Japan Pharmaceutical Manufacturers Association

Survey on Physicians' Perception of AMR

Apr. 4, 2022

Rakuten Insight, Inc.

Rakuten Insight

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Survey Overview

Objective	To survey physicians' attitudes toward antimicrobials and antimicrobial resistance (AMR).
Sample criteria	The physicians meeting the following criteria. ■ Working at an institution having at least 100 beds ■ Selecting antimicrobials they use at their own discretion ■ Experiencing cases of AMR Total: 300 samples

Internal medicine	Respiratory medicine	Gastroenterology	Endocrinology & metabolism / Diabetes	Nephrology	Hematology	Neurology	Medical oncology	Other internal medicine
26	14	9	7	9	5	11	9	4
Cardiovascular surgery	Respiratory surgery	Gastrointestinal surgery	Neurosurgery	Pediatric surgery	Surgery	Orthopedics	Plastic surgery	Cardiology
5	16	16	7	5	14	9	5	11
Allergy	Rheumatology	Geriatrics	General medicine	Pediatrics	Obstetrics & gynecology	Breast care	Ophthalmology	Otorhinolaryngology
5	9	7	12	7	7	7	11	14
Dermatology	Urology	Radiology	Palliative care	Emergency/ICU	Proctology	Others		
7	7	7	7	7	2	2		

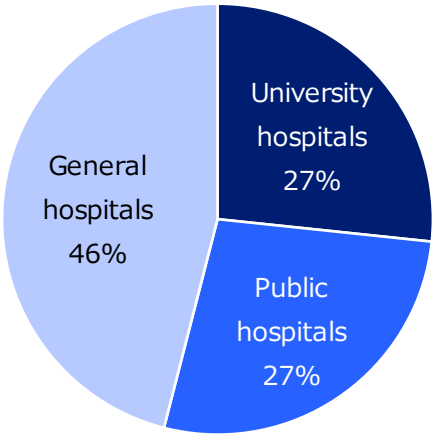
*The allocation by department was determined according to the primary collected data.

Method	Internet survey
Period	Mar. 7 (Mon) to Mar. 22, 2022 (Tue)
Research firm	Rakuten Insight, Inc.

Survey Subject Data

Survey Subject data

Institution type



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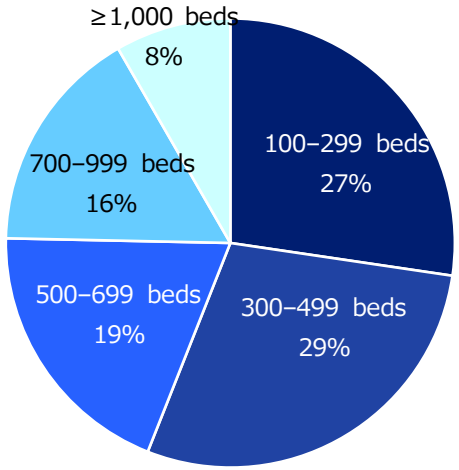
Number of beds



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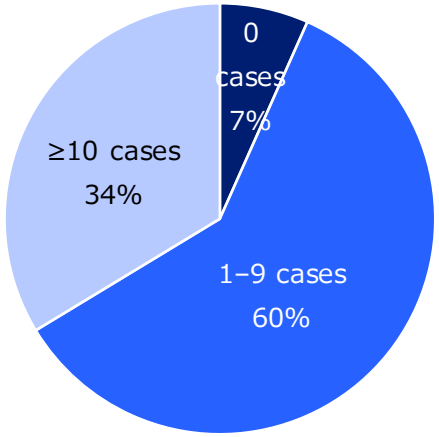
Number of AMR cases in last 1 year



