

Introduction to Quadripartite Guidance document on integrated AMR/AMU surveillance

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Outline

- The Guidance document
- Definition of Integrated Surveillance
- Objectives of Integrated Surveillance (Agnes)
- Examples from the Guidance
- Is Integrated Surveillance complex?



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Outcome of the UNGA

- Integrated surveillance is a critical priority of the Quadripartite Organizations and the Global Leaders Group.
- Aim: generate data for action!



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GISSA - Global Architecture for Integrated AMR and AMU Surveillance

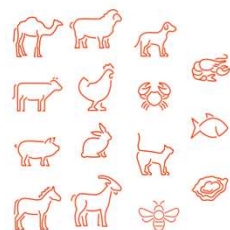
Quadripartite Global Systems

Health System



AMR/AMU

Agricultural System



ANIMUSE Global Database



AMU

Environmental health



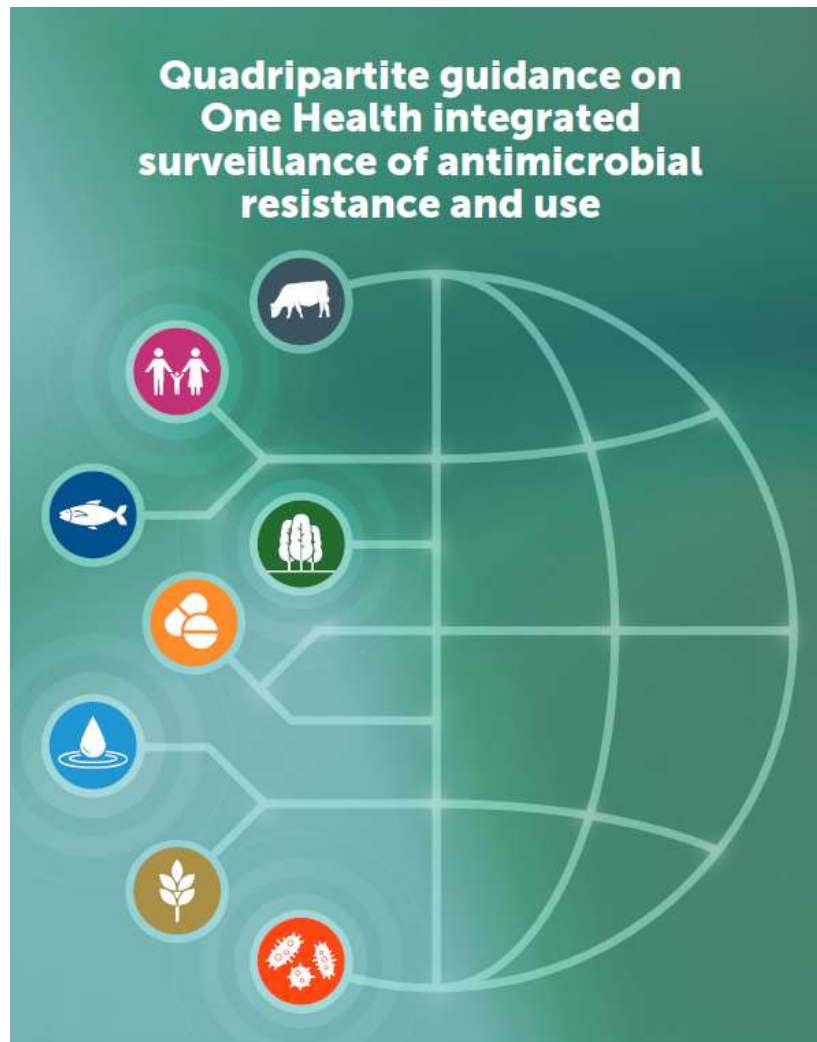
AMR and Residues



AMR
in animals and food

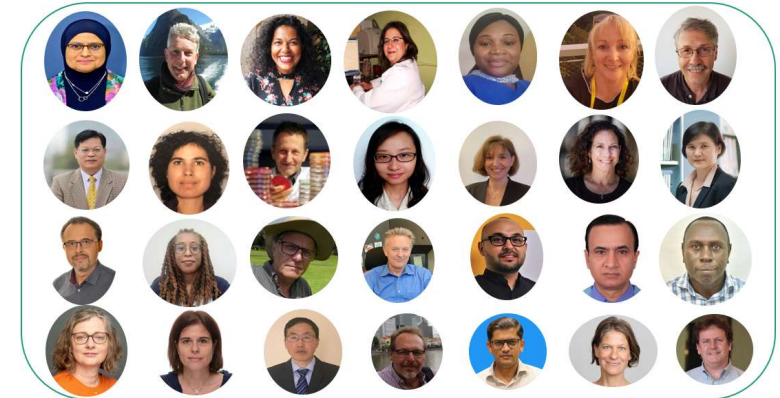
AMU
in plant production and protection

Global Integrated Surveillance for AMR and AMU



The Quadripartite has established the Quadripartite Technical Group on Integrated AMR and AMU Integrated Surveillance (est. 2022)

28 experts with AMR and/or AMU multi-sectoral surveillance experience and expertise were selected



Staff of WHO, FAO,
WOAH, UNEP!!!



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Chapters of the Guidance document

- 1 Introduction
- 2 Purpose, scope and target leadership
- 3 Definition and purposes of One Health integrated surveillance of AMR and AMU
- 4 Priority microbial targets, metrics and indicators
- 5 Resources and requirements

Examples



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Definition of Integrated Surveillance



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Definition of Integrated Surveillance

Integrated AMR and AMU surveillance is the continuous, collaborative, coordinated, and systematic collection, collation, validation, analysis, interpretation, communication, and sharing of AMU and AMR data.

