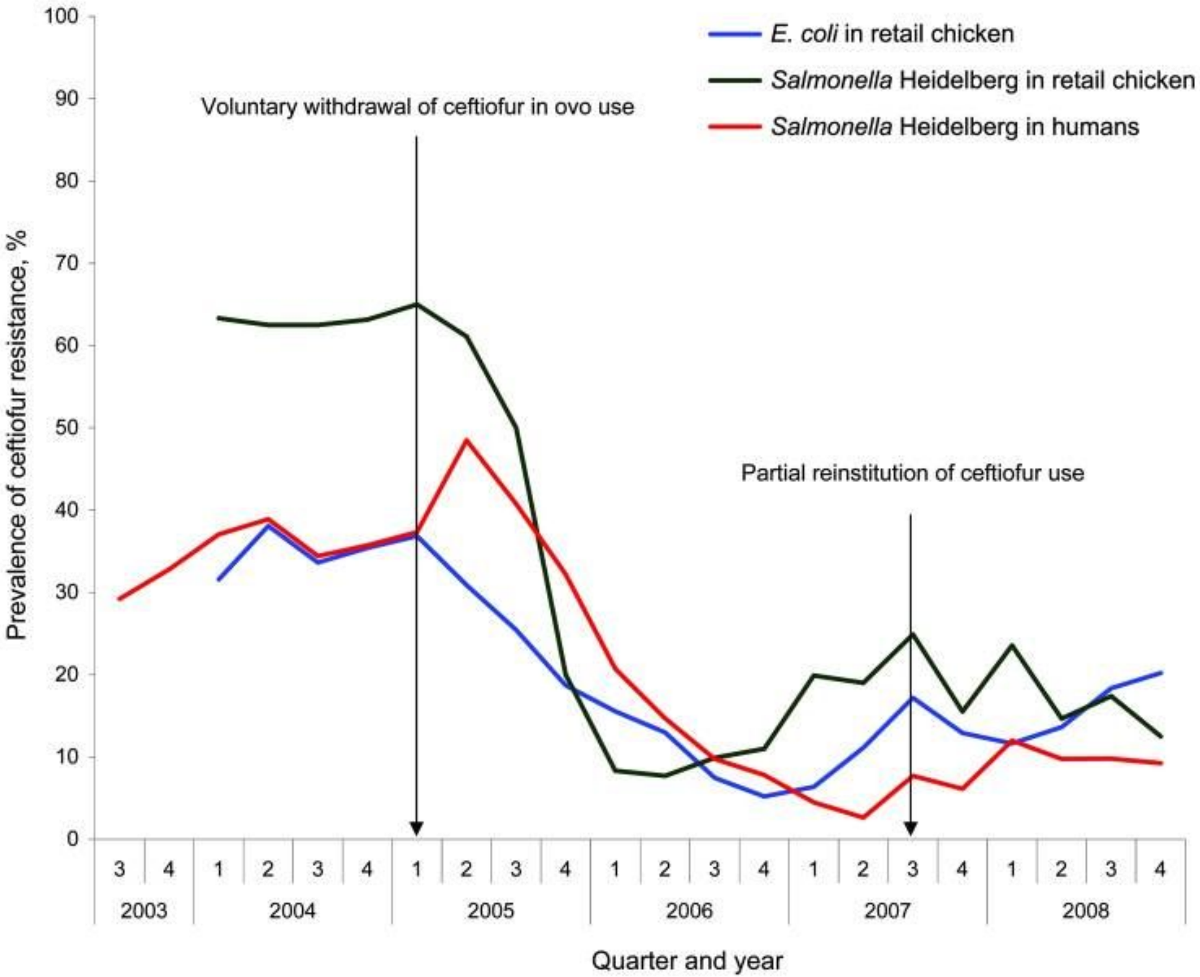


Surveillance/Collaborative initiatives: Africa

Antimicrobial Stewardship: New paradigm shift



Canada's story



Dutil, et al., 2010. Ceftiofur resistance in *Salmonella enterica* serovar Heidelberg from chicken meat and humans, Canada. Emerging Infectious Diseases, 16, 48-54.

Summary

- AMR is a major global One Health threat affecting humans, animals, and the environment.
- Key drivers cut across the human, animal, and environmental interface.
- AMR already causes high mortality and economic losses, with projections reaching 10 million deaths annually by 2050.
- Effective mitigation requires coordinated action through policy, education, research innovation, multisector collaboration, integrated surveillance, diagnostics, and stewardship across sectors.

Get in touch: babafela.awosile@ttu.edu

The Impact of Operational Research as a Tool to Tackle Anti-microbial Resistance with a One Health Approach

Dr. Robert Terry

Manager of Research Policy,
TDR, WHO
https://orcid.org/0000-0003-3849-7705

Dr. Robert Terry

Manager of Research Policy,
TDR, WHO

Take home message.....

*'Integrating research and communication skills in frontline workers in health, agriculture and environment has enabled countries to unlock the data in their systems and move from being data rich to being **information rich**.'*

Dr Rony Zachariah, TDR

TDR For research on diseases of poverty
UNICEF • UNDP • World Bank • WHO

What is structured operational research training?

- A practical training programme developed by Médecins sans Frontières, The TB Union and TDR from 2009
- Research using local data to answer locally relevant questions: **NTDs, TB, HIV, Antibiotic Resistance & One Health**.
- Provides hands on research training to frontline workers +/- research experience
- 2019 a new module, knowledge translation, was added including the communication of research findings □ recommendations to improve policy, practice and behaviour

Case study: District hospital, Kabul

Are we over prescribing?

