

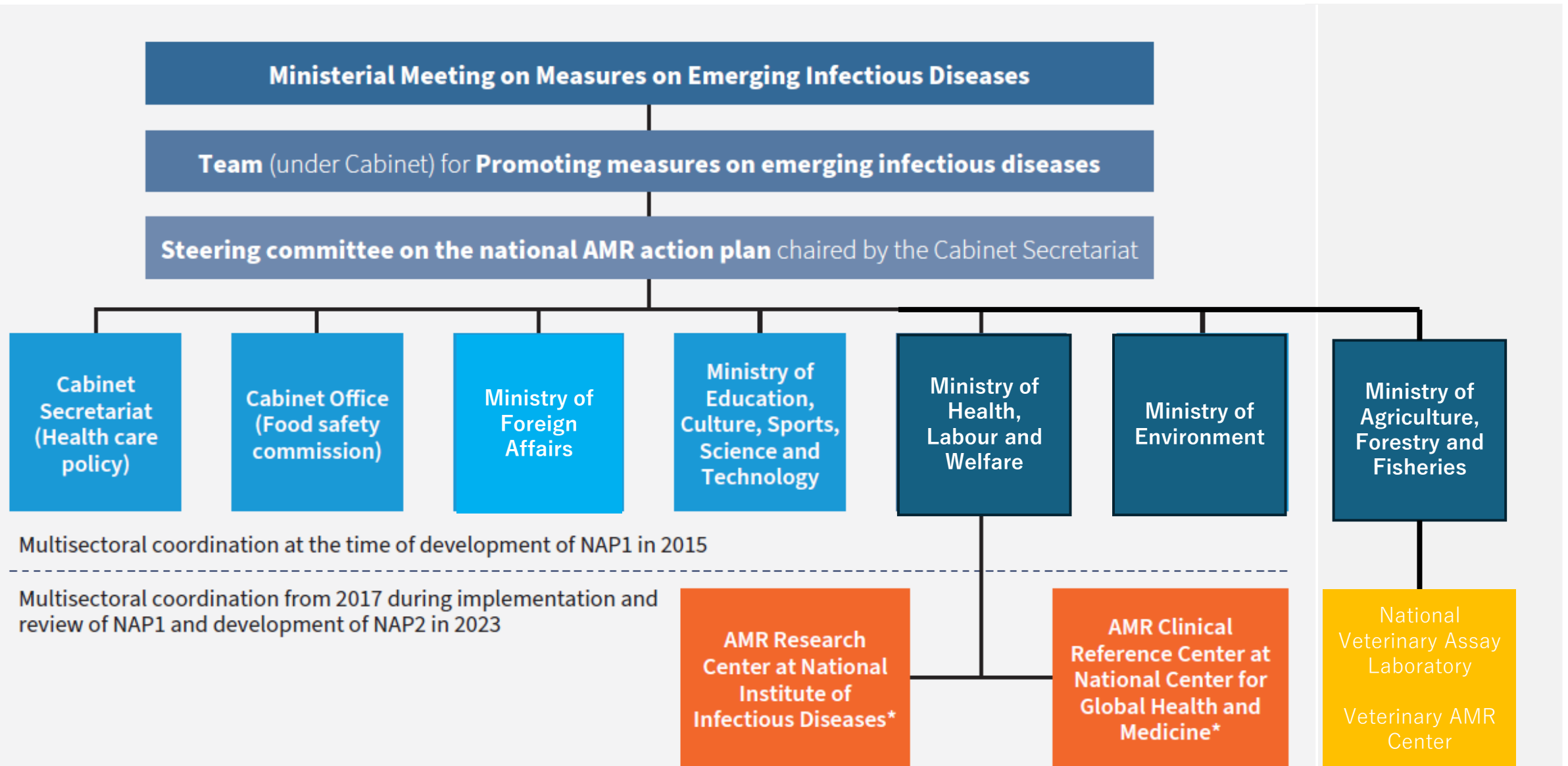
# **Introduction of Integrated AMR/AMU Surveillance and Risk-Based AMR Management in Japan**

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**Michiko Kawanishi**

**Veterinarian, Senior research officer, Veterinary AMR Center  
National Veterinary Assay Laboratory  
Ministry of Agriculture, Forestry and Fisheries**

# Multisectoral coordination of the AMR response in Japan



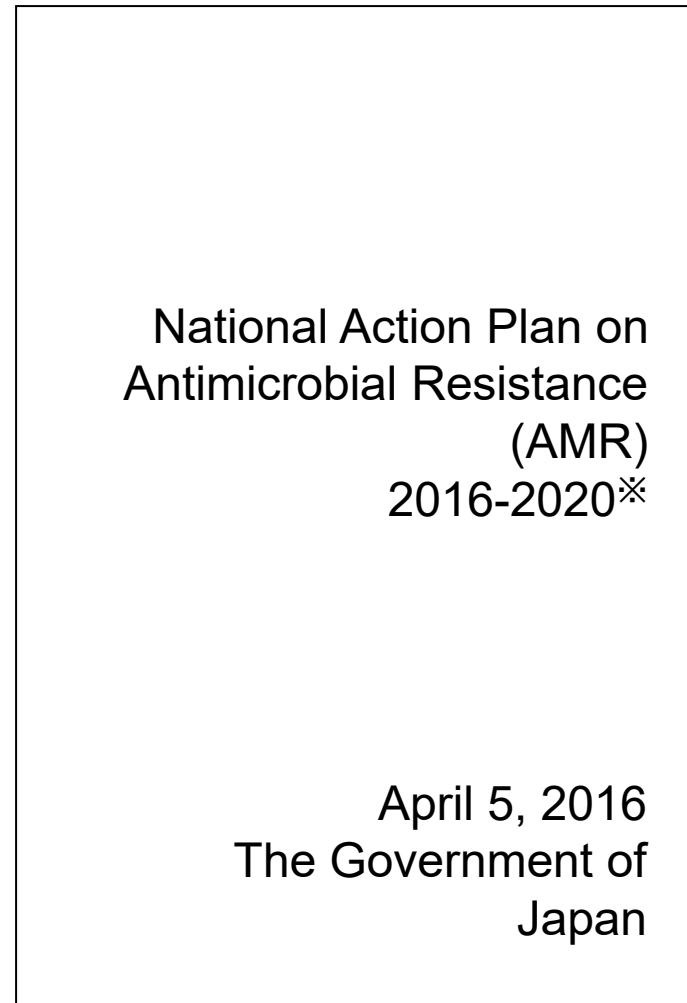
\* Established and included in multisectoral coordination from 2017 : Japan Institute for Health Security 2025

# Development of National Action Plans on AMR

WHO: 2015

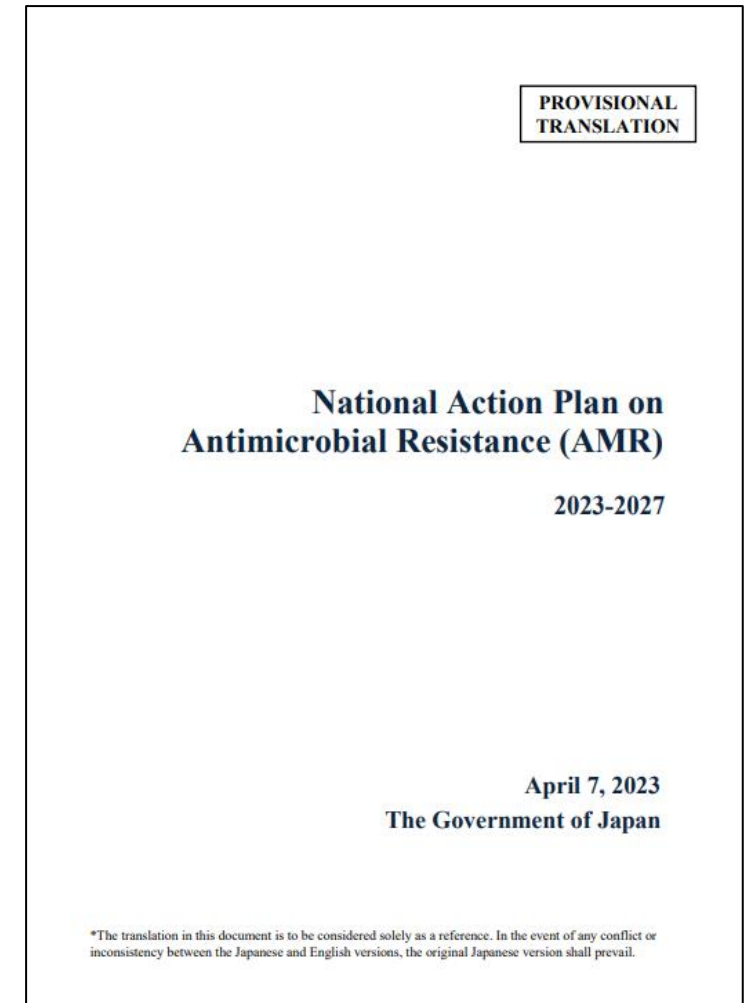


Japan: 2016

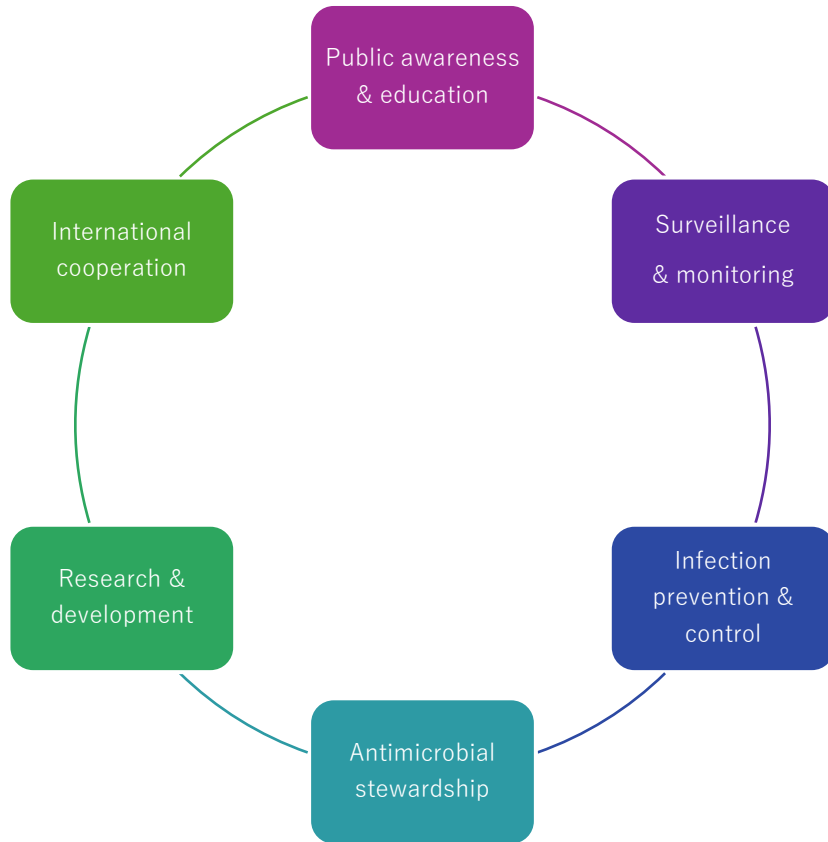


※ Extended until 2022

Japan: 2023



# Goals of National Action Plans on AMR



## Goal 1

Improve Public Awareness and Understanding, and Promote Education and Training of Professionals

## Goal 2

Continuously Monitor Antimicrobial Resistance and Use of Antimicrobials, and Appropriately Understand the Signs of Change and Spread of Antimicrobial Resistance

## Goal 3

Prevent the Spread of Antimicrobial-resistant Organisms by Implementing Appropriate Infection Prevention and Control

## Goal 4

Promote Appropriate Use of Antimicrobials in the Fields of Healthcare, Livestock and Aquaculture

## Goal 5

Promote Research on Antimicrobial Resistance and Foster Research and Development to Secure the Means to Prevent, Diagnose and Treat the Antimicrobial-resistant Infections

## Goal 6

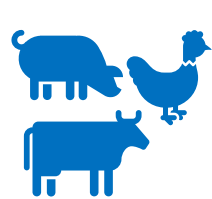
Enhance Global Multidisciplinary Countermeasures against Antimicrobial Resistance

# Goal 2

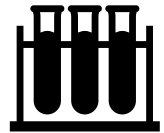
*Continuously Monitor Antimicrobial Resistance and Use of Antimicrobials, and Appropriately Understand the Signs of Change and Spread of Antimicrobial Resistance*



- 2.1 Strengthen the Surveillance of Antimicrobial Resistance in Healthcare and Nursing Care
- 2.2 Monitor the Trend of the Antimicrobial Use at Medical Institutions



- 2.3 Strengthen Antimicrobial Resistance Surveillance in the Fields of Veterinary Medicine, Livestock and Aquaculture, etc.