This includes data from humans, animals and products, plants/crops and products, and the environment

Integrated Surveillance: data from at least two sectors are included.



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Guidance document (1)

- Problem is harmonization:
 - Lack of common overarching objectives,
 - Lack of coordination and governance for integration,
 - The diversity of surveillance frameworks, from sampling to communicating results, laboratory testing procedures and sector-specific indicators,
- Aiming for: For surveillance data from different sectors to be effective, they must be representative of AMR and AMU and **harmonized** to allow comparison and meaningful interpretation.



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Guidance document (2): Approach

- Integration of surveillance of AMR among One Health sectors requires a stepwise approach, starting with strengthening **sector-specific surveillance**, **followed by integration** of One Health sectors at one or more stages.
- In One Health integrated surveillance systems, **AMU data** collected during **sector-specific surveillance** (in animals, humans and plants) can be used to explore potential associations between use of specific antimicrobial agents and classes and the emergence and occurrence of particular **antimicrobial resistance patterns** in **commensal and/or pathogenic bacteria** within and across sectors at certain interfaces and to gain better understanding of the mechanisms and the epidemiology of AMR in a systems-based approach



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Objectives of Integrated Surveillance (Agnes)

Provide information on patterns, trends and potential associations in AMU and AMR

Support and inform risk analysis for AMR (*transmission pathways*)

Alert authorities about emerging and re-emerging AMR and changes in patterns of AMU

Inform the development of and assess the effectiveness of interventions to address AMR and improve public health and sector-specific outcomes



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How to start with Integrated Surveillance?

