Food and Agriculture Organization of the United Nations

Global One health aspects of AMR from an agricultural perspective.

FAO's role in reducing AMR

Riga, 22 november 2018

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Senior veterinary Policy Advisor FAO

What to discuss:

1. What is FAO

2. AMR in agriculture

3. What is FAO doing on AMR

What is FAO?

Eliminating Hunger

Fighting Poverty

Caring for the Earth

Food and Agriculture Organization of the United Nations

achieving
food security for all
and making sure
people have regular
access to enough
high-quality **food** to
lead active, healthy lives

How do we get the job done?

Putting information within reach

Providing a meeting place for nations

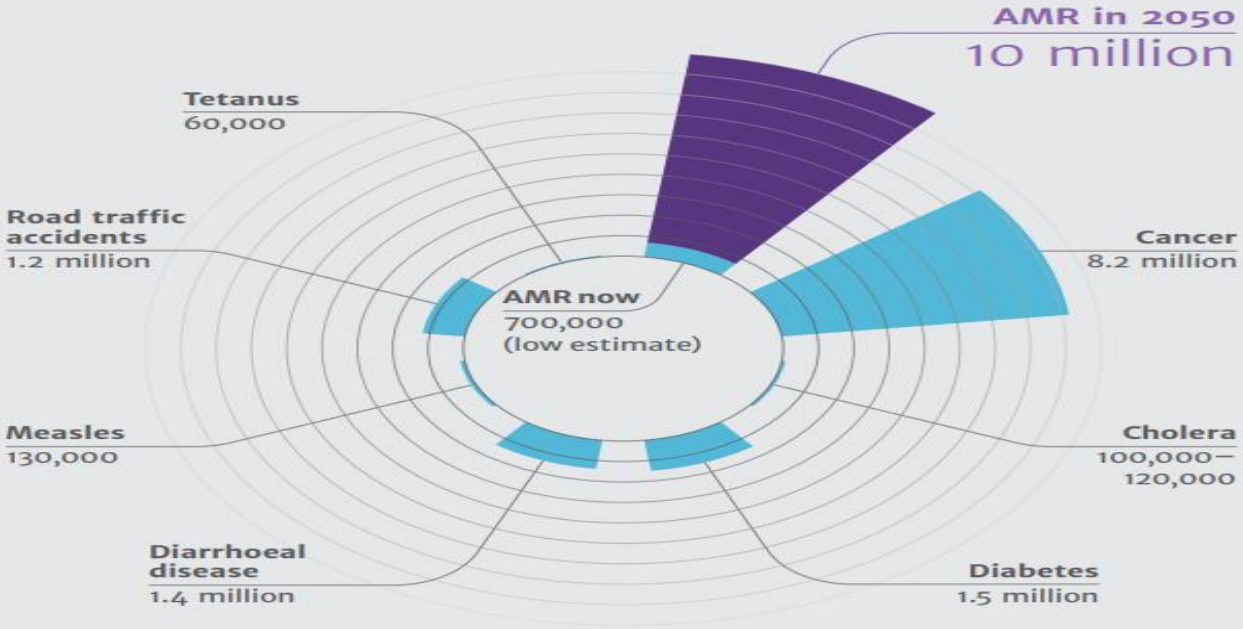
Sharing policy expertise

Bringing knowledge to the field

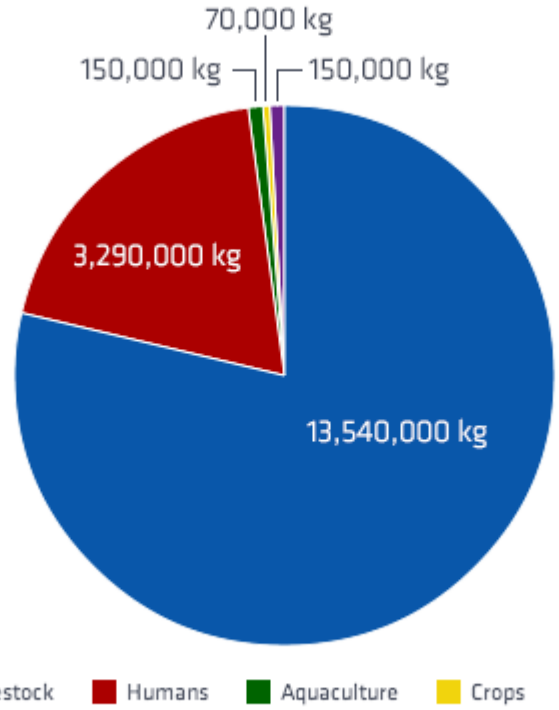
FAO Buildings in the world

Agriculture and AMR

Deaths attributable to AMR every year compared to other major causes of death



Estimated Annual Antibiotic Use in the United States

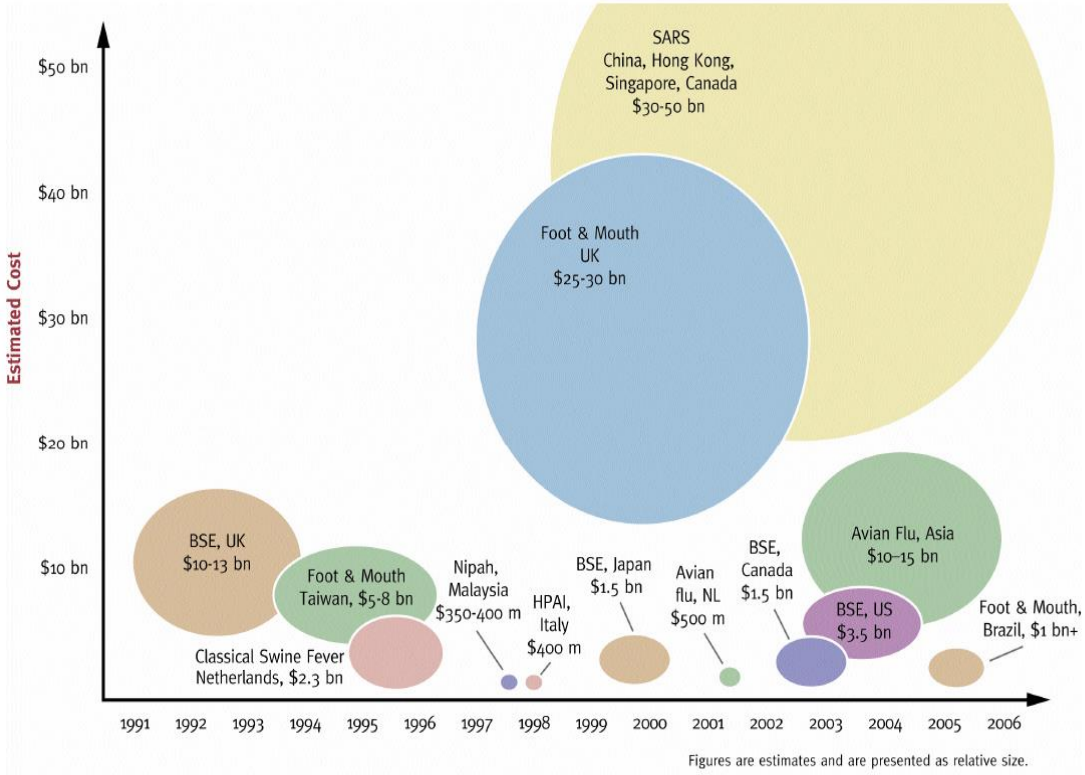


Data are shown as approximate numbers of kilograms of antibiotics used per year.

