



Food and Agriculture
Organization of the
United Nations

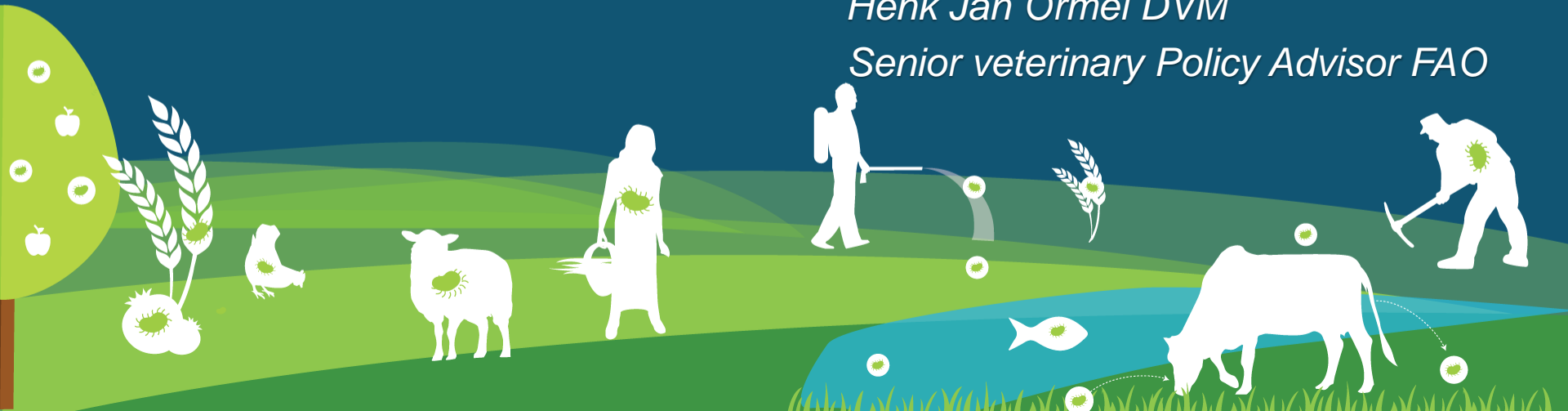
Global One health aspects of AMR from an agricultural perspective.

FAO's role in reducing AMR

Riga, 22 november 2018

Henk Jan Ormel DVM

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



**SUSTAINABLE
DEVELOPMENT** **GOALS**

THE GLOBAL GOALS
For Sustainable Development



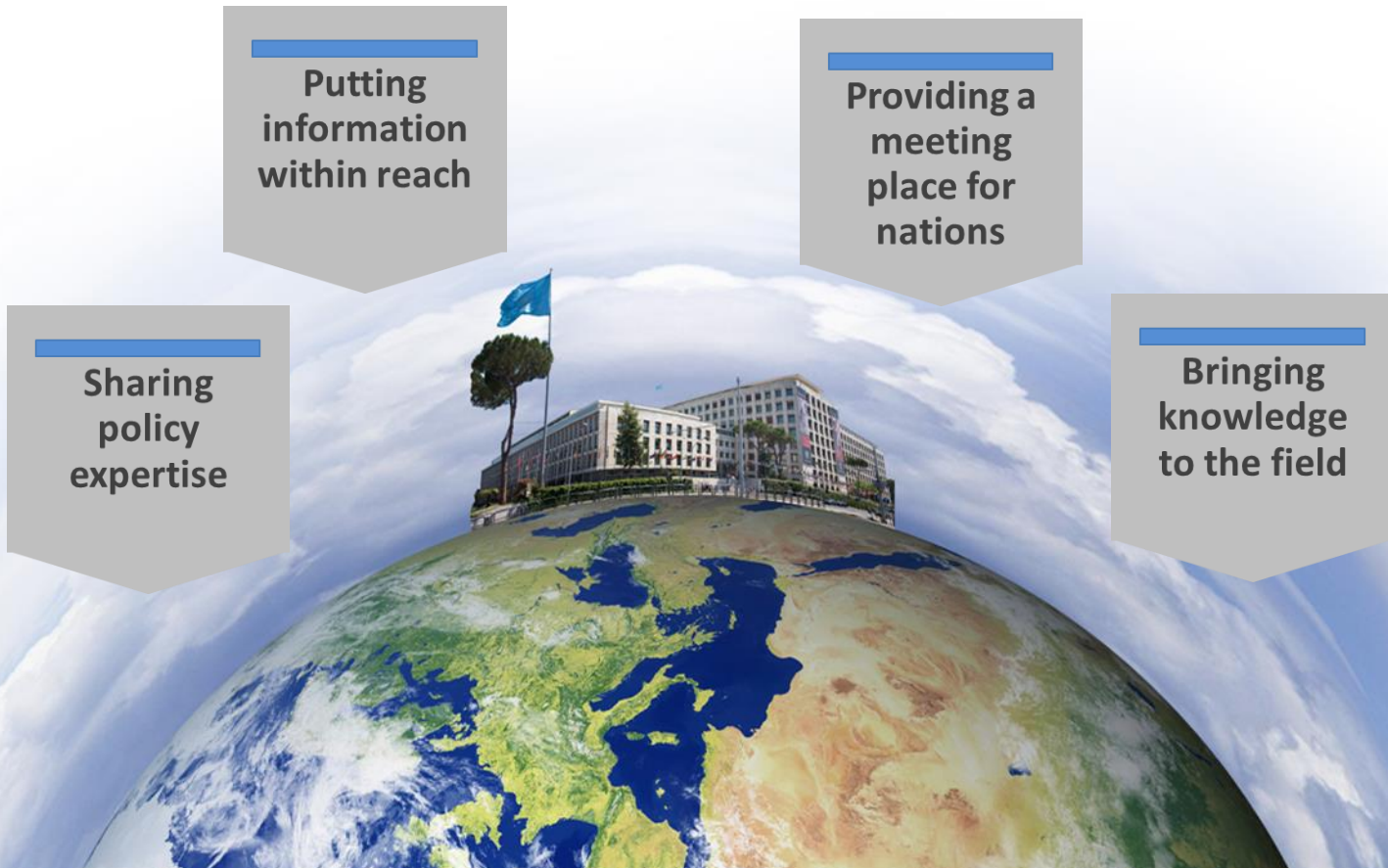
How do we get the job done?