Fig. 4. Approach A. Use of existing surveillance systems

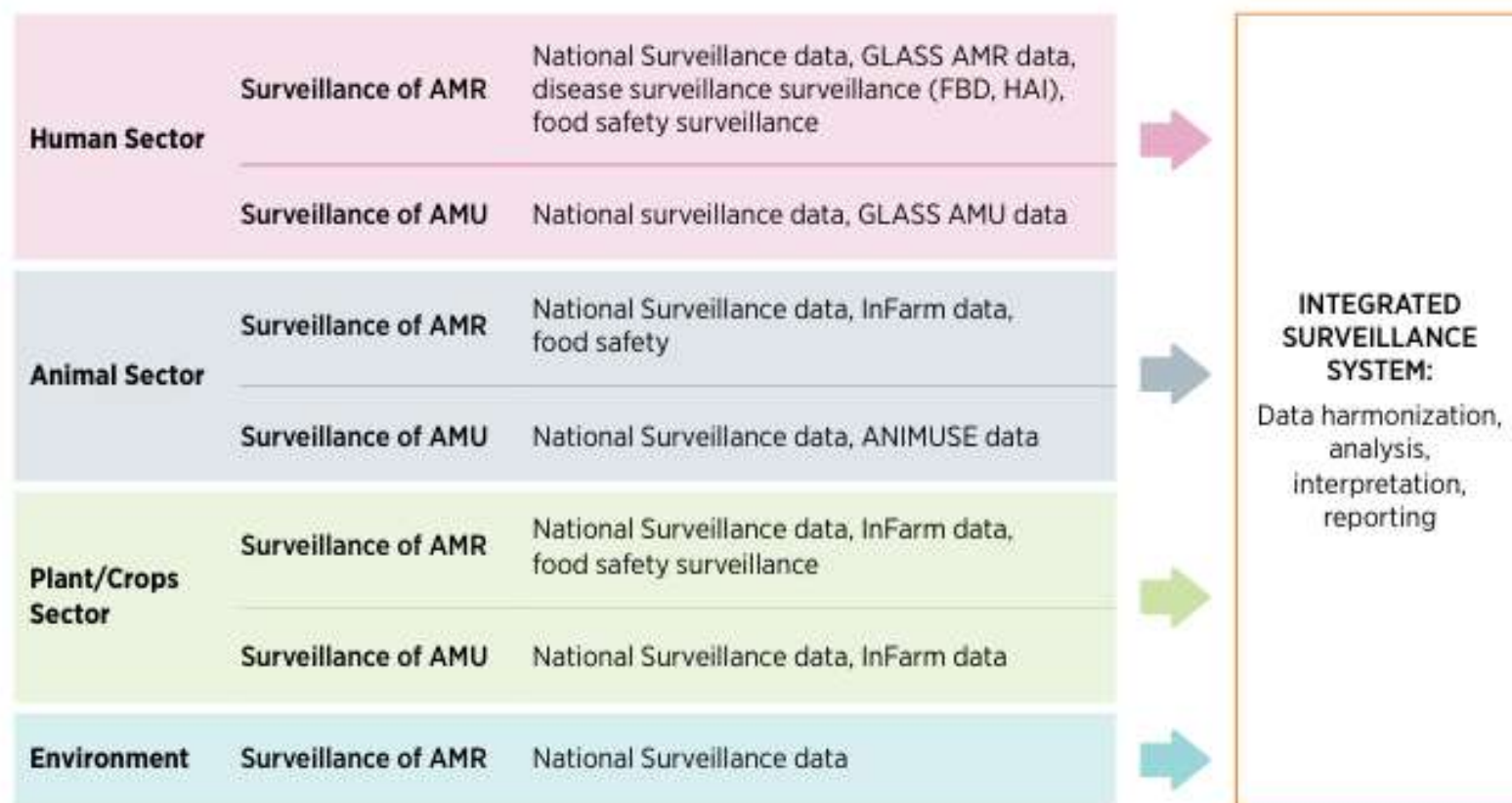