Research: *using hospital records*

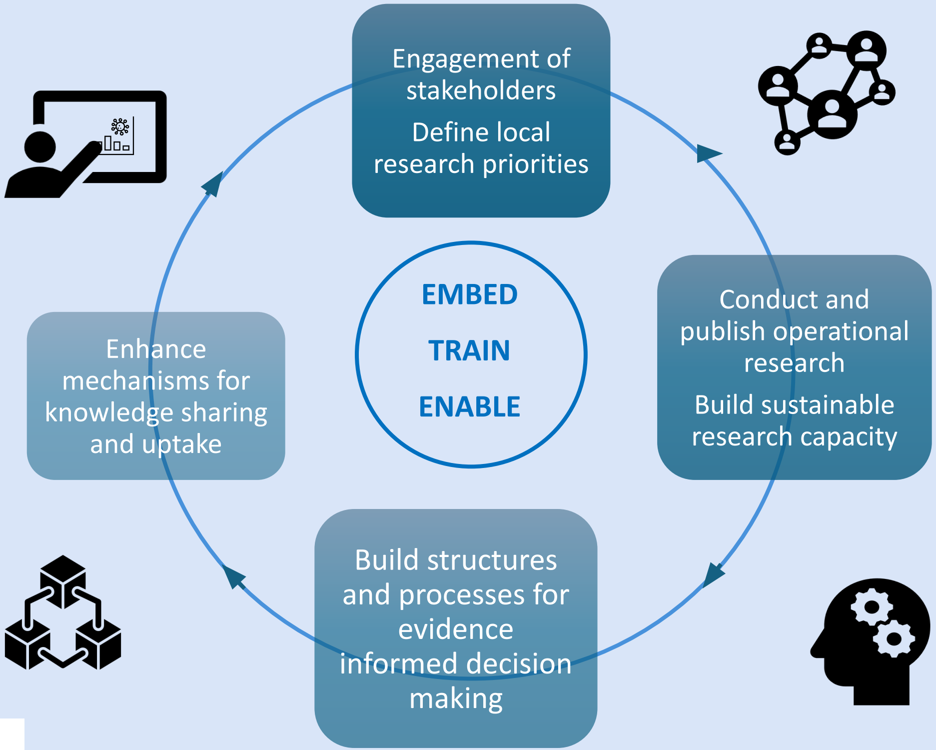
Findings: *Outpatient prescriptions 60%*
Two times greater than WHO guidelines @ 30%

Action: *Education of health staff and the community on rational antibiotic prescribing practices.*

Impact: *2 year follow up prescription within WHO recommended limits.*

HOW KNOWLEDGE TRANSLATION IS EMBEDDED IN THE RESEARCH CYCLE

Stakeholder analysis
Evidence Briefs
Presentations (3 mins)
Networking
Elevator pitches



SORT IT
Improving health systems through research

TDR For research on diseases of poverty
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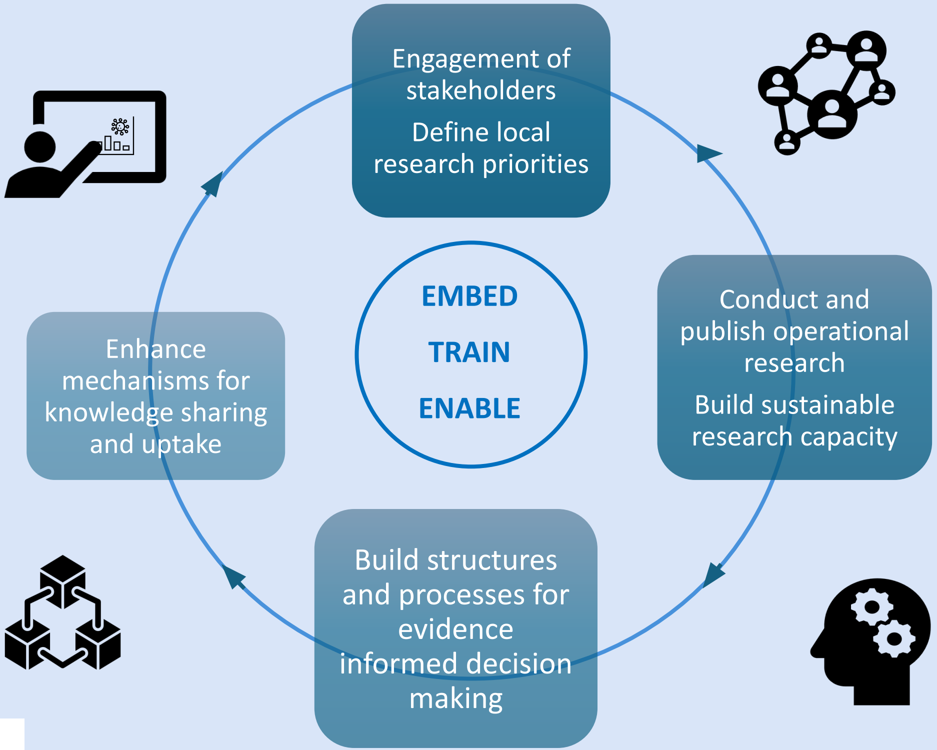
HOW KNOWLEDGE TRANSLATION IS EMBEDDED IN THE RESEARCH CYCLE

4 modules over 8-12 months +/- 12 projects

Milestones and %Targets 80:80:80:80

Mentors >50% alumni



SORT IT
Improving health systems through research

TDR For research on diseases of poverty
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SORT IT: building research capacity & knowledge translation since 2009

SORT IT
Improving health systems through research

Europe

18 Armenia
1 Azerbaijan
3 Belarus
5 Belgium
1 Denmark
1 Estonia
2 Georgia
4 Greece
4 Italy
2 Latvia
3 Moldova
2 Serbia
1 Switzerland
26 Ukraine
36 United Kingdom

Asia

5 Afghanistan
12 Bangladesh
15 Bhutan
5 Cambodia
21 China
177 India
1 Indonesia
4 Kazakhstan
14 Kyrgyzstan
1 Malaysia
1 Mongolia
79 Myanmar
33 Nepal
31 Pakistan
1 Singapore
6 Sri Lanka
4 Tadjikistan
2 Timor Leste
1 Turkmenistan
17 Uzbekistan
4 UAE
5 Viet Nam
1 Yemen

South Pacific

1 American Samoa
1 Cook Islands
3 Federated States of Micronesia
25 Fiji
1 Guam
4 Kiribati
3 Marshall Islands
3 New Caledonia
2 Palau
12 Papua New Guinea
1 Samoa
2 Solomon Islands
2 Tonga
3 Vanuatu

North and South America

5 Brazil
1 Canada
17 Colombia
1 Dominican Republic
6 Ecuador
1 El Salvador
1 Guatemala
2 Haiti
1 Honduras
2 Mexico
11 Peru

