Tissa

The Tripartite Integrated System for Surveillance of AMR/AMU

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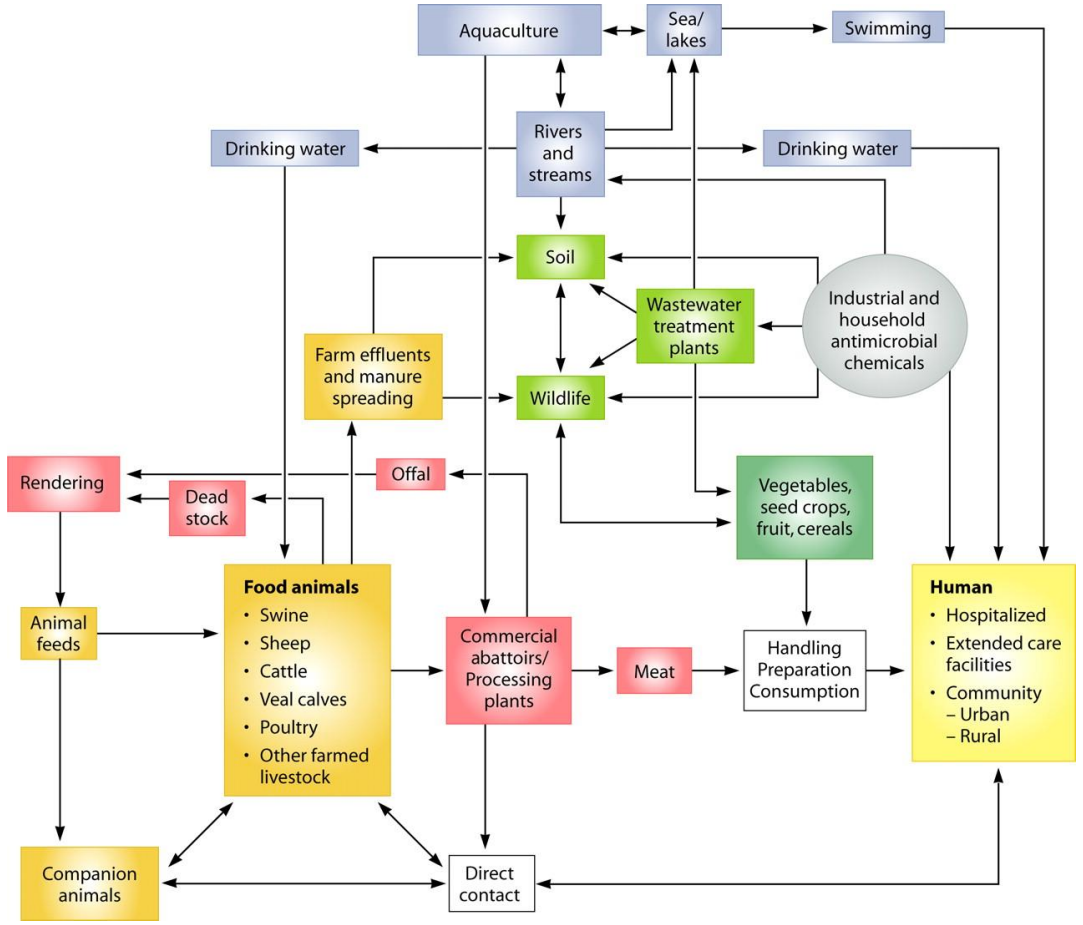
AMR dynamics and global response

- AMR has no border
- Complex epidemiology
- One Health approach
- Integrated surveillance essential for generating evidence for action
  - Country level
  - Global level

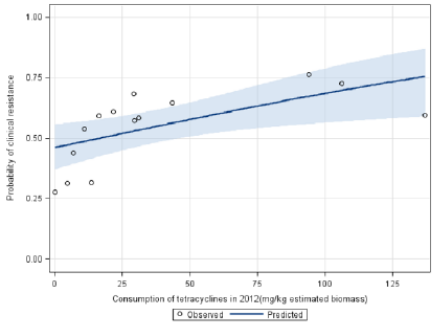
- One Health governance structure: Quadrapartite partnership for One Health



Integrated surveillace is essential for AMR control...