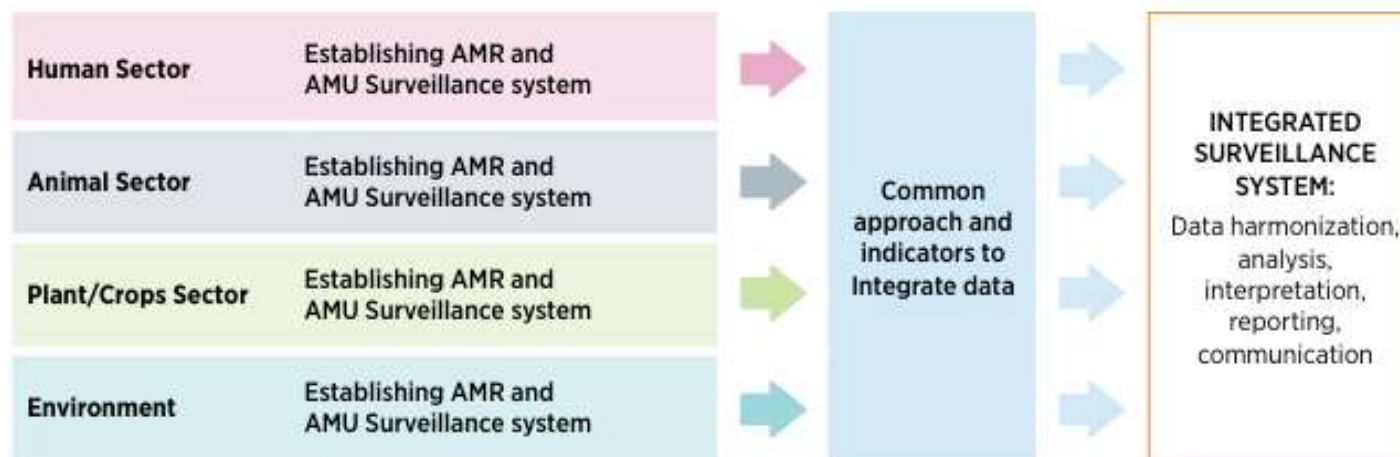
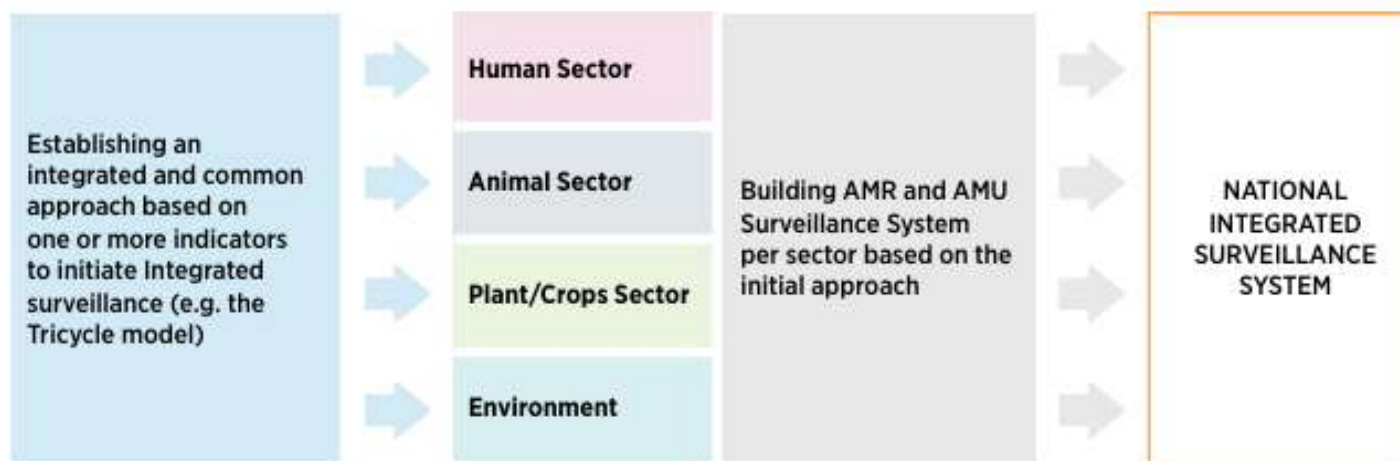