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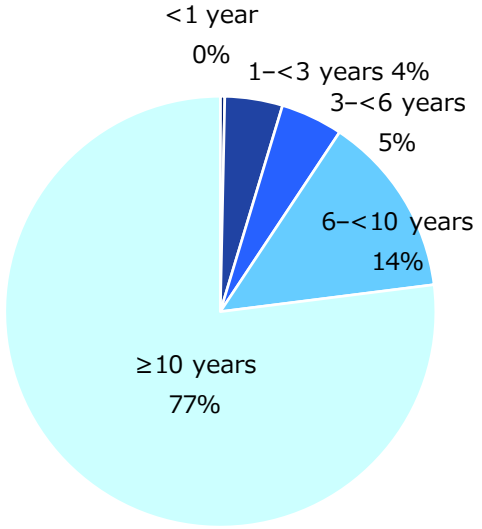
Years of clinical experience



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Summary

Summary (1)

<Situations using antimicrobials>

- **Antimicrobials were used mostly for the treatment of infection, but also used in various situations including before and after surgery, during anticancer drug therapy, immunosuppressed state, delivery, and transplant.**

<Difficulties in using antimicrobials>

- **Start of antimicrobials before identification of causative bacteria**

  Decision to broaden the spectrum of antimicrobial therapy / I often end up using antimicrobials with broad spectrum activity / appropriate drug selection / 1-week time lag before culture results / difficult to identify the cause whether infection or deterioration of tumors in some cases

- **Dealing with AMR, timing of de-escalation or switching**

  Identifying of infection route when detecting antimicrobial-resistant bacteria / dealing with patients unresponsive to antimicrobials / determination of susceptibility / appropriateness at drug selection and during long-term use

- **Many elderly patients**

  Having many super-elderly patients, prone to infection and difficult to narrow down target bacteria

- **Drug selection and dose adjustment according to underlying diseases (decreased renal/hepatic function)**

- **Drug selection for patients with a history of antimicrobial allergy**

- **Antimicrobials ineffective in the case of immunodeficiency/immunosuppressed state, surgical-wound infection or refractory infection associated with increased susceptibility to infection in diabetic patients**

  Not clear if antimicrobials are ineffective because of serious sepsis or unsusceptible bacteria / insufficient effect of antimicrobials because of immunodeficiency state / refractory or serious infection such as those caused by gas-producing bacteria in diabetic patients

- **Drug adverse reactions**

  Drug-induced hepatic/renal disorder / onset of concurrent pseudomembranous enteritis or drug rash

- **Drug adherence depending on patients' awareness**

  Dose reduction by patient's own judgement / problems with drug compliance

Summary (2)

<Difficulties in explanation when prescribing antimicrobials>

- **Need for supplementing patients' knowledge**

  Making patients understand side effects and drug-drug interaction with simple explanation / difference from antivirals / explaining antimicrobial-resistant bacteria / fact that antimicrobials may be ineffective / explaining to patients who desire antimicrobials when they don't need them / difficult to explain the choice of antimicrobial when the causative bacterium is not identified / difficult to answer to patients who just ask if the antimicrobial is potent or not potent / difficult to explain all of side effects

<Impact of AMR>

- **Nearly 70% of physicians answered there was "prolonged duration of treatment of infection" and more than 50% each cited "prolonged hospitalization" and "made it difficult to treat the patients because of lack of effective antimicrobials," indicating that AMR had significant impacts on treatment.**

- **Other answers included "caused exacerbation of primary diseases," "impact in treating other patients (e.g. schedule, therapeutic regimens)," "difficulties in explaining to patient's family," and "difficulties in hospital transfer negotiations," indicating that AMR had various impacts.**

<Coping with AMR>

- **More than half of physicians answered "definitely" or "somewhat managing to cope with AMR," while 15% "not really" or "not managing to cope with AMR."**

<Need for development of new antimicrobials>

- **Seventy percent (70%) of physicians think it is "required."**

- **Physicians raised expectations for antimicrobials which were unlikely to gain resistance to bacteria and with high selectivity. Some mentioned those against specific bacteria such as Pseudomonas aeruginosa and MRSA.**

<Solutions for development of antimicrobials>

- **The most common answer was "financial support for the research and development from the government to pharmaceutical companies" in 65% of physicians.**

Summary (3)

<Degree of recognition of National Action Plan on Antimicrobial Resistance (AMR) 2016–2020>

- Thirty-seven percent (37%) of physicians answered “I know well” or “I know,” while 30% “I don’t know.”