Putting
information
within reach

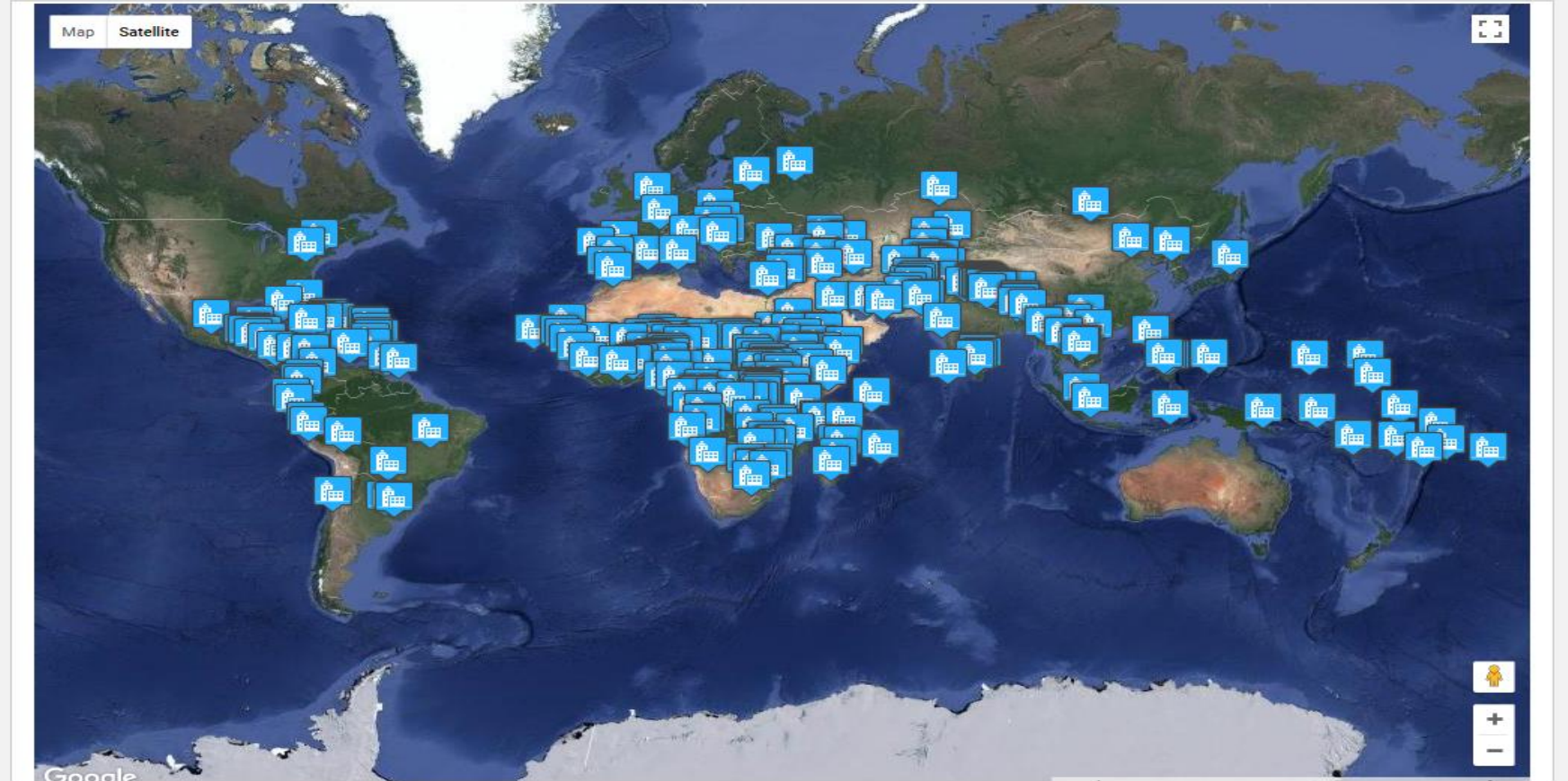
Providing a
meeting
place for
nations

Sharing
policy
expertise

Bringing
knowledge
to the field



FAO Buildings in the world



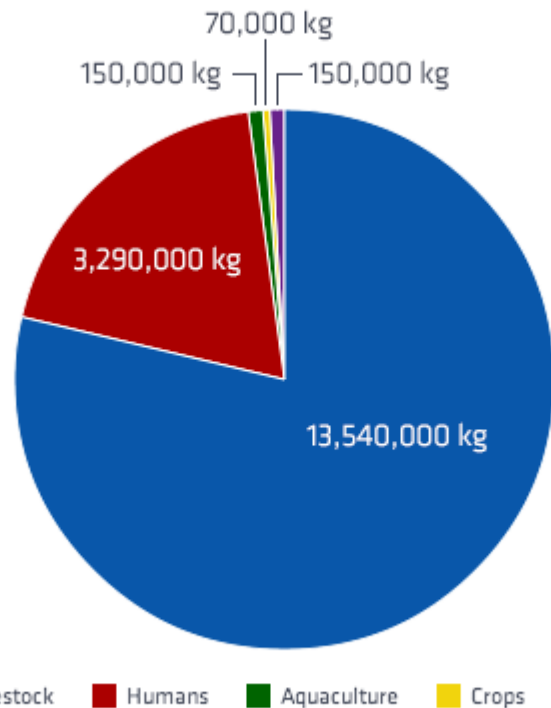
Agriculture and AMR



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



Estimated Annual Antibiotic Use in the United States

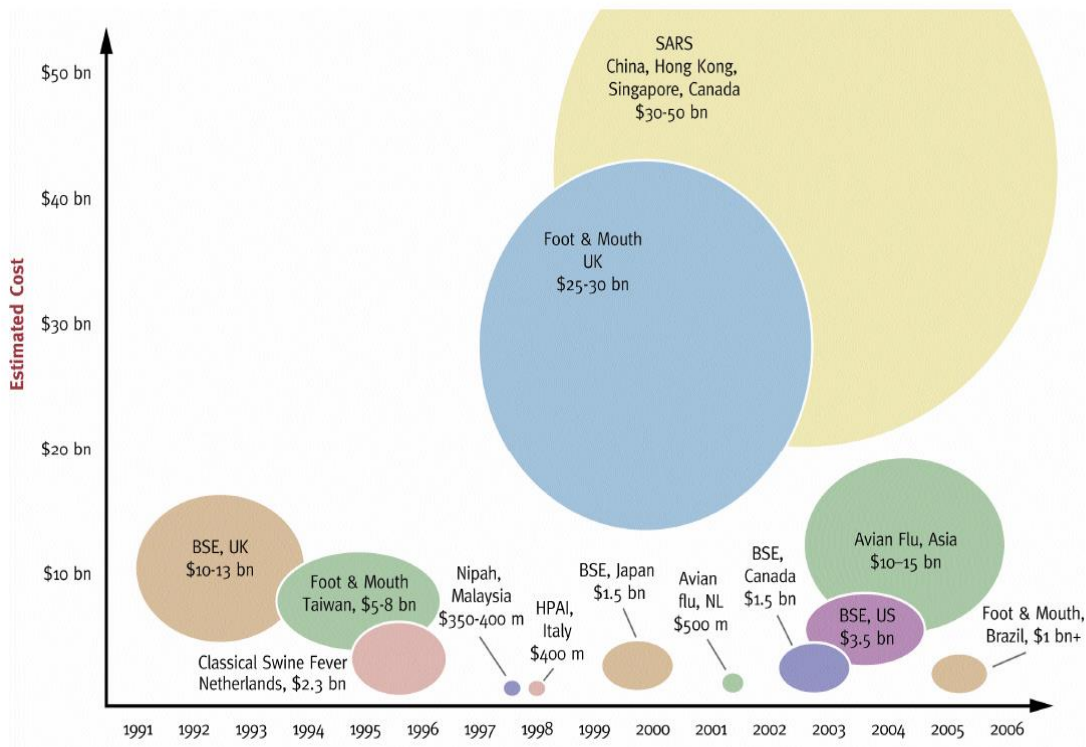


Data are shown as approximate numbers of kilograms of antibiotics used per year.