Africa

1 Benin
3 Botswana
6 Burundi
1 Central African Republic
2 Côte d'Ivoire
7 Democratic Republic of the Congo
7 Egypt
34 Ethiopia
22 Ghana
10 Guinea
50 Kenya
1 Lebanon
1 Lesotho
13 Liberia
1 Madagascar
19 Malawi
1 Mauritania
6 Mozambique
3 Namibia
1 Niger
9 Nigeria
8 Rwanda
50 Sierra Leone
2 Somalia
2 Somaliland
12 South Africa
3 South Sudan
1 Sudan
4 Tunisia
22 Uganda
2 United Republic of Tanzania
10 The Kingdom of eSwatini
2 Zambia
53 Zimbabwe

- 102 •Courses
- 1073 •Projects - Participants
- 900+ •Publications
- 50% •Continue independent research

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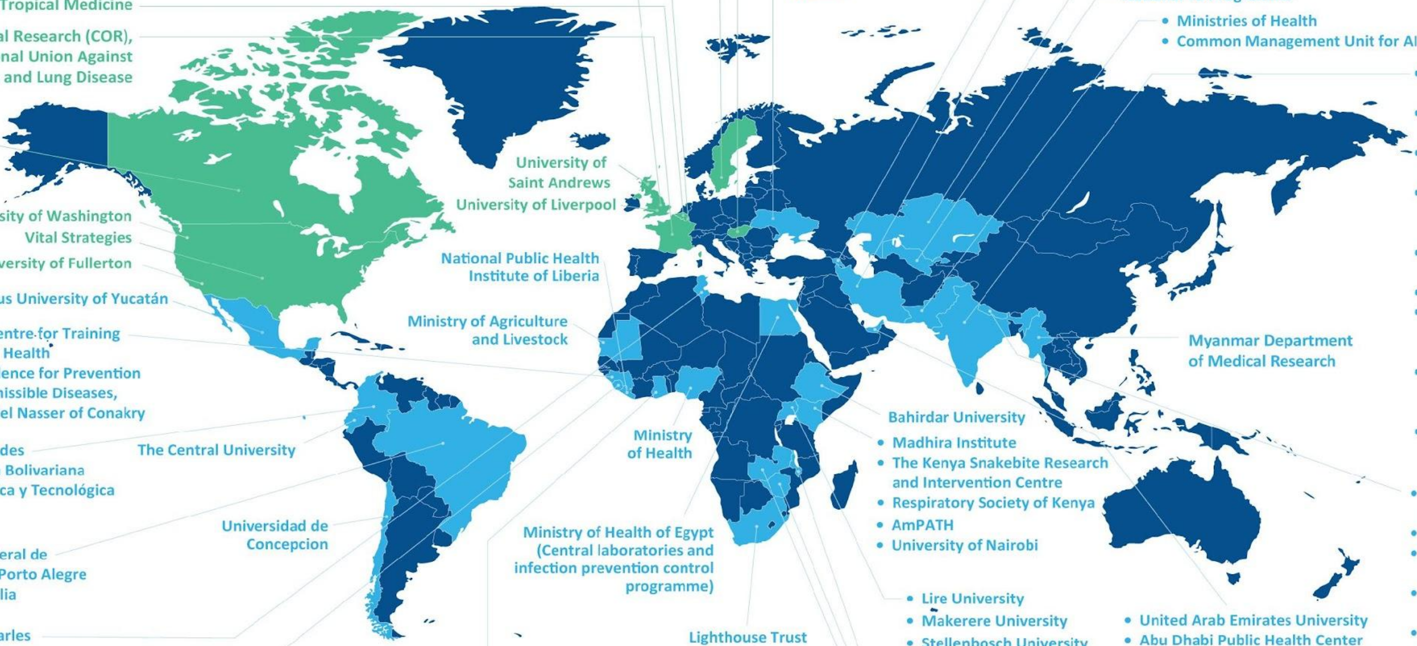
SORT IT: building research capacity & knowledge translation since 2009: 87 partner institutions



Impact: veterinary services Sierra Leone

Dr Leno Chief Surveillance Officer and Data Manager, Ministry of Agriculture and Food Security, Livestock and Veterinary Services Division in Sierra Leone.

- Three rounds of SORT IT: identify the issue – implement recommendations – measure impact – monitor sustainability
- Today 14 (100%) districts now report livestock data : 3 in 2017
- 88% of 527 expected weekly reports are received : 1% in 2017
- Data quality has also improved, enabling an analysis of antimicrobial use under routine programmatic conditions.

"By misusing or over-using antimicrobials, we all suffer. By allowing pathogens to become drug-resistant, we put ourselves and our animals at risk – our existences are inter-dependent."

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Impact: Ghana one health approach to tackle AMR

3 x rounds of research 12 x projects

- 5 Hospital based
- Drinking water
- Salad treatment
- Pig production + analysis of slurry
- AMR in seafood effluent

Field Impact of the SORT IT Initiative on Combating Antimicrobial Resistance Through a One Health Approach in Ghana
https://www.mdpi.com/journal/tropicalmed/special_issues/1H50KYTOP4

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Impact: Ghana OR and policy change

Strategic Area	Enabling Factor
Align research with national priorities.	All studies were vetted by the National AMR Committee to ensure relevance. The principle was clear: "*national research, with national ownership, for national solutions.*"
Engage end-users early and continuously.	Key decision-makers were involved throughout—from conception to publication—building shared ownership and accountability.
Ensure timely, high-quality publications and inclusive co-authorship	Decision-makers valued credible evidence delivered on time for use in policy and practice, with their direct involvement.
Disseminate and communicate effectively.	Scientific papers were translated into plain-language summaries tailored to various audiences, including community members. "*What matters is not what we say, but what they hear.*"
Build and sustain a critical pool of researchers.	Collaboration between public health programs and academia pooled expertise and resources, creating a pipeline of trained researchers who mentor others and renew leadership.
Provide sustained support and follow-up.	Continued engagement by the World Health Organization office in Ghana and the SORT IT team ensured progress in tracking, funding, and problem-solving. "*What gets measured gets done*".