Source: Food and Drug Administration

CNBC

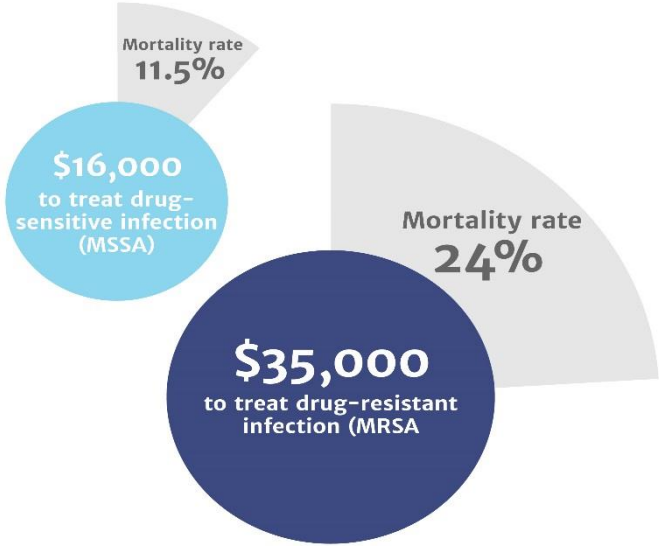
FIGURE 1: Economic Impact of Selected Infectious Diseases: Recent Livestock Disease Outbreaks and SARS



Figures are estimates and are presented as relative size.

RESISTANT INFECTIONS LEAD TO HIGHER DEATH RATES AND ARE MORE EXPENSIVE TO TREAT

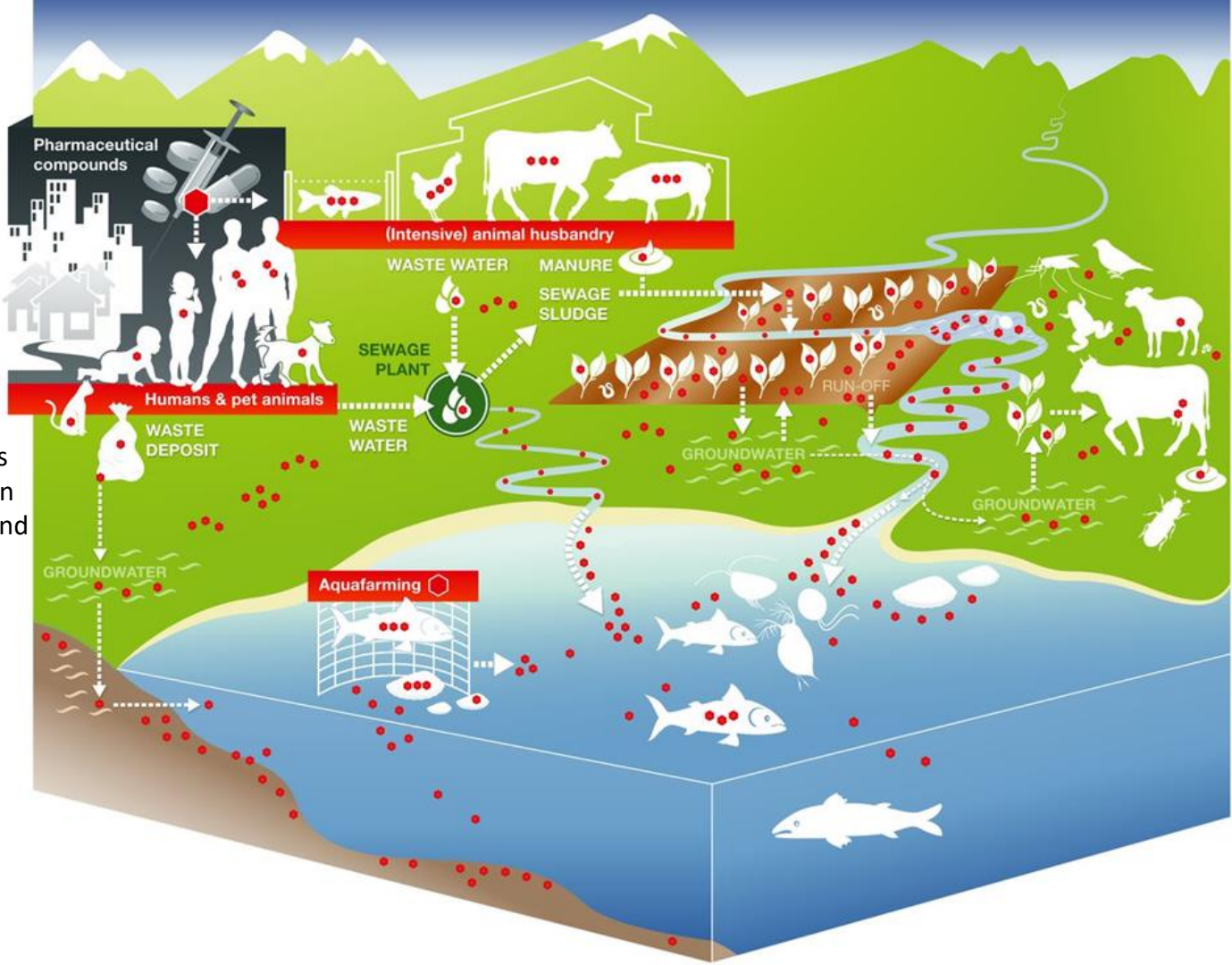
A study in the US in 2010 found that infections caused by the superbug methicillin-resistant *Staphylococcus aureus* (MRSA) were more than twice as expensive to treat as infection caused by the easier-to-treat methicillin-sensitive *Staphylococcus aureus* (MSSA)