Fig. 5. Approach B: building a new integrated surveillance system

Model 1



Model 2



Is Integrated Surveillance new?

Animal Health

Diseased animals
Animal Pathogens
Clinical Breakpoints

Public Health

Healthy Animals
Commensals
ECOFFs/CBPs

Public Health

Healthy and diseased
humans, healthy animals
and environment
ESBL-producing *E. coli*

Human Health/Public Health

Diseased humans
Human Pathogens
Clinical Breakpoints

Public Health

Healthy Animals/Food/Humans
Human Pathogens (Salm/Campy)
ECOFFs/CBPs



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Is Integrated Sur

Animal Health

Diseased animals
Animal Pathogens
Clinical Breakpoints

Public Health

He

EC

⁺
Regional guidelines for the monitoring and surveillance of antimicrobial resistance, use and residues - Volume 2

Monitoring and surveillance of antimicrobial resistance in bacterial pathogens from diseased livestock and poultry

Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Pacific

Diseased
by animals
nt
g *E. coli*

Human Health/Public Health

Diseased humans
Human Pathogens
Clinical Breakpoints

humans

Human Pathogens (Salm/Campy)
ECOFFs/CBPs



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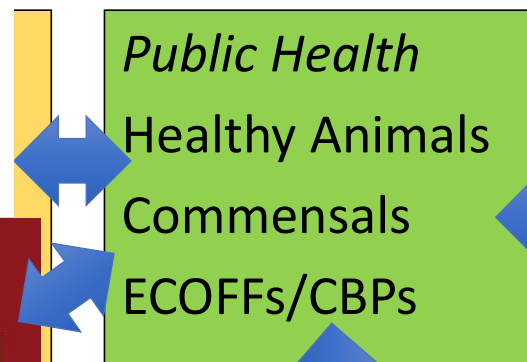
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The European Union Summary Report on Antimicrobial Resistance in zoonotic and indicator bacteria from humans, animals and food in 2019–2020

European Food Safety Authority and
European Centre for Disease Prevention and Control



Surveillance new?



Is Integrated Surveillance new?



WHO integrated global surveillance
on ESBL-producing *E. coli* using a
“One Health” approach:
Implementation and opportunities



Health
Animals
also
CBPs



Public Health
Healthy and diseased
humans, healthy animals
and environment
ESBL-producing *E. coli*

Public Health
Healthy Animals/Food/Humans
Human Pathogens (Salm/Campy)
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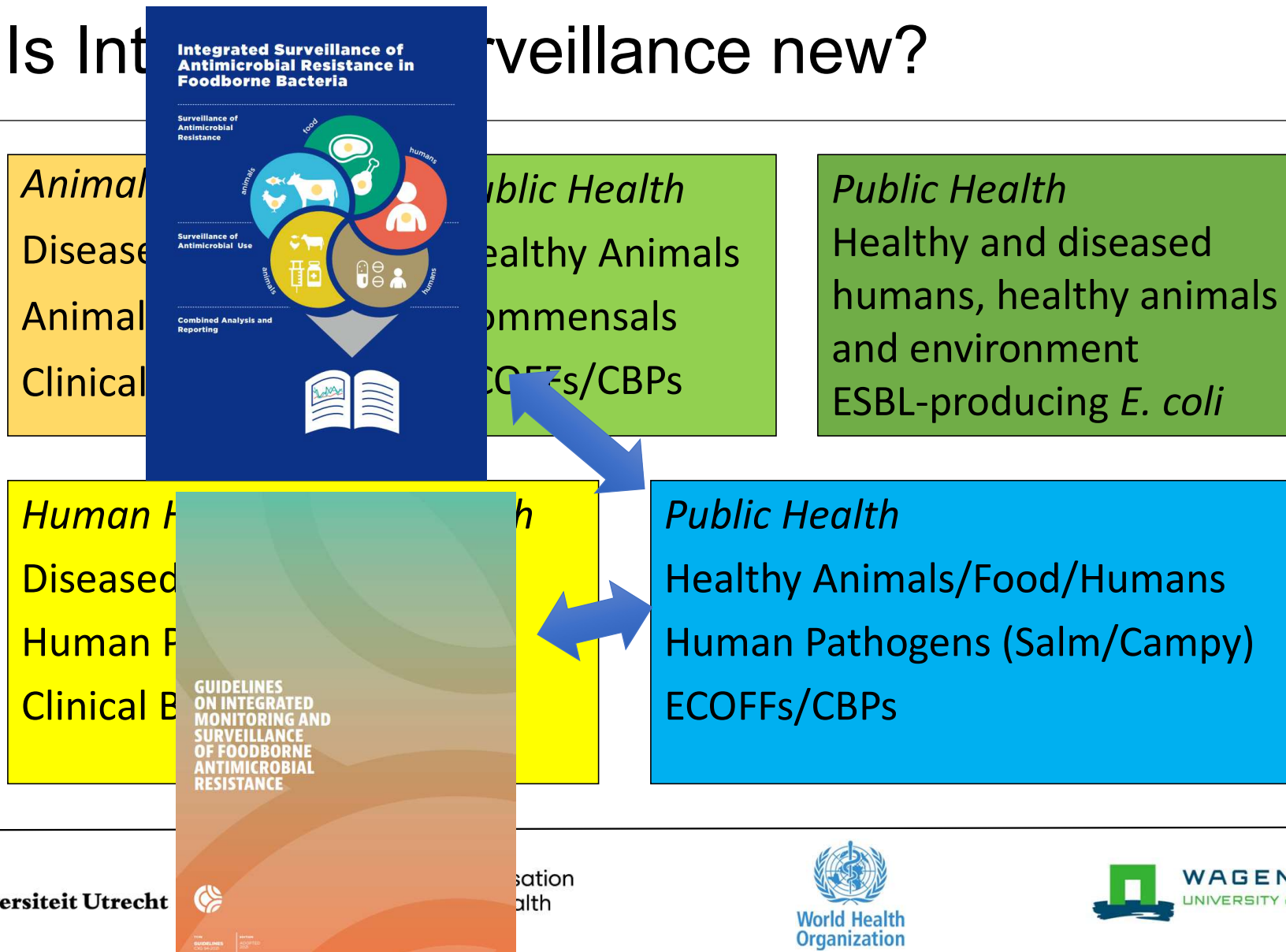