<Countermeasures in Action Plan that are lagging>

- The most common answer was “(Public awareness and education) Improve public awareness and understanding of AMR, and promote education and training of professionals.”

<Need for new action plan>

- Of the physicians who knew the current Action Plan, more than 90% considered that a new action plan was required.

<How we can make people consider the spread of AMR as their own issue>

- Media: TV, YouTube, newspaper, SNS, and public lecture
- Methods: Animation, lecture show, and use of influencers for making people understand
- What should we tell them?: Risk of AMR, comparison with other countries, mechanism of development of AMR, and actual condition in clinical practice

Summary (4)

<Issues in infection treatment other than lack of effective antimicrobials>

- **Patients' knowledge and health conditions**

  Misunderstanding about antimicrobials / lack of drug adherence / abuse of antibiotics/requesting for antibiotics when unnecessary / allowing for zero risk / systemic treatment such as improvement of nutrition status

- **Healthcare professionals' knowledge**

  Use of antimicrobials without reasonable cause / inconsistent use among physicians / inadequate education for infectious disease specialists / non-adherence to basic hygiene practices even in healthcare professionals

- **Test/treatment aspect**

  Determining if the infection requires treatment / identification of causative bacteria/test for rapid determination of antimicrobial susceptibility / definitive diagnosis of infection

- **Regulatory aspect and other issues**

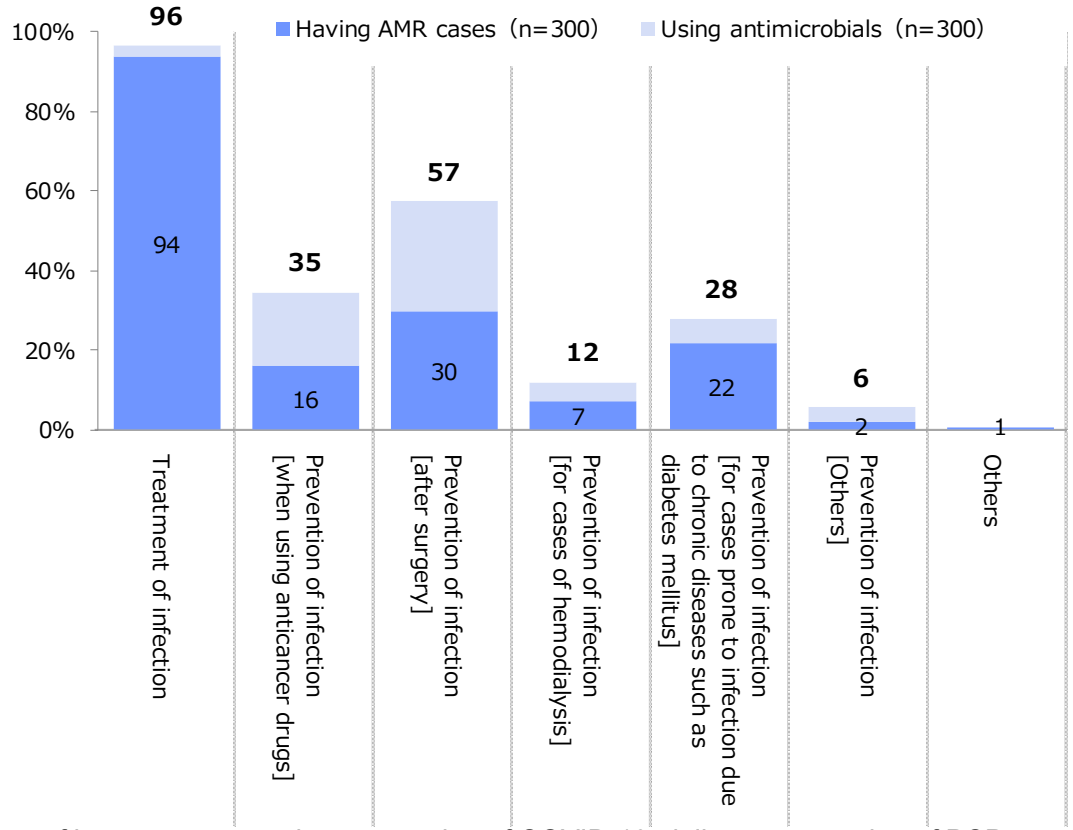
  Limitation of treatment duration in insurance system / issues on medical expenses/high drug price / sharing of AMR data / manufacturers unenthusiastic about development