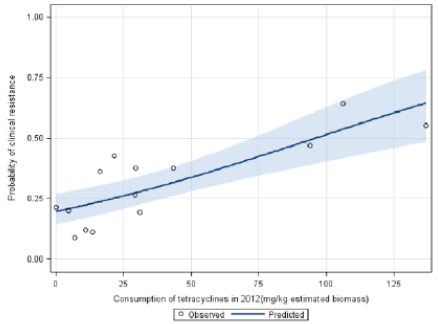
Fig.3.8 JIACRA model of animal antimicrobial use and human resistance for *Salmonella* spp. and *Salmonella* serotype Typhimurium.

a. *S.* Typhimurium



Countries included: AT, DK, ES, FR, HU, IE, IT, LT, LU, NL, NO, SI, SK, UK
p-value < 0.05 OR = 1.009; 95 % PL CI: [1.002, 1.017]

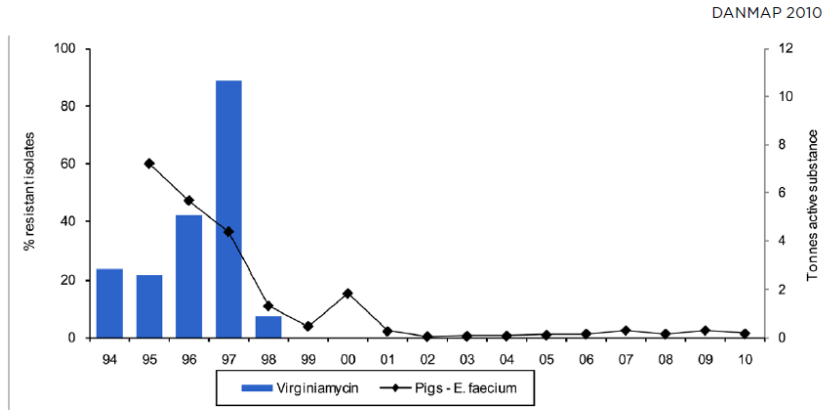
b. *Salmonella* spp.



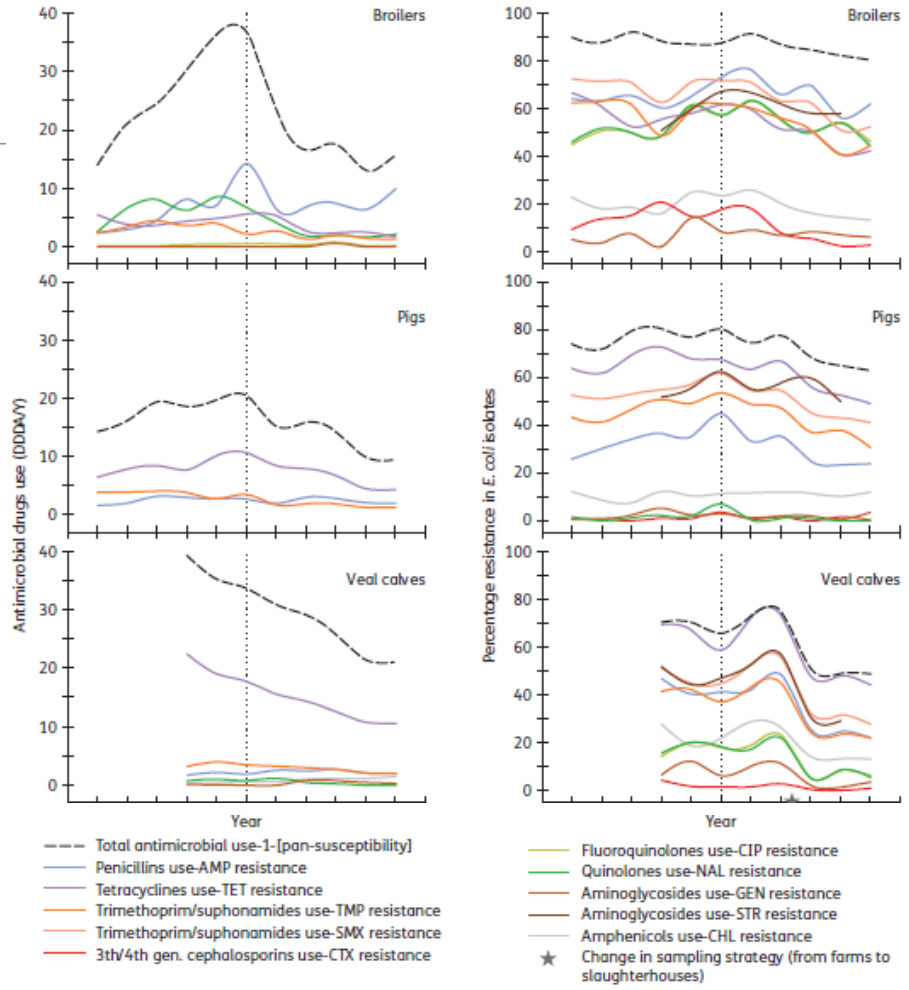
Countries included: AT, EE, ES, FR, HU, IE, IT, LT, LU, NL, NO, SI, SK, UK
p-value < 0.001; OR = 1.015; 95 % PL CI: [1.008, 1.022]