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New TDR training: Communication of research findings

CONTENT

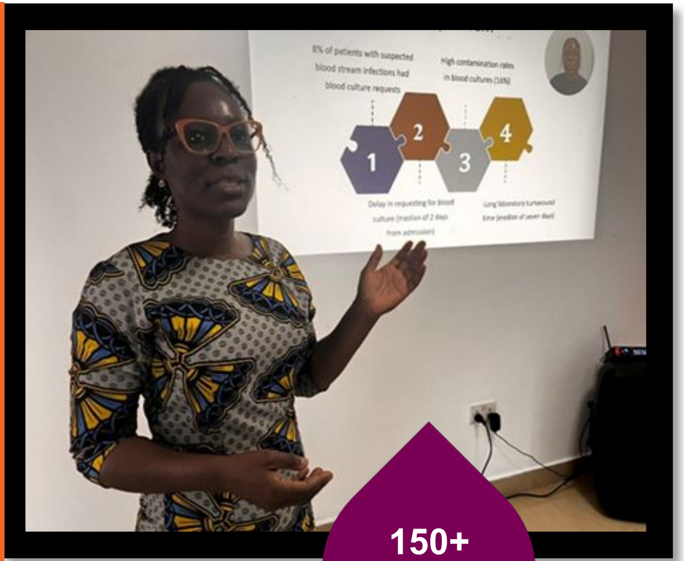
- Stakeholder mapping
- Evidence briefs
- PPTX Lightning presentation + videos

Courses in Ghana and online

1,900 registered for the course

137 certificates issued

Rita Sewornu, Ghana



150+ Trained

Link to MOOC

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“If research is to have impact and improve outcomes, it must be locally relevant and the findings actionable to shape policy and/or practice. Structured Operational Research Training (SORT IT) is well designed and invaluable for this purpose.”

Dr Sartie Kenneh, Chief Medical Officer, Ministry of Health and Sanitation, Sierra Leone

Future & References

Publish more impact studies

Migrate to WHO Academy

SORT IT operational research and training – links:

- Published papers
- Evidence briefs
- Lightning presentation videos

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Acknowledgements

The following people contributed content and reviewed this presentation:

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Dr Jacklyne Ashubwe Jalemba, Medwise Solutions (jashubwe@medwisesolutions.org)

Jamie Guth, Global Health Connections LLC (guth.jamie@gmail.com)

Dr. Ravi M. Ram, Director of Evaluation, Madhira Institute and Medwise Solutions, Kenya (ram@jhu.edu)

TDR, the Special Programme for Research and Training in Tropical Diseases, is a global programme of scientific collaboration that helps facilitate, support and influence efforts to combat diseases of poverty. It is co-sponsored by the United Nations Children's Fund (UNICEF), the United Nations Development Programme (UNDP), the World Bank and the World Health Organization (WHO).

Breaking The Resistance: How Diagnostics Empower Africa's Fight Against AMR

Dr. Sigei Kiplangat

Medical Affairs Manager,
Anglophone Africa,
bioMérieux

Dr. Kiplangat Sigei

Medical Affairs Manager,
Anglophone Africa,
bioMérieux

THE GLOBAL HEALTH NETWORK

Enabling research by sharing knowledge

BIOMÉRIEUX

BREAKING THE RESISTANCE: HOW DIAGNOSTICS EMPOWER AFRICA'S FIGHT AGAINST AMR

Dr. Kiplangat Sigei, MBChB (Nairobi), PGD (Edinburgh), MSc Public Health (London)

Medical Affairs Manager, bioMérieux

AMR – THE GLOBAL IMPACT

O'Neill AMR Review 2016:
Estimated 700 000 deaths* WW
Projected 10 million deaths by 2050

4,95 million deaths **associated** with bacterial AMR
1,27 million deaths **attributable** to bacterial AMR
(equivalent to deaths HIV+Malaria)

Review on Antimicrobial Resistance

Tackling drug-resistant infections globally

*: attributable to resistance to 6 pathogens: HIV, TB, malaria, *S. aureus*, *E. Coli*, *K. pneumoniae*

« If all drug-resistant infections were replaced by drug-susceptible infections,1,27 millions deaths could have been prevented »

1. **AMR Alliance https://www.amrindustryalliance.org/**
2. Murray, C.J.et al 2022. Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis. *The Lancet*.