Source: Food and Drug Administration



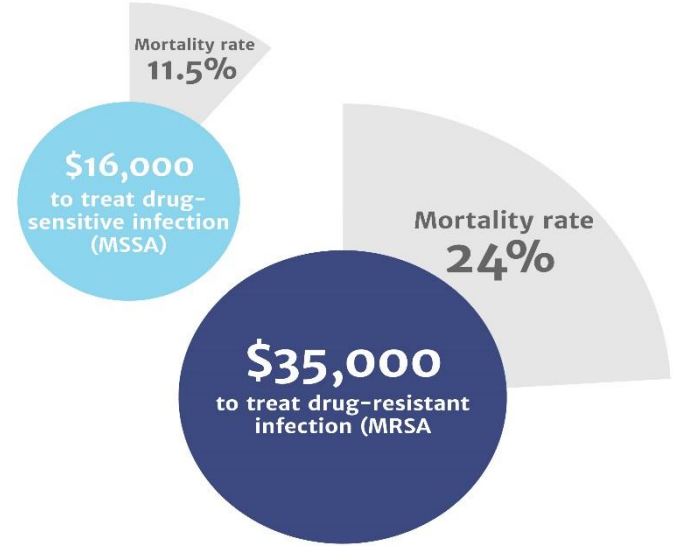
FIGURE 1: Economic Impact of Selected Infectious Diseases: Recent Livestock Disease Outbreaks and SARS



Figures are estimates and are presented as relative size.

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

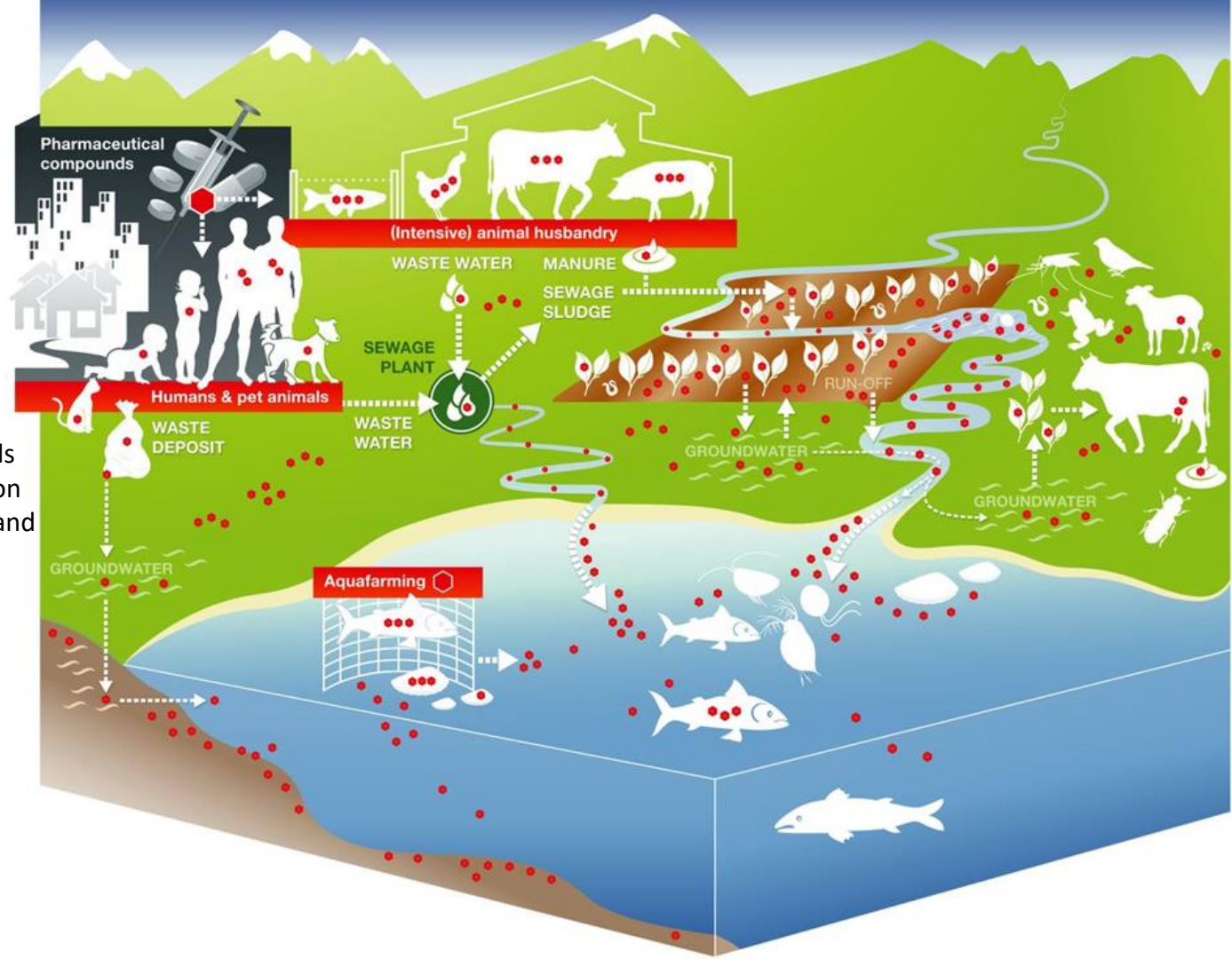
A study in the US in 2010 found that infections caused by the superbug methicillin-resistant *Staphylococcus aureus* (MRSA) were more than twice as expensive to treat as infection caused by the easier-to-treat methicillin-sensitive *Staphylococcus aureus* (MSSA)