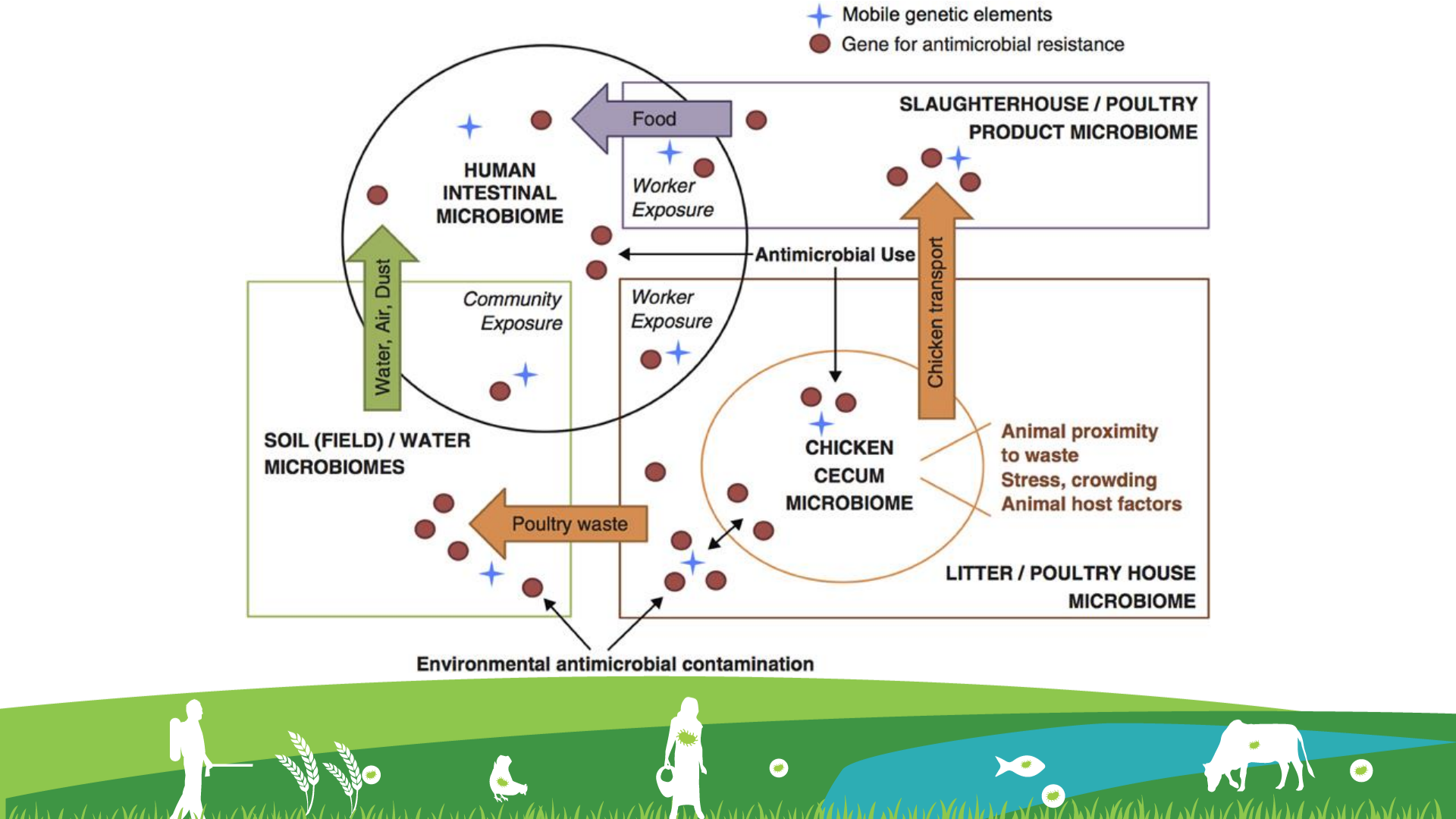


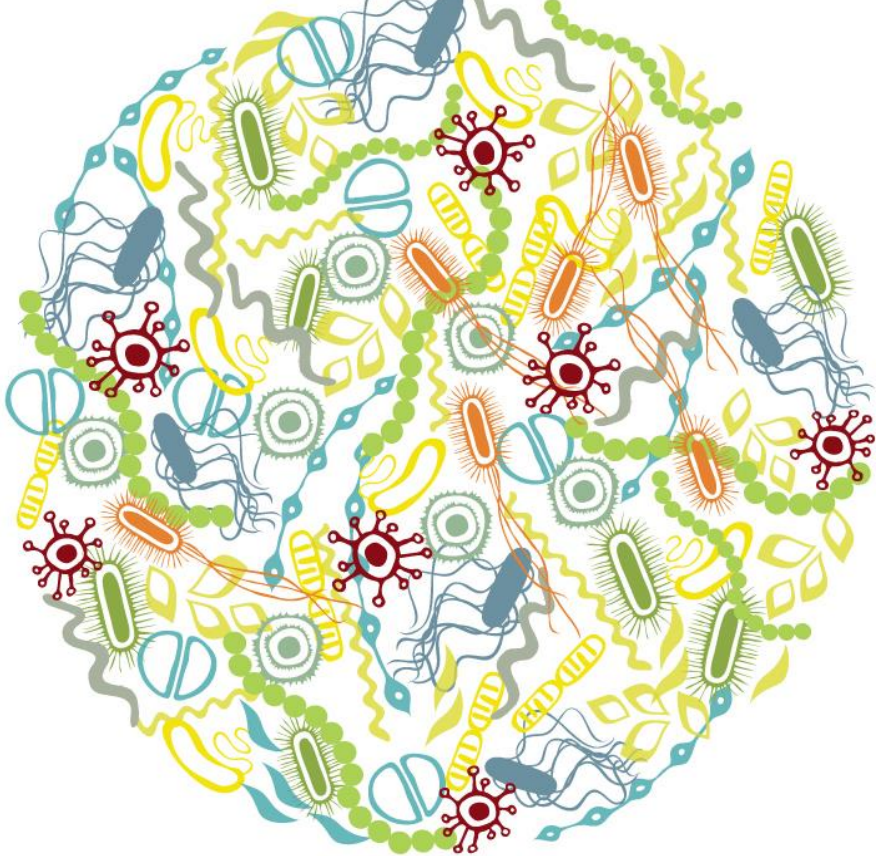
Source: Filice GA, Nyman JA, Lexau C et al., Excess costs and utilization associated with methicillin resistance for patients with *Staphylococcus aureus* infection, *Infection Control and Hospital Epidemiology*, 2010, 31 (4).

Review on Antimicrobial Resistance

Antimicrobial usage in humans, animals and agriculture, and resulting dispersion of antimicrobial residues into aquatic and terrestrial environments (represented by red dots) (source: Berkner et al., 2014)



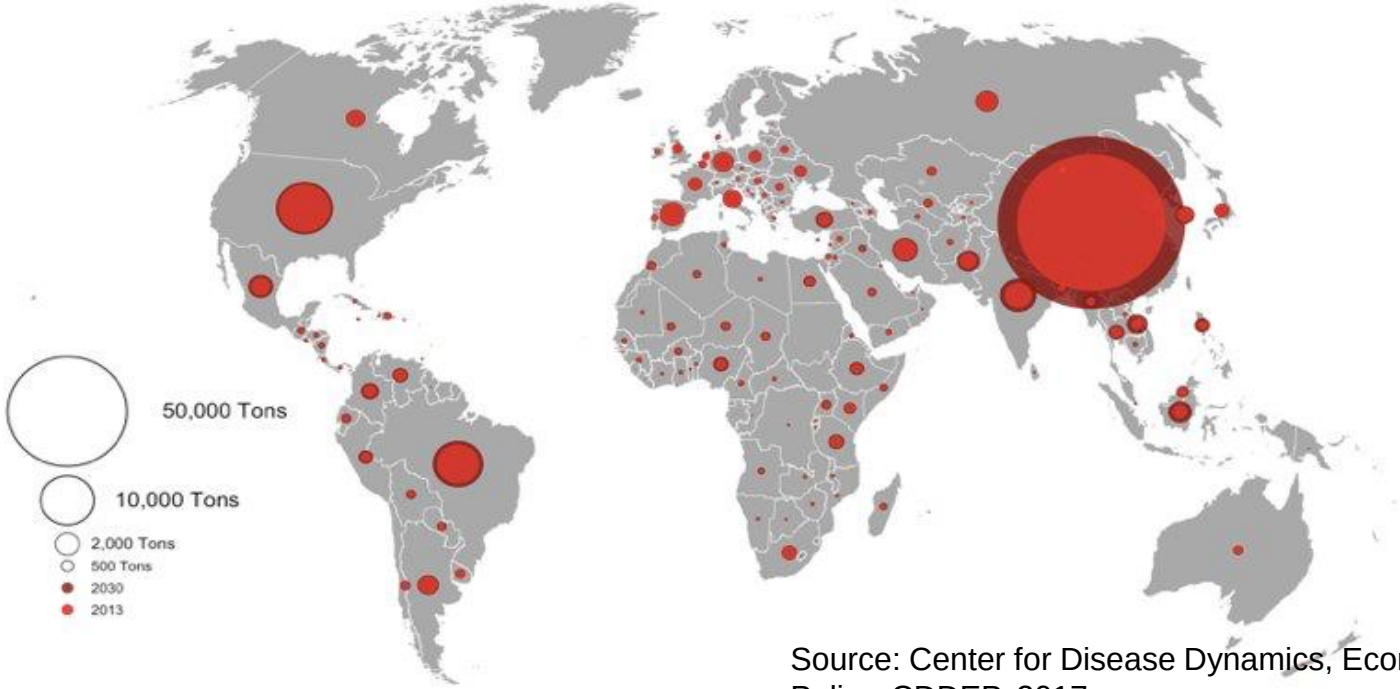

Mobile genetic elements
Gene for antimicrobial resistance
Food
HUMAN INTESTINAL MICROBIOME
Worker Exposure
SLAUGHTERHOUSE / POULTRY PRODUCT MICROBIOME
Antimicrobial Use
Water, Air, Dust
Community Exposure
Worker Exposure
Chicken transport
SOIL (FIELD) / WATER MICROBIOMES
CHICKEN CECUM MICROBIOME
Animal proximity to waste
Stress, crowding
Animal host factors
Poultry waste
LITTER / POULTRY HOUSE MICROBIOME
Environmental antimicrobial contamination