Result Details

Situations using antimicrobials and encountering AMR cases

- Regarding the situations using antimicrobials, more than 90% of physicians answered “treatment of infection” and nearly 60% “prevention of infection [after surgery].”
- As for the situations encountering AMR cases, about 90% answered “treatment of infection” and 30% “prevention of infection [after surgery].”

Q1. What are your purposes to use antimicrobials?
Q3. What are the situations where you have encountered antimicrobial-resistant bacteria?



Others include: State of immune suppression, prevention of COVID-19, delivery, prevention of PCP, steroid therapy, trauma cases, endoscopic therapy, before surgery, liver transplant, dysphagia

Difficulties in using antimicrobials

- Physicians had various difficulties including start of antimicrobial treatment before identification of causative bacteria, coping with AMR, timing of de-escalation or switching, drug adjustment according to underlying diseases (deterioration of renal/hepatic function), drug selection for patients with a history of antimicrobial allergy, dose reduction made by patient's own judgement, and problems with drug compliance.

Q2-1. What difficulties have you had in explaining appropriate use of antimicrobials to patients?
Q2-2. Is there any effort you make in explaining appropriate use of antimicrobials to patients?

Difficulties
I often end up using antimicrobials with broad spectrum activity
Appropriate drug selection
Dose adjustment according to renal function
Identifying infection route when detecting antimicrobial-resistant bacteria
Dealing with patients unresponsive to antimicrobials
Not clear if antimicrobials are ineffective because of serious sepsis or unsusceptible bacteria
Drug-induced hepatic/renal disorder
Appropriateness of drug selection and long-term use
Insufficient effect of antimicrobials because of immunodeficiency
Timing of de-escalation
Onset of concurrent pseudomembranous enteritis, and onset of drug rash

Difficulties
Decision on whether or not additional antifungals should be used, and whether or not therapy should also target MRSA
How much to broaden the spectrum of initial antimicrobial therapy in possibly serious cases
Dose reduction by patient's own judgement
Problems with drug compliance
Drug selection for patients with a history of antimicrobial allergy
1-week time lag to get results of bacterial culture test
Recurrent aspiration pneumonia, multidrug-resistant Pseudomonas aeruginosa
Difficult to identify the cause whether infection or deterioration of tumors occurred
Refractory or serious infection such as those caused by gas-producing bacteria in diabetic patients
Having many super-elderly patients susceptible to infection and difficult to narrow down target bacteria

Difficulties and efforts in explaining the choice of antimicrobials

- Physicians had difficulties in giving simple explanation of side effects and drug interaction and in explaining the fact that antimicrobials might be ineffective.
- Physicians made efforts by providing thorough explanation without prompting undue anxiety and by providing explanation with plain words and illustrations.

Q2-1. What difficulties have you had in explaining appropriate use of antimicrobials to patients?
Q2-2. Is there any effort you make in explaining appropriate use of antimicrobials to patients?