AMR – THE IMPACT IS HIGHEST IN AFRICA

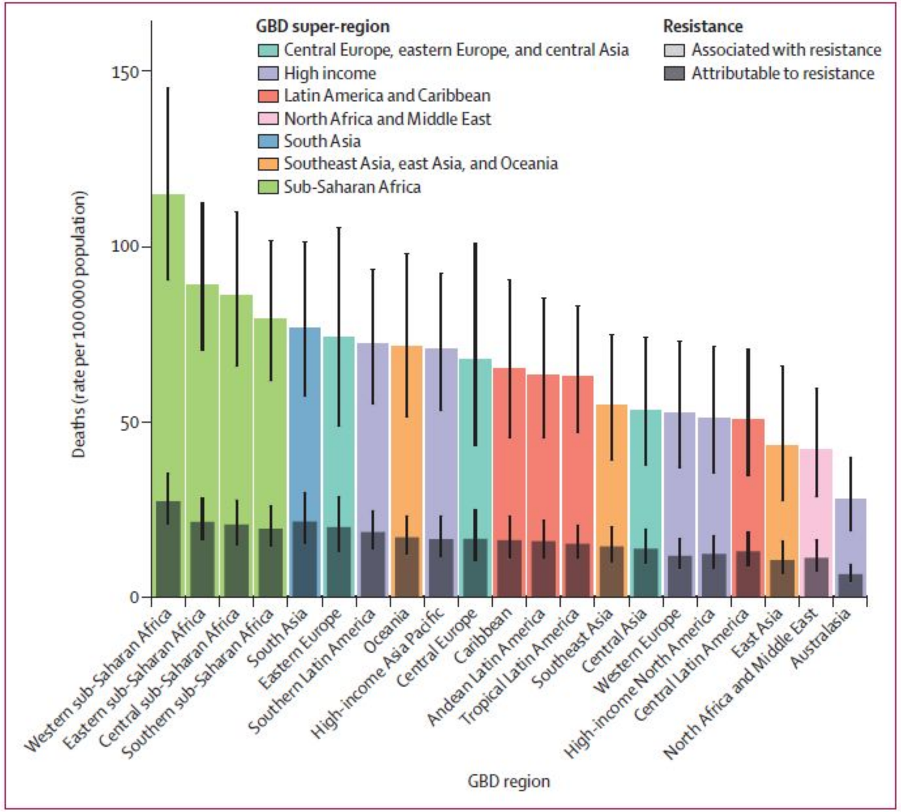


Figure 2: All-age rate of deaths attributable to and associated with bacterial antimicrobial resistance by GBD region, 2019
Estimates were aggregated across drugs, accounting for the co-occurrence of resistance to multiple drugs. Error bars show 95% uncertainty intervals. GBD=Global Burden of Diseases, Injuries, and Risk Factors Study.

«The scarcity of lab infrastructure making microbiological testing unavailable to inform treatment to stop or narrow antibiotics drives the higher burden (..)» in LIC.

In LIC: 1 in 5 of deaths linked to resistance were in children under 5.

Murray, C.J.et al 2022. Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis. *The Lancet*.

AFRICA AMR & AMC SITUATION

Antimicrobial Resistance (AMR) has been identified as one of the leading public health threats of the 21st century.

NEARLY
1.3 MILLION
deaths attributed to AMR in 2019

$US
100 TRILLION
lost global production by 2050 without immediate action

Africa has highest mortality rate from AMR infections in the world, with
27.3 DEATHS PER 100,000
attributable to AMR

The MAAP project, led by, and for Africans, represents the first time that large quantities of AMR and AMC data are being systematically collected, processed, and evaluated in Africa.

MAAP REVIEWED

819,584

AMR records spanning from 2016 to 2019, from **205 LABORATORIES** across **14 COUNTRIES**.

326 hospital and community pharmacies and 16 national level datasets on antimicrobial consumption.

KEY FINDINGS

ONLY **1.3%** of the biology laboratories across the 14 countries perform bacteriological testing

Of 205 participating laboratories:

26% of labs use electronic laboratory information system

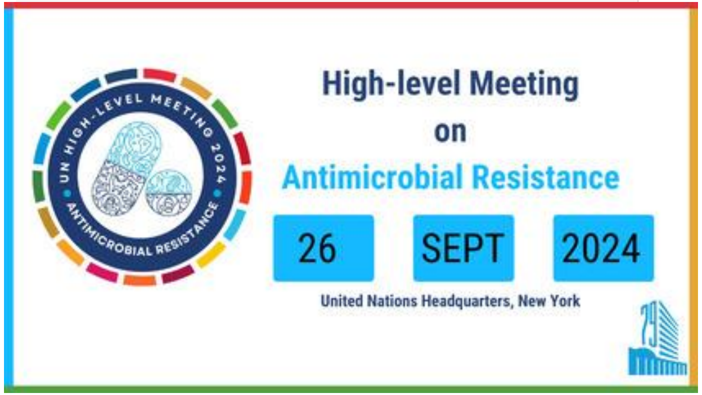
80% perform less than 1,000 Antimicrobial Susceptibility Tests per year