World
Microbiome
Day
27th June 2018

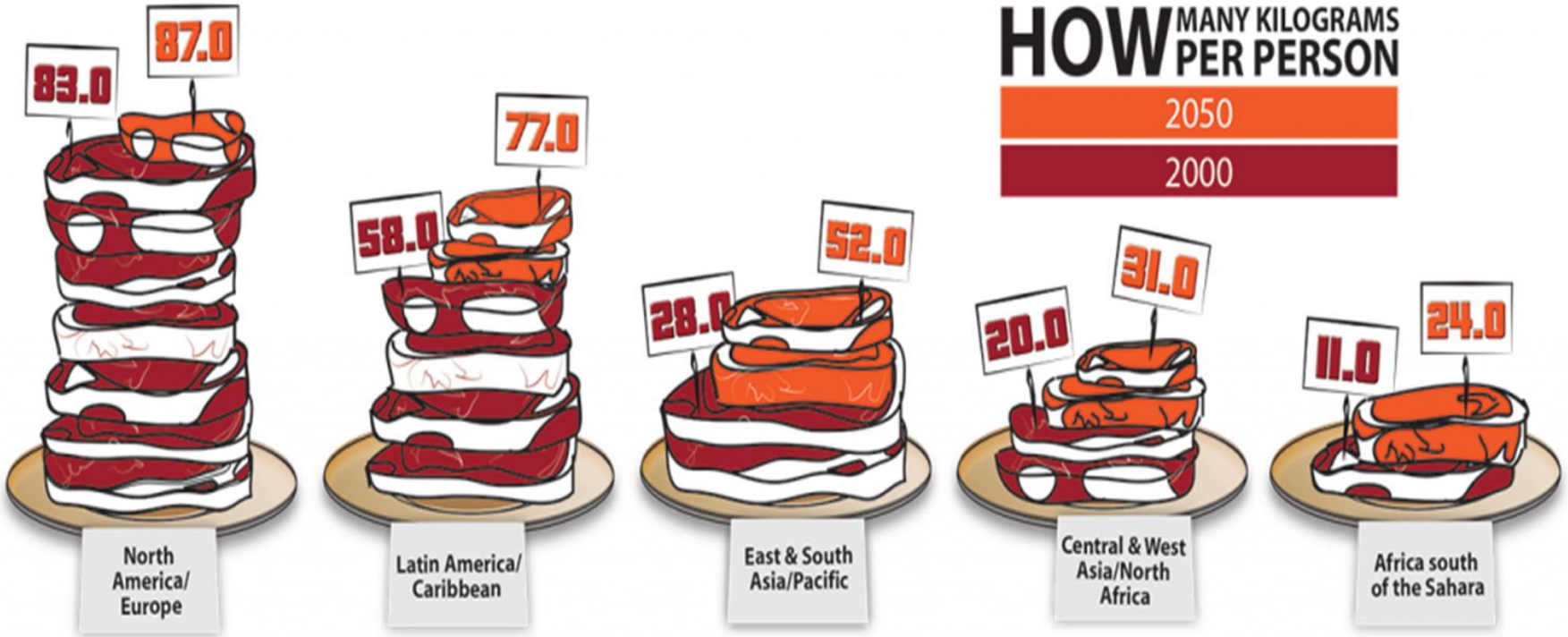
Global antibiotic use in farm animals:

2010 – 63.000 tons 2030 – 200.000 tons

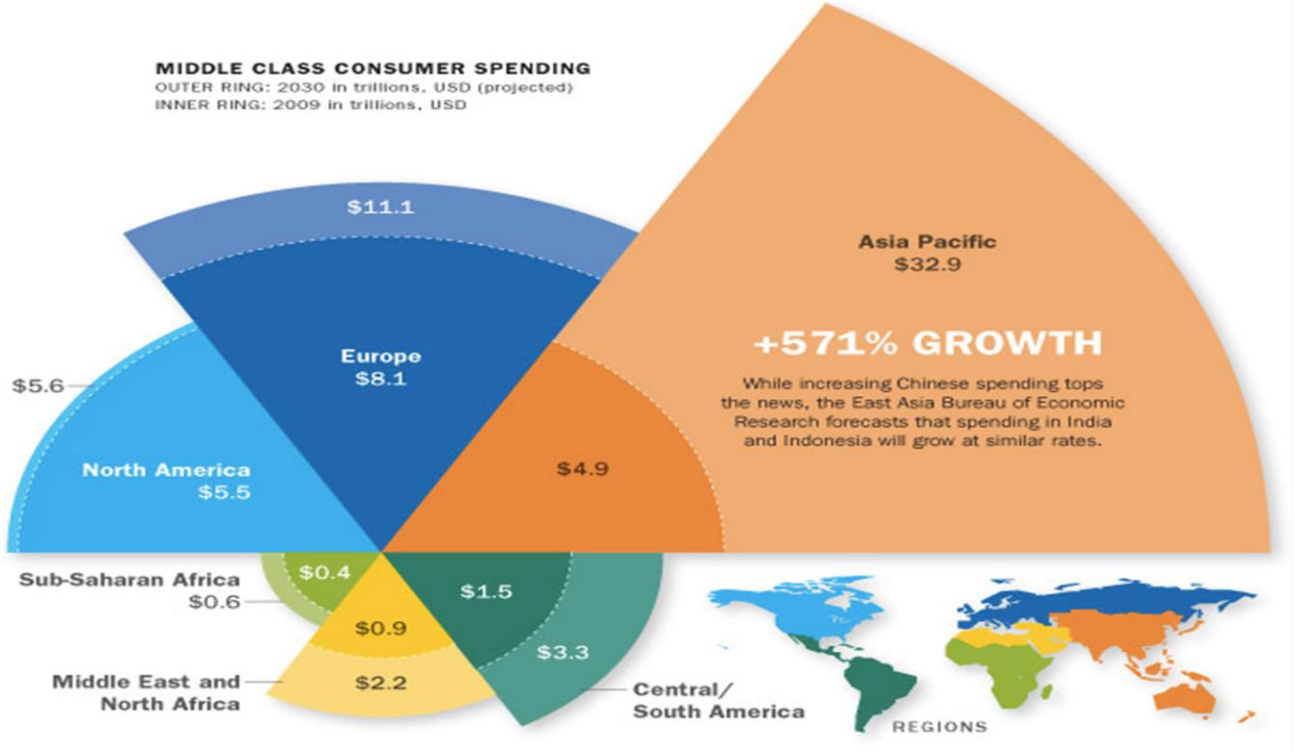


Source: Center for Disease Dynamics, Economics & Policy, CDDEP, 2017

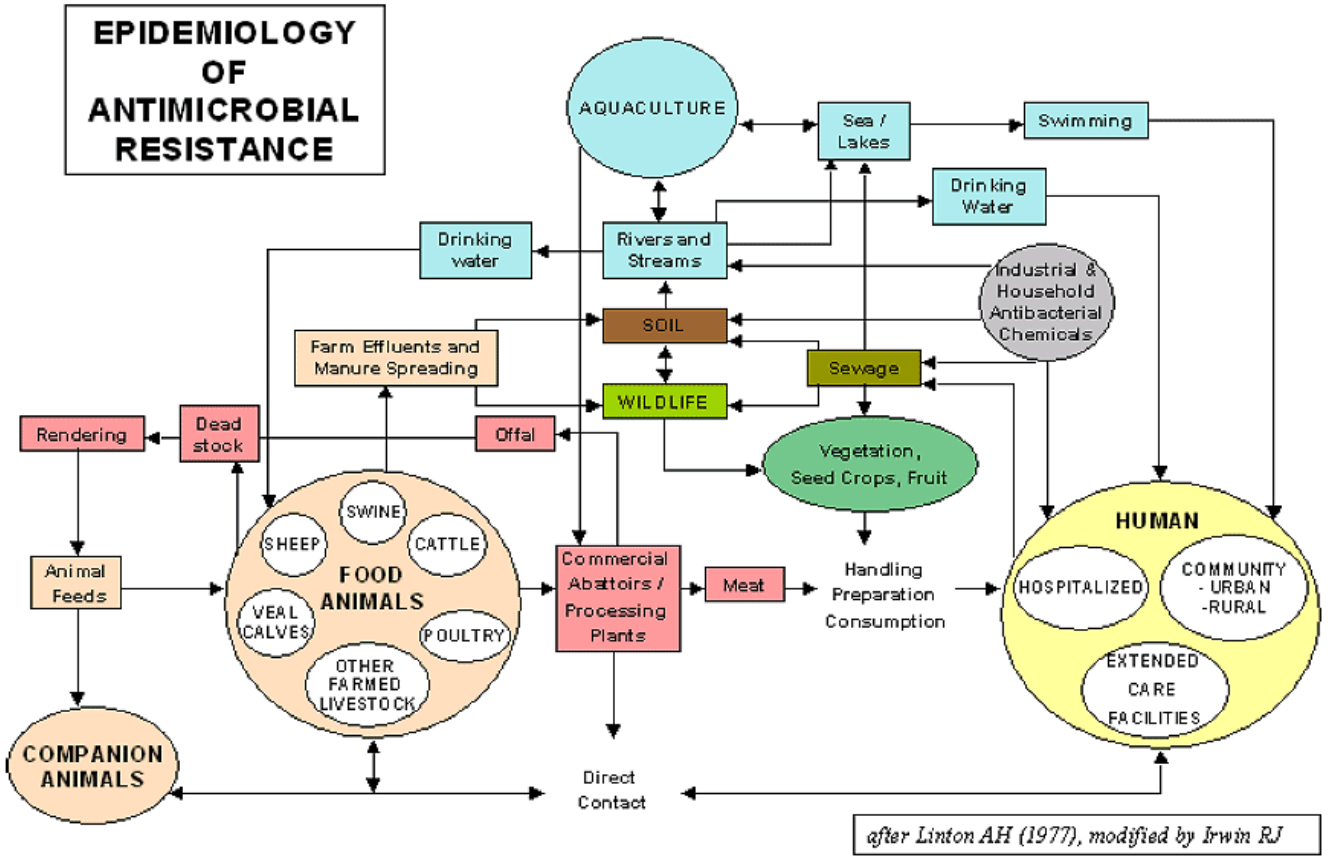
2050: 70% rise in the demand of animal proteins



