

Where AMR Control & Surveillance is Today

AMR Clinical Reference Center,
National Center for Global Health and Medicine

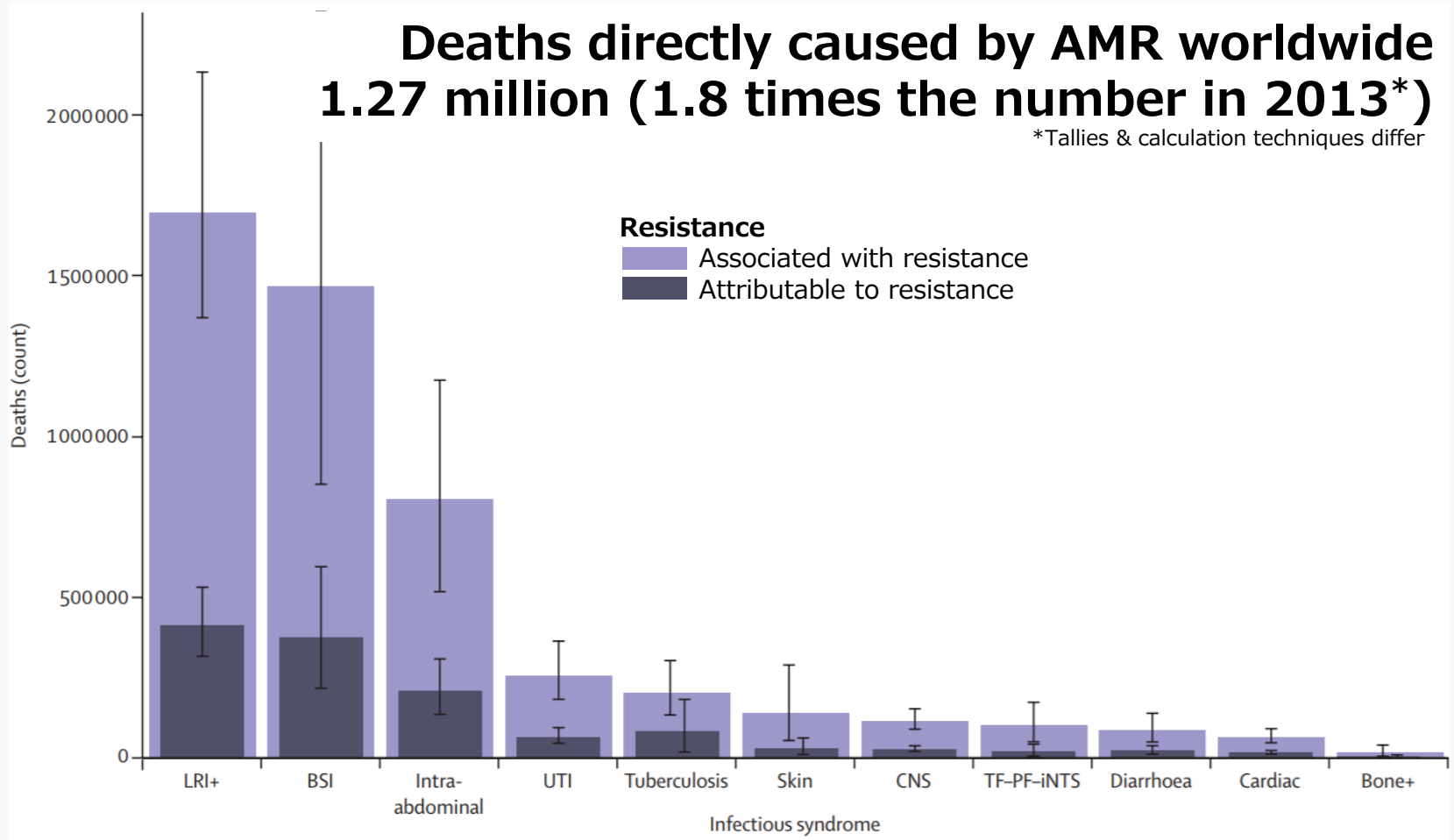
Nobuaki Matsunaga

Chair, Clinical Epidemiology Division

An overview of the activities of the Clinical Epidemiology Division

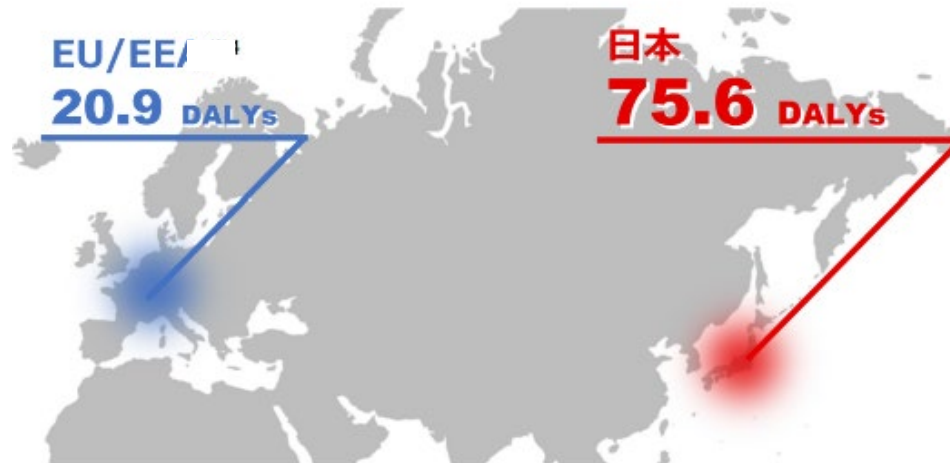
- **J-SIPHE**
[Japan Surveillance for Infection Prevention and Healthcare Epidemiology]
- **The Antimicrobial Resistance (AMR) One Health Platform**
- **Surveys of facilities for the elderly**
- **Disease burden**

Current conditions around the world (deaths due to AMR in 2018)



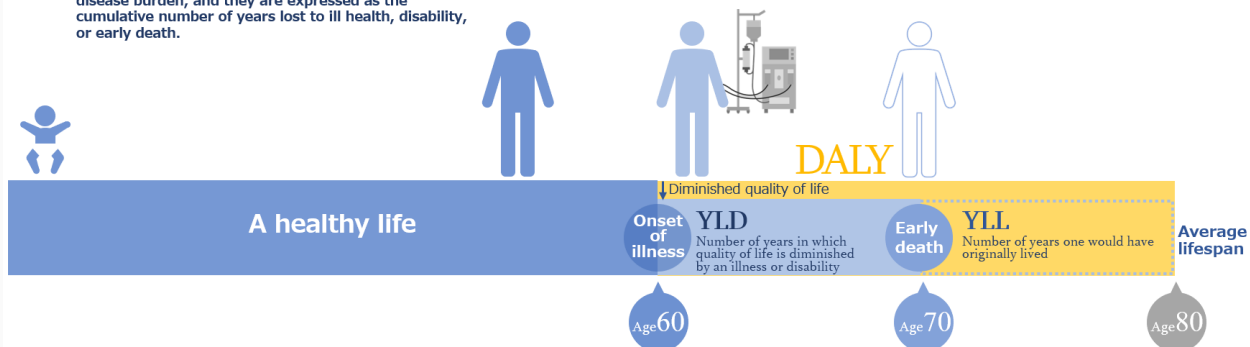
Current conditions in Japan and elsewhere in the world (disease burden)

A comparison of DALYs due to MRSA (2015)



DALY Disability-Adjusted Life Year = YLD Years Lived with Disability + YLL Years of Life Lost

Disability-adjusted life years are a measure of the overall disease burden, and they are expressed as the cumulative number of years lost to ill health, disability, or early death.