- 2.4 Standardize Methods of Laboratory Testing and Strengthen Testing Functions of Antimicrobial Resistance at Clinical, Commercial and Public Health Laboratories



- 2.5 Implement Integrated **One Health Surveillance** Including Humans, Animals, Food, and the Environment

# AMR surveillance in human health ; JANIS



- Japan Nosocomial Infections Surveillance (**JANIS**) is a national surveillance program organized by the Ministry of Health, Labour and Welfare (MHLW) of Japan
- Designed to provide basic information on the incidence and prevalence of nosocomial infections and antimicrobial-resistant bacteria in Japanese medical settings

## Pathogens

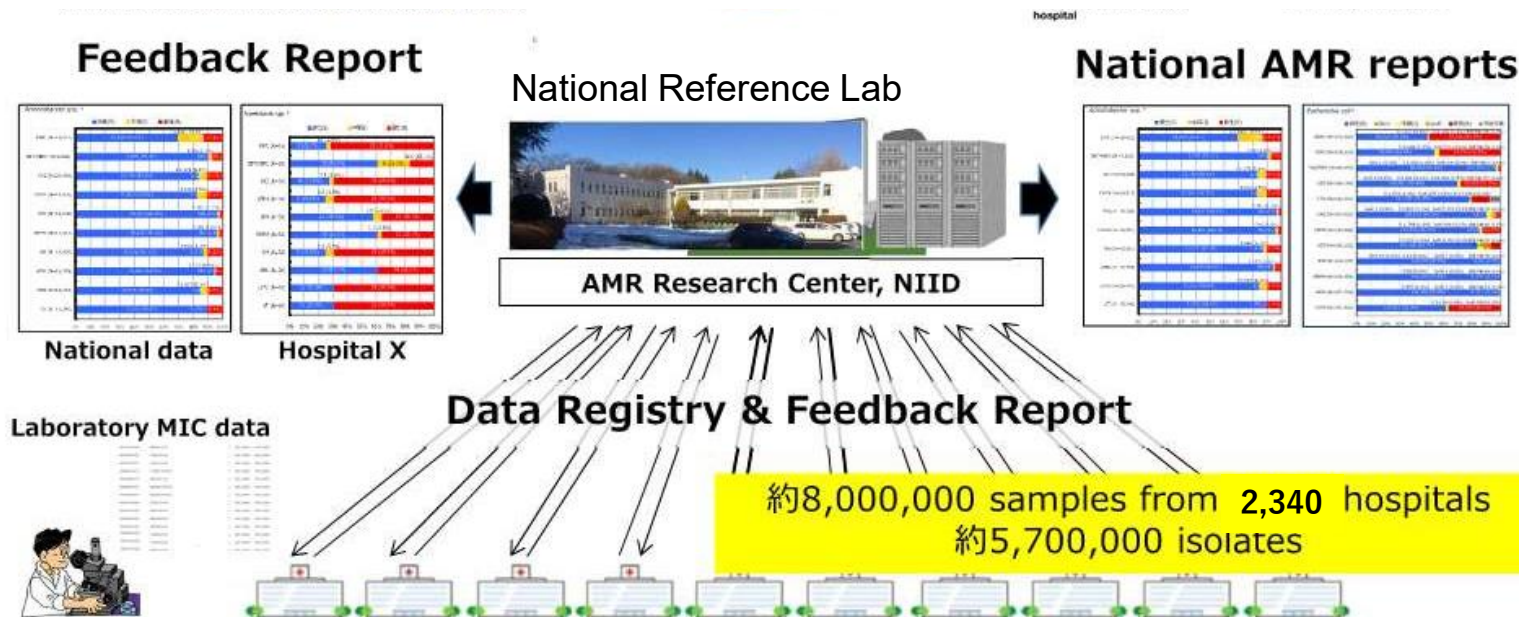
*Staphylococcus aureus* (MRSA, MSSA)  
*Staphylococcus epidermidis*  
Coagulase-negative staphylococci  
*Enterococcus faecalis*  
*Enterococcus faecium*  
*Streptococcus pneumoniae*  
*Streptococcus pyogenes*  
*Streptococcus agalactiae*  
*Escherichia coli*  
*Klebsiella pneumoniae*  
*Enterobacter cloacae*  
*Enterobacter cloacae* complex  
*Klebsiella aerogenes*  
*Citrobacter freundii*  
*Citrobacter koseri*  
*Proteus mirabilis*  
*Proteus vulgaris*  
*Serratia marcescens*  
*Pseudomonas aeruginosa*  
*Acinetobacter* spp.  
*Haemophilus influenzae*

## Mycology

NIID (The National Institute of Infectious disease) has also the role as the National Mycology Reference Laboratory including *Candida* and *Aspergillus*

## Coverage

2,340 hospitals as of Jan 2022  
30.0% of hospitals in Japan





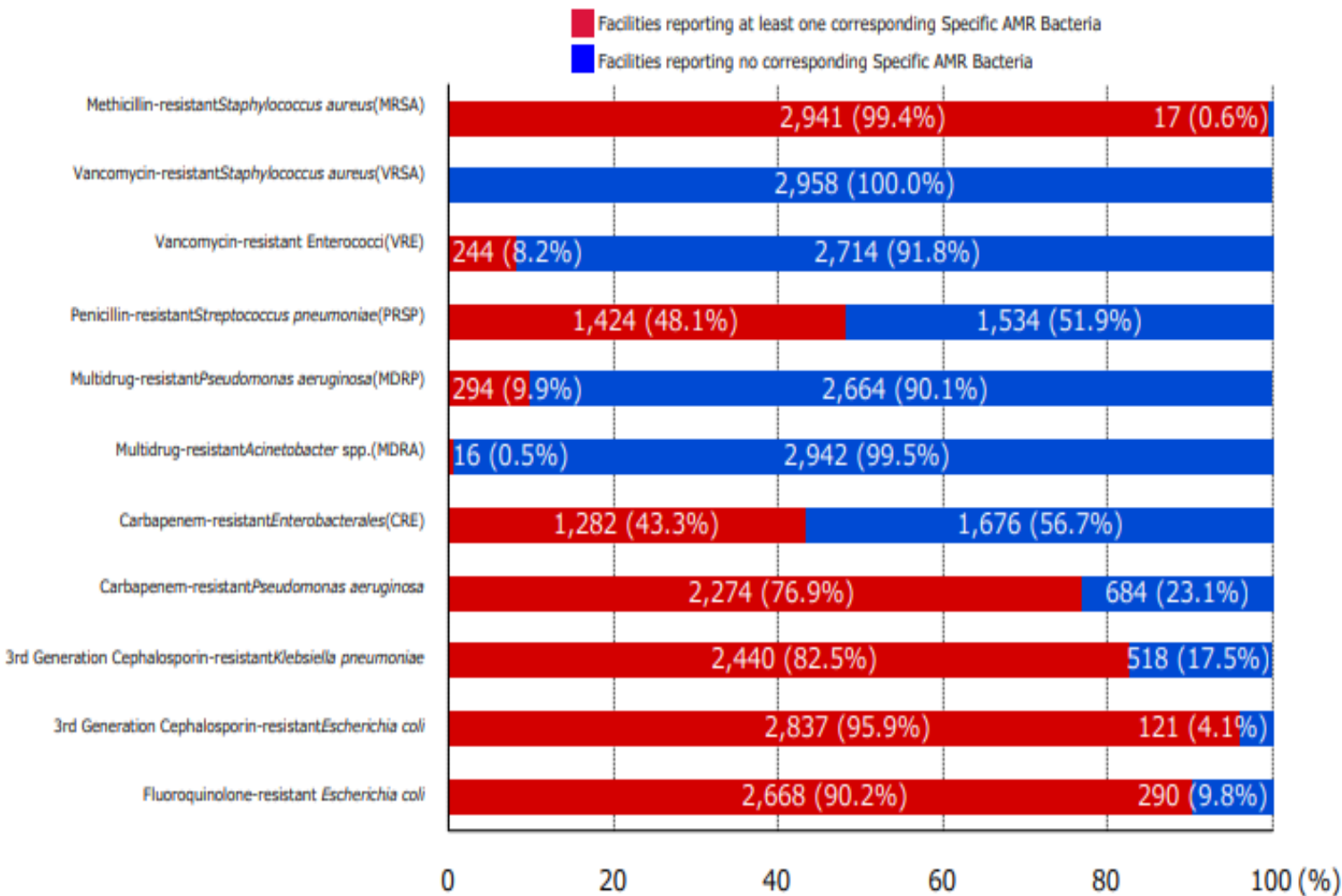
# AMR surveillance in human health – Example of data sharing in JANIS



Annual Open Report 2024 (All Facilities)  
Japan Nosocomial Infections Surveillance (JANIS) [Inpatient]  
Clinical Laboratory Division

## 6. Percentage of Facilities Reporting Specific AMR Bacteria

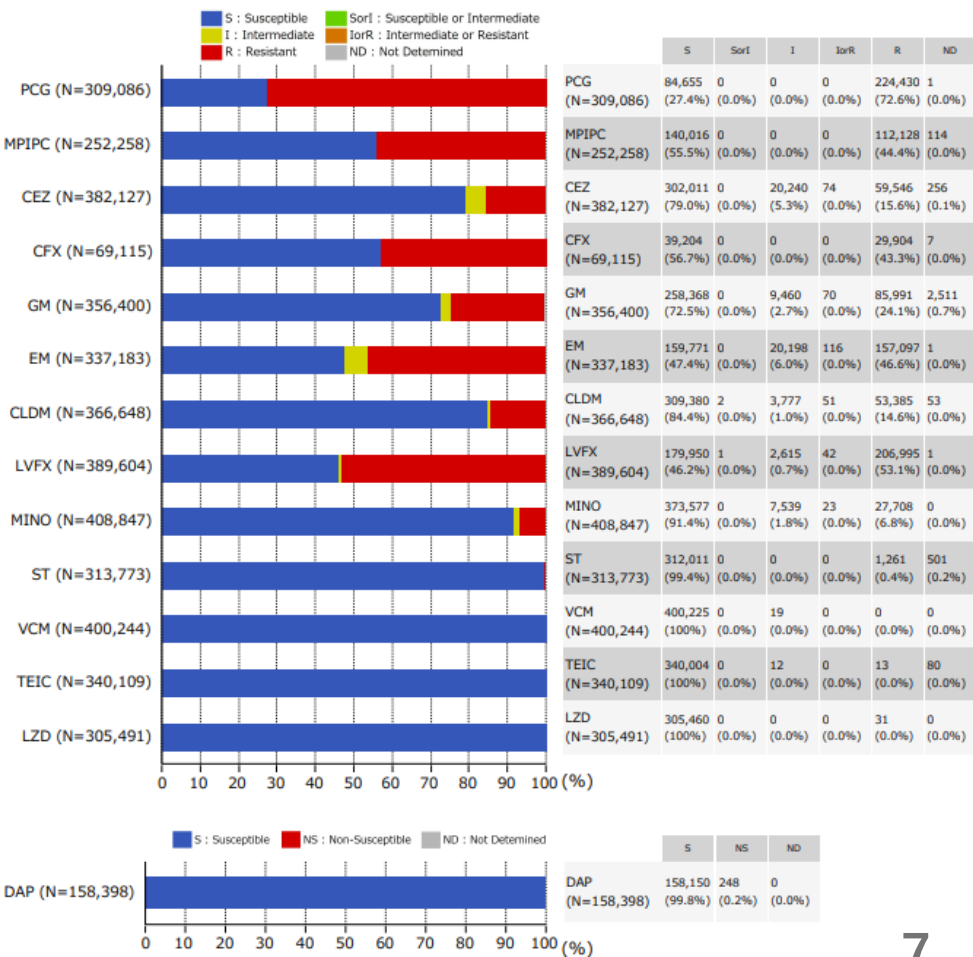
Percentage of Facilities Reporting Specific AMR Bacteria in 2024 (N=2,958)

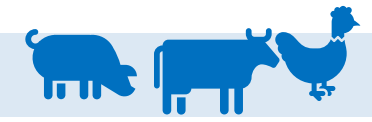


Annual Open Report 2024 (All Facilities)  
Japan Nosocomial Infections Surveillance (JANIS) [Inpatient]  
Clinical Laboratory Division

## 7. Antimicrobial Susceptibility of Major Bacteria\*

*Staphylococcus aureus* (ALL) †





The sales amount of veterinary medicines  
(reported by Marketing Authorization  
Holder of veterinary drugs)

The amount of Antimicrobials for  
human health sold to pet clinics  
(reported by Veterinary Products Association  
And Pharmaceutical wholesalers association)

**Sales of  
antimicrobials**

**JVARM**

**AMR  
in foodborne  
pathogens  
/indicator bacteria**

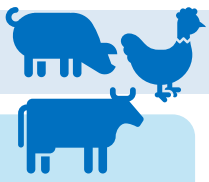
**AMR in animal  
pathogens**

**Healthy  
animals**

**Diseased  
animals**







## Ministry of Agriculture, Forestry and Fisheries (MAFF)

Data

Data

Data

- **National Veterinary Assay Laboratory (NVAL) Veterinary AMR Center**
- **Food and Agricultural Materials Inspection Center (FAMIC)**

• Measure MIC • Analyze, and evaluate data • Research for molecular epidemiology etc.