Main growth of demand for animal proteins in countries with rise of middle class consumer spending



Shift towards large scale farming with routine use of antimicrobials?


EPIDEMIOLOGY OF ANTIMICROBIAL RESISTANCE
AQUACULTURE
Sea / Lakes
Swimming
Drinking Water
Drinking water
Rivers and Streams
Industrial & Household Antibacterial Chemicals
SOIL
Farm Effluents and Manure Spreading
Sewage
WILDLIFE
Rendering
Dead stock
Offal
Vegetation, Seed Crops, Fruit
HUMAN
SWINE
SHEEP
CATTLE
FOOD ANIMALS
VEAL CALVES
POULTRY
OTHER FARMED LIVESTOCK
Animal Feeds
Commercial Abattoirs / Processing Plants
Meat
Handling Preparation Consumption
HOSPITALIZED
COMMUNITY - URBAN -RURAL
EXTENDED CARE FACILITIES
COMPANION ANIMALS
Direct Contact
after Linton AH (1977), modified by Irwin RJ

Agricultural use of antimicrobials: Not only in Livestock production

Use of Tetracycline & Ampicilin in Orange Tree


VACIDE

Colistin Sulphate

Zhejiang Chemicals Import And ...

US $10-100
1 Kilogram (Min. Order)

Contact Supplier

supply cas1264-72-8 EP6 Colistin Sulfate

Simagchem Corp.

25 Kilograms (Min. Order)

Contact Supplier

Factory supply colistin sulphate 1264-72-8

Shangqiu Kangmeida Bio-Techn...

US $10-30
1 Kilogram (Min. Order)

Contact Supplier

high quality colistin sulph

Anhui Minmetals Developmer

US $14.5-20.5
1 Kilogram (Min. Order)

Contact Supplier

Feed Additives Colistin Sulphate / Veterinary soluble

Guangxi Nanning Taoyuan Veter...

10% colistin sulfate premix drug for growing pig

Wuxi Zhengda Poultry Co., Ltd.

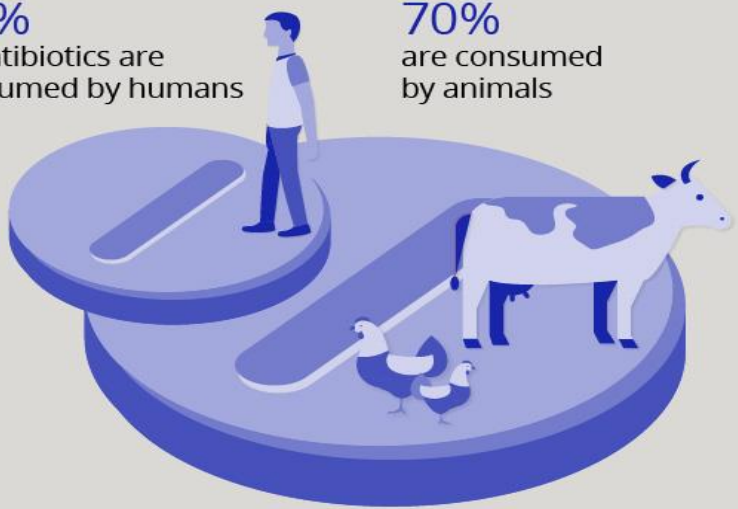
Antibiotics in humans and animals

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

2012

30%
of antibiotics are consumed by humans

70%
are consumed by animals



2010

63,200 tons

2030

105,600 tons

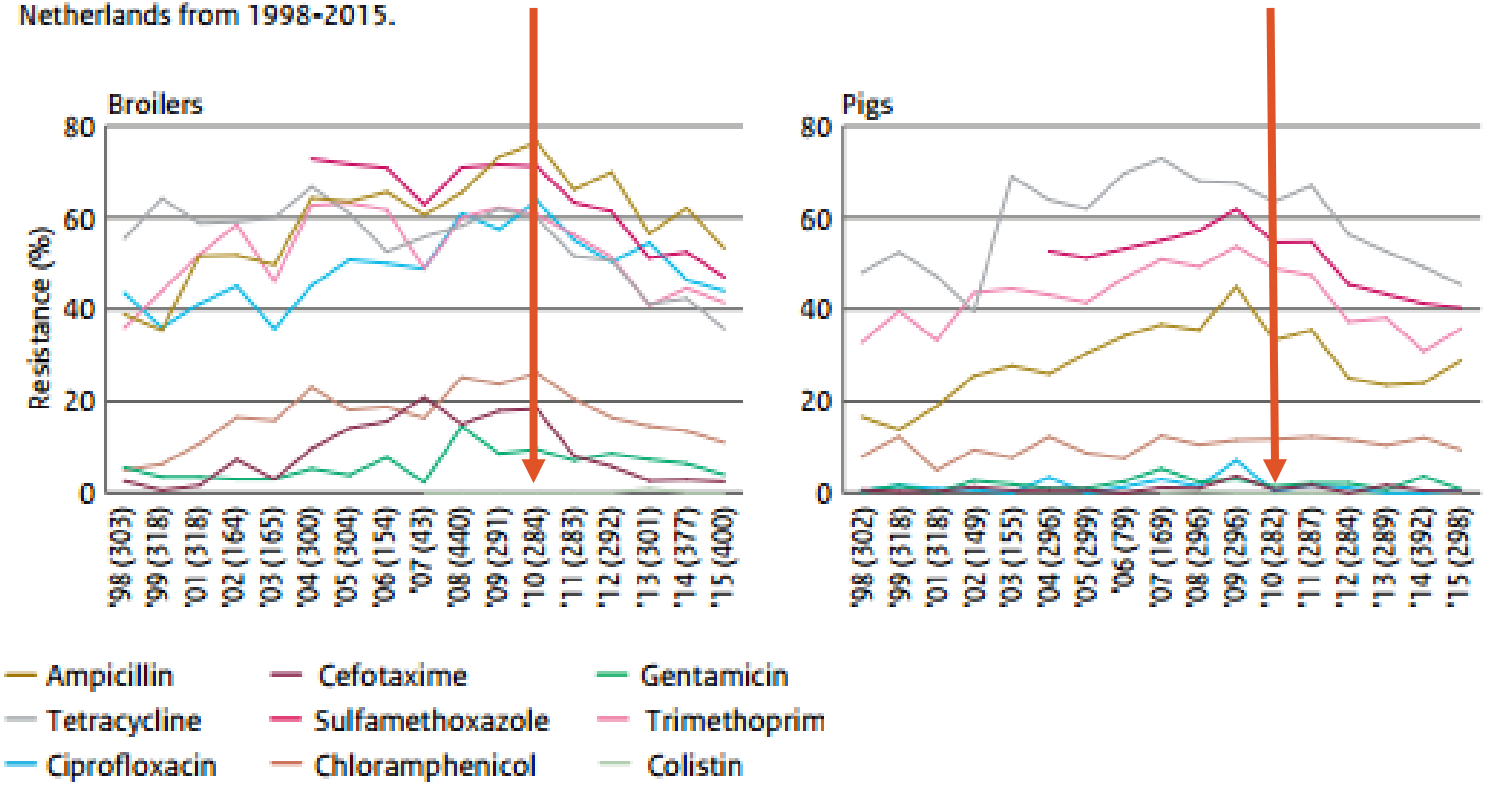
By 2030

Global consumption of antibiotics in livestock production to increase by two-thirds