Current conditions around the world (surveillance)

Region ◊	Country ◊	Surveillance System Name ◊	Target HAI ◊				Target pathogen ◊					
			CLABSI ◊	CAUTI ◊	VAP ◊	SSI ◊	CDI ◊	MRSA ◊	MDRP ◊	MDRA ◊	CRE ◊	VRE ◊
Americas (6) ◊	Argentina ◊	National Program for the Surveillance of Hospital Infections in Argentina (VIHDA) ◊										
	Brazil ◊	Brazilian Surveillance and Control of Pathogens of Epidemiologic Importance (Br SCOPE) ◊	u ◊	u ◊	u ◊	u ◊		u ◊	u ◊	u ◊	u ◊	u ◊
	Canada ◊	Canadian Nosocomial Infection Surveillance Program (CNISP) ◊	v ◊			m ◊	v ◊	v ◊				v ◊
	Colombia ◊	National Network for the Prevention, Surveillance, and Control of Healthcare-Associated Infections (PREVINS) ◊										
	Mexico ◊	The Committee for the Control and Detection of HAI (CODECIN)/ Red Hospitalaria de Vigilancia Epidemiológica (RHOVE) ◊	v ◊	v ◊	u ◊	v ◊	v ◊	u ◊	u ◊	u ◊	u ◊	u ◊
	United States ◊	National Healthcare Safety Network (NHSN) ◊	v ◊	v ◊	v ◊	v ◊	v ◊	v ◊		v ◊	v ◊	v ◊
Europe (23) ◊	Austria ◊	Austrian Nosokomial Infections Surveillance System (ANISS) ◊				u ◊						
	Belgium ◊	National Surveillance of Infections in Hospitals (NSIH) ◊	m ◊	v ◊	v ◊	u ◊	m ◊	m ◊				u ◊
	Croatia ◊	Intersectoral Coordination Mechanism for the Control of Antimicrobial Resistance (ISKRA) ◊						v ◊	v ◊	v ◊	v ◊	v ◊
	Denmark ◊	Danish Hospital-Acquired Infections Database (HAIBA) ◊		u ◊		m ◊	u ◊					
		Danish Integrated Antimicrobial Resistance Monitoring and Research Programme (DANMAP) ◊						m ◊			m ◊	m ◊
	Finland ◊	National Infectious Diseases Register (NIDR) ◊										
		Finnish Hospital Infection Programme (SIRO) ◊	v ◊				v ◊					
	France ◊	Réseau d'Alerte d'Investigation et de Surveillance des Infections Nosocomiales (RAISIN) ◊	v ◊	v ◊	v ◊	v ◊	v ◊	v ◊	v ◊	v ◊	v ◊	v ◊
	Germany ◊	Krankenhaus Infektions Surveillance System (KISS) ◊	v ◊	v ◊	v ◊	v ◊	v ◊	v ◊	v ◊	v ◊	v ◊	v ◊
	Hungary ◊	Nemzeti Nosocomialis Surveillance Rendszer (NNSR) ◊	u ◊	u ◊	u ◊	u ◊	u ◊	u ◊	u ◊	u ◊	u ◊	u ◊
	Ireland ◊	Health Protection Surveillance Center (HPSC) Surveillance ◊				m ◊	u ◊	v ◊			v ◊	
	Italy ◊	Sorveglianza Attiva Prospettica delle Infezioni Nosocomiali nelle Unità di Terapia Intensiva (UTI) ◊	u ◊	u ◊	u ◊	v ◊		v ◊		v ◊	v ◊	
		Surveillance of antibiotic resistance–National Institute of Health (AR-ISS) ◊						u ◊		u ◊	u ◊	u ◊

Current conditions in Japan (surveillance)

Drug-resistant microorganisms

Nosocomial infection control and surveillance project
Tuberculosis Research Institute
Tokyo Metropolitan Institute of Public Health
Local institutes of public health
Dept. of Bacteriology I, National Institute of Infectious Diseases

Healthcare-associated infections

Nosocomial infection control and surveillance project
JHAIS

Antimicrobials-Attitudinal survey

2017- AMR Clinical Reference Center

Infectious diseases

Program to study trends in outbreaks of infectious diseases
Tuberculosis Research Institute
Dept of Bacteriology I, National Institute of Infectious Diseases

Surveillance

Seeking to prevent & manage disease



Continuous monitoring



**Collection, analysis,
and interpretation of data**



Provision of feedback

Surveillance

Surveillance cannot fulfill every goal

**Collection of information
revolves around**

- **Completeness
(details & scope)**
- **Accuracy**
- **Simplicity & rapidity**

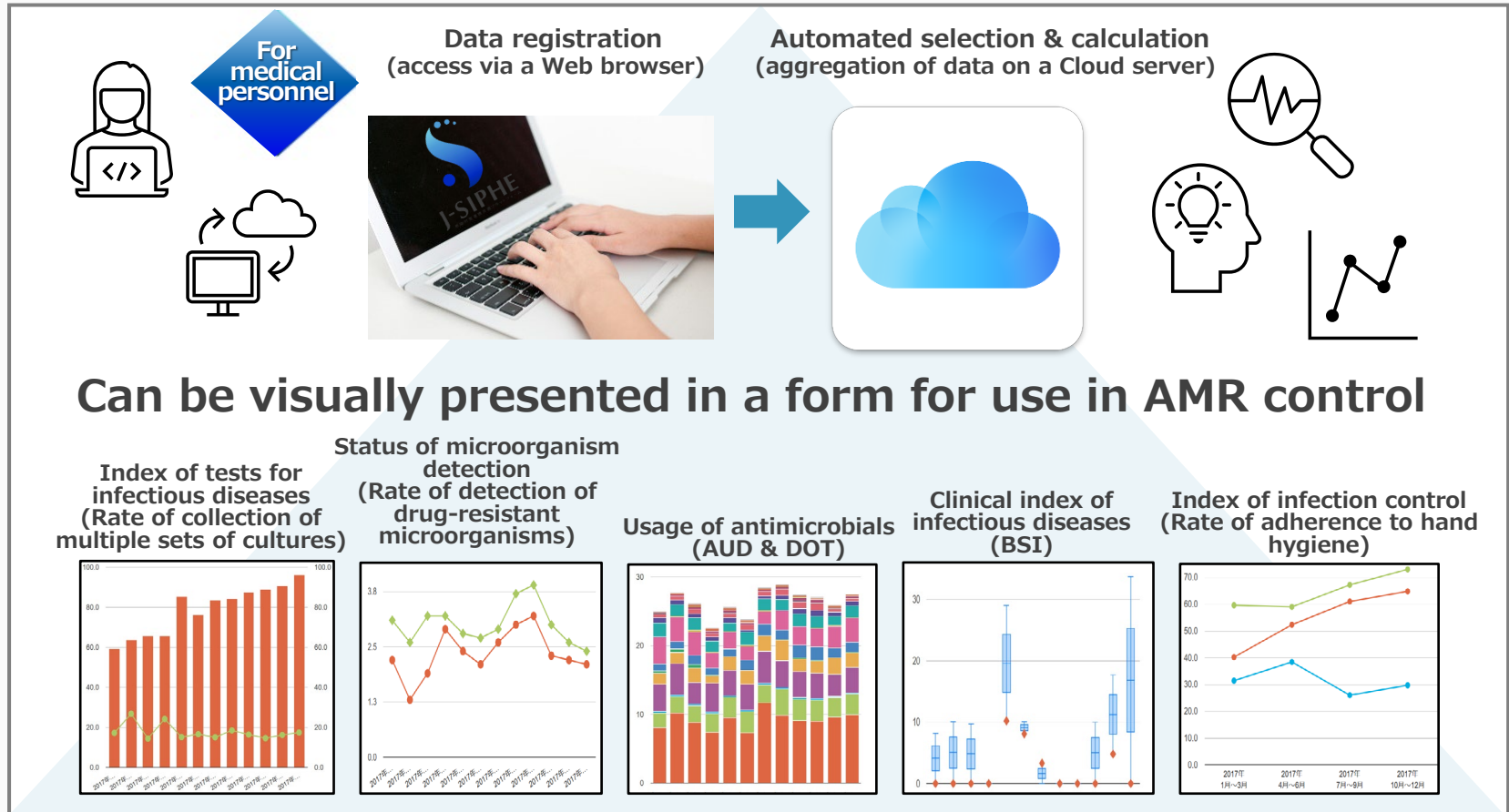
Level (extent)