[ECDC/EFSA/EMA First joint report on integrated analysis of the consumption of antimicrobial agents and occurrence of antimicrobial resistance in bacteria from humans and food-producing animals. 2015: Stockholm, Sweden]

Fig.AP3.4.5 Resistance (%) to streptogramins in *Enterococcus faecium* from pigs and the consumption of virginiamycin, Denmark



[DANMAP 2010. Monitoring AMR and AMU in animals in Denmark]



[Quantitative assessment of antimicrobial resistance in livestock during the course of a nationwide antimicrobial use reduction in the Netherlands. Dorado-García A., et.al, 2016.]

Birth of TISSA

2015: Global Action Plan to fight AMR adopted by FAO-OIE-WHO

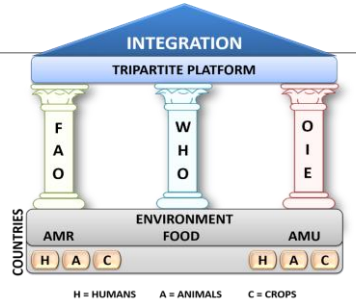
- Surveillance is key component of the AMR GAP
- Each organization supports countries to collect data and report at global level according to their respective mandate

2017: Initial discussion to set up a common repository of data on antimicrobial resistance (AMR) and antimicrobial use (AMU) across human, animal and agriculture sectors

2018 – 2020: High-level tripartite agreements for TISSA

2021: Development of the TISSA platform

2022: Launch of the TISSA platform



Objectives of TISSA

Develop and maintain a global platform to make available and share data on AMR and AMU across human, animal and agricultural sectors

- Using data collected by each organization's respective global surveillance systems

Foster integrated analysis of data across sectors

Foster integrated surveillance at country level

Data for action

AMR ecology

Understanding AMR transmission across sectors
- AMR epidemiology, chain of transmission

Understanding burden of AMR on human and animal health
- identifying problematic pathogens for public health, animal health and agri-food industry

Inform decision makers for:
- controlling AMR in specific sectors
- limiting spread to other sectors
- health management policies