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Is Integrated Surveillance new?



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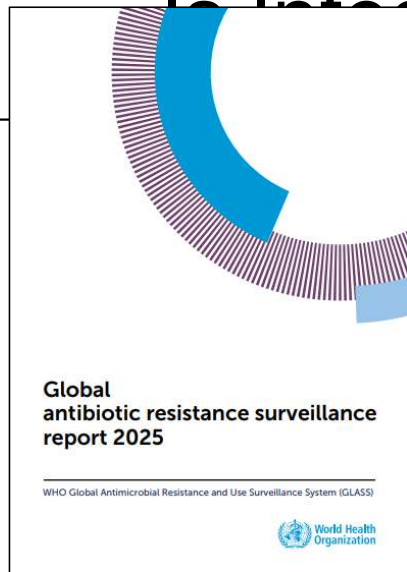


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Integrated Surveillance new?



Health
Diseased animals
Pathogens
Breakpoints

Public Health
Healthy Animals
Commensals
ECOFFs/CBPs

Public Health
Healthy and diseased humans, healthy animals and environment
ESBL-producing *E. coli*



Human Health/Public Health
Diseased humans
Human Pathogens
Clinical Breakpoints

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Healthy Animals/Food/Humans
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Is Integrated Surveillance new?

Animal Health

Diseased animals
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Clinical Breakpoints

Public Health

Healthy Animals
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Public Health

Healthy and diseased
humans, healthy animals
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ESBL-producing *E. coli*