**The world
The country
The local community
A hospital**

**Valid studies need to be conducted
in accordance with goals**

Hospital Surveillance Platform J-SIPHE

With an Internet connection, data can be accessed and handled
in any place at any time



A surveillance platform that is as extensive, accurate, simple, and quick as possible

Collection of information by the J-SIPHE

Basic information

- (1) Information on treatment of infectious diseases and proper use of antimicrobials**
- (2) Information on usage of antimicrobials**
(Integrated E & F files [indicating tests performed and care provided] during hospitalization)
- (3) Information related to the infection control team**
- (4) Information on healthcare-associated infections**
(SSI: JANIS & JHAIS files)
- (5) Information on microorganisms & drug-resistant microorganisms**
(JANIS feedback file)

Secondary use of existing data as much as possible

An image of the J-SIPHE

① Main menu [Feedback]
→[Tabulate in a Graph/
Output]

② Selection of feedback

③ Feedback can be listed



Displays feedback for
each item as a graph
with an explanation



Detailed
↓
Clear

Feature to
set default
feedback
to display

(Time series) Feedback from the J-SIPHE

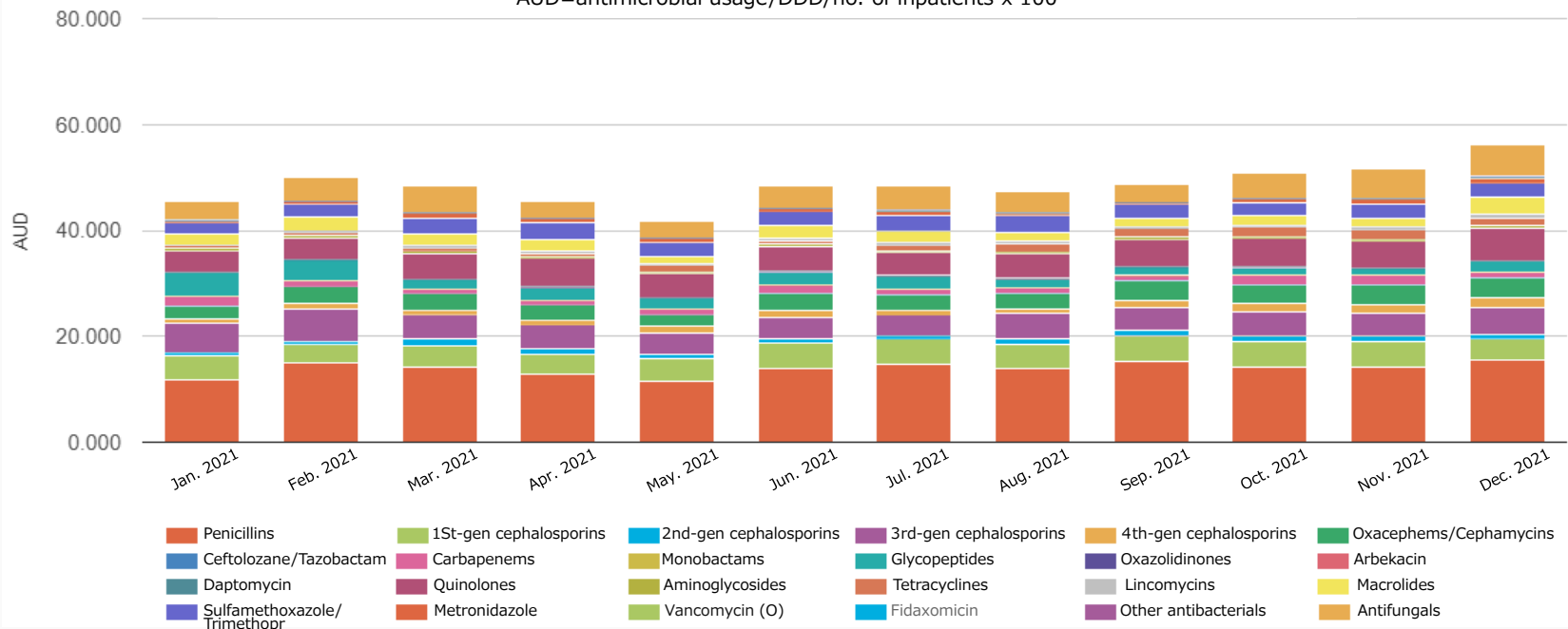
Usage of antimicrobials: Your facility; time series

[Period: January-December 2021

What is displayed: Your facility Units displayed: AUD

Type of output: All type of drug: Injectables Drug category: All categories Drug family: Antimicrobials (22)]

AUD=antimicrobial usage/DDD/no. of inpatients x 100



Usage at your facility can be verified over time, facilitating infection control

(Comparison of) Feedback from the J-SIPHE

AUD & DOT and AUD/DOT (all systems)

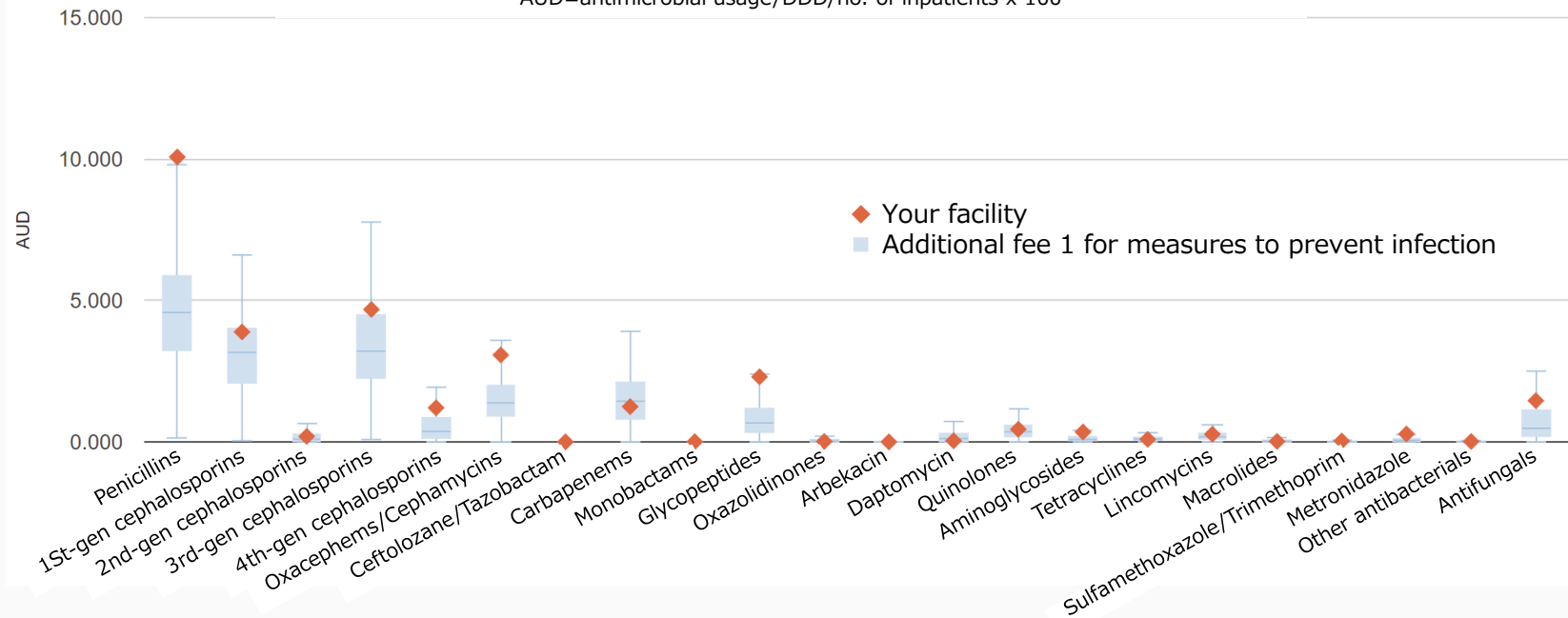
[Period: January-December 2021]