Isolated bacteria

### Contracted Laboratories

isolate and identify bacteria, measure MIC

### Livestock Hygiene Service Centers in local governments

isolate and identify bacteria, measure MIC

Samples

Samples

## Slaughterhouses

Isolates from healthy animals



Pig



Cattle



Broiler

- Indicator bacteria (*E. coli*, *Enterococcus spp.*)
- Zoonotic bacteria (*Salmonella spp.*, *Campylobacter spp.*)

## Farms

Isolates from Diseased animals



Pig



Cattle,  
Daily cow



Broiler

- Animal pathogen

(*Staphylococcus aureus*, *Pasteurella multocida*, *E. coli*,  
*Salmonella spp.*, *Actinobacillus pleuropneumoniae* etc.)



## Pharmaceutical companies (Marketing Authorization Holders)

Report  
(total sales amount)



Format

➤ **NVAL** (National Veterinary Assay Laboratory)  
Summing up, Analysis, Evaluation



## Report on the website of NVAL

### For example

Class	Active substance	Route of administration	Sales amount (¥1,000)	Amount of pure active substance (kg)	Estimated percentages of sales for each animal species						
					Beef cattle	Dairy cow	Horse	Pig	Broiler	Layer	Dog/Cat
Penicillins	Ampicillin	Oral	391,473	36,136.4	1.8	1.5	0.0	32.7	7.7	15.8	0.0
		Injection	480,999	8,449.4	9.3	17.6	0.0	73.2	0.0	0.0	0.0
		Infusion	8,666	11.7	60.0	40.0	0.0	0.0	0.0	0.0	0.0
		Total	881,137	44,597.5							
	Ampicillin sodium	Injection	294,896	2,256.0	37.2	48.4	0.0	0.0	0.0	0.0	14.4
		Total	294,896	2,256.0							

### Contents of Report

- Sales amount
- The name of antimicrobials
- Annual weight in kilograms of the active ingredients
- The route of administration
- Target animal species
- Estimated percentages of sales for each animal species

*Under the Pharmaceutical and Medical Device Act*

[https://www.maff.go.jp/nval/yakuzai/yakuzai\\_p3\\_6.html](https://www.maff.go.jp/nval/yakuzai/yakuzai_p3_6.html)