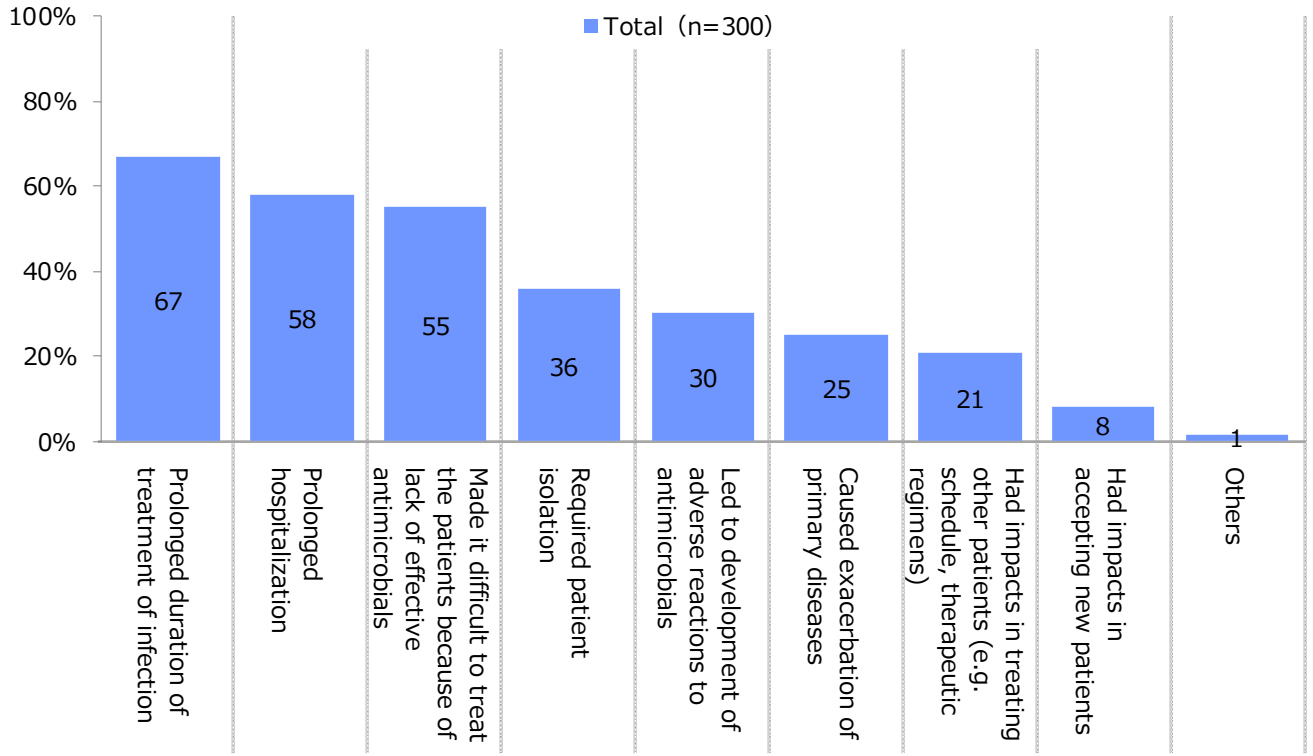
Difficulties
Making patients understand side effects and drug interaction with simple explanation
Making patients continue to take antimicrobials
Explaining the difference from antivirals
Time to determination of antimicrobial effect
Explaining antimicrobial-resistant bacteria
Explaining to patients who desire antimicrobials when they don't need them
Explaining the fact that antimicrobials might be ineffective
Explaining why antimicrobials are required or why patients have to take them for a long period even without symptoms after anticancer therapy or transplant
Difficult to explain the choice of antimicrobial when the causative bacterium is not identified
Difficult to answer to patients who just ask if the antimicrobial is potent or not potent
Difficult to explain all of side effects

Efforts
Thoroughly explaining without prompting undue anxiety
Explaining proper use and duration of use
Suggesting patients ask to pharmacists as well
Providing explanation with plain words and illustrations
Administering antimicrobials for a minimum duration
Explaining possible side effects before use
Using materials prepared by manufacturers for explanation
Explaining risk of AMR
Explaining the need of antimicrobials in detail
Carefully explaining the fact that antimicrobials may be ineffective
Explaining evidence for empiric therapy
Not to mention specific product names

Impact of AMR

- The most common impact was “prolonged duration of treatment of infection,” chosen by nearly 70% of physicians, followed by “prolonged hospitalization” and “made it difficult to treat the patients because of lack of effective antimicrobials” in more than 50% each.
- The answers other than the response alternatives included “difficulties in explaining to patient’s family” and “difficulties in hospital transfer negotiations,” indicating that AMR had various impacts.