ONLY **23%** are ISO 15189 accredited for bacteriology testing

ONLY **20%** use automated methods for pathogen identification or AST

Mapping AMR & AMU Partnership

AMR – GLOBAL SOLUTIONS & INITIATIVES THAT HAVE DRIVEN LOCAL ACTION



World Health Organization

EXECUTIVE BOARD
152nd session
Agenda item 5

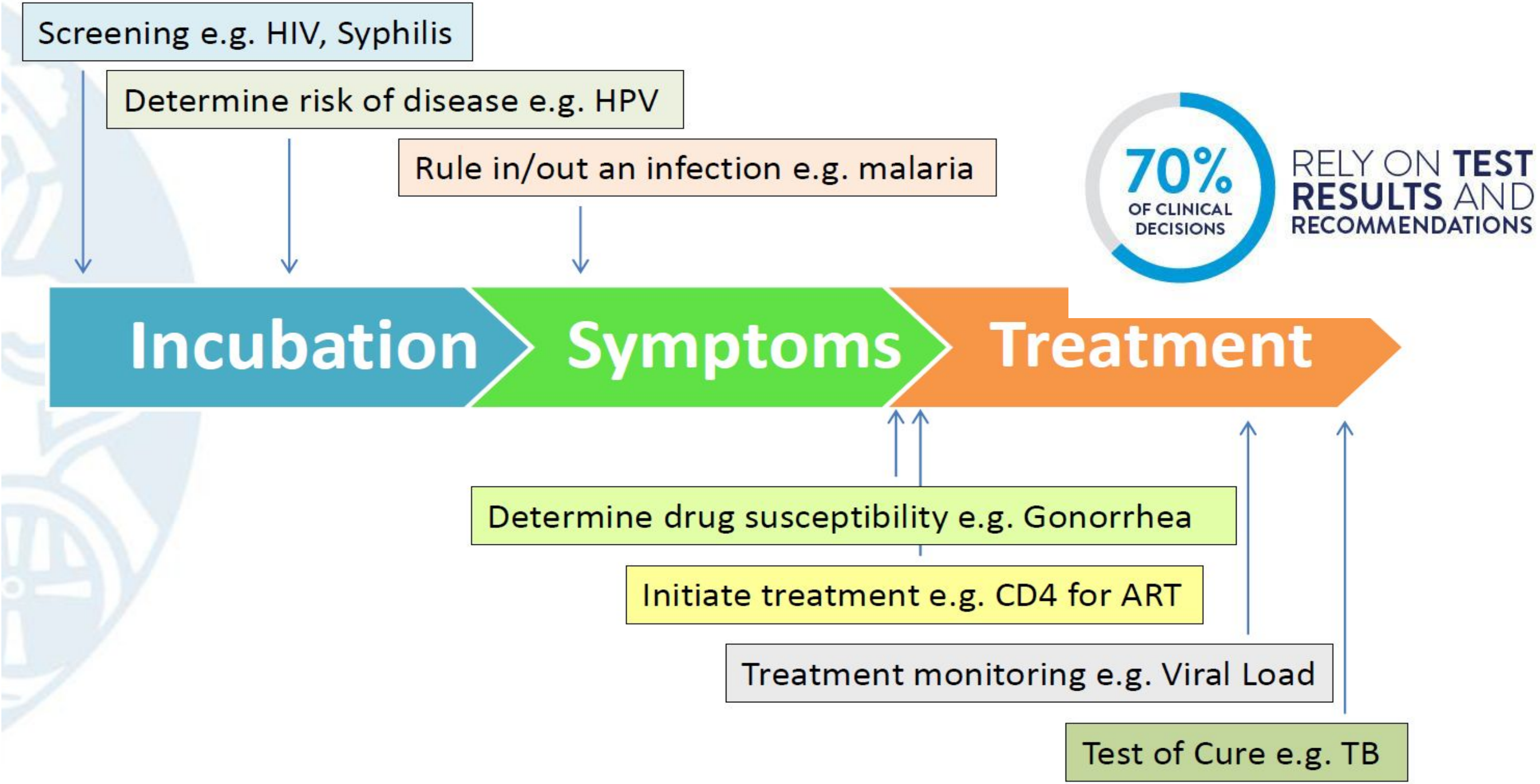
EB152(6)
1 February 2023

Strengthening diagnostics capacity[1]

The Executive Board, having considered the report by the Director-General,[2]

"Recognizing the critical role of rapid and accurate diagnostics to combat antimicrobial resistance by guiding the correct management of infections, and the appropriate use of new and existing antimicrobials through improved antimicrobial stewardship and surveillance"

THE ROLE OF DIAGNOSTICS IN CLINICAL DECISION MAKING



Adapted from Rosanna Peeling – ACDx 2019

WHO ESSENTIAL DIAGNOSTIC LIST

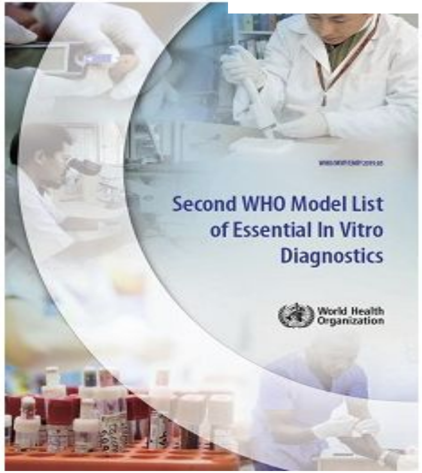
Editorial

BMJ Global Health

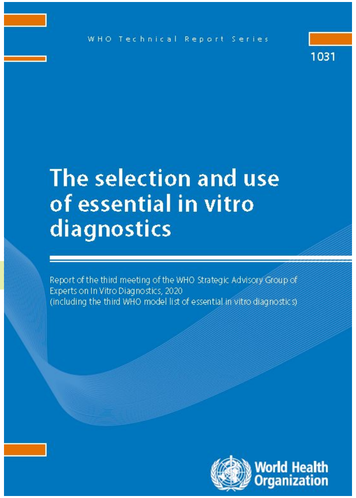
Making diagnostic tests as essential as medicines

Adriana Velazquez Berumen,[1] Sarah Garner,[1] Suzanne Rose Hill,[1] Soumya Swaminathan[2]