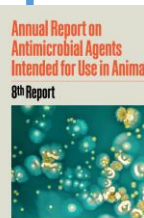


World Organisation  
for Animal Health  
Founded as OIE

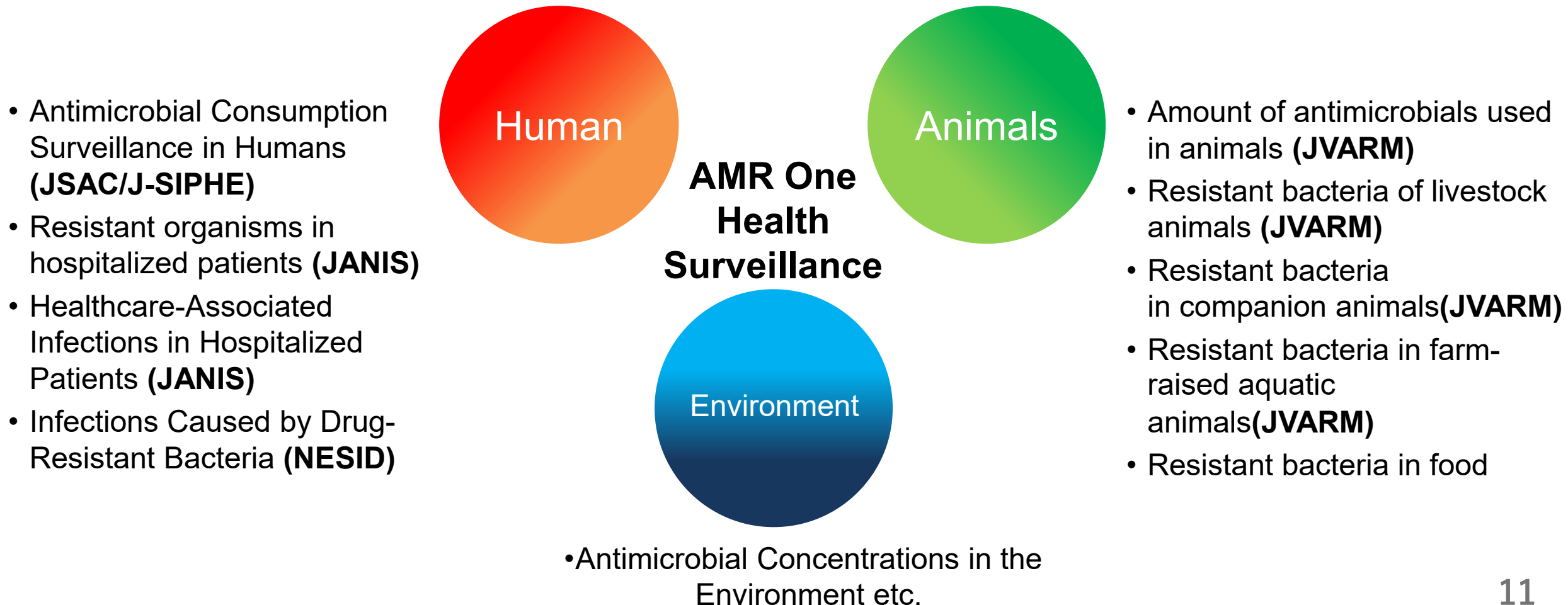
OIE data collection



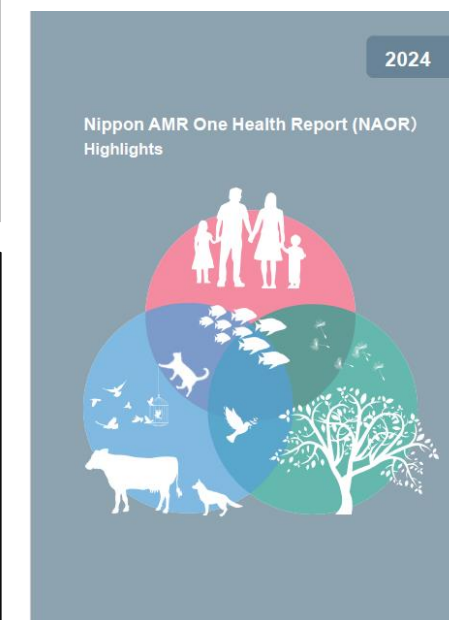
OIE  
Reporting  
Option3



### Antimicrobial Resistance One Health Surveillance Committee

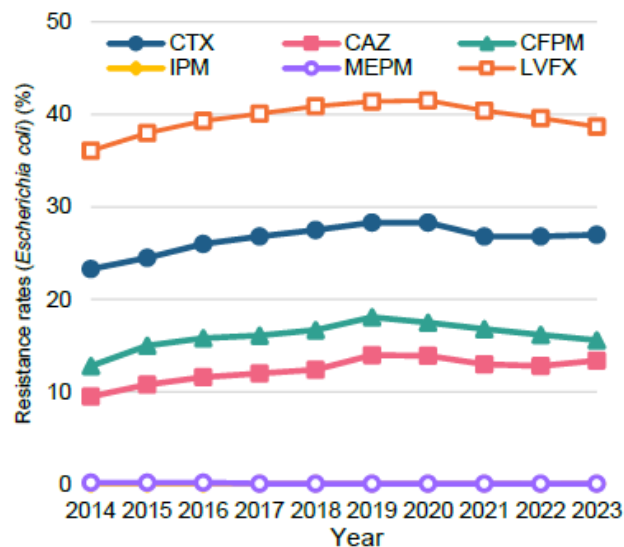


# Nippon AMR One Health Report (NAOR)

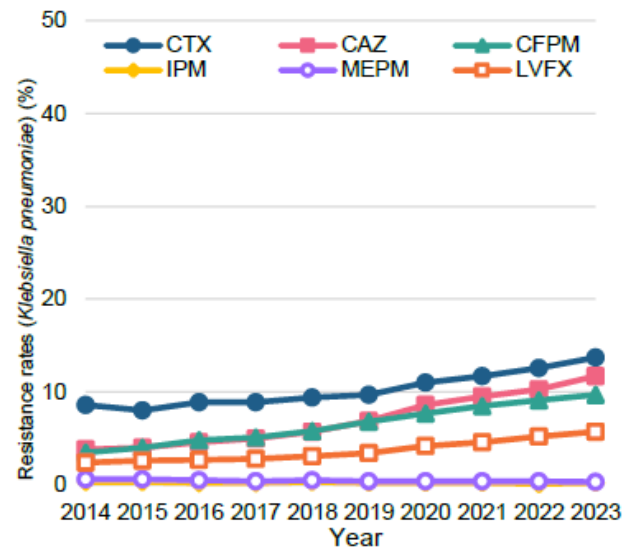


# Antimicrobial resistance for humans

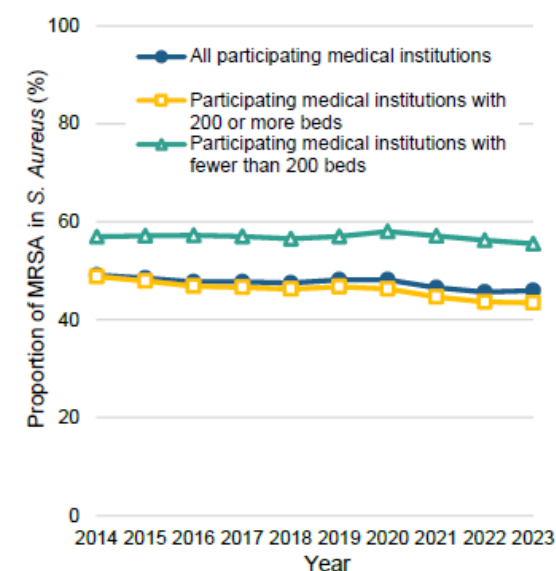
## *Escherichia coli*



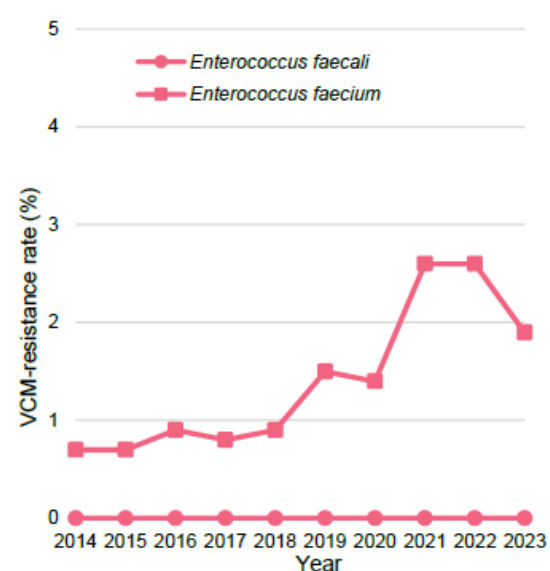
## *Klebsiella pneumoniae*



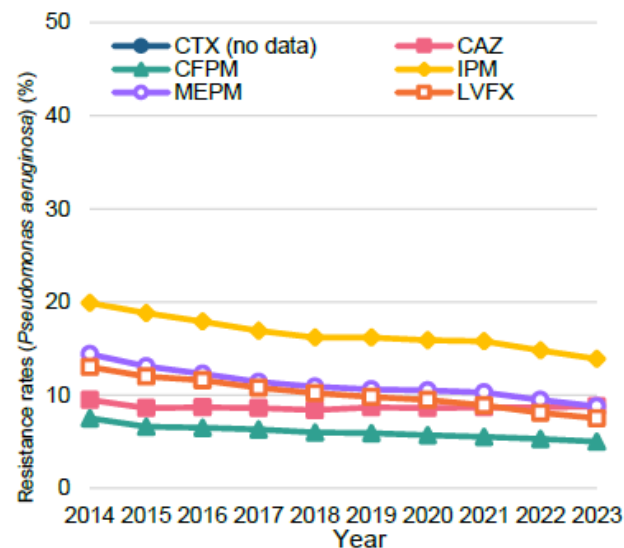
## *Staphylococcus aureus*



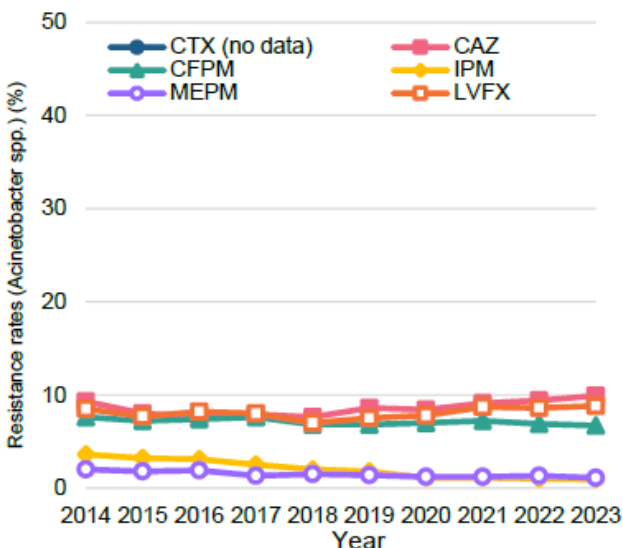
## *Enterococcus spp.*



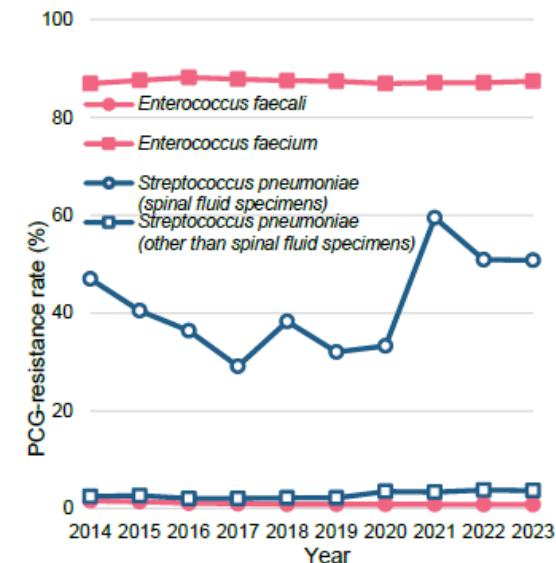
## *Pseudomonas aeruginosa*



## *Acinetobacter spp.*

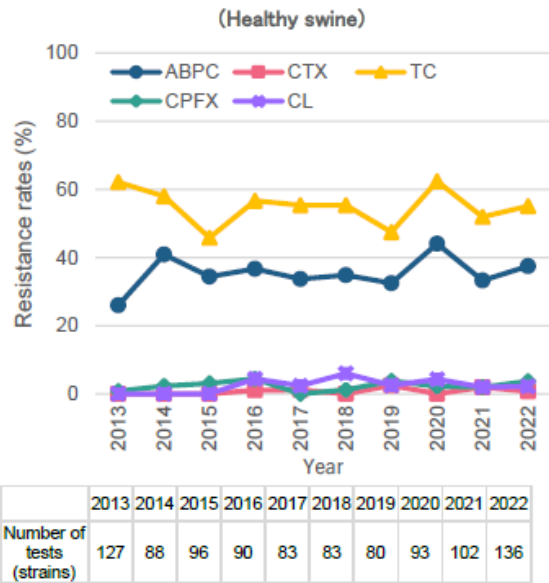
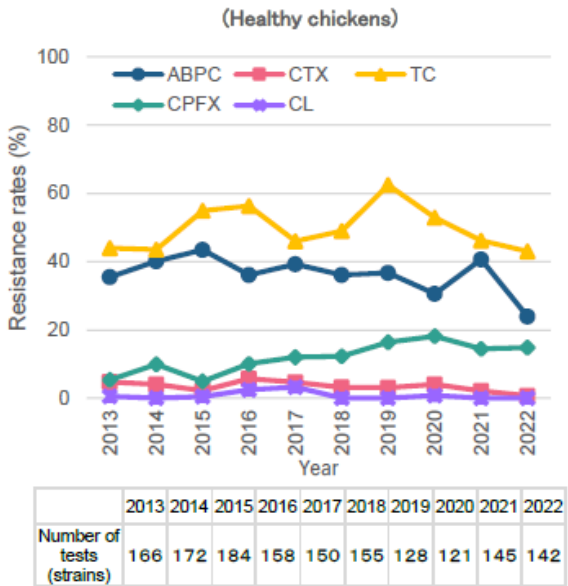
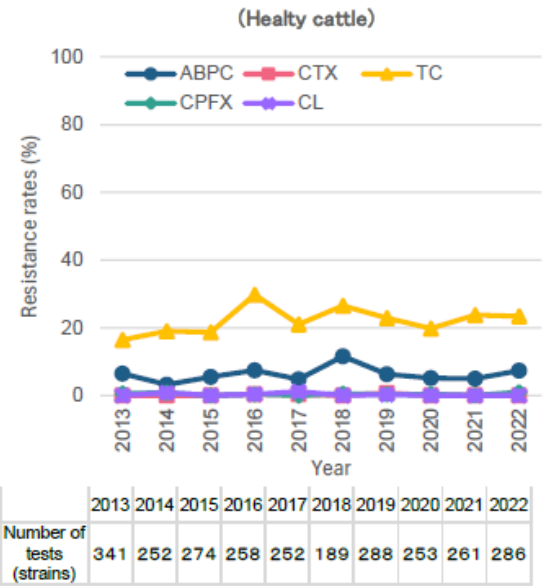


## *Streptococcus pneumoniae*



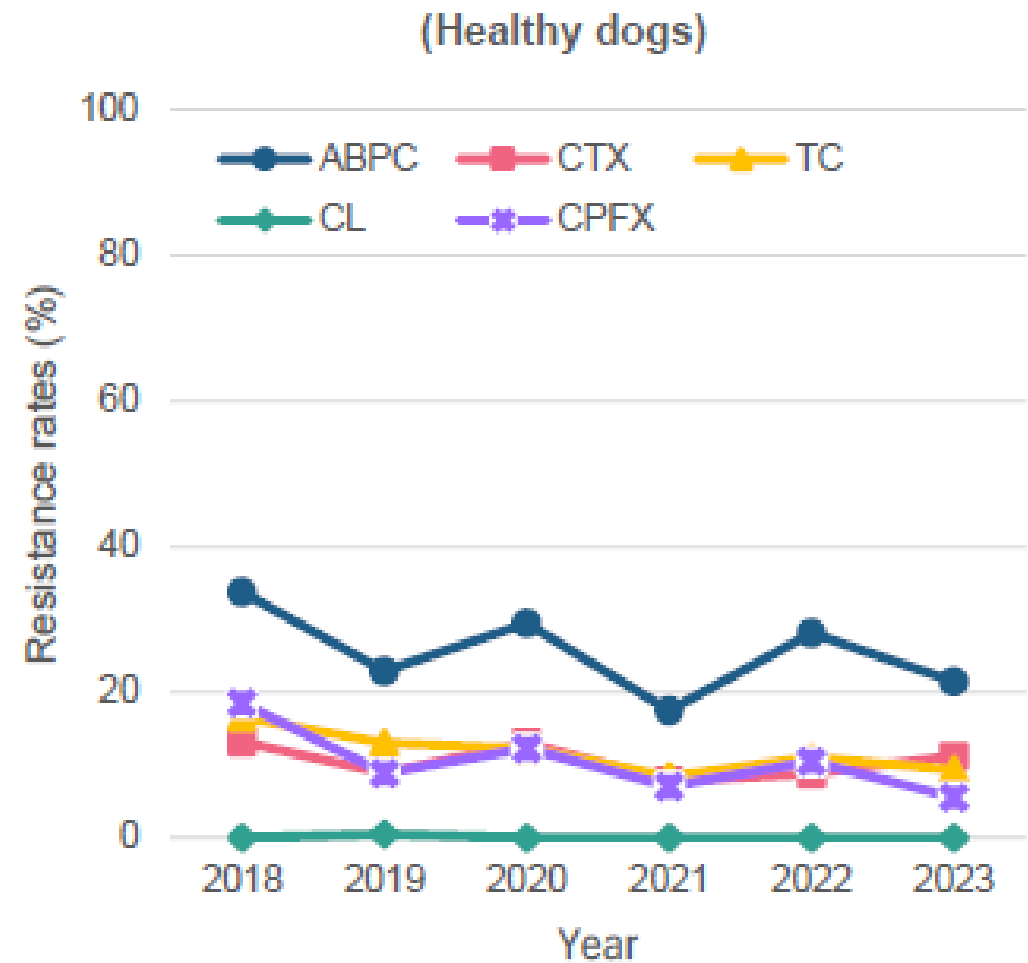
# Antimicrobial resistance bacteria in animal