What is displayed: Your facility For comparison: Additional fee 1 for measures to prevent infection

Units displayed: AUD Ward classification: Hospital-wide

Type of drug; Injectables Drug category: All categories Drug family: Antimicrobials (22)]

AUD=antimicrobial usage/DDD/no. of inpatients x 100



Usage at your facility can be compared to that at other facilities, facilitating infection control

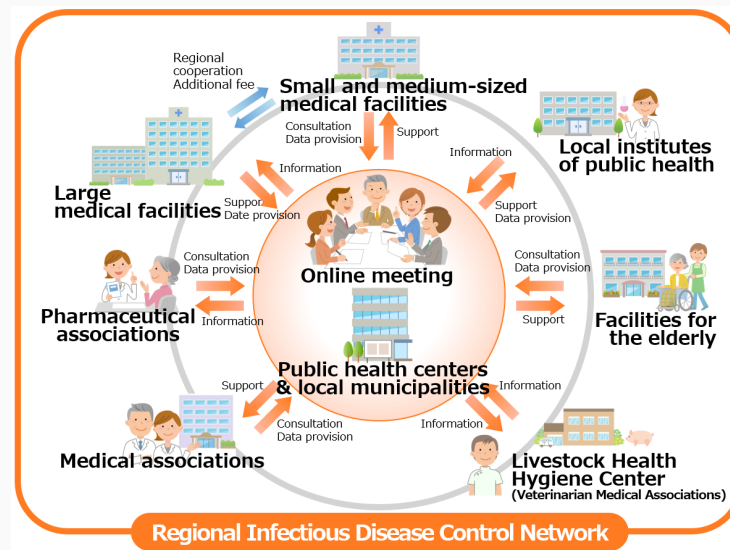
What the revised medical fees require

Additional fee 1 to improve infection control [Facility standards]

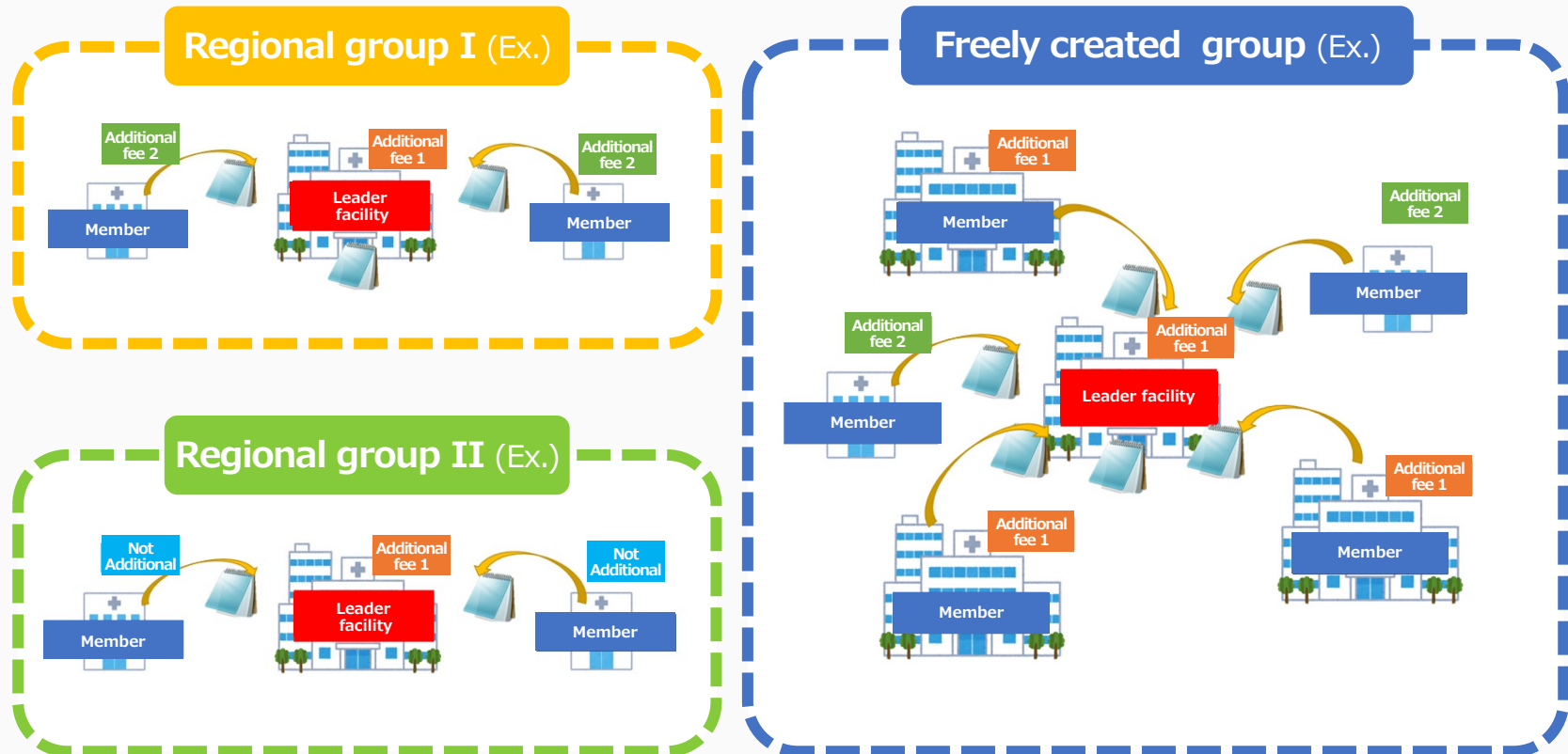
Medical facilities that have submitted a notice of **Additional fee 2** or **Additional fee 3** to improve infection control will **coordinate with public health centers and local medical associations** and **jointly hold regular conferences on nosocomial infection control** at least 4 times a year or so and conference minutes will be recorded

Additional fees 2 and 3 to improve infection control [Facility standards]

Participation in conferences on nosocomial infection control periodically held at least 4 times a year or so by a medical facility that has submitted a notice of Additional fee 1



Feedback (local collaboration) to the J-SIPHE



**Information is shared in the community,
facilitating infection control**

Feedback (local collaboration) to the J-SIPHE

The rate of major drug-resistant microorganisms & the incidence of bloodstream infections