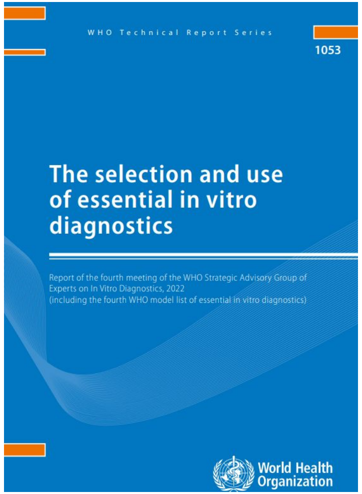
2018



2019



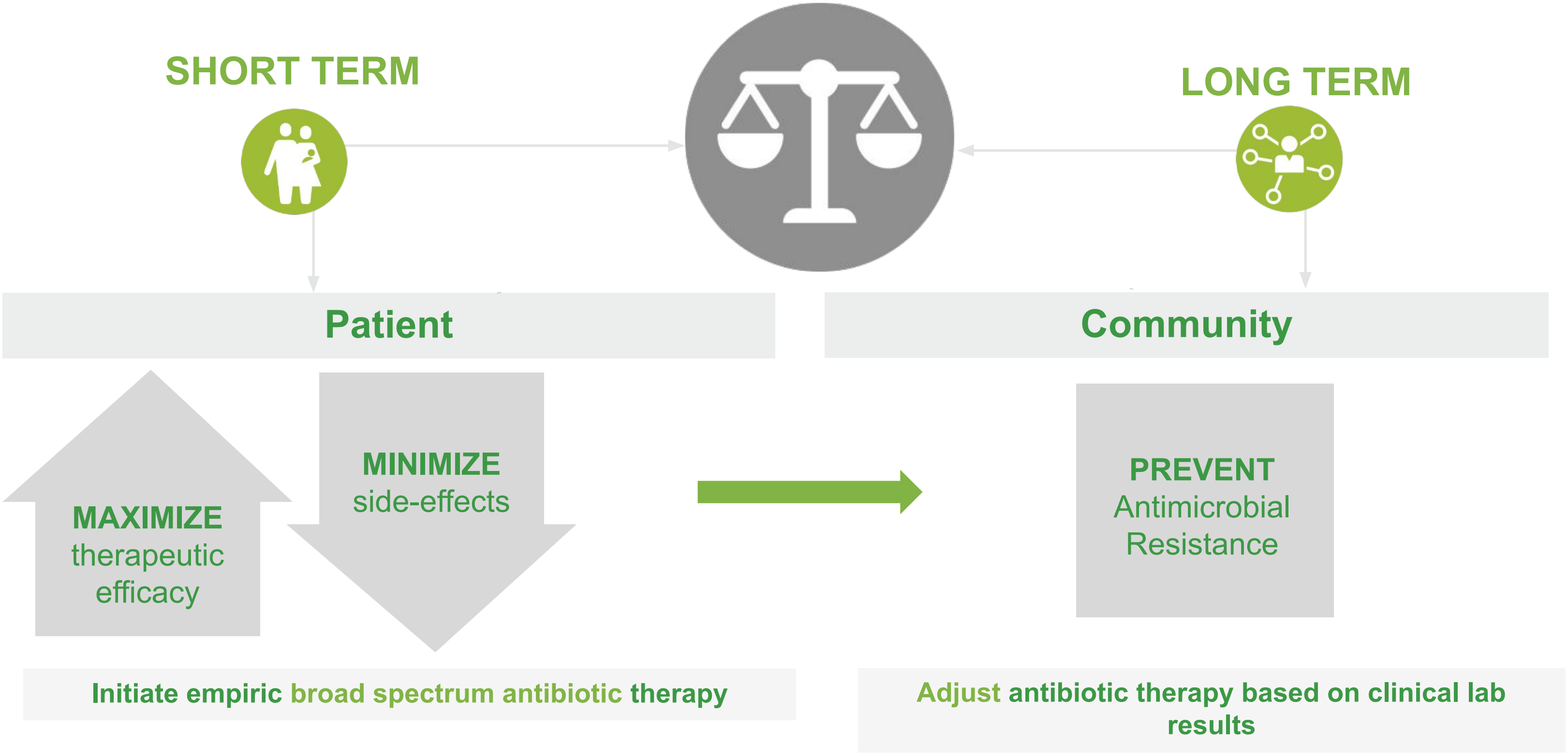
2021



2023

"Correct diagnosis is the first step to effective treatment", WHO

TO TREAT AND TO PREVENT AMR - FINDING THE RIGHT BALANCE!



DIAGNOSTICS ARE CRITICAL IN RAPIDLY SHIFTING FROM EMPIRIC TO TARGETED ANTIBIOTIC THERAPY

Initial antibiotic therapy | Targeted therapy | Personalized therapy | Monitoring therapy

Empiric ← Consolidated AST data

Oriented ← Rapid tests

- Is it likely viral or bacterial?
- Is an antibiotic really necessary?
- Is there a risk of pathogen transmission?

Rapid antigen tests
Serum biomarkers: CRP, PCT
Multiplex PCR tests direct on specimen
Others…

Technological innovation enables faster oriented therapy

AST – Antimicrobial Susceptibility Testing

PIVOTAL ROLE OF DIAGNOSTICS IN COMBATING AMR IN AFRICA

ASLM – Why diagnostics matters in AMR

1. **Providing Evidence**: Laboratories generate critical data that on pathogens drug sensitivity profiles which enable policy formulation and the implementation of effective AMR control strategies.
2. **Surveillance**: Through regular testing, laboratories monitor the sensitivity of pathogens, providing valuable information for understanding the spread and impact of AMR across different regions.
3. **Capacity Building**: Strengthening laboratory networks is vital. ASLM is committed to enhancing the capacity of laboratories in Africa to detect and identify resistant pathogens effectively. This includes training the workforce to be aware of AMR issues and equipping them with the necessary skills for testing and diagnostics.

ASLM - African Society for Laboratory Medicine


OPINION | OPINION: GLOBAL HEALTH

A diagnostic gap is fueling Africa's antimicrobial resistance

Opinion: Failing to act means locking vulnerable communities in a cycle of unchecked infections, creating a global health crisis.

By *Chinwe Catherine Eze* // *20 August 2025*


News / Press Releases

Scaling-up Antimicrobial Resistance Genomic Surveillance in Africa

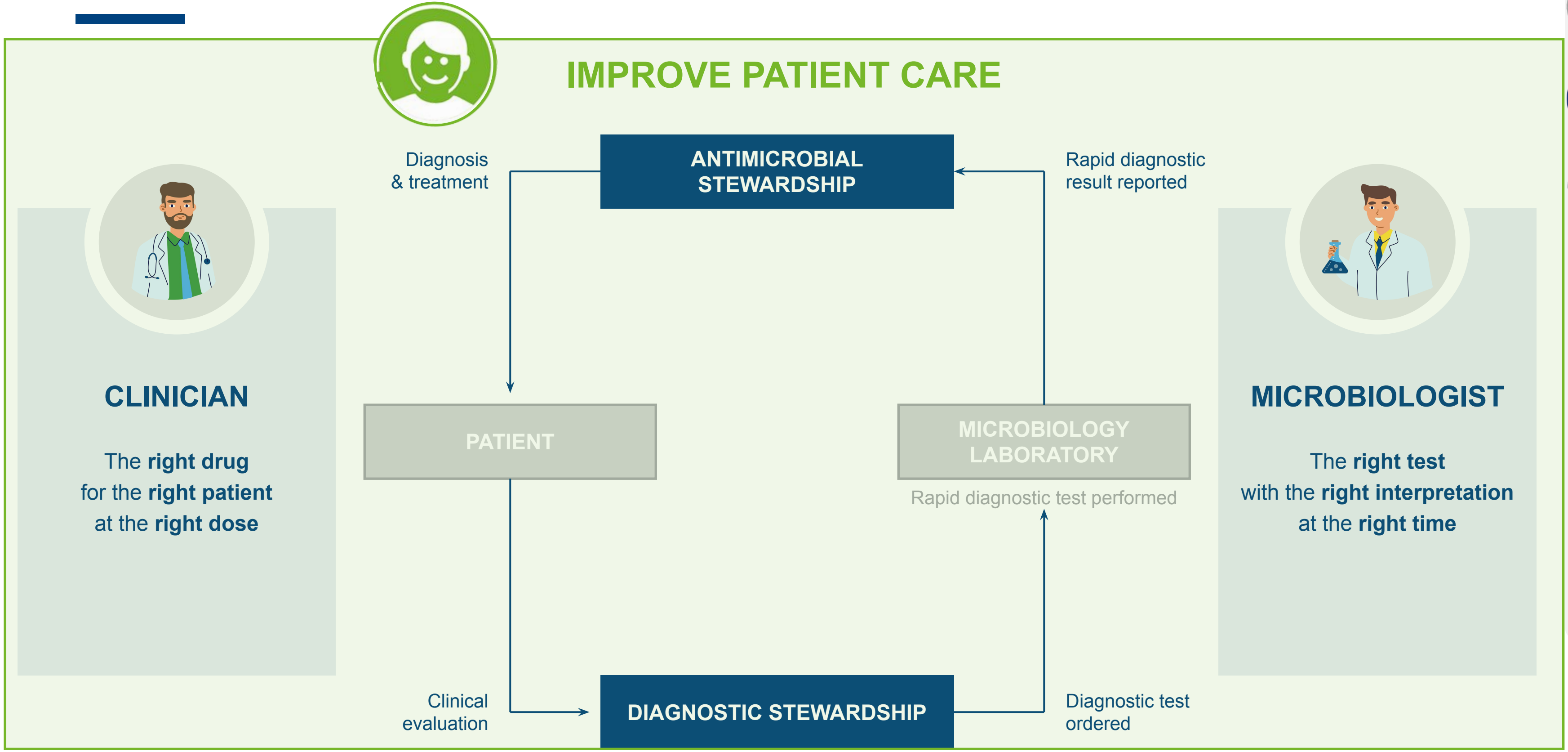
AfricaCDC
Centres for Disease Control and Prevention