## Bacteria derived from food-producing animals *Escherichia coli*

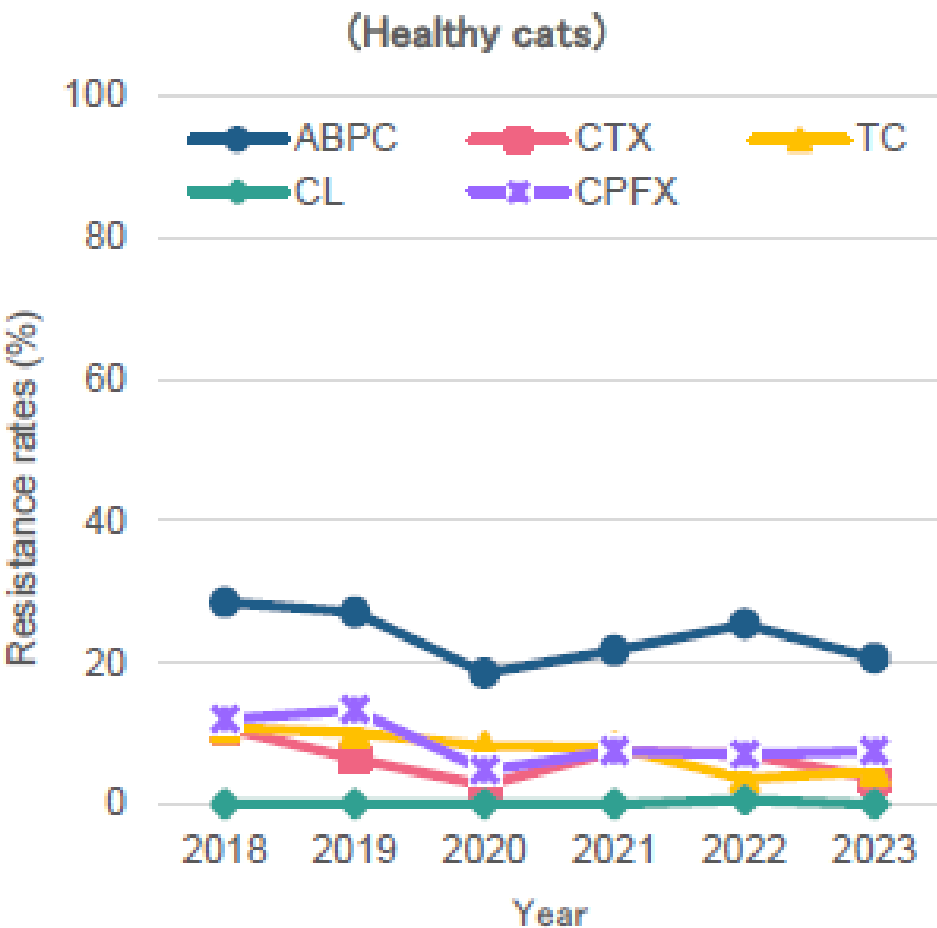




Companion animals  
*Escherichia coli*

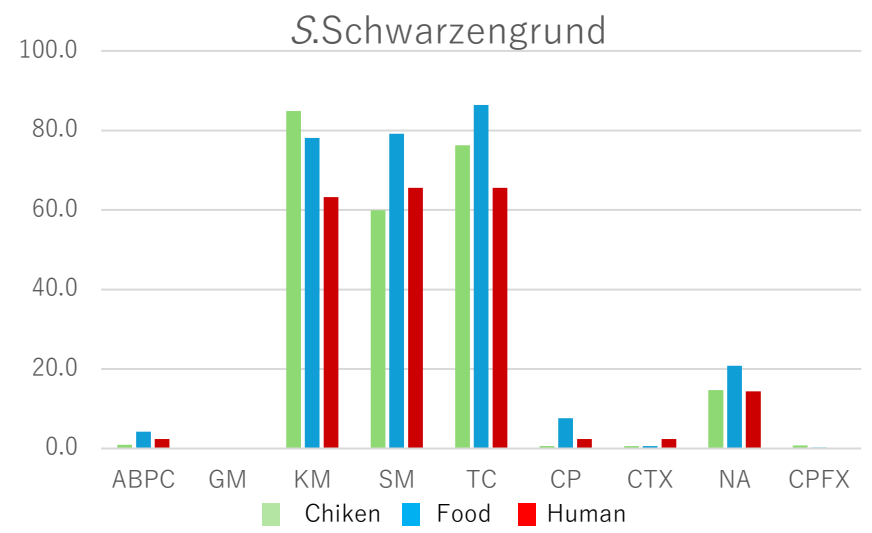
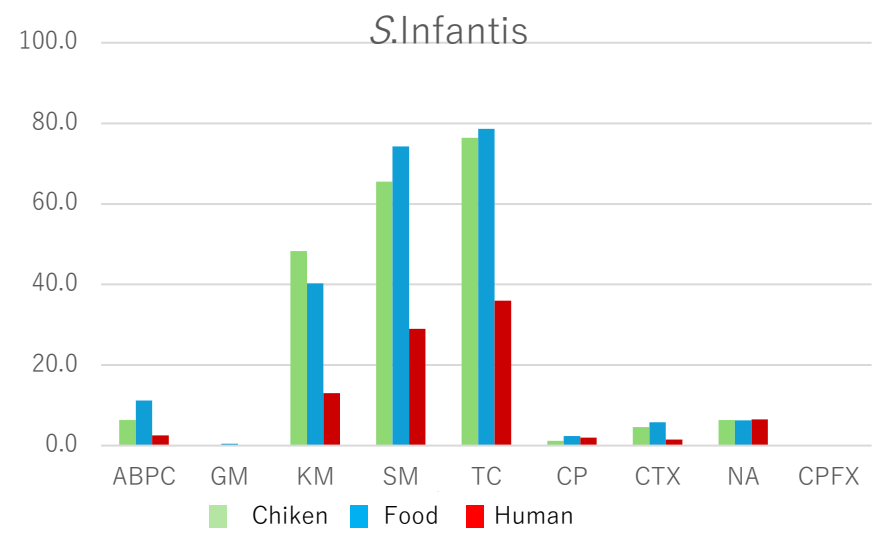
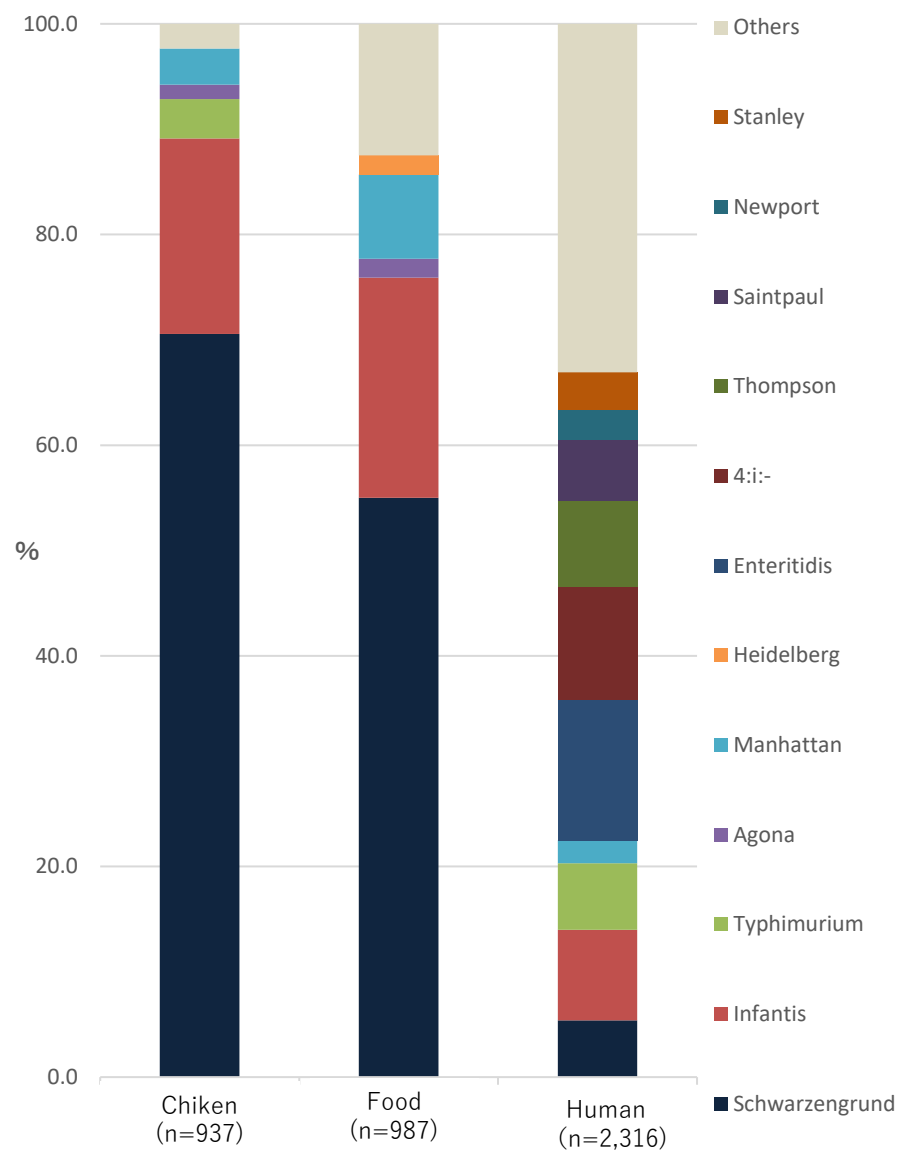


	2018	2019	2020	2021	2022	2023
Number of tests (strains)	151	192	146	154	171	107

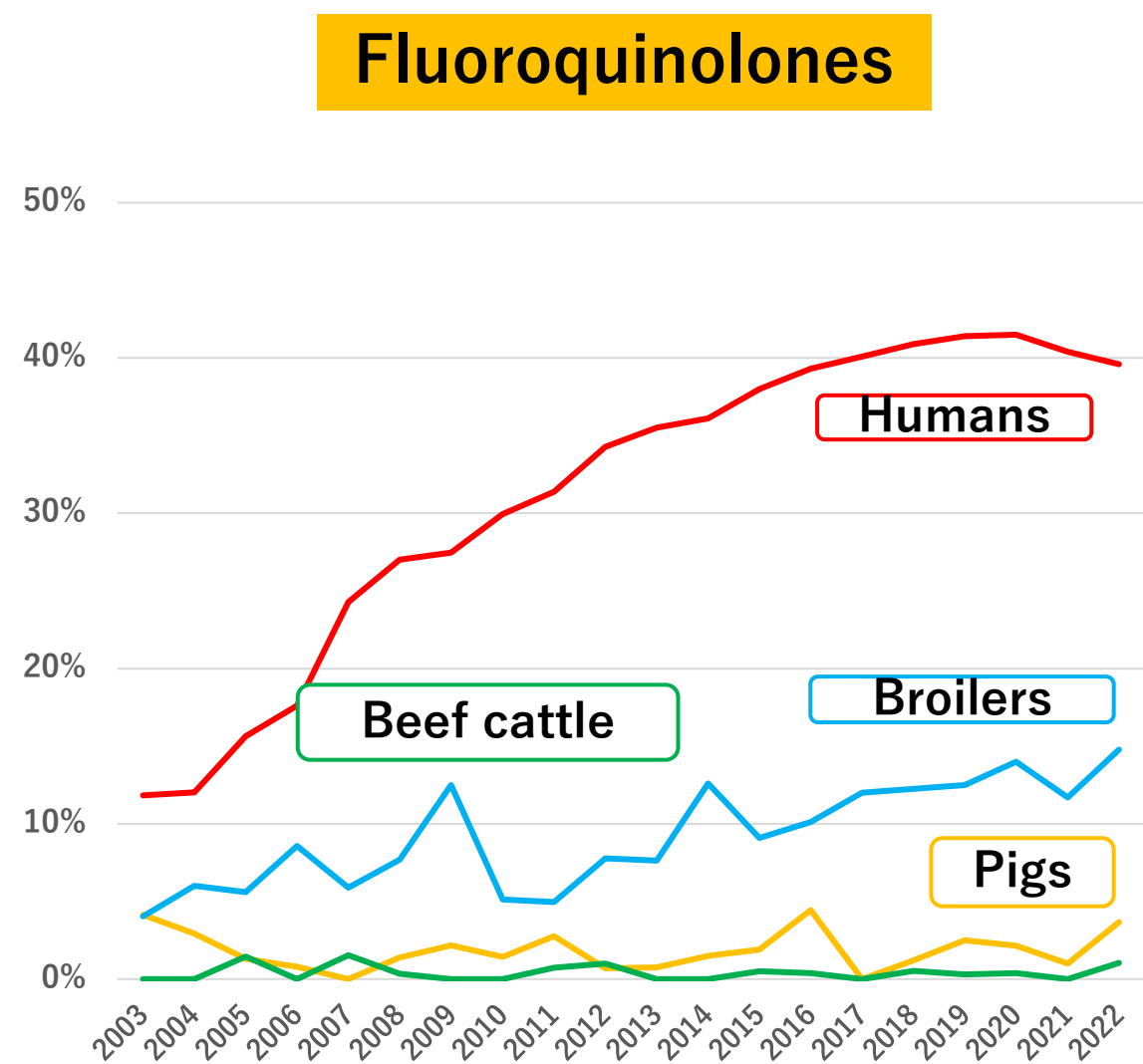
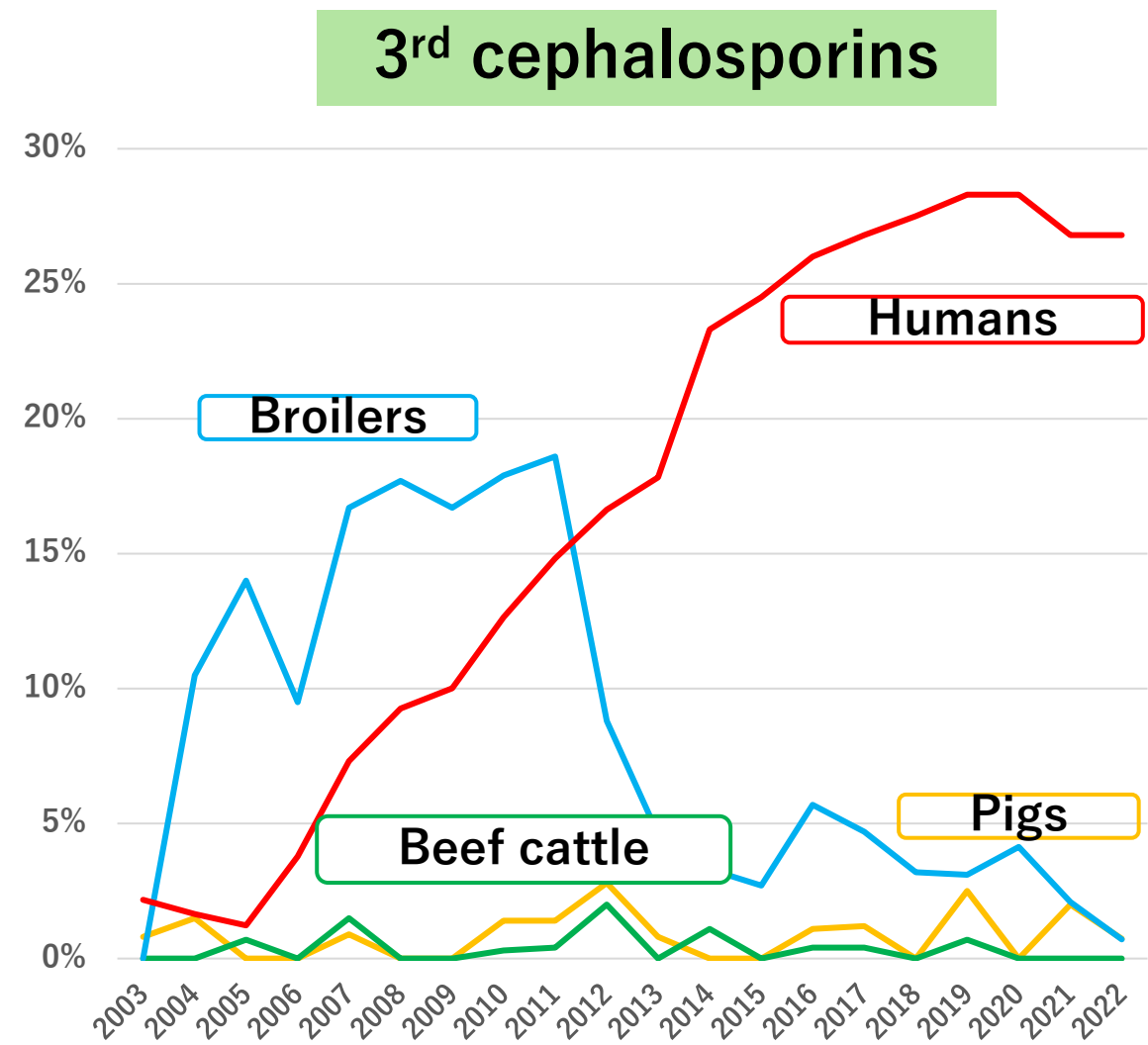