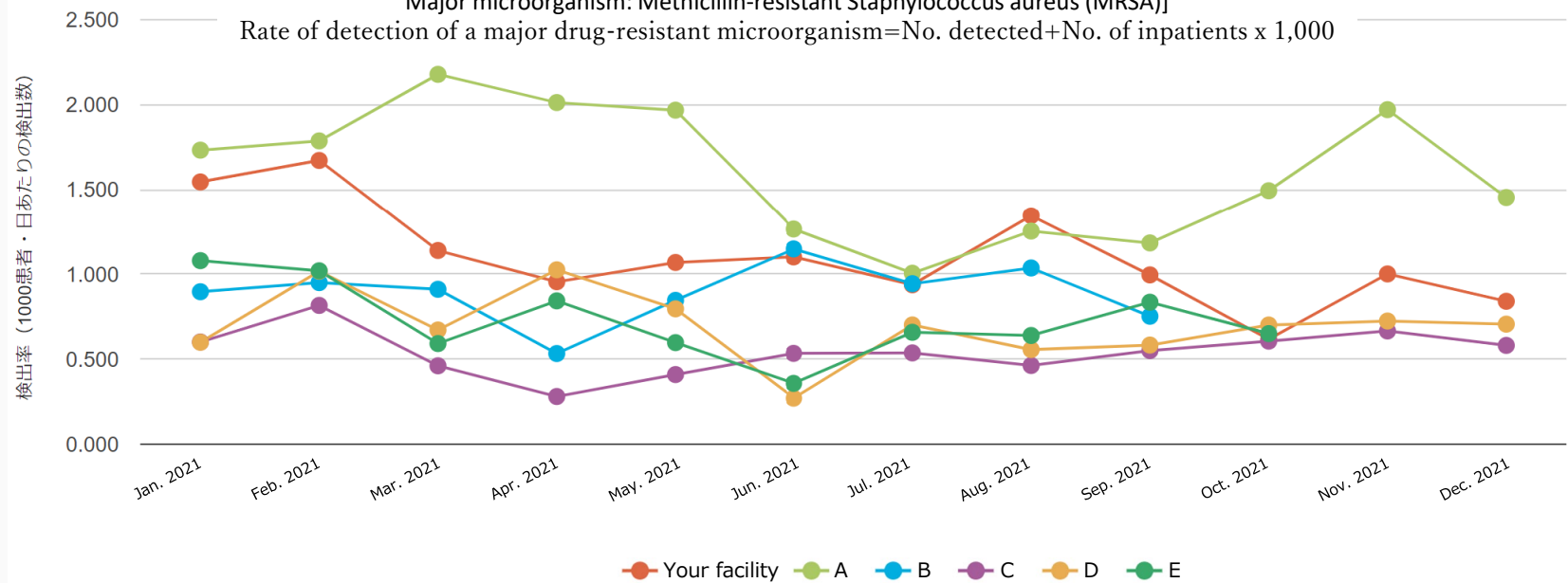
[Period: January-December 2021]

What is displayed: Categories of drug-resistant microorganisms Compared to: Nothing

Ward classification: Hospital-wide Form of detection: Total count

Major microorganism: Methicillin-resistant Staphylococcus aureus (MRSA)]

Rate of detection of a major drug-resistant microorganism=No. detected+No. of inpatients x 1,000



Detection of drug-resistant microorganisms and discussion of countermeasures

Feedback (local collaboration) to the J-SIPHE

AUD & DOT and AUD/DOT: For groups

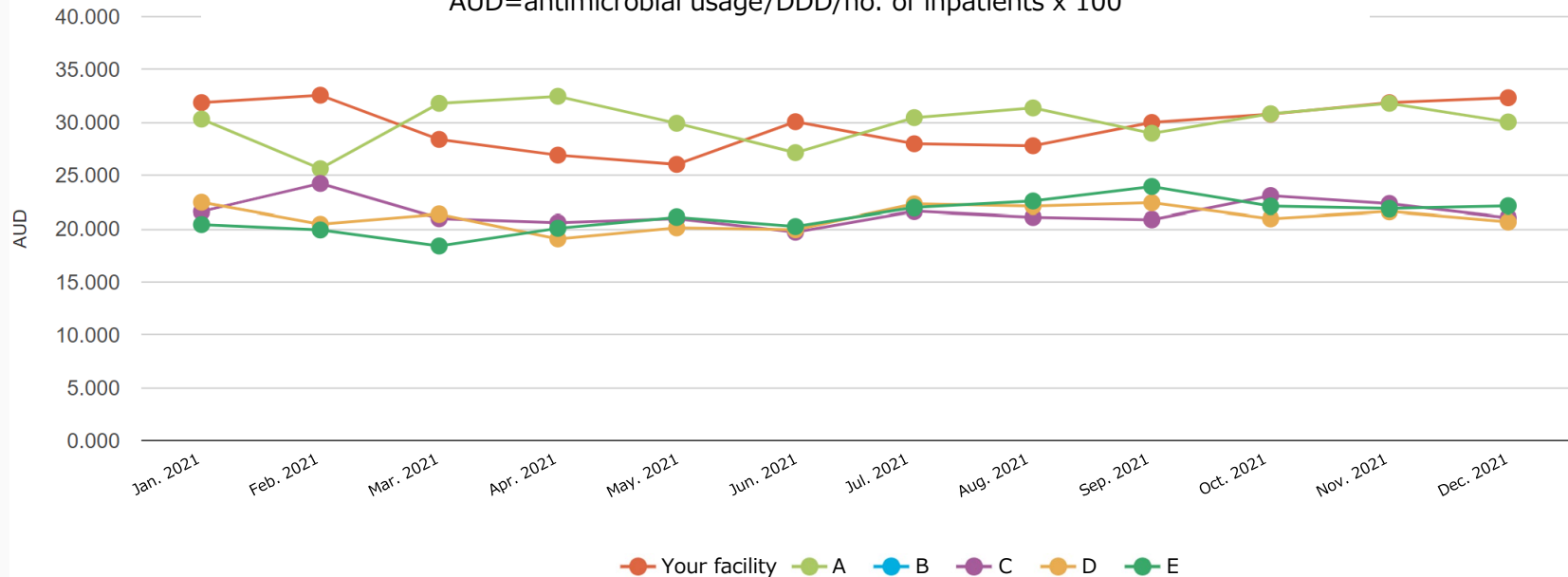
[Period: January-December 2021]

What is displayed: Categories of drug-resistant microorganisms Compared to: Nothing

Units displayed: AUD Ward classification: Hospital-wide

Type of drug; Injectables Drug category: All categories Drug family: Antimicrobials (22)]

AUD=antimicrobial usage/DDD/no. of inpatients x 100



Discussion of improvements based on usage of antimicrobials

Points for the J-SIPHE to be mindful of (regarding usage of antimicrobials)

✓ Tallies only include patients with integrated E & F files (hospitalization insurance)

<Not included>

- Patients paying entirely out of pocket and patients solely using workers' compensation, medical insurance for victims of pollution, or other types of insurance
- * When some expenses are not covered or covered by workers' compensation or medical insurance for victims of pollution, only the portion covered by medical insurance is considered

✓ Characteristics may be evident depending on the way pharmaceuticals are entered in medical files at your facility

(E.g., handling of unused/discarded medication)

- Differences from actual usage are likely to occur with patients such as pediatric patients and patients with kidney damage
 - Differences may occur due to the handling of discontinued oral antimicrobials after their prescription
- These factors can lead to discrepancies between the data and previous tallies at your facility
- In many instances, the total number of inpatients will differ from the number of patients for whom basic information has been registered



or

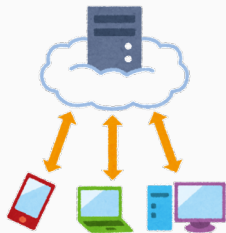


Where the J-SIPHE is today

Seeking to improve AMR control in the community



Continuous monitoring of drug-resistant microorganisms, antimicrobials, and medical practice