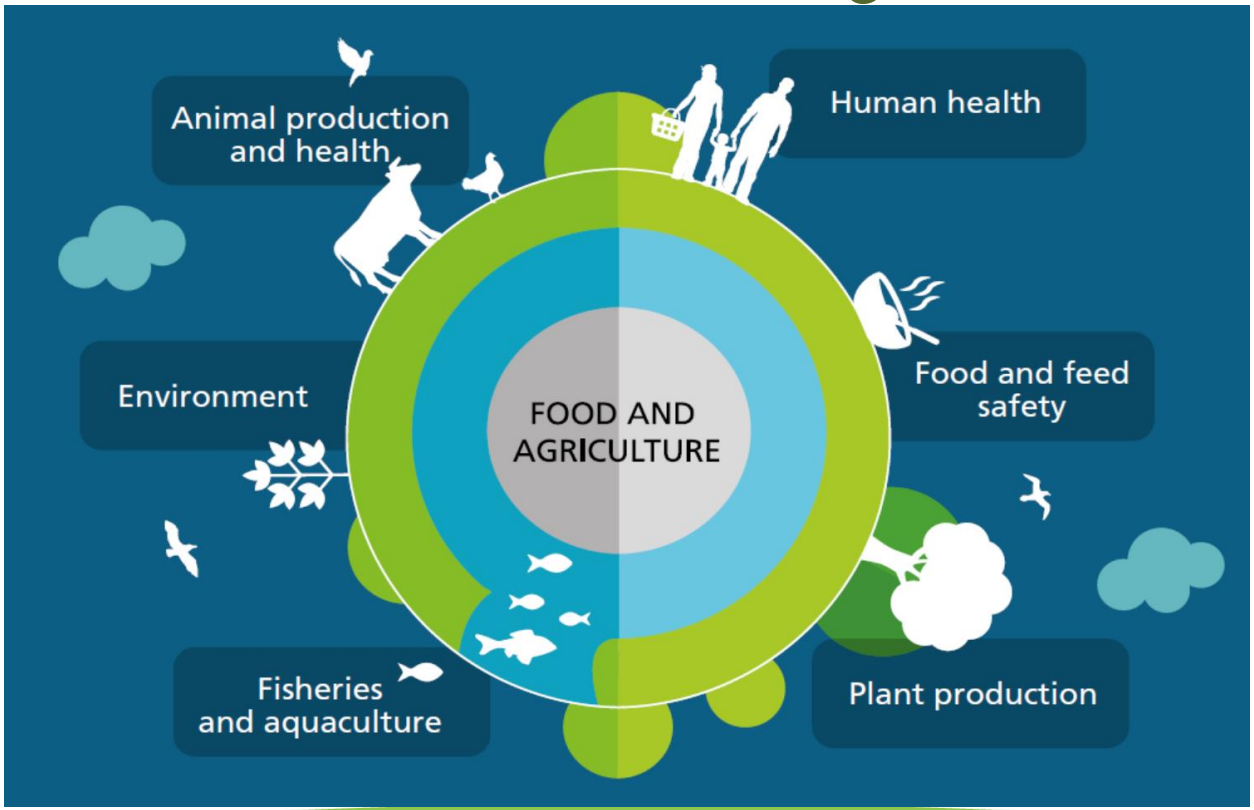
Source: Review on antimicrobial resistance
Credit: Rebeccah Robinson/LSHTM

Decrease in AMR?

Figure Eco01 Trends in resistance (%) of *E. coli* isolated from broilers, slaughter pigs, veal calves and dairy cattle in the Netherlands from 1998-2015.

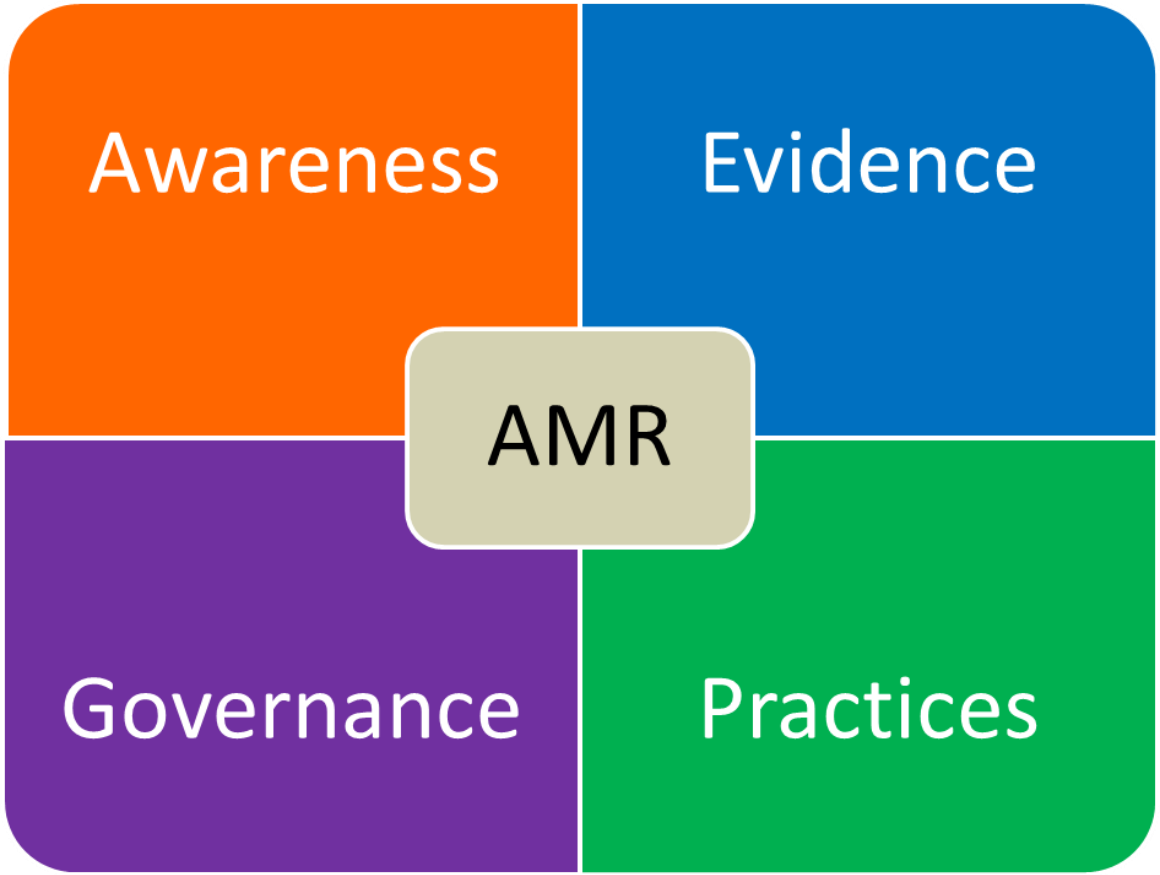


What is FAO doing on AMR?