	2018	2019	2020	2021	2022	2023
Number of tests (strains)	158	188	146	161	169	107

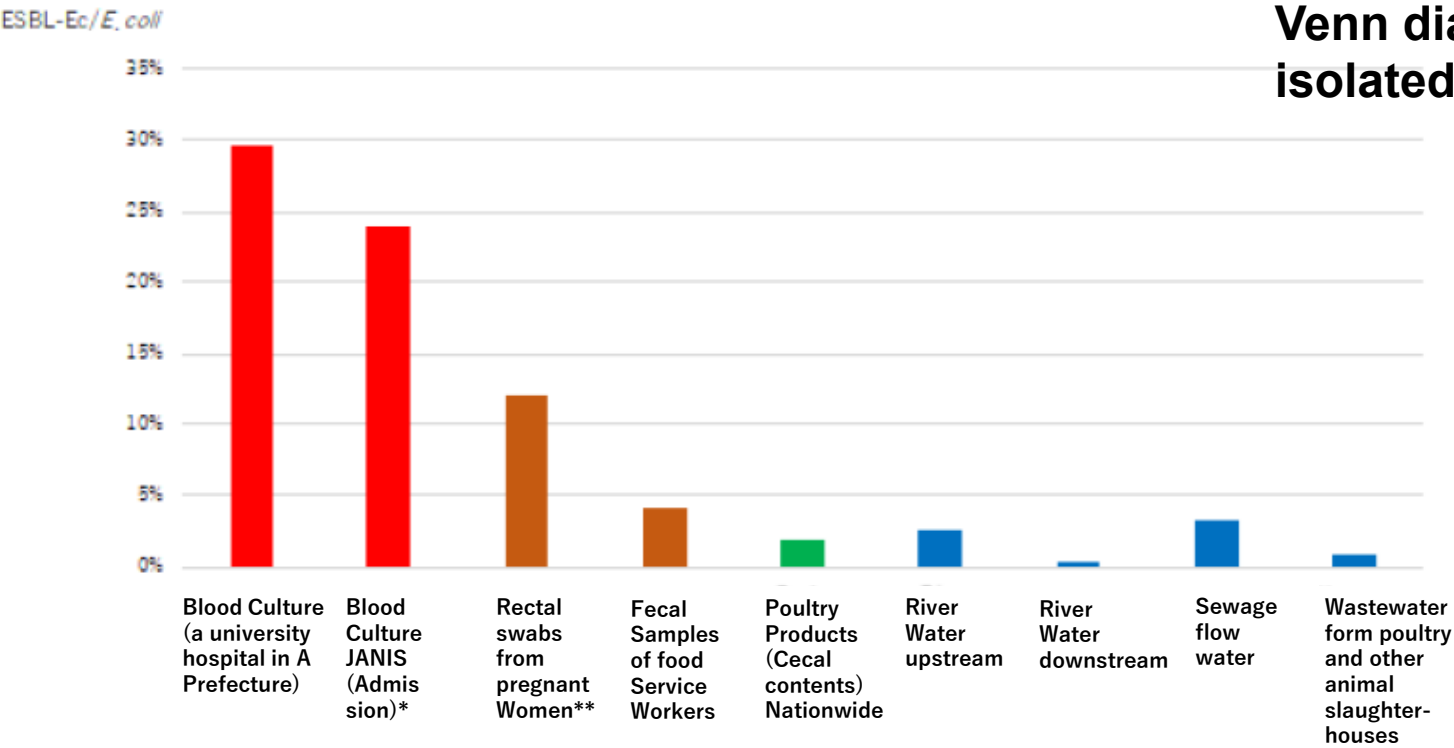
# Cross-Sector Comparison of Salmonella: Humans, Food, and Healthy Broiler Chickens



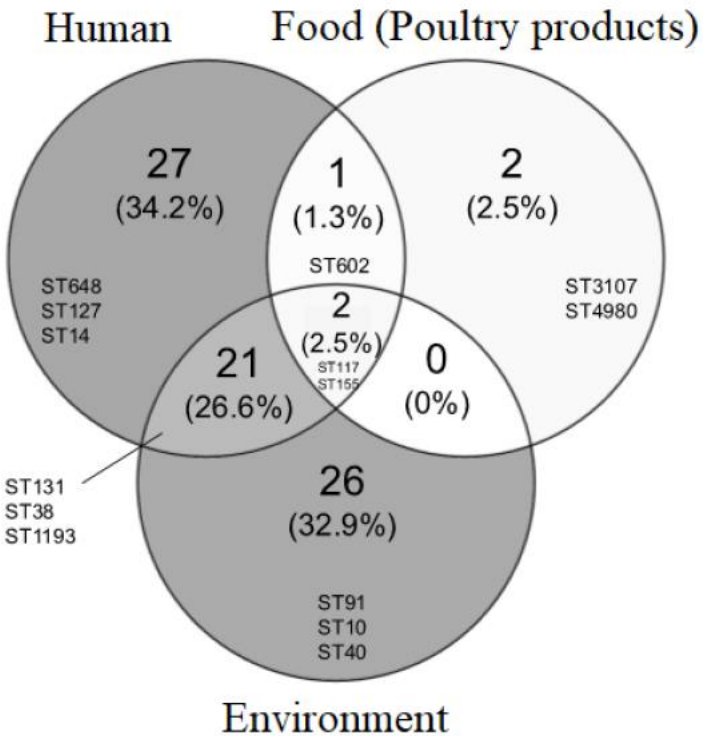
# Comparison of the resistant rate in *Escherichia coli* derived from humans and food-producing animal



# The Antimicrobial Resistance (AMR) One Health Surveillance in coordination with the WHO surveillance (Tricycle Project)



Venn diagram illustrating the types of STs of ESBL-Ec isolated from humans, food, and the environment

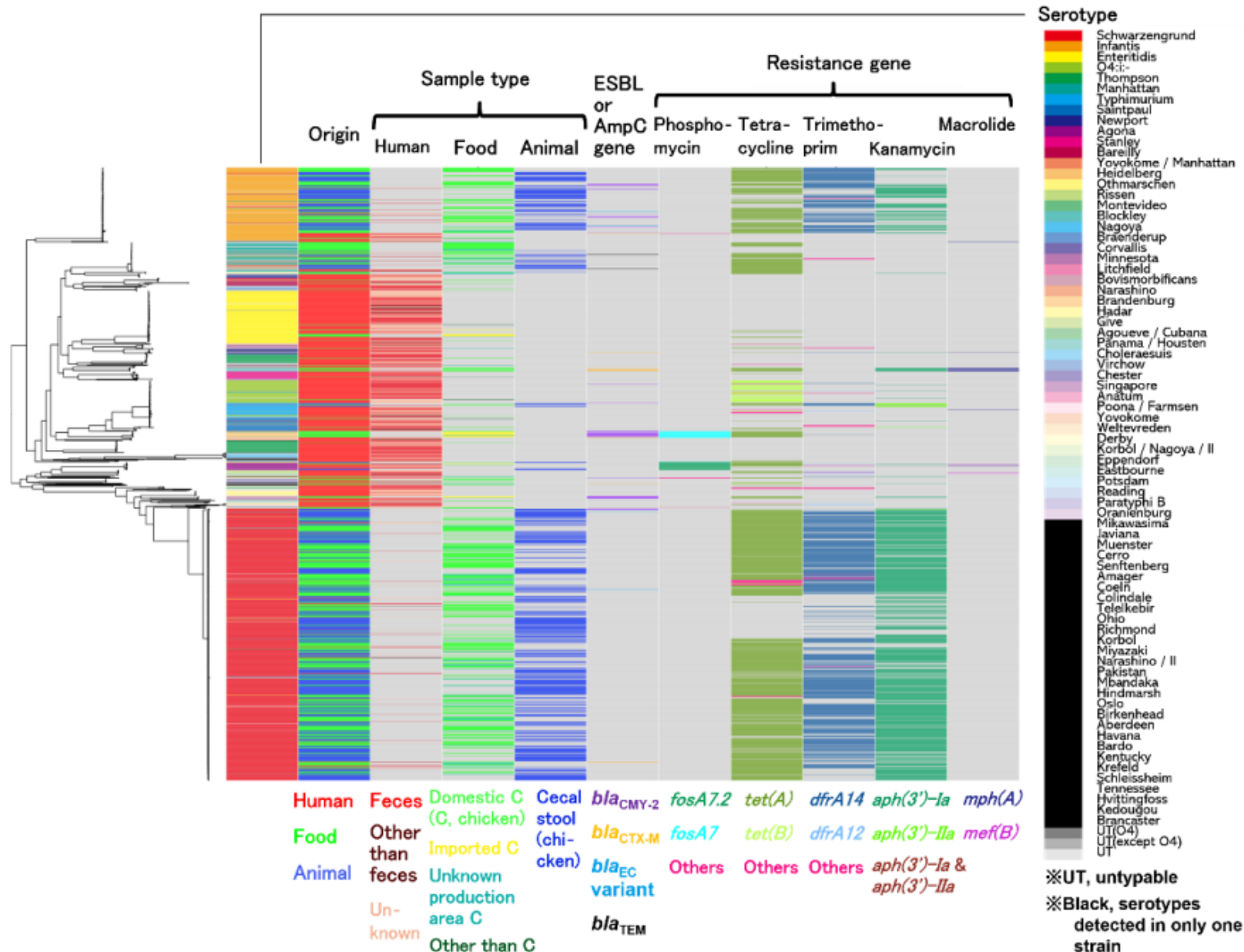


2019	74	25,004		311	128				
2020	111	25,587		281	121	29	185	1,754	574
2021	97				145	211	127	4,395	1,848
2022			133***						
2023									