Pharmaceutical market & rational use

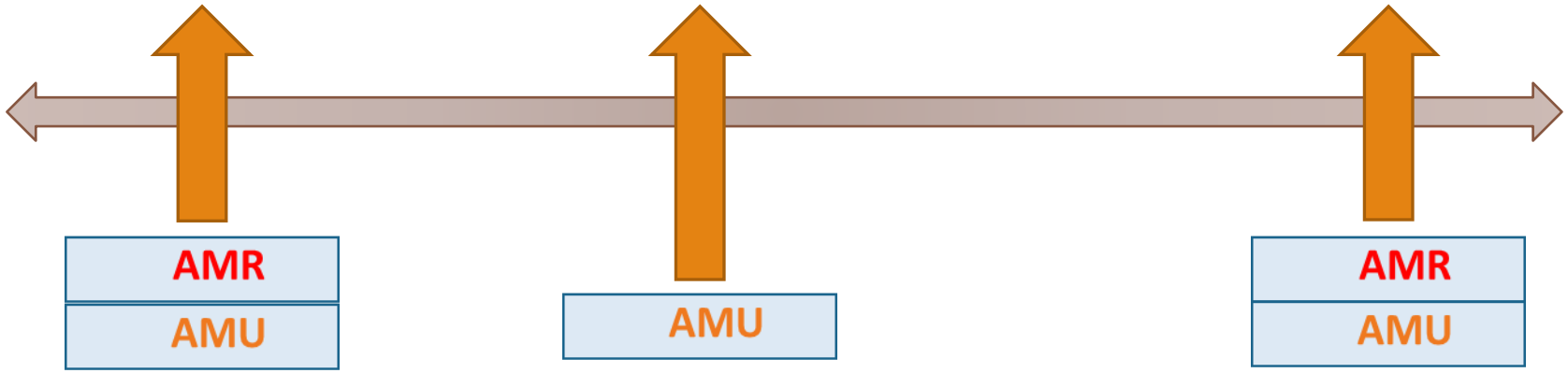
Understand impact of use of antimicrobials across sectors on development of AMR
- selection pressure

Understanding market dynamics and use behavior across sectors
- changes in market regulations or medicines policies in one sector impact other sectors (e.g., ban of medicines)

Inform decision makers for:
- regulating medicines, incl. enforcement
- procuring & suppling
- developing policies on rational use of antimicrobials

TISSA data

TRIPARTITE INTEGRATED SURVEILLANCE SYSTEM FOR AMR/AMU (TISSA)



GLASS

Global database on the use of antimicrobial agents in animal

InFARM

World Health Organization

WORLD ORGANISATION FOR ANIMAL HEALTH

Food and Agriculture Organization of the United Nations

TISSA Platform functionalities

Provide access to the TISSA database

- Online reports on AMR & AMU in humans and animals

Provide access to One Health surveillance information

Requirements for TISSA

Data are collected:

- 3 different systems
- 4 main protocols

All 3 surveillance systems should produce comparable data

- AMR Animals ⇔ AMR Humans
- AMU Animals ⇔ AMU Humans

Requirements:

- Protocols are aligned to collect data
- Same metrics are used to report data
- Data are collected in the same settings at the same time

Standardization

Standardization: protocol

Protocols

- Separate protocols:
  - Can respond to specific needs of each sector
  - Data might be collected at different pace and in different settings
  - Need bridges and alignment
  - E.g WHO GLASS-AMC and OIE database on the use of antimicrobial agents in animal
- Integrated protocols:
  - Protocol designed from scratch as One Health and integration
  - Data are collected at the same time in the same settings
  - Subset of common data/information is collected
  - E.g WHO Tricycle ESBL *E. coli*

Standardization: metrics/classification

AMU:

- Common metrics: tonnes
- Antibiotic classes

AMR:

- Common metrics: proportion of resistant isolates on the total isolates
- Definition of resistance: Clinical breakpoints vs wild types
- Definition of specimen

TISSA phases

Phase 1: Common repository
- Protocols aligned
- Metrics and indicators defined
- Data reported separately

Present

Phase 2: Cross-reporting
- AMU & AMR data reported together
- Need comparable data (same country/same year)

Future

Phase 3: Cross-analysis
- Analyzing AMU & AMR data from different sectors together
- Need statistical requirements and models

Transposing TISSA to national level

Protocols developed by the Tripartite organizations and provided to countries are aligned

TISSA metrics and standardization can be transposed to national surveillance systems

TISSA works on cross-reporting and cross-analysis will bring valuable guidance for countries to repeat reporting and analyses at national level

Complementing guidance (e.g., Integrated surveillance of antimicrobial resistance in foodborne bacteria: application of a one health approach: guidance from the WHO Advisory Group on Integrated Surveillance of Antimicrobial Resistance (AGISAR))

But need to be adapted to national context

Conclusion

TISSA is a central repository of AMR & AMU data across sectors managed by the Tripartite organizations

Data collected from Tripartite organizations' respective global surveillance systems

Foster understanding of AMR across sectors

Foster One Health surveillance in countries

TISSA to be launched in 2022