Q4. What impact did antimicrobial-resistance have on patients, therapeutic strategies, or your institution?

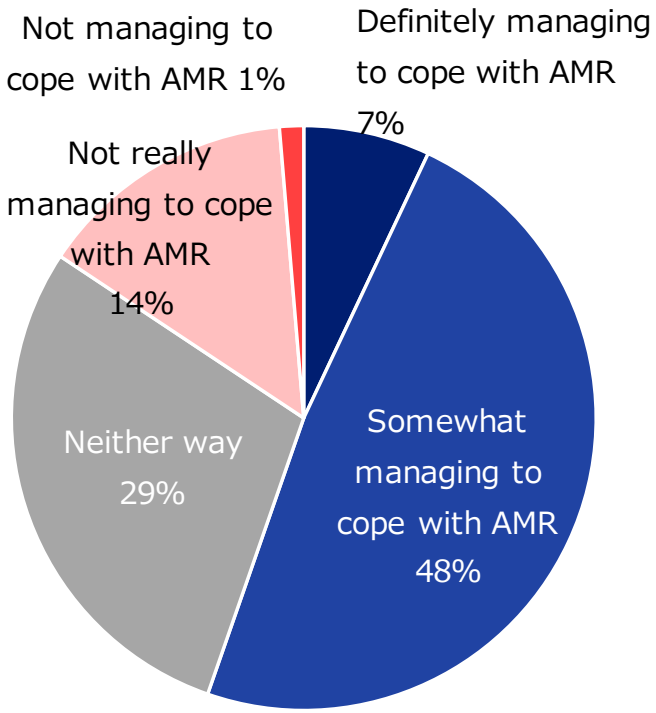


Others include: Difficulties in explaining to patient’s family, difficulties in hospital transfer negotiations, required hospital transfer

Coping with AMR

- The rate of the physicians who answered “definitely” or “somewhat managing to cope with AMR” using existing antimicrobials was 55%, while the rate of those who answered “not really” or “not managing to cope with AMR” was 15%.

Q5. Do you think that existing antimicrobials manage to cope with AMR bacteria?



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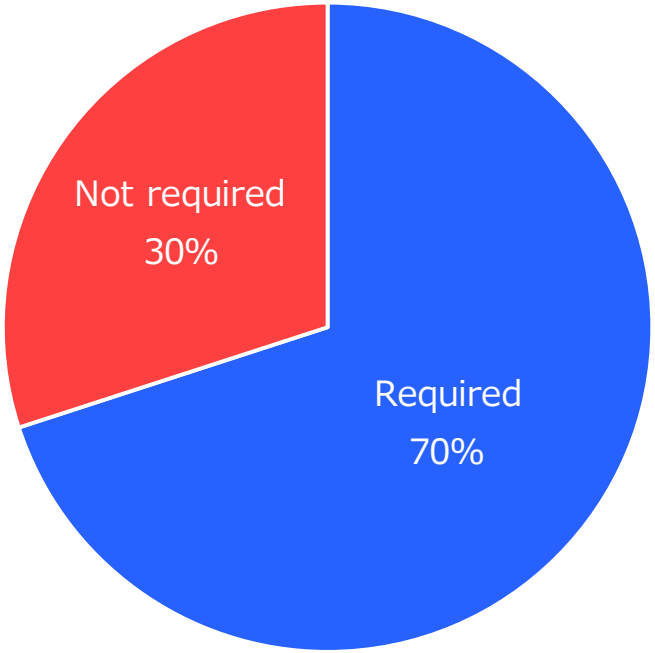
Need for development of new antimicrobials

- 70% of physicians considered that development of new antimicrobials was “required.”
- Physicians raised expectations for antimicrobials which were unlikely to gain resistance to bacteria, effective against multidrug-resistant bacteria, and with high selectivity. Some specifically mentioned those against Pseudomonas aeruginosa, MRSA, and ESBL.

Q6. Do you think that new antimicrobials should be developed to cope with antimicrobial-resistant bacteria? If yes, please indicate what kinds of antimicrobials are required?



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