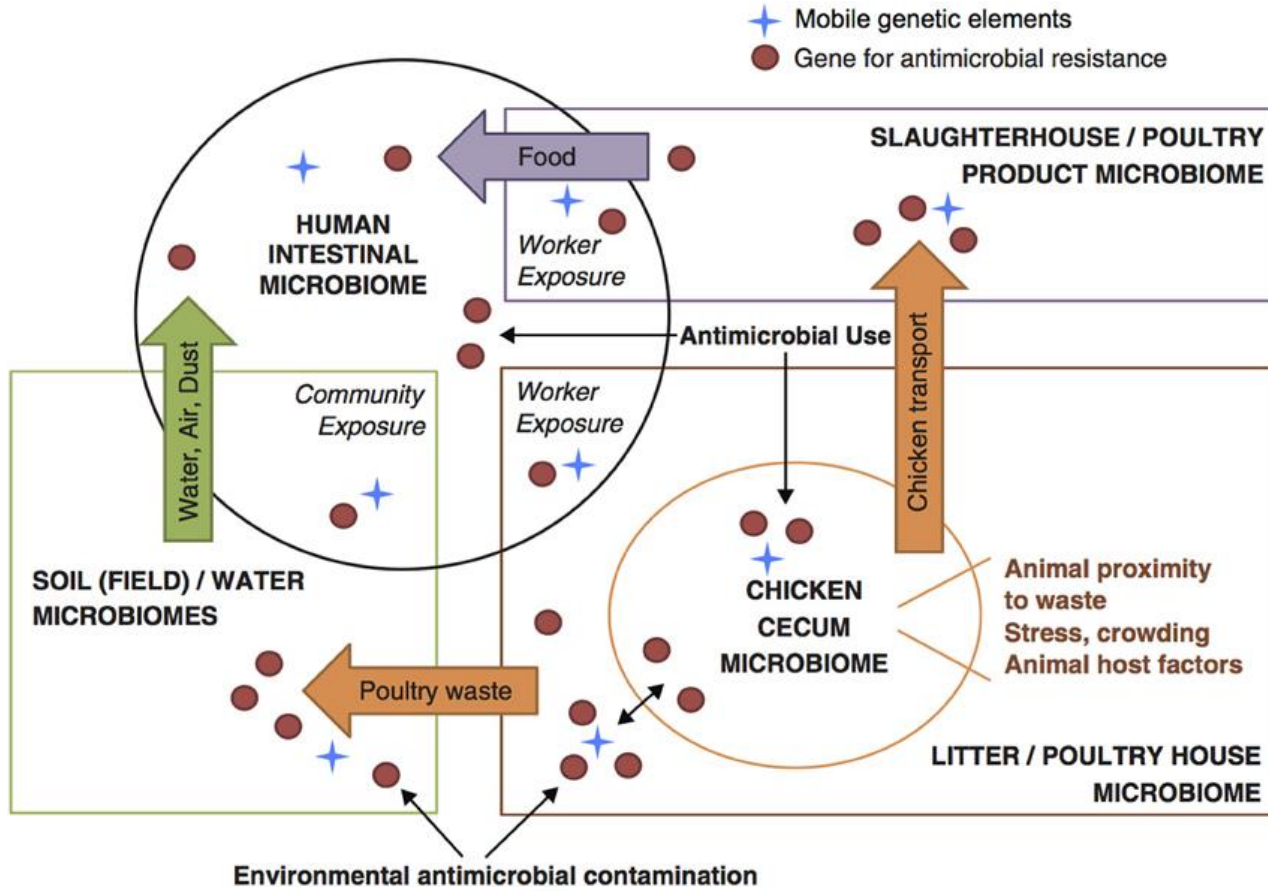
Source: Filice GA, Nyman JA, Lexau C et al., Excess costs and utilization associated with methicillin resistance for patients with *Staphylococcus aureus* infection, *Infection Control and Hospital Epidemiology*, 2010, 31 (4).