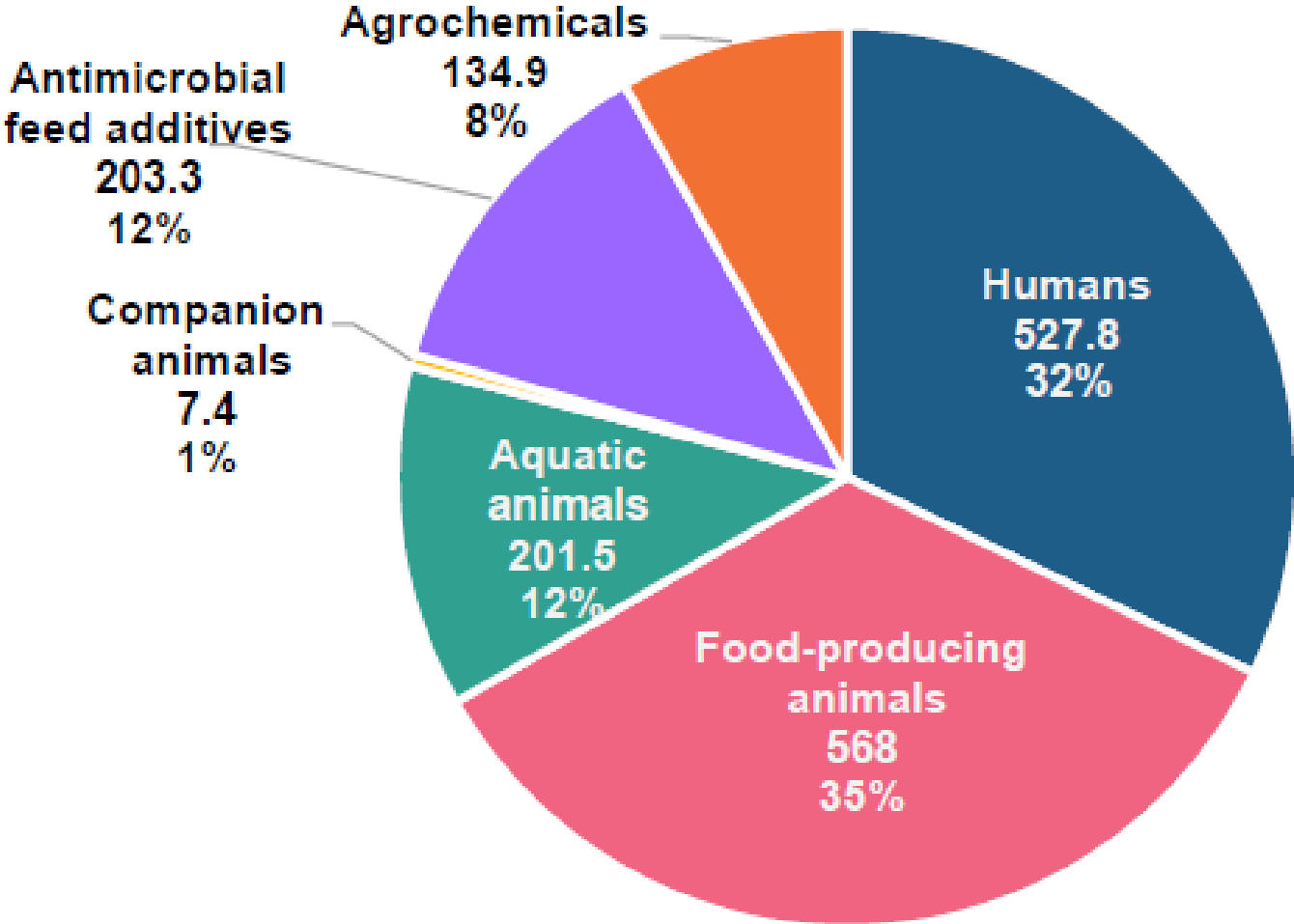
\*Blood Culture JANIS(Admission): CTX resistant *E.coli/E.coli*(%)  
 \*\*Number of ESBL-Ec-positive pregnant women/ Total number of pregnant women(%)  
 \*\*\*Samples was collected over two years

(The number of *E.coli*)

# Relationship Between Humans, Food, and Animals Based on Genome Comparisons of Non-typhoidal *Salmonella* spp. Strains

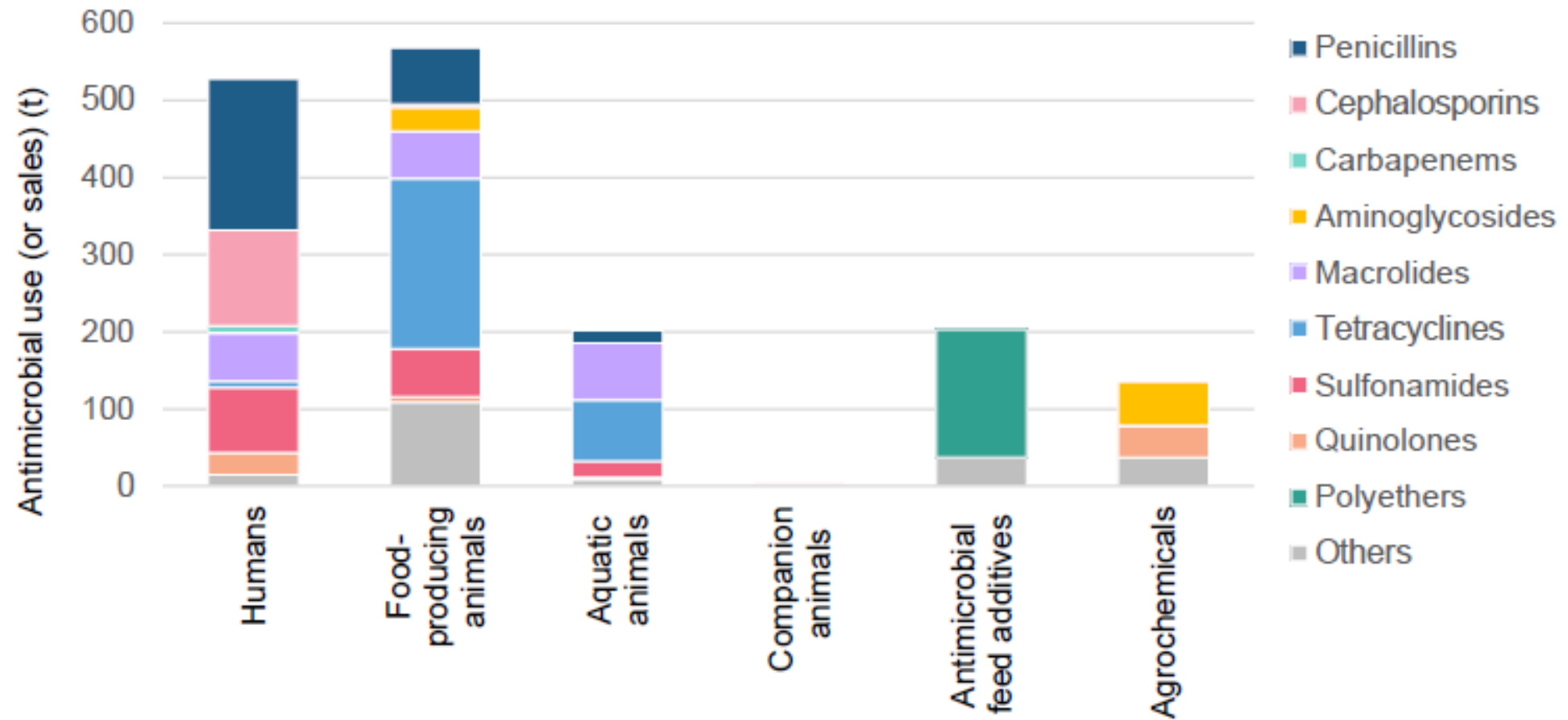


The proportion of antimicrobial usage by field within the overall antimicrobial use(2022)

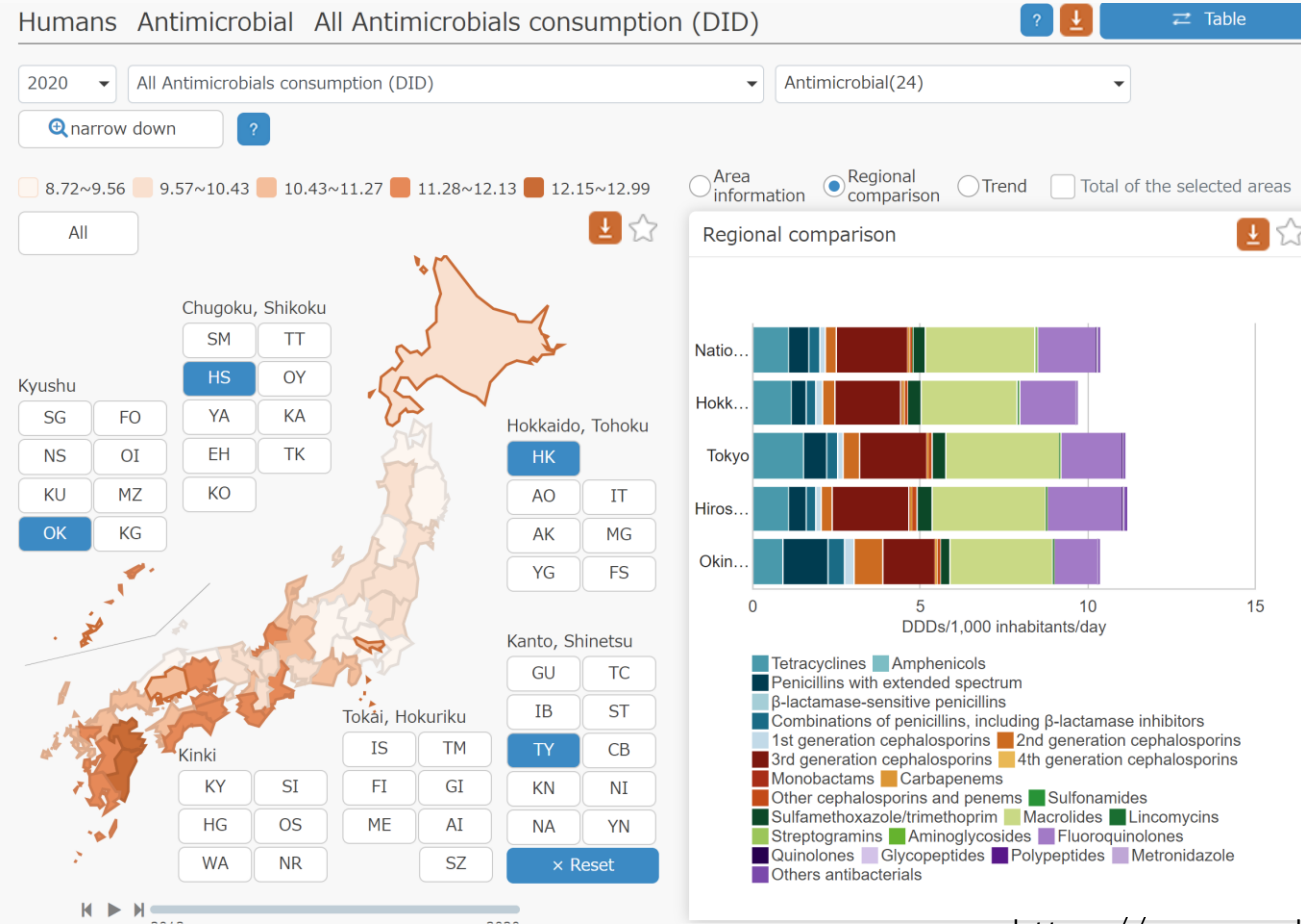
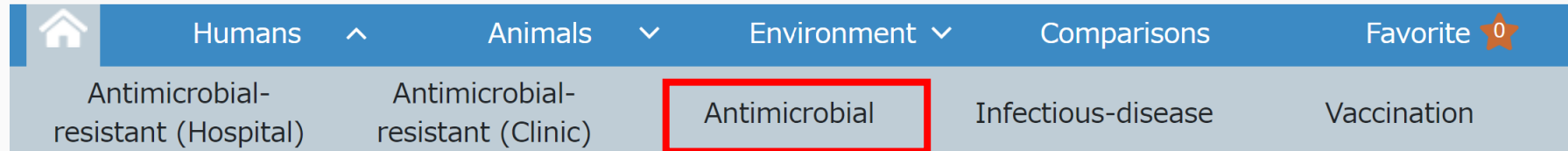




## Current antimicrobial use by field(2022)



# Antimicrobial Usage One Health Platform System



# AMR National Action Plan

Conduct research on surveillance and monitoring of antimicrobial-resistant organisms (AROs) and residual antimicrobials in aquatic and terrestrial environment, as well as in wild animals

# Act on the Assessment of Releases of Specified Chemical Substances in the Environment and the Promotion of Management Improvement

Implement surveys that provide the basic resources to properly evaluate chemical substances which may present environmental risk by compiling and tracking data notably from areas susceptible to high concentrations in their general environments

## Who Samples?

- Environmental Research Institute in local governments
- Institute of Public Health in local governments

## Sampling sites



Figure 1-1-1 Surveyed sites (surface water and sediment) in the Initial Environmental Survey in FY 2021