Right now, it's here ↓

Data are collected and presented visually, but they are analyzed and interpreted by each facility



Feedback on support provided to individual facilities & to facilitate local collaboration helps to make improvements



<https://amr-onehealth-platform.ncgm.go.jp/home>

Drug-resistant microorganisms (in humans)

Nosocomial infection control and surveillance project, Tuberculosis Research Institute
Tokyo Metropolitan Institute of Public Health, local institutes of public health
Dept. of Bacteriology I, National Institute of Infectious Diseases

Antimicrobials-Attitudinal survey

AMR Clinical Reference Center (AMRCRC)

Infectious diseases

Program to study trends in outbreaks of infectious diseases, Tuberculosis Research Institute
Dept. of Bacteriology I, National Institute of Infectious Diseases

Immunization

Study group, Japan Agency for Medical Research and Development (AMED)

Drug-resistant microorganisms in animals

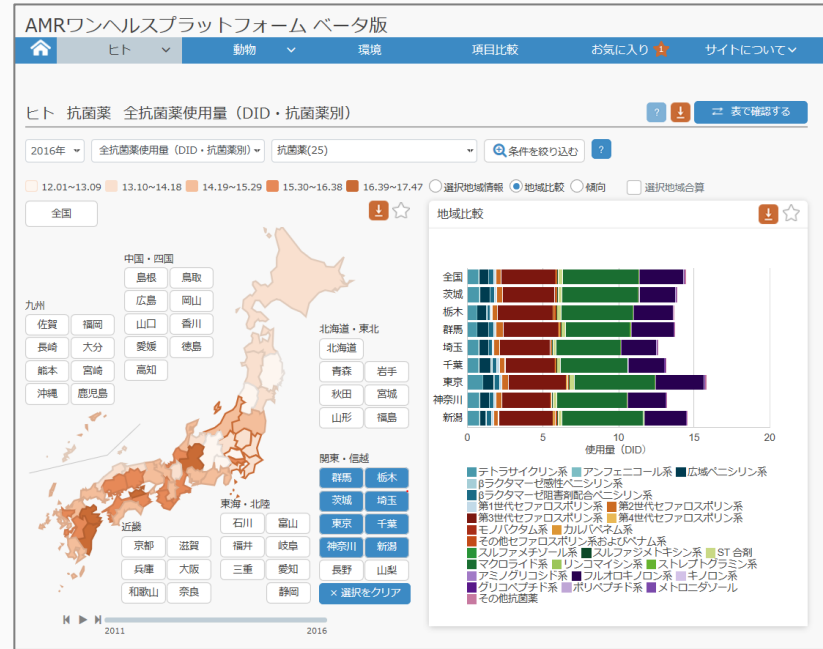
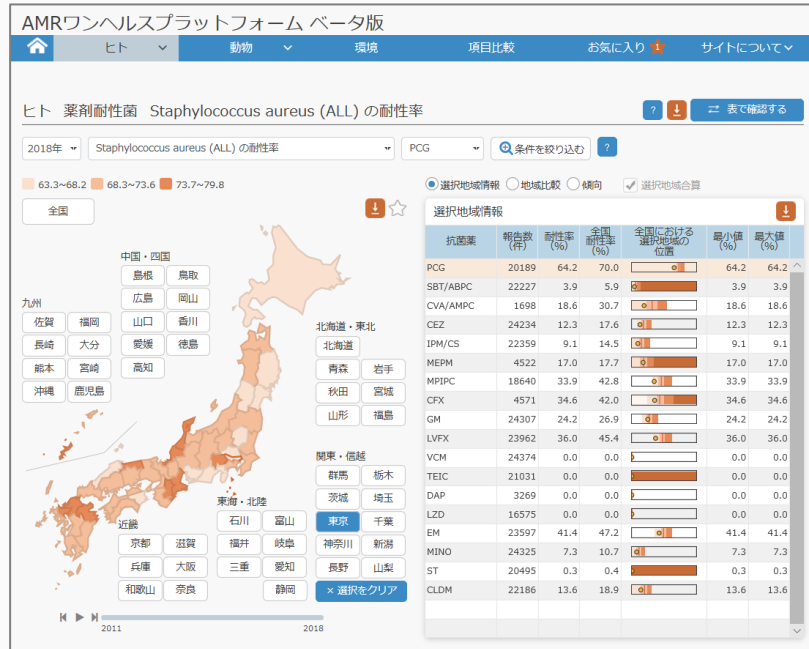
National Veterinary Assay Laboratory Japanese Veterinary Antimicrobial Resistance Monitoring (JVARM)

Antimicrobials for animals

National Veterinary Assay Laboratory, Food and Agricultural Materials Inspection Center
Japan Scientific Feeds Association

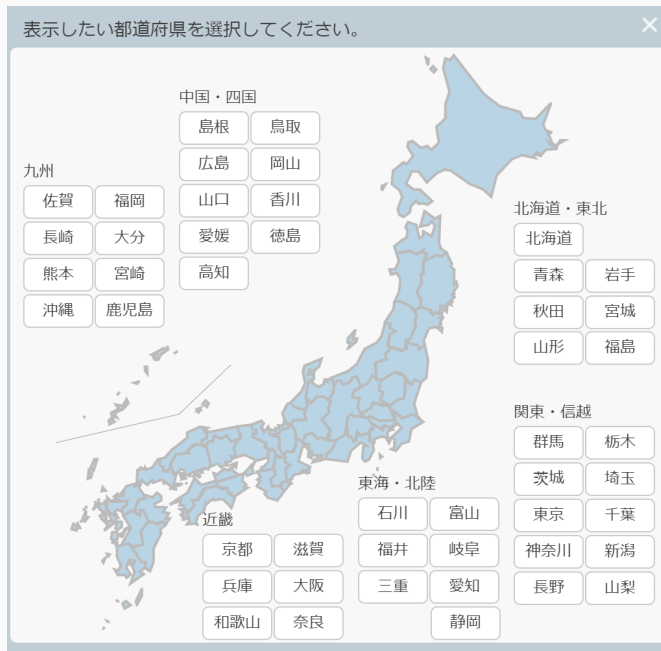
Presenting a summary of trends in indicators in various fields related to AMR control

In humans Drug-resistant microorganisms & usage of antimicrobials



A site where users can select information from each prefecture and major metropolitan area

In humans Drug-resistant microorganisms & usage of antimicrobials



病院向けリンク集

基本情報

- [年齢別人口分布・施設情報など](#)

薬剤耐性菌関連情報

- [アンチバイオグラム \(JANIS\)](#)
- [Streptococcus pneumoniae の耐性率 \(PCG\)](#)
- [Staphylococcus aureus\(All\)の耐性率 \(MPIPC\)](#)
- [Staphylococcus aureus\(All\)の耐性率 \(CEZ\)](#)
- [Staphylococcus aureus\(All\)の耐性率 \(VCM\)](#)
- [Escherichia coli の耐性率 \(CTX\)](#)
- [Escherichia coli の耐性率 \(CTRX\)](#)
- [Escherichia coli の耐性率 \(LVFX\)](#)
- [Escherichia coli の耐性率 \(MEPM\)](#)
- [Klebsiella pneumoniae の耐性率 \(CTX\)](#)
- [Klebsiella pneumoniae の耐性率 \(CTRX\)](#)
- [Klebsiella pneumoniae の耐性率 \(MEPM\)](#)
- [Pseudomonas aeruginosa の耐性率 \(LVFX\)](#)
- [Pseudomonas aeruginosa の耐性率 \(MEPM\)](#)
- [Pseudomonas aeruginosa の耐性率 \(GM\)](#)
- [Mycobacterium tuberculosis の耐性率](#)