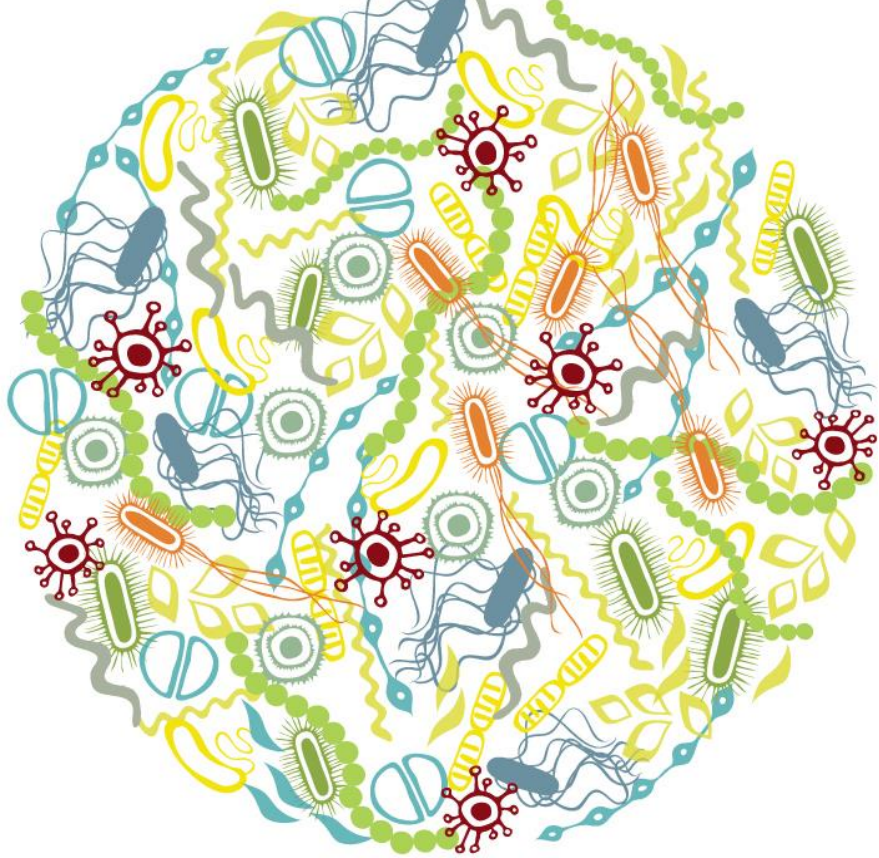
Review on Antimicrobial Resistance



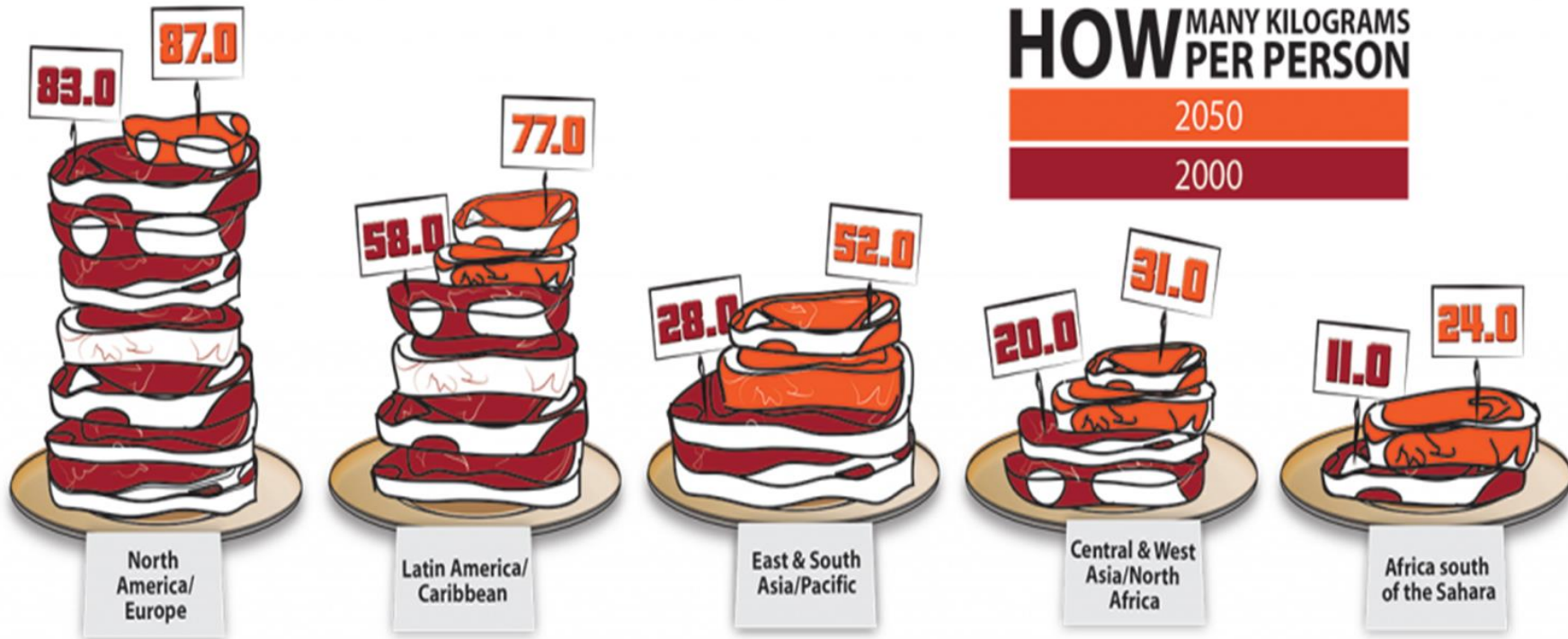


Antimicrobial usage in humans, animals and agriculture, and resulting dispersion of antimicrobial residues into aquatic and terrestrial environments (represented by red dots) (source: Berkner et al., 2014)

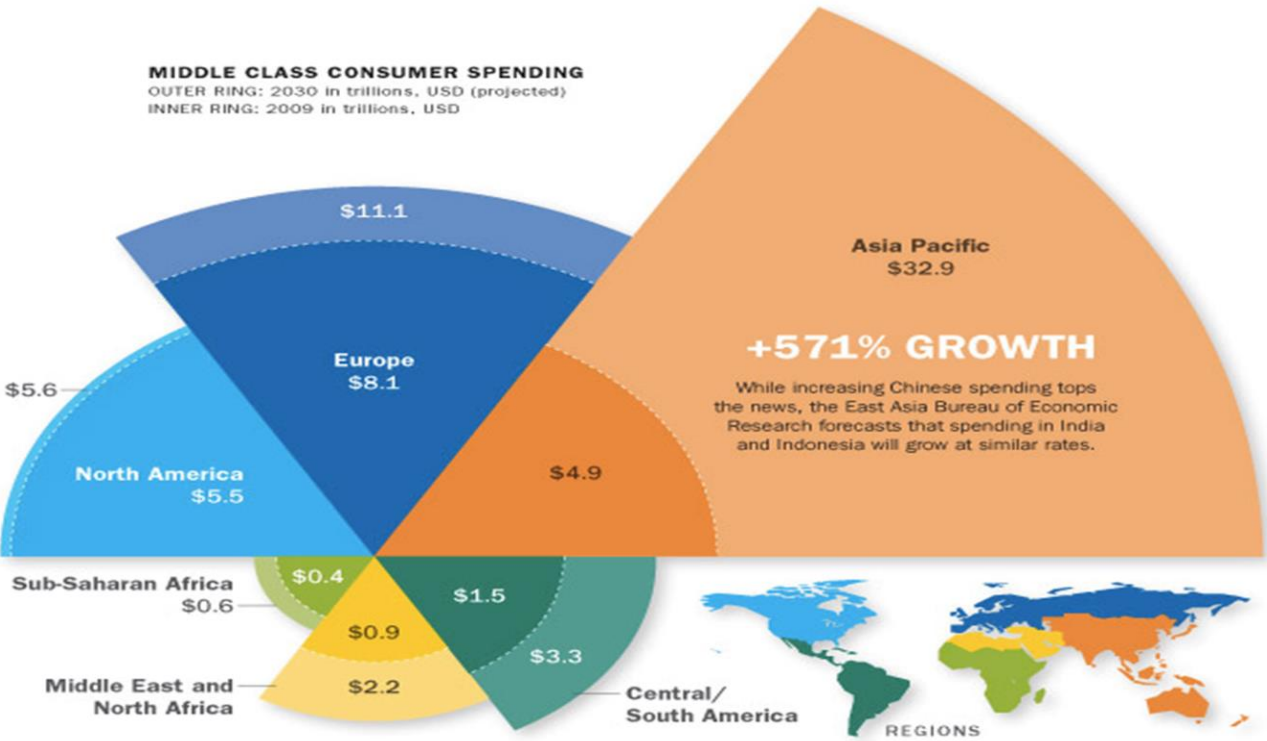




2050: 70% rise in the demand of animal proteins



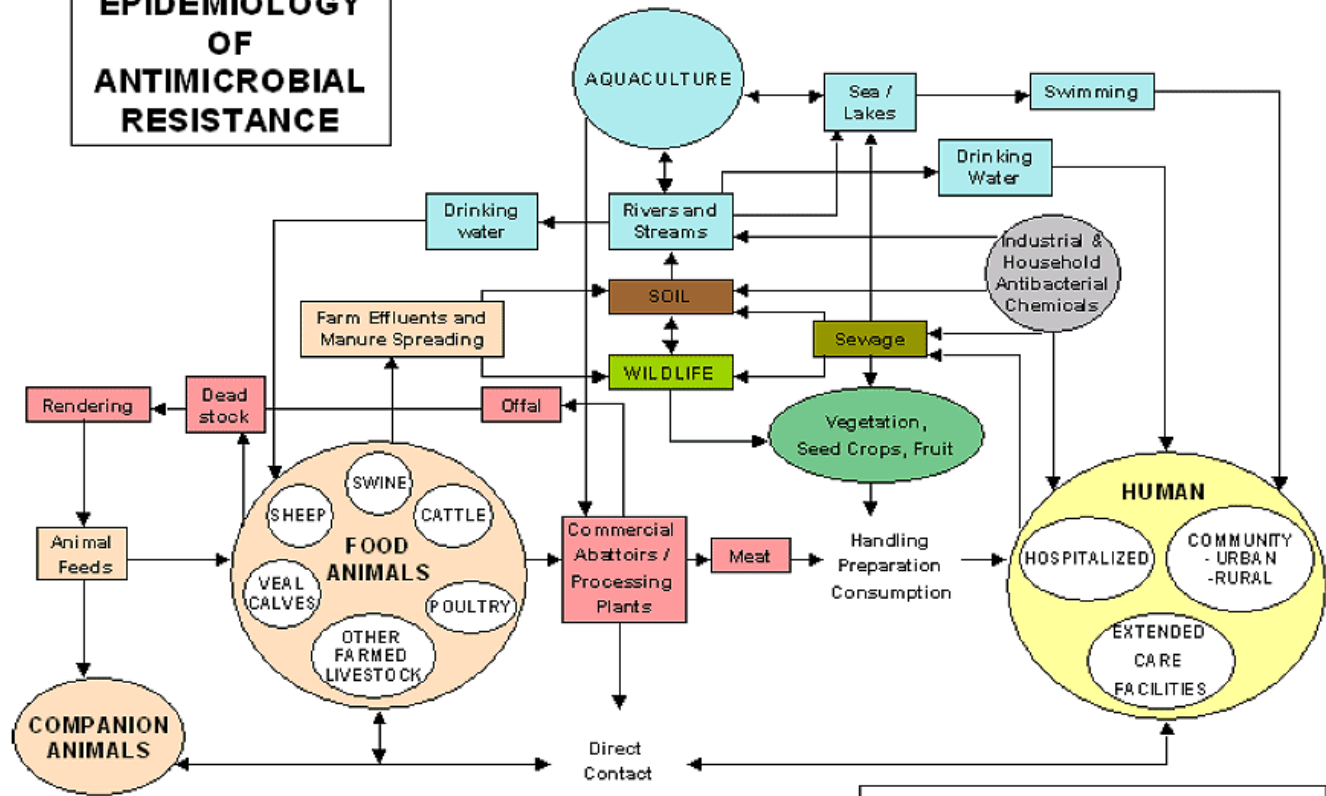
Main growth of demand for animal proteins in countries with rise of middle class consumer spending



Shift towards large scale farming with routine use of antimicrobials?