Antimicrobial Resistance Diagnostic Initiative

Strengthening bacteriology and mycology diagnostic capacity, laboratory systems and service delivery

World Health Organization

DIAGNOSTIC STEWARDSHIP IS A CRITICAL PART OF ANTIMICROBAL STEWARDSHIP



Adapted from Messacar et al. J. Clin. Microbiol 2017;55:715-723.

BIOMERIEUX PARTNERSHIPS IN COMBATING AMR

BIOMÉRIEUX COMPANY OVERVIEW

PIONEERING DIAGNOSTICS

To improve public health,
focusing on the fight against infectious diseases

IMMUNOASSAYS

Specialized high-medical-value offer - VIDAS®

MOLECULAR BIOLOGY

Leader in the syndromic diagnosis of infectious diseases - BIOFIRE®

MICROBIOLOGY

Two leadership positions in both clinical and industrial applications

Medical Education Resource Hub

www.biomerieux.com/corp/en/educational-support.html

BIOMÉRIEUX

Supporting AMR PPS through the Global Point Prevalence Survey (GPPS) of antimicrobial consumption and resistance

- Supporting local AMS activities
- Many countries have participated globally including Africa
- Easy-to-use protocol and online data analysis

Laboratory of Medical Microbiology
Vaccine & Infectious Disease Institute
University of Antwerp

Global-PPS@uantwerpen.be
www.global-pps.com

Equipping AMR reference labs in Africa & Asia through the Fleming Fund

The Fleming Fund

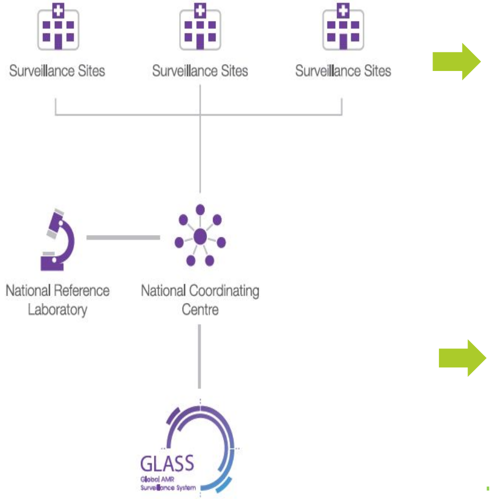
Global Objectives :

Improve laboratory capacity and diagnosis as well as data and surveillance of antimicrobial resistance (AMR) through a 'One Health' approach

The Fleming Fund
Regional Grants

Program Implementation

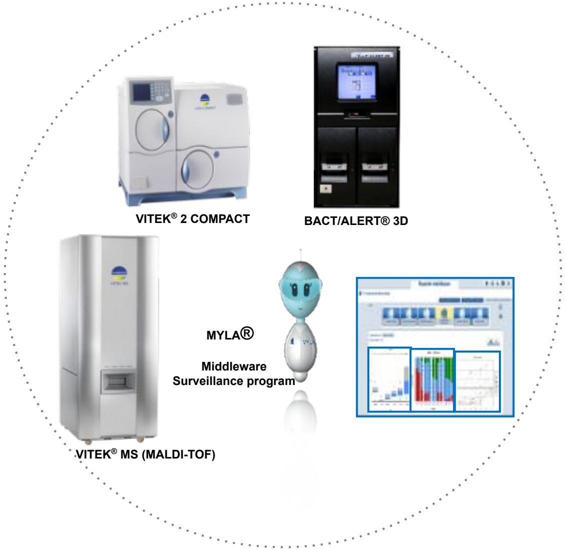
Same proposed organization in 24 selected countries with local implementers



BIOMÉRIEUX

Program Execution

bioMérieux applied to Fleming Fund tender offer its full AMR solutions



BIOMÉRIEUX & Partners

Awarded for Reference Labs

Fleming Fund has placed its confidence in bioMérieux in equipping the AMR reference labs in their program for Human and Veterinary (one health

- Burkina Faso
- Eswatini
- Malawi
- Nigeria
- Senegal
- Sierra Leone
- Tanzania
- Zambia
- Zimbabwe

TAKE HOME MESSAGE

1. AMR is a global threat and a local reality with the highest global mortailty in Africa
2. Diagnostics are a key element in antimicrobial stewardship and must be prioritized especially in Africa.
3. Innovation in diagnostics is improving time to result and many of these innovations can be launched and scaled up in Africa.
4. Partnerships and collaboration across the One Health ecosystem are key to improve antimicrobial stewardship with prioritization and local resources being the foundation for sustainable action.

THE GLOBAL HEALTH NETWORK
Enabling research by sharing knowledge

Without diagnostics, medicine is blind!

Alain Mérieux

THANK YOU / MERCI / SHUKRAN / OBRIGADO!

BIOMÉRIEUX

Q&A

Join Us Tomorrow

Scan QR Code to Register

Closing Remark & Announcement

Thank you for joining.