抗菌薬使用量情報

- [全抗菌薬\(全体\)](#)
- [全抗菌薬\(経口\)](#)
- [全抗菌薬\(経静脈\)](#)
- [カルバペネム\(全体\)](#)
- [第3世代セファロスポリン系\(経口\)](#)
- [マクロライド系\(経口\)](#)
- [フルオロキノロン系\(経口\)](#)
- [AWaRe分類別](#)

抗菌薬適正使用情報

- [急性上気道炎抗菌薬使用割合](#)

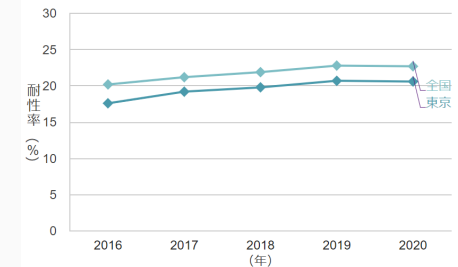
感染症情報

- [カルバペネム耐性腸内細菌科細菌感染症](#)
- [バンコマイシン耐性黄色ブドウ球菌感染症](#)
- [バンコマイシン耐性腸球菌感染症](#)
- [薬剤耐性アシネトバクター感染症](#)
- [ペニシリン耐性肺炎球菌感染症](#)
- [メチシリン耐性黄色ブドウ球菌感染症](#)
- [薬剤耐性緑膿菌感染症](#)
- [結核感染症](#)

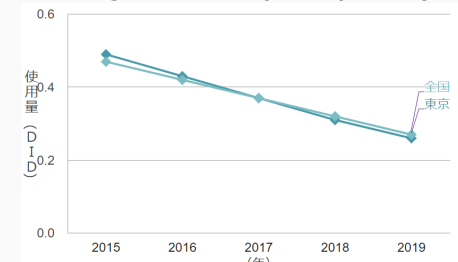
予防接種情報

- [Hibワクチン 1回目](#)
- [小児用肺炎球菌ワクチン 1回目](#)

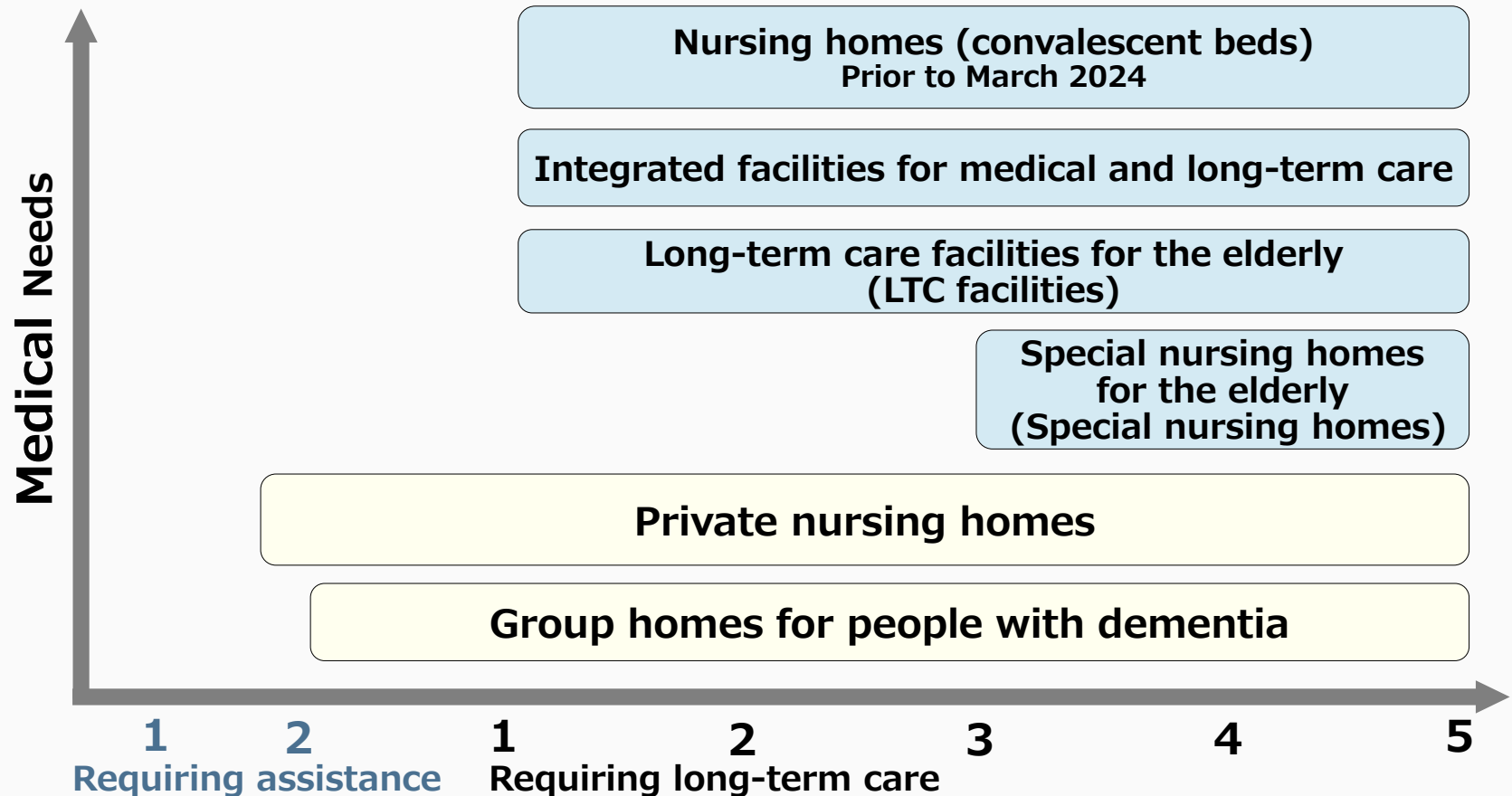
Drug resistance of *Escherichia coli* (to CTX)



Third-generation cephalosporins (oral)