EPIDEMIOLOGY OF ANTIMICROBIAL RESISTANCE



after Linton AH (1977), modified by Irwin RJ



Agricultural use of antimicrobials: Not only in Livestock production

Use of Tetracycline & Ampicilin in Orange Tree









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

Shangjiu Kangmeida Bio-Tech...

US \$10-30

1 Kilogram (Min. Order)

Contact Supplier



high quality colistin sulph

Anhui Minmetals Developer

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.

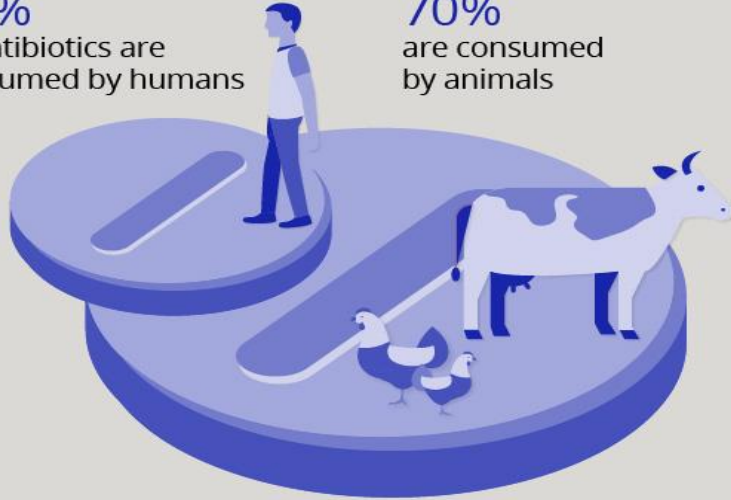


Antibiotics in humans and animals

2012

30%
of antibiotics are
consumed by humans

70%
are consumed
by animals

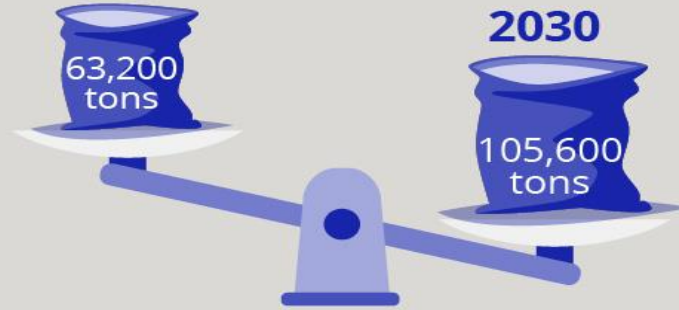


2010

63,200
tons

2030

105,600
tons



By 2030

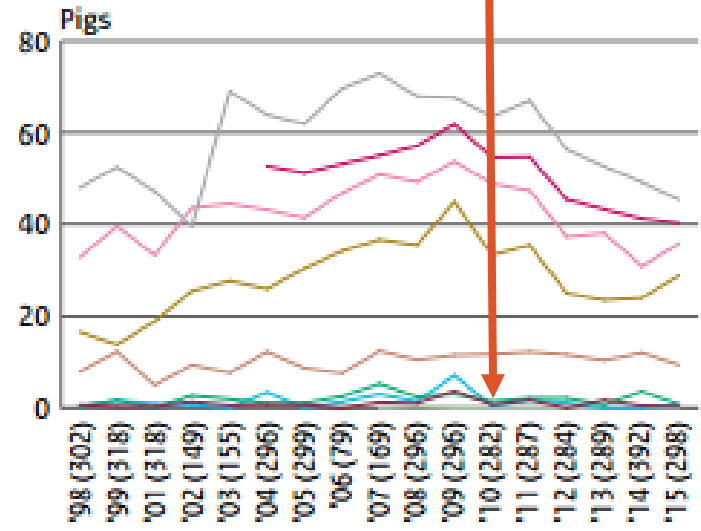
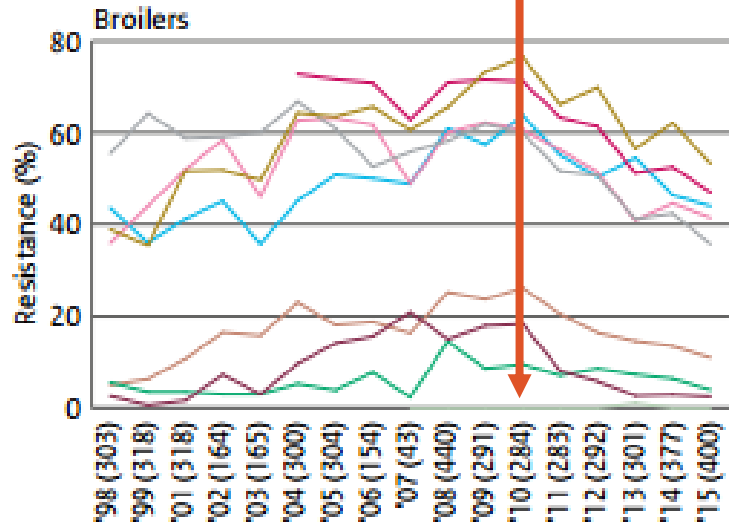
Global consumption of antibiotics in
livestock production to increase by
two-thirds