FAO Action Plan on AMR

- Improve awareness on AMR and related threats
- Develop capacity for surveillance and monitoring of AMR and AMU (antimicrobial use) in food and agriculture
- Strengthen governance related to AMU and AMR in food and agriculture
- Promote good practices in food and agricultural systems and the prudent use of antimicrobials


Awareness
Evidence
AMR
Governance
Practices

AMR awareness raising

AMR thematic web page: http://www.fao.org/antimicrobial-resistance/en/

AMR in Bangladesh : https://youtu.be/YmOey7FGrfE

AMR in Kenya: https://www.youtube.com/watch?v=zepLLI0XSxA


Food and Agriculture Organization of the United Nations
DRIVERS, DYNAMICS AND EPIDEMIOLOGY OF
ANTIMICROBIAL RESISTANCE IN ANIMAL PRODUCTION
Food and Agriculture Organization of the United Nations
THE FAO ACTION PLAN ON
ICROBIAL RESISTANCE
2016-2020
Supporting the food and agriculture sectors in implementing the Global Action Plan on Antimicrobial Resistance to minimize the impact of antimicrobial resistance
Codex texts
foodborne
antimicrob
resistance
Textes
concern
la résis
Improving biosecurity through prudent and responsible use of veterinary medicines in aquatic food production
547
Agricultura

Work of the FAO/WHO CODEX ALIMENTARIUS on AMR

- **Main documents**:
  - *Code of Practice to Minimize and Contain Antimicrobial Resistance* (2005)
  - *Guidelines for Risk Analysis of Foodborne Antimicrobial Resistance* (2011)
- **Other Codex texts relevant to AMR includes**:
  - *General Principles of Food Hygiene*
  - *Code of Practice on Good Animal Feeding*
  - Several Codes of hygienic practices for different commodities (e.g. milk and milk products)

FAO Guidance

In terrestrial animal production systems and health and animal feed

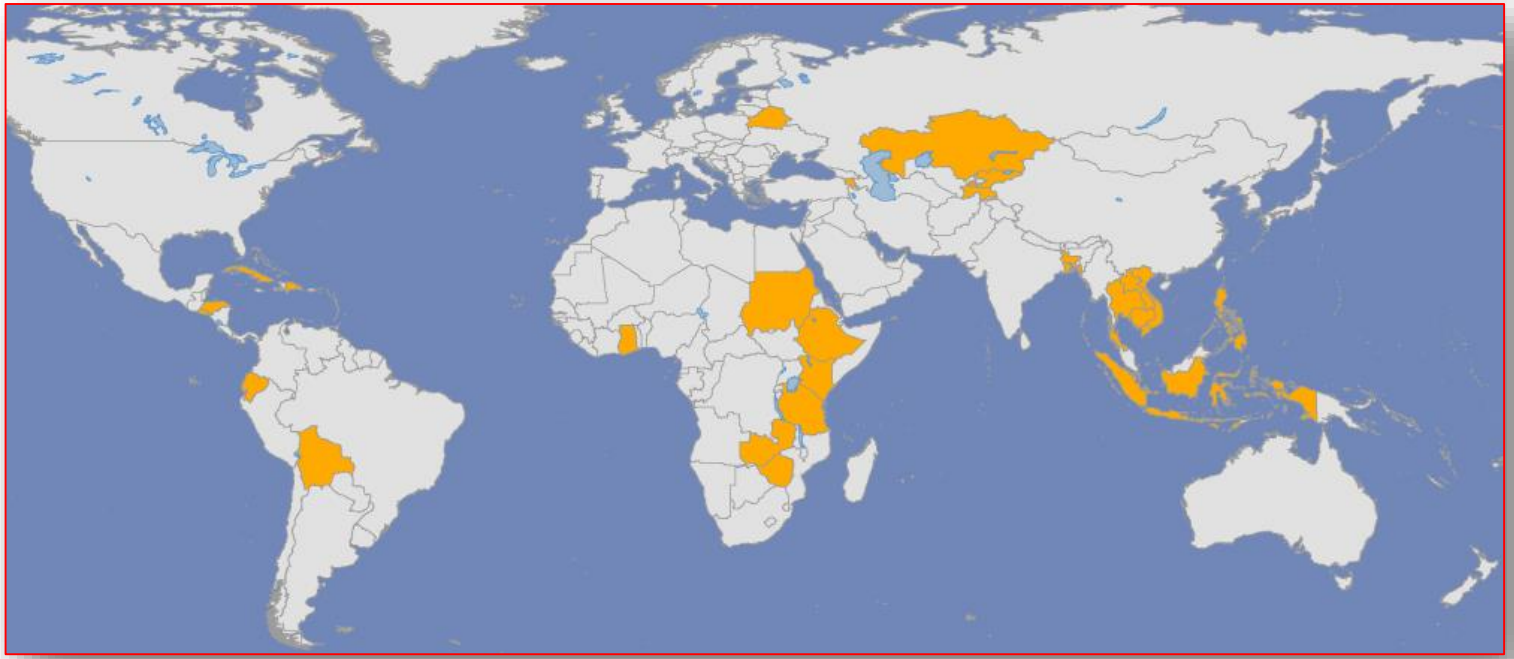
- Good husbandry and Good hygiene practices
- Improved biosecurity
- Animal welfare, proper animal handling and stress avoidance to decrease susceptibility to diseases
- Feed processing/presentation and use of appropriate feed ingredients to promote growth
- Infection control
- Vaccination regimes

In aquatic animal production systems and health

- Biosecurity a priority for the work of COFI/SCA
- AMR as a priority research topic
- CCRF Technical Guidelines: Prudent and Responsible Use of Veterinary Medicines
- Bacterial diseases in Aquaculture

In crop production and health

- Good Agriculture Practice
- Regulation of antimicrobials used for crop production
- Integrated Pest Management (IPM) for reducing use of antimicrobials
- Management and use of microbial pesticides (pesticide life-circle management)
- Management and use of pesticides including microbial pesticides
- Registration of pesticides including assessment of microbial pesticides



FAO – NAP guidance and implementation (October 2018)

The Tripartite: FAO-OIE-WHO Collaboration

Food and Agriculture Organization of the United Nations

Global leader for food and agriculture

WORLD ORGANISATION FOR ANIMAL HEALTH

for animal health and welfare

World Health Organization

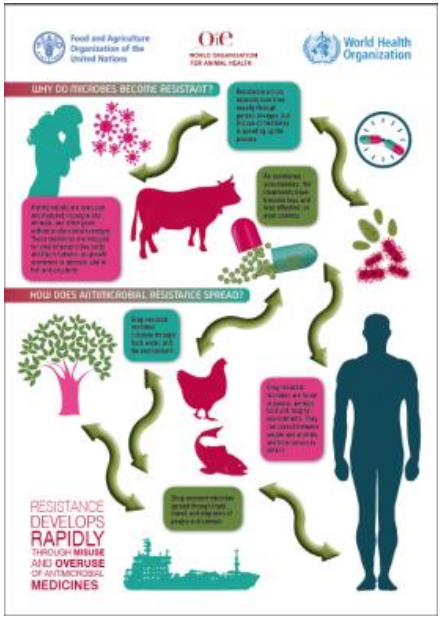
Global leader for human health

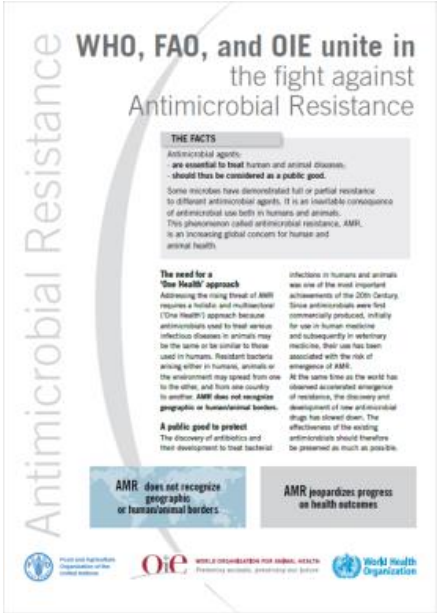
Joint priorities including on AMR

- Global Action Plan on AMR
- National Action Plan (NAP) development suppor
  - *Manual for developing NAP*
  - *Checklist to be used to assist with the develop NAP*
- Communication tools
  - Joint media statements