Medical facilities and facilities for the elderly



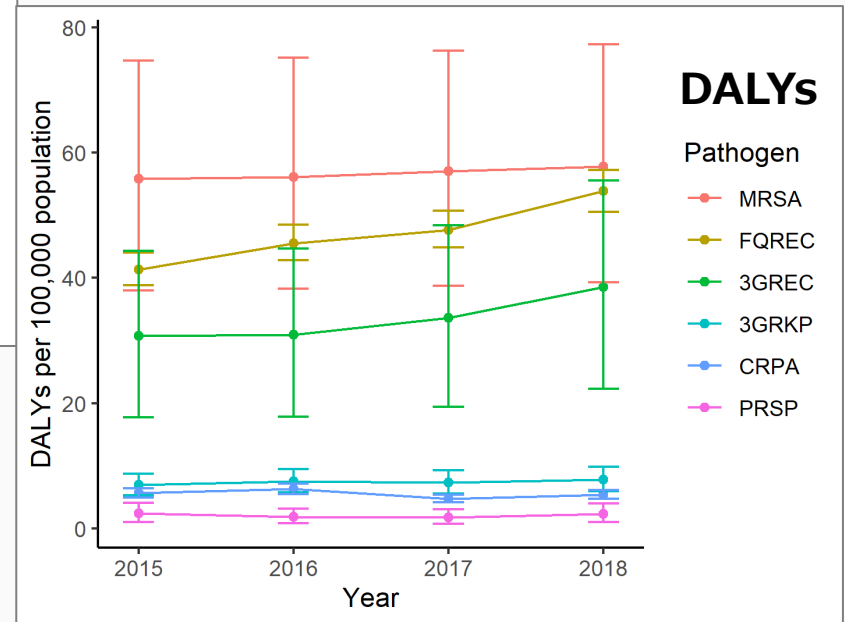
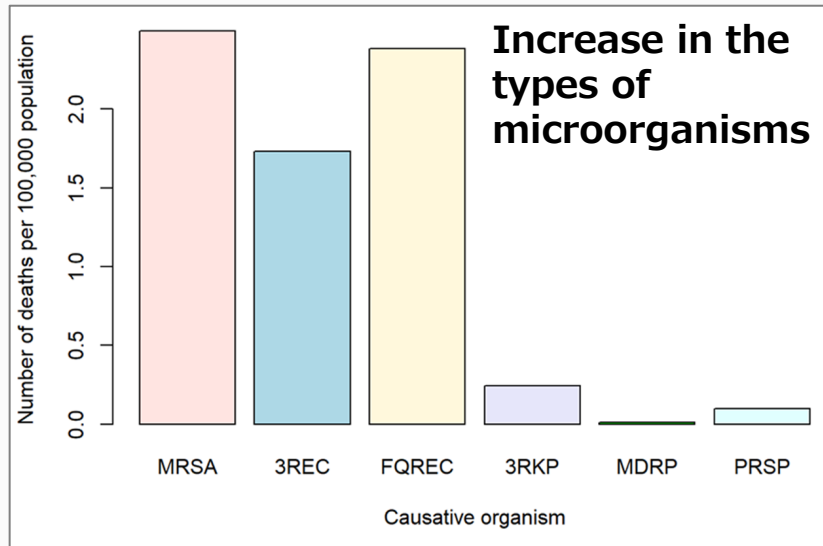
Areas that cannot be tabulated based on medical or care bills

Medical facilities and facilities for the elderly

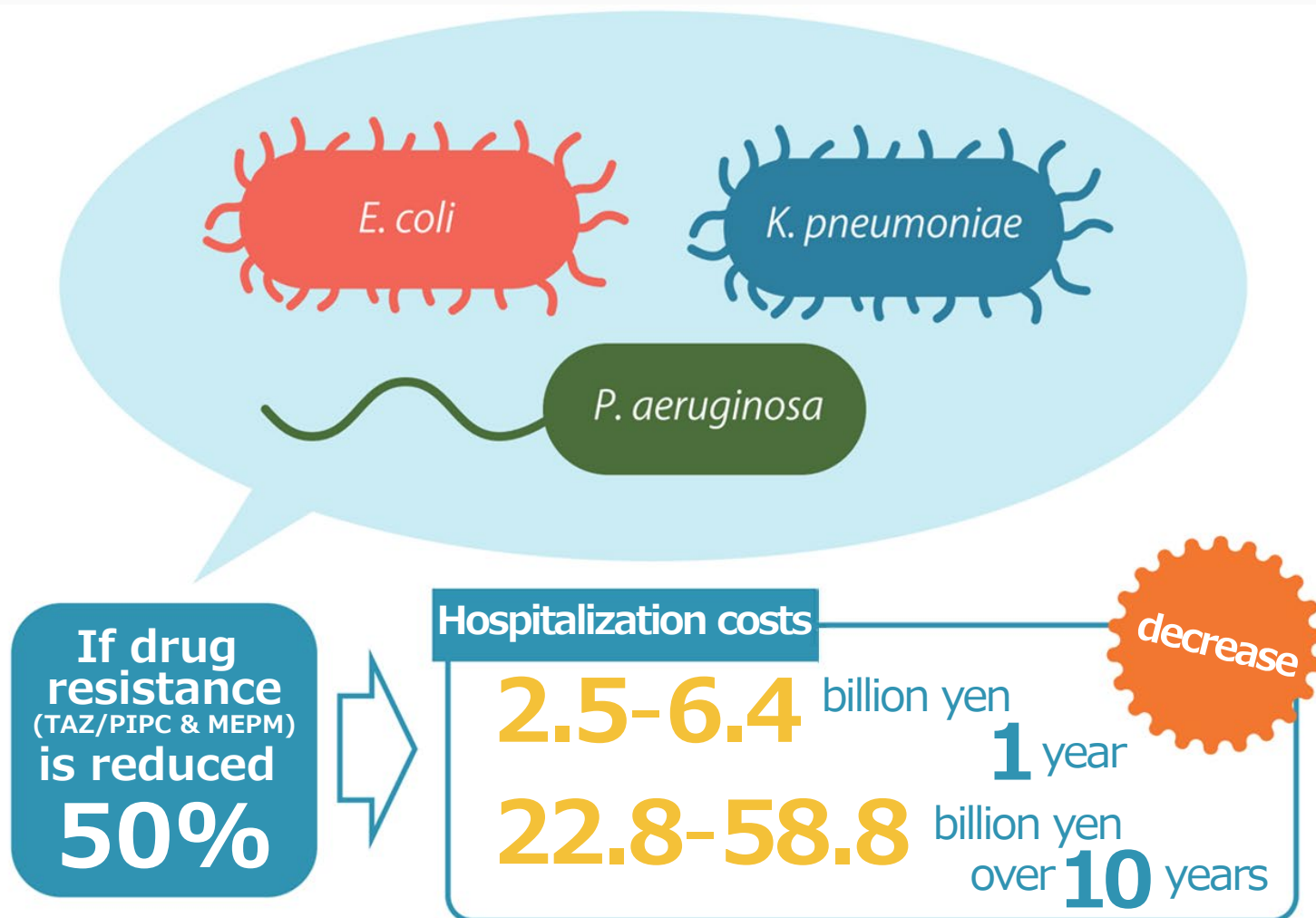
A point prevalence survey conducted by the Center

Facilities [No. of facilities responding]	Usage of antimicrobials	Main infectious diseases treated with antimicrobials	Main types of antimicrobials
Convalescent beds (Medical facilities) [82]	9.4%	Pneumonia (39.5%) Urinary tract infections (26.8%) Bronchitis (3.8%) Cellulitis (3.8%) Unknown (2.2%)	Third-generation cephalosporin injections Oral quinolone-based antibacterials Carbapenems Penicillin-based antibiotics
Long-term care facilities for the elderly (LTC facilities) [126]	1.7%	Urinary tract infections (51.3%) Pneumonia (24.3%) Upper respiratory inflammation (9.9%) Bronchitis (5.9%) Cellulitis (4.6%)	Third-generation cephalosporins Quinolone-based antibacterials Penicillin-based antibiotics
Special nursing homes for the elderly (Special nursing homes) [137]	1.0%	Urinary tract infections (31.1%) Pneumonia (14.9%) Upper respiratory inflammation (12.2%) Bronchitis (9.5%) Cellulitis (5.4%)	Third-generation cephalosporin injections Oral quinolone-based antibacterials Oral penicillin-based antibiotics

Disease burden



Estimated costs of drug-resistant microorganisms



Conclusion

- A platform to collect basic information has been built in Japan, and a system to feed those data back to facilities has been created.
- A system to integrate and verify data in hospitals and information between hospitals has been created. The system needs to be expanded to include information from the community (hospitals, clinics, facilities for the elderly, etc.).
- Effective feedback, based on multifaceted information, is vital. Measures that lead to changes in behavior need to be promoted.