Human Health/Public Health

Diseased humans
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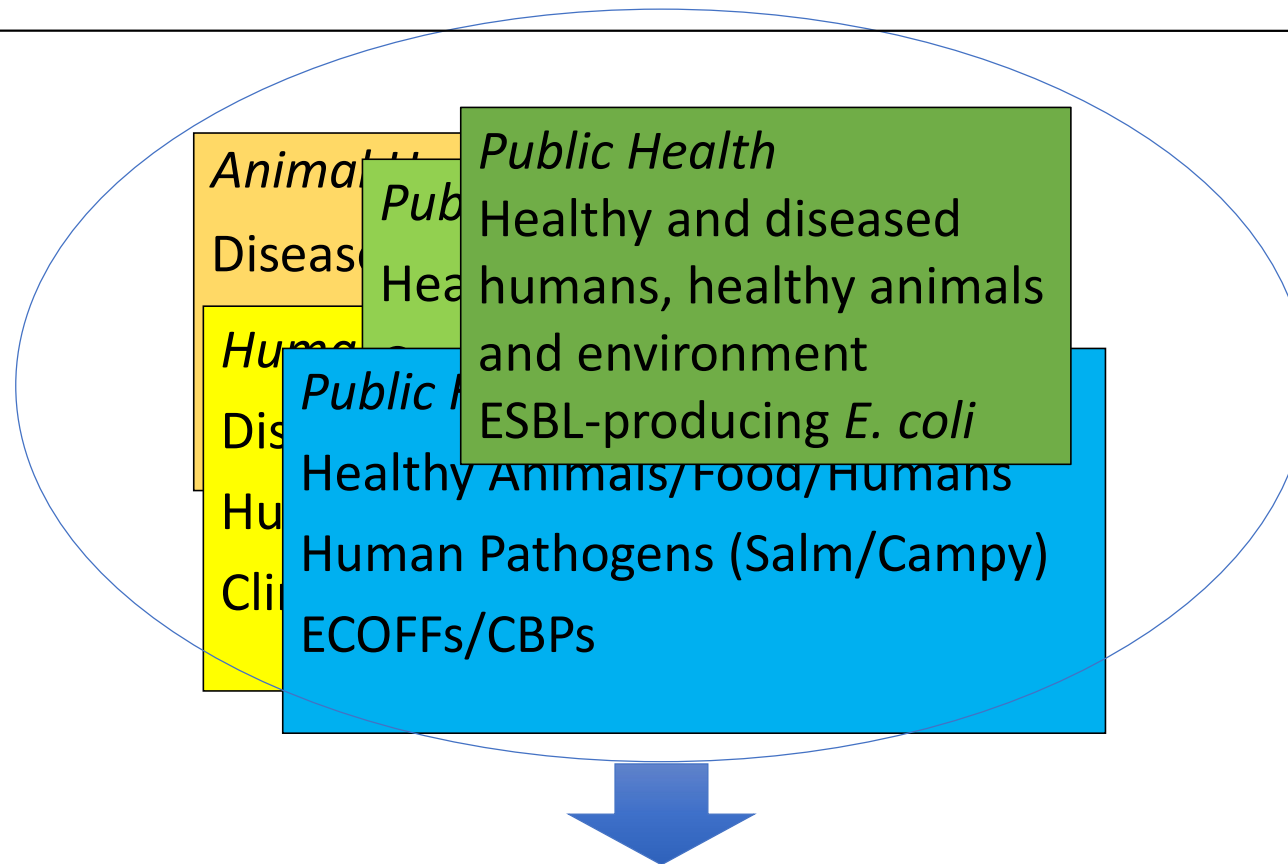


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One Health: common analysis and reporting

- There are different units and metrics in the different domains:
 - Bacterial species
 - Different types of antimicrobials to test
 - Clinical breakpoints vs epidemiological cut-offs
 - CLSI vs EUCAST
 - Animal sector: different animal species
- Aquaculture vs Terrestrial animals



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Do not become paralyzed by challenges but go for opportunities and start small.



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Examples of Integrated Surveillance



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Table 2. Integrated surveillance of AMR/AMU: Country examples and global guidance