Summary of recent survey results on antimicrobials

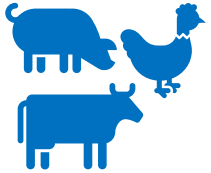
		Media	Range [ng/L]	Detection limits [ng/L]	Positive site / tested site
FY2019	Azithromycin	Surface water	nd ~ 130	1.7	9/25
	Amoxicillin	Surface water	nd ~ 2.3	0.013	15/24
	Clarithromycin	Surface water	nd ~ 240	1.4	19/30
	Levofloxacin	Surface water	nd ~ 540	0.44	20/26
	Tiamulin	Surface water	nd ~ 3.1	0.013	6/27
FY2020	Ampicillin	Surface water	nd ~ 1.4	0.12	4/22
FY2021	Streptomycin	Surface water	nd ~ 2.3	1.1	7/35

# Goal 4

## Promote Appropriate Use of Antimicrobials in the Fields of Healthcare, Livestock and Aquaculture



### 4.1 Promote Antimicrobial Stewardship at Medical Institutions

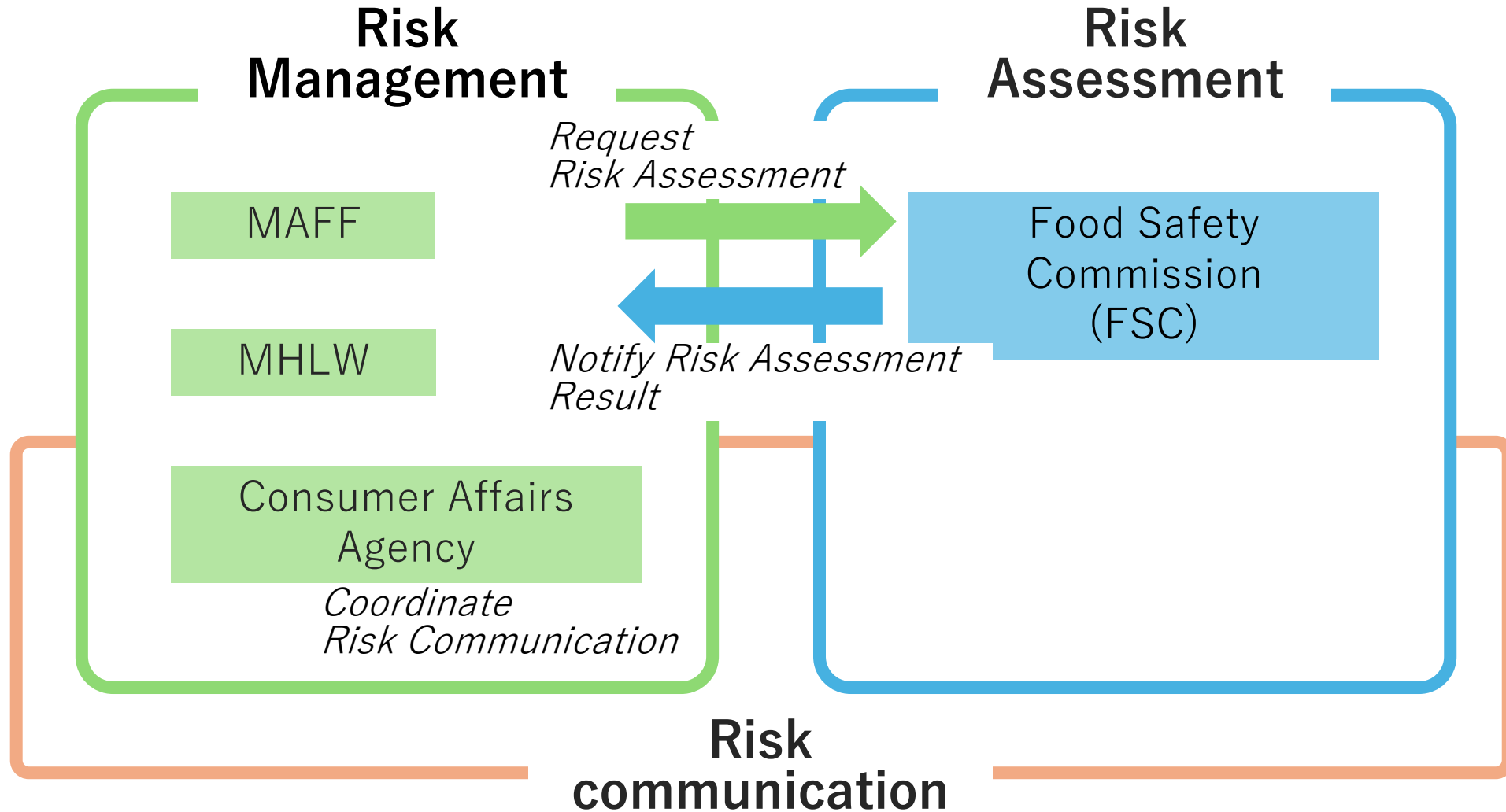


### 4.2 Ensure Prudent Use of Antibiotics for Animals in the Field of Livestock and Aquaculture and Veterinary Medicine

- **Promote risk assessment and risk management of the effects on human health via food of antimicrobial resistance (AMR) due to use of antibiotics for animals**
- Establish a veterinary antimicrobial stewardship system
- Strengthen the system for ensuring the prudent use of antibiotics for animals

# Risk analysis framework

Based on the international standards (the Codex guidelines and the WOA code)





# Food Health Impact Assessment framework

## Conducted by Food Safety Commission

### Hazard identification



### Risk assessment

#### Release assessment:

The potential and degree of hazard to be selected in the case veterinary antimicrobials are used in farming.

JVARM data

#### Exposure assessment:

The explanation of the route of hazard exposure in humans, as well as the potential of such hazard arising and the degree.

#### Consequence assessment:

The explanation of the relation between the hazard exposure in humans and the consequences of the same, as well as the potential of human antimicrobials to have reduced or no treatment benefit and the degree.

#### Risk estimation:

Cumulative assessment of Release, Exposure and Consequence assessments

JANIS data

## Assessment of the Effect of Food on Health

Aligning with the international standards (the Codex guidelines and the WOAHA code)

# Optimal use of antimicrobials

Risk management measures have been implemented based on risk assessments conducted by the Food Safety Commission of Japan (FSC)

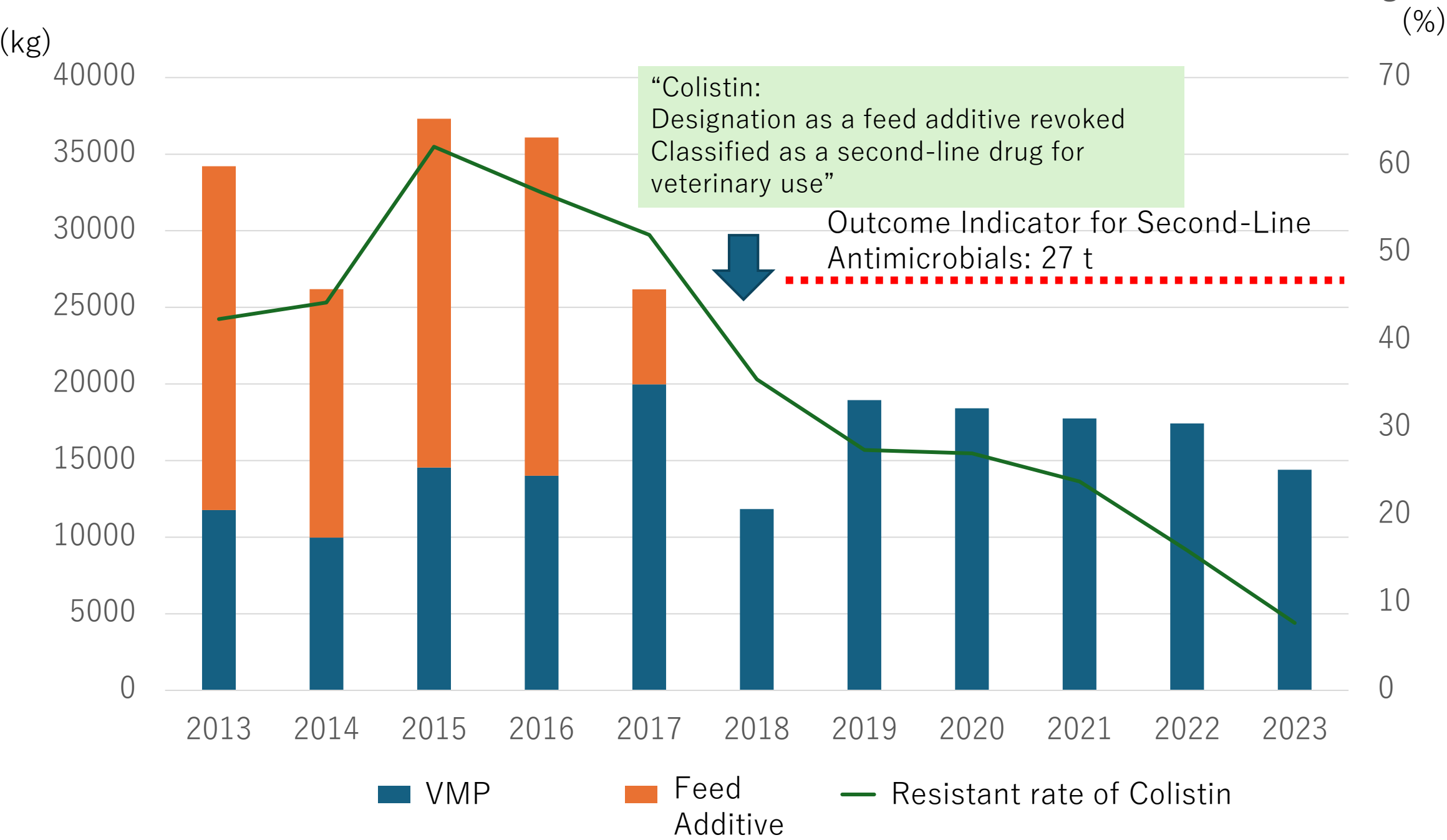
Risk Assessment Result	Examples of Risk Management	
	Veterinary Drugs	Feed Additives
High	<ul style="list-style-type: none"><li>- Revocation of approval</li><li>- Temporary ban of use</li></ul>	<div>- <b>Revocation of designation</b></div> <div><ul style="list-style-type: none"><li>• Use <b>not allowed</b> cattle</li><li>• Use <b>restricted</b> hens and beef on the pre-ship</li></ul></div>
	<ul style="list-style-type: none"><li>- Restriction of the usage</li></ul>	
Medium	<ul style="list-style-type: none"><li>- Shortened applicable periods</li><li>- Strict use as a second choice drug</li></ul>	
	<ul style="list-style-type: none"><li>- Enhanced monitoring (e.g. increasing number of samples)</li></ul>	
Low	<ul style="list-style-type: none"><li>- Continued monitoring</li></ul>	
Negligible		

Gamithromycin  
Ceftiofur  
Cefquinom  
Tulathromycin  
Fluoroquinolone  
Colistin

Virginiamycin  
**Colistin**  
Tylosin  
Chlortetracycline  
Oxytetracycline

• Use **not allowed** for **dairy cattle**  
• Use **restricted** for pigs, laying hens and beef cattle **depending on the pre-shipment period**

Sales Volume of Colistin Products and Trends in Colistin Resistance Rates in *E. coli* from Diseased Pigs



# Summary

- Japan has advanced AMR control under the National Action Plan through surveillance and risk management based on a One Health approach.
- Since 2017, integrated One Health reports have been compiled using existing data.
- Collaborative projects across sectors have initiated genome-based comparative analyses.
- Monitoring results from human and animal sectors are utilized for risk assessment and risk-based management.
- Interpretation of monitoring and genomic data remains a challenge; clear answers are still lacking.
- Move beyond simple comparisons—enforce science-based, risk-based policies essential for AMR control.
- Continued communication and discussion among administrative bodies and researchers across all fields is crucial.

# Acknowledgements

## **Ministry of Health, Labour and Welfare**

Division of Infectious Disease Prevention and Control

- Nakamura Takafumi

## **Japan Institute for Health Security (JIHS)**

*National Institute of Infectious Diseases (NIID), Antimicrobial Resistance Research Center*

- Motoyuki Sugai
- Shizuo Kayama
- Liansheng Yu

## ***AMR Clinical Reference Center***

- Nobuaki Matsunaga
- Masahiro Ishida
- Yusuke Asai

## **Ministry of the Environment**

Environmental Management Division, Environment Management Bureau

- Isao Fukuda

## **Kanazawa University**

Institute of Science and Engineering

- Ryo Honda

# Thank you very much for your kind attention



National Veterinary Assay Laboratory

Relocated from Tokyo to a newly constructed facility  
in Tsukuba, Ibaraki Prefecture(September 2025)