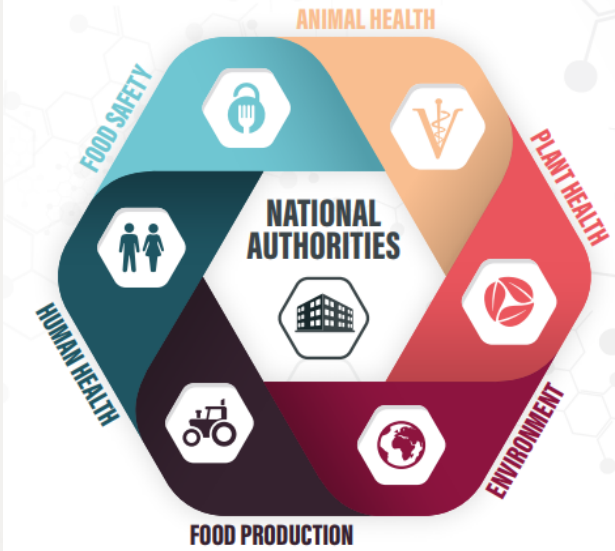
World Health Organization

Materials for Tripartite communication on AMR





HANDLE ANTIMICROBIALS WITH CARE. WE CAN ALL HELP!



Food and Agriculture Organization of the United Nations

OIE WORLD ORGANISATION FOR ANIMAL HEALTH

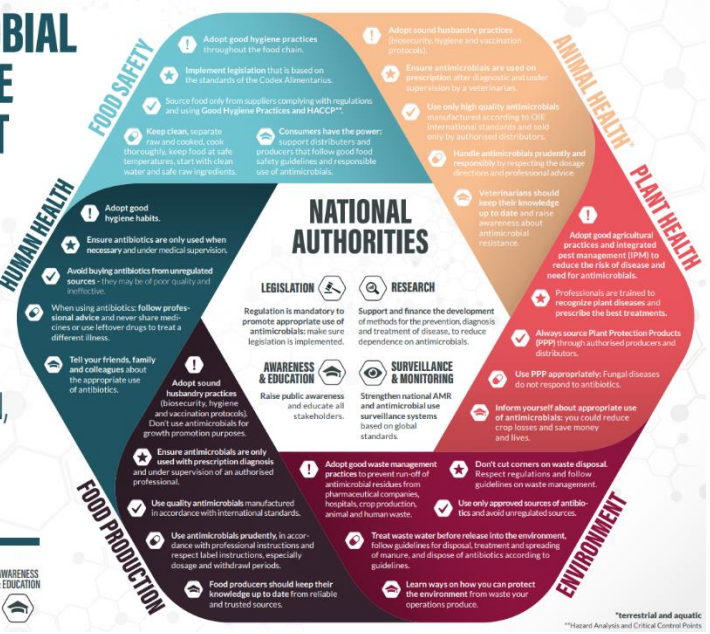
World Health Organization

ANTIMICROBIAL RESISTANCE CAN AFFECT US ALL!

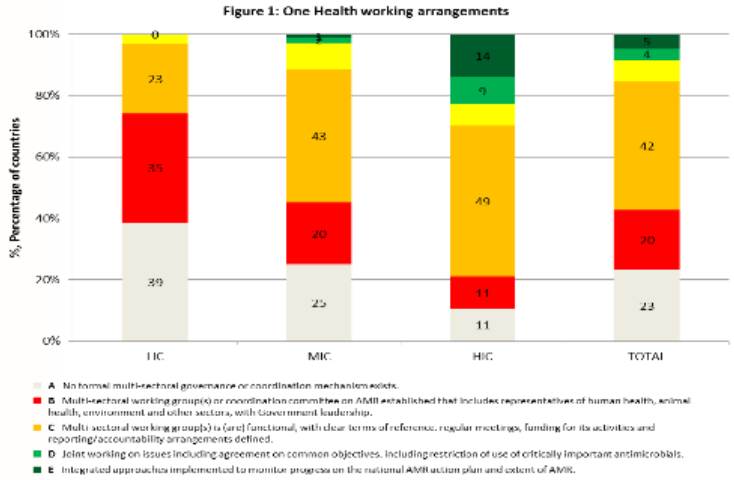
TAKE ACTION NOW

TO PROTECT HUMAN, ANIMAL, PLANT & ENVIRONMENTAL HEALTH

PREVENTION · EXPERT ADVICE · SOURCE · USE · AWARENESS & EDUCATION



FAO-OIE-WHO Collaboration:
NAP implementation Global open-access database



WHO, FAO and OIE welcome governments and interested partners to take this opportunity to access the database to see all country responses which are visualized through interactive maps and can be sorted by WHO, FAO and OIE regions and by World Bank income groups.

The database can be accessed at:

➔ **Global Monitoring of Country Progress on Antimicrobial Resistance (AMR): Country self-assessment questionnaire: version two available soon**


Global Database for Antimicrobial Resistance
Country Self Assessment
Choose your question and filters:
Survey year
2017
Question
4.1 Multi-sector and One Health
WHO
FAO
OIE
Income
OIE Region
All
Country
All
Map View
Visualization View
Table View
Response Overview
Documents
Print
4.1 Multi-sector and One Health collaboration/coordination
A - No formal multi-sectoral governance or coordination mechanism exists.
B - Multi-sectoral working group(s) or coordination committee on AMR established with Government leadership.
C - Multi-sectoral working group(s) is (are) functional, with clear terms of reference; regular meetings, and funding for working group(s). Activities and reporting/accountability arrangements are defined.
D - Joint working on issues including agreement on common objectives, including restriction of use of critically important antimicrobials.
E - Integrated approaches used to implement the national AMR action plan.
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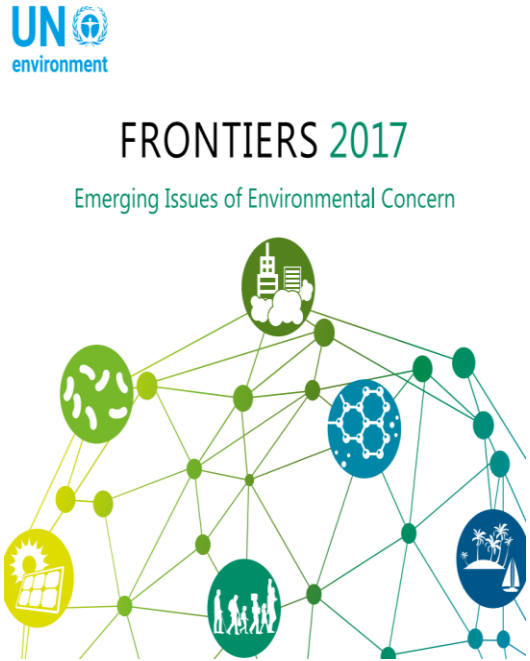
30 May 2018: Tripartite Memorandum of Understanding

From Tripartite to Tripartite Plus



Tripartite + Work program 2019-2021….and beyond

- Focus on collaborative activities
- Budget estimations developed but requires funding support
- Five focus areas
  1. Awareness and Behavioural Change
  2. Surveillance and Monitoring of AMR and AMU
  3. Fostering Research and Development, Access and Stewardship
  4. Implementation of National Action Plans
  5. Monitoring and Evaluation

Conclusions

- AMR is an ‘One-Health”issue. Only possible to control in an inter-sectoral approach.
- For **Behaviour change** cooperation with private sector, civil society and academia is essential.
- Do not ‘blame-game’ but cooperate.
- Responsible use of antimicrobials is a necessity to maintain food security, animal welfare and economic stability for farmers.
- Tripartite+ can support Latvia, and Latvia can support the Tripartite+ in its global activities.
- Congratulations with the Latvian inter-sectoral approach !

Food and Agriculture Organization of the United Nations

PALDIES

Thank you

www.fao.org/antimicrobial-resistance

Antimicrobial-Resistance@fao.org

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