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



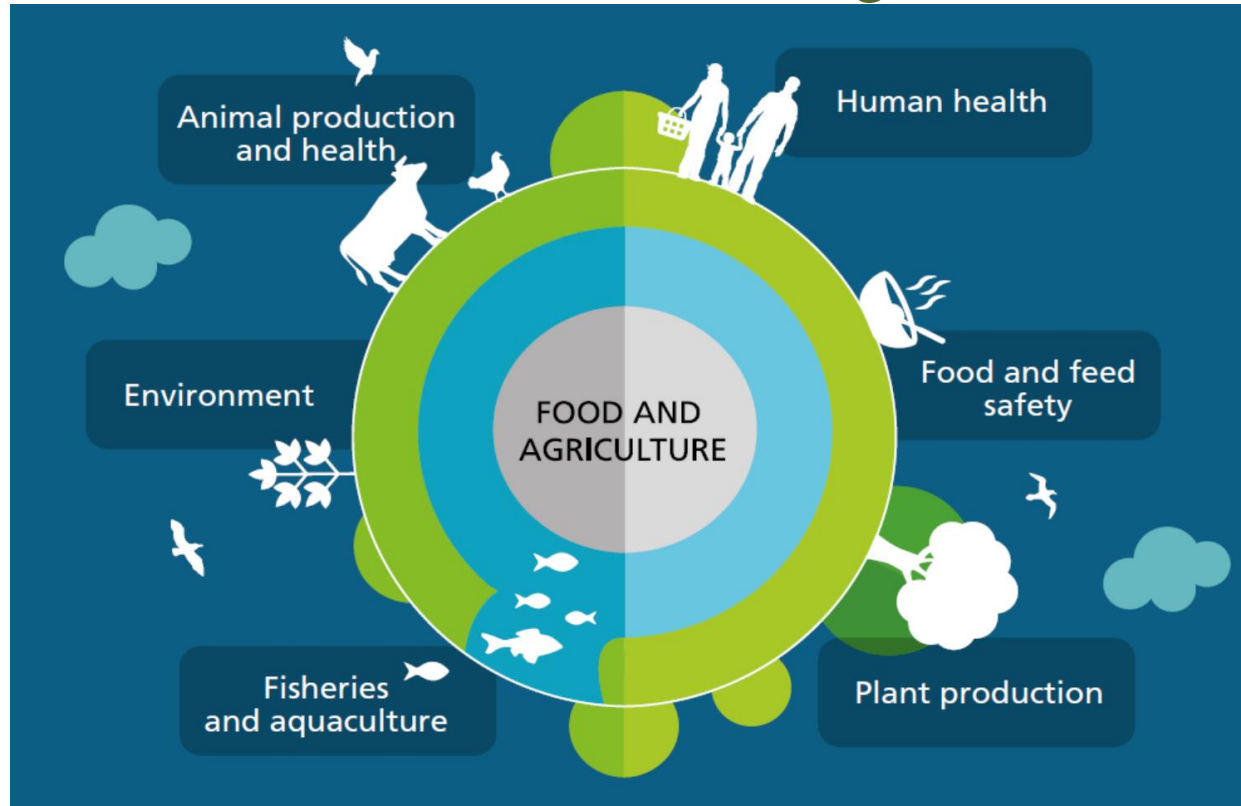
Decrease in AMR?

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



- Ampicillin
- Tetracycline
- Ciprofloxacin
- Cefotaxime
- Sulfamethoxazole
- Chloramphenicol
- Gentamicin
- Trimethoprim
- Colistin

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>





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DRIVERS, DYNAMICS AND EPIDEMIOLOGY OF ANTIMICROBIAL RESISTANCE IN ANIMAL PRODUCTION



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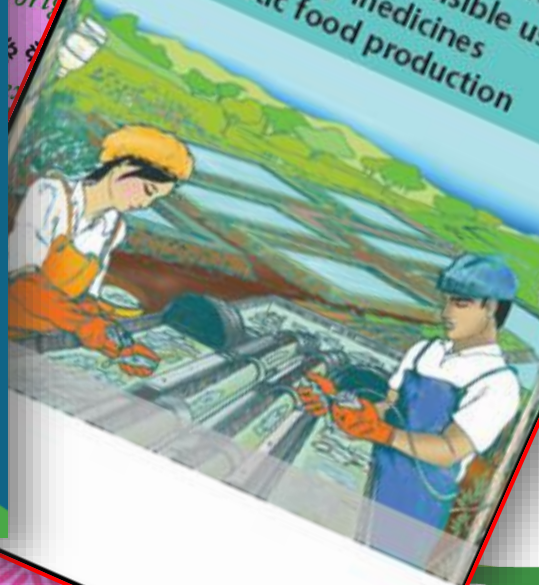
THE FAO ACTION PLAN ON ANTIMICROBIAL RESISTANCE 2016-2020

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
antimicrobial
resistance

Improving biosecurity through prudent and responsible use of veterinary medicines in aquatic food production



547



Organización de las
Naciones Unidas
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



The Tripartite: FAO-OIE-WHO Collaboration



Global leader
for food and
agriculture



for animal
health and
welfare



Global leader
for human
health

Joint priorities including on AMR

- Global Action Plan on AMR
- National Action Plan (NAP) development support
 - *Manual for developing NAP*
 - *Checklist to be used to assist with the development of NAP*
- Communication tools
 - Joint media statements
 - Antibiotic Awareness Week



Materials for Tripartite communication on AMR

LA RÉSISTANCE AUX ANTIBIOTIQUES

ANTIBIOTIQUES

Les antibiotiques ont une efficacité limitée et leur utilisation doit être responsable.

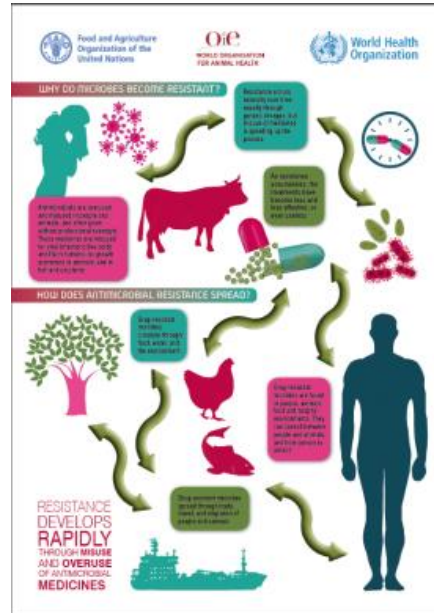
Un usage excessif et abusif des antibiotiques conduit à l'émergence de bactéries résistantes. Ces bactéries résistent aux antibiotiques et peuvent donc provoquer des infections plus graves et plus difficiles à traiter. Elles peuvent également provoquer des effets secondaires.

Vous devez être en mesure d'expliquer aux patients les raisons de votre prescription.

CE QUE LE SECTEUR AGRICOLE PEUT FAIRE

1. Éviter d'utiliser des antibiotiques à large spectre ou à large spectre pour traiter des infections bactériennes.
2. Éviter d'utiliser des antibiotiques à large spectre pour traiter des infections bactériennes.
3. Éviter d'utiliser des antibiotiques à large spectre pour traiter des infections bactériennes.
4. Éviter d'utiliser des antibiotiques à large spectre pour traiter des infections bactériennes.
5. Éviter d'utiliser des antibiotiques à large spectre pour traiter des infections bactériennes.
6. Éviter d'utiliser des antibiotiques à large spectre pour traiter des infections bactériennes.
7. Éviter d'utiliser des antibiotiques à large spectre pour traiter des infections bactériennes.

Source: OIE, FAO, OMS



Antimicrobial Resistance

WHO, FAO, and OIE unite in the fight against Antimicrobial Resistance

THE FACTS

Antimicrobial agents are essential to treat human and animal diseases. Antibiotics should thus be considered as a public good.

Some microbes have demonstrated full or partial resistance to different antimicrobial agents. It is an undesirable consequence of antimicrobial use both in humans and animals. This phenomenon called antimicrobial resistance, AMR, is an increasing global concern for human and animal health.