Example of Integrated surveillance systems	Competent authority	Sectors represented ^a	Interfaces Included
WHO Integrated Surveillance of Antimicrobial Resistance in Foodborne Bacteria – Application of a One Health Approach – AGISAR guidance (52)	All relevant multisectoral national, regional and global authorities	Humans (H) Food of animal origin (A) Animals (A)	Humans, animals, food of animal origin (HA)
Codex Guidelines on Integrated Monitoring and Surveillance of Foodborne Antimicrobial Resistance (7,53)	All relevant multisectoral national, regional and global authorities	Food-producing animals and derived food products (A) Plant/crops (P) Environment (E)	Food producing animals, derived products, food production environment (AE) and wastewater from farms (AE or PE)
WOAH Aquatic Animal Health Code. Chapter 6.4. Development and harmonization of national antimicrobial resistance surveillance and monitoring programmes for aquatic animals (5)	Veterinary or other government authority of a member country with responsibility and competence to ensure or supervise aquatic animal health and welfare measures, international health certification and other standards and recommendations in the Aquatic Code over the whole territory.	Animals (aquatic) (A) Food of animal origin (aquatic) (A)	Animals and food derived from animal products throughout the food chain (HA)
WOAH Terrestrial Animal Health Code. Chapter 6.8 Harmonisation of national antimicrobial resistance surveillance and monitoring programmes (6)	Veterinary authority or other government authority of a member country with the responsibility and competence to ensure or supervise animal health and welfare measures, international veterinary certification and other standards and recommendations in the Terrestrial Code and in the WOA Aquatic Animal Health Code over the whole territory.	Animals (terrestrial) (A) Food of animal origin (terrestrial) (A) Animal feed (AF) Environment (E)	Animals and food derived from animal products throughout the food chain (farm, slaughterhouse, processing and packaging facilities, retail) Points in the feed supply chain, including processing, retail and use. Animals' immediate environment and/or wider environment (AP, AE, HA, HAE)
InFARM (45,46)	National structures that oversee AMR surveillance; peripheral and national reference laboratories that generate AMR data	Animals (terrestrial) (A) Food of animal origin (terrestrial) (A) Animals (aquatic) (A) Food of animal origin (aquatic) (A) Food of plant origin (P) Food production environment (E) AMU in plant production and protection (P)	Provides guidance to countries for participating in the InFARM system, supporting collecting, collating, analysing, visualizing and effectively using AMR monitoring and surveillance data throughout the food chain, from livestock, fisheries and aquaculture, with food products (according to Codex and WOAH standards) and AMU in plant production and protection (AP, AE, PE, HAP, HAE, HPE, APE, HAPE)



Example of Integrated surveillance systems	Competent authority	Sectors represented ^a	Interfaces included
European Joint Inter-agency Antimicrobial Consumption and Resistance Analysis (JIACRA) (54,55)	European Centre for Disease Prevention and Control; European Food Safety Authority; European Medicines Agency	humans and food-producing animals (HA)	Humans, animals, food-derived from animal & plant products (HA, AP, HAP)
CIPARS (43)	Canadian Ministry of Health under the auspices of the Public Health Agency of Canada	Human (H) Food-producing animals (A), Food of animal origin (A), Environment (E)	Animal-derived food products or direct contact with animals and/or their waste (HA), environment (sick animal environment, surface and irrigation water) (E)
Danish Integrated Antimicrobial Resistance Monitoring and Research Programme (DANMAP) (40)	The Danish Integrated Antimicrobial Resistance Monitoring and Research Programme. Supported by a Steering Committee made up of the National Food Institute and the Statens Serum Institute	Companion animals (A) Food-producing animals (A) Food of animal origin (A) Humans (H)	Food-producing animals, food of animal origin and humans
NARMS (47)	Partnership between the Food and Drug Administration, the Centers for Disease Control and Prevention, the US Department of Agriculture, the Environmental Protection Agency and the National Center for Biotechnology Information	Human (H) Food-producing animal and derived products (HA)	humans, retail meats, and food animals (HA)
Consumption of antimicrobial agents and AMR among medically important bacteria in Netherlands (Kingdom of the) NethMap and MARAN (42)	The Dutch Foundation of the Working Party on Antibiotic Policy, in collaboration with the Centre for Infectious disease control of the National Institute for Public Health and the Environment	Human (H) Animals (A) Food of animal and plants/crop origin (HAP)	Human-animal-food (HA, AP, HAP)

Example of Integrated surveillance systems	Competent authority	Sectors represented ^a	Interfaces included
WHO integrated global surveillance on ESBL-producing <i>E. coli</i> in a "One Health" approach: The Tricycle Protocol (44)	National level: A national multidisciplinary, integrated core group comprising individuals from each of the human, food chain and environment by the WHO Country Office AMR focal point are the contact points for regional and global levels for all matters concerning implementation of Tricycle and the national action plan. Regional level: WHO AMR regional focal points will support, facilitate and link activities from national to global level. Global level: WHO will coordinate implementation and monitoring of surveillance at global level. On request through the WHO country office, WHO supports countries with assessment visits and/or training to assist in selection of sampling sites, methods, data collection and analysis.	Human (H) Food-producing animals (A) Environment (E)	Human (healthy and sick)/ food chain/ environment (wastewater plants and river) (HA, AE, HAE)



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Is Integrated surveillance complicated?



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Thank you!



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