The need for a 'One Health' approach

Addressing the rising threat of AMR requires a holistic and multifaceted 'One Health' approach because antimicrobials used to treat serious infectious diseases in animals may be the same or be similar to those used in humans. Resistant bacteria arising either in humans, animals or the environment may spread from one to the other, and from one country to another. AMR does not recognize geographic or human/animal borders.

A public good to protect

The discovery of antibiotics and their development to treat bacterial infections in humans and animals was one of the most important achievements of the 20th Century. Since antibiotics were first commercially produced, widely for use in human medicine and subsequently in veterinary medicine, their use has been associated with the risk of emergence of AMR. At the same time as the world has observed accelerated emergence of resistance, the discovery and development of new antimicrobial drugs has slowed down. The effectiveness of the existing antimicrobials should therefore be preserved as much as possible.

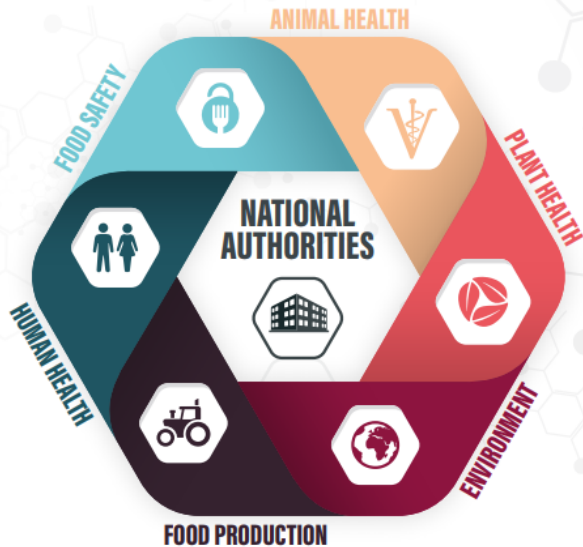
AMR does not recognize geographic or human/animal borders

AMR jeopardizes progress on health outcomes

Food and Agriculture Organization of the United Nations | OIE WORLD ORGANIZATION FOR ANIMAL HEALTH | World Health Organization



HANDLE ANTIMICROBIALS WITH CARE. WE CAN ALL HELP!

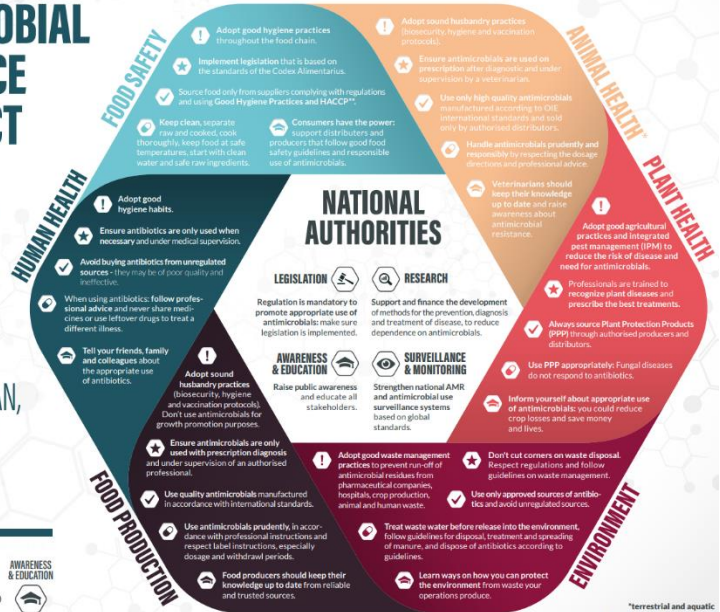


ANTIMICROBIAL RESISTANCE CAN AFFECT US ALL!

TAKE ACTION NOW

TO PROTECT HUMAN, ANIMAL, PLANT & ENVIRONMENTAL HEALTH

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



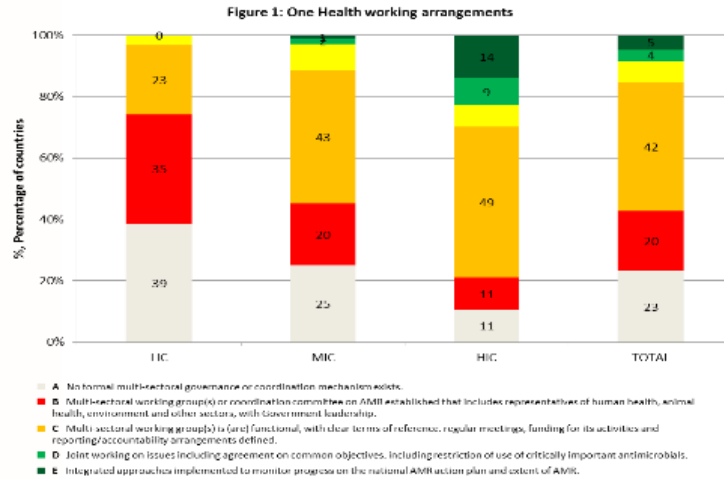
*Terrestrial and aquatic
**Hazard Analysis and Critical Control Points

The OIE, FAO and WHO strengthen their collaboration to address health challenges



The three organizations published a second strategic document reaffirming their commitment to providing collaborative and multilateral leadership to address health challenges. While continuing their efforts to combat antimicrobial resistance, zoonotic influenza, they are widening the scope of their collaboration and taking a 'One Health' approach, which considers that the health of humans, animals and the environment are interconnected. The strengthening of health systems is a new area of cooperation.

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.

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

The database can be accessed at:



Choose your question and filters:

Survey year

2017

Question

4.1 Multi-sector and One Health

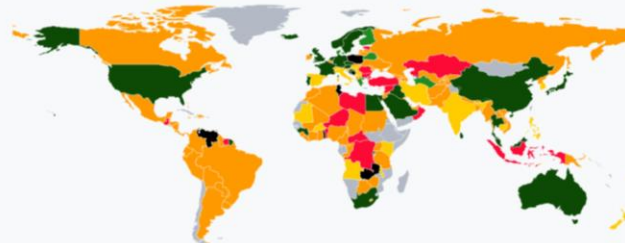
WIKI FAO OIE Income

OIE Region

All

Country

All



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.

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full arrangements. All rights reserved. Copyright - WHO 2018



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30 May 2018: Tripartite Memorandum of Understanding



From Tripartite to Tripartite Plus

United Nations Environment Programme

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03 DEC 2017 | PRESS RELEASE | ENVIRONMENTAL RIGHTS AND GOVERNANCE

Antimicrobial resistance from environmental pollution among biggest emerging health threats, says UN Environment



- Human antibiotic use up 36% this century; antibiotic use in livestock to grow 67% by 2030.
- Up to 75% of antibiotics used in aquaculture may be lost into the surrounding environment.
- Antimicrobial resistance one of six emerging areas of concern highlight in UN Environment Frontiers Report.

Nairobi, 5 December 2017 – Growing antimicrobial resistance linked to discharge of drugs and



FRONTIERS 2017

Emerging Issues of Environmental Concern



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 !





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Organization of the
United Nations

PALDIES

Thank you

www.fao.org/antimicrobial-resistance

Antimicrobial-Resistance@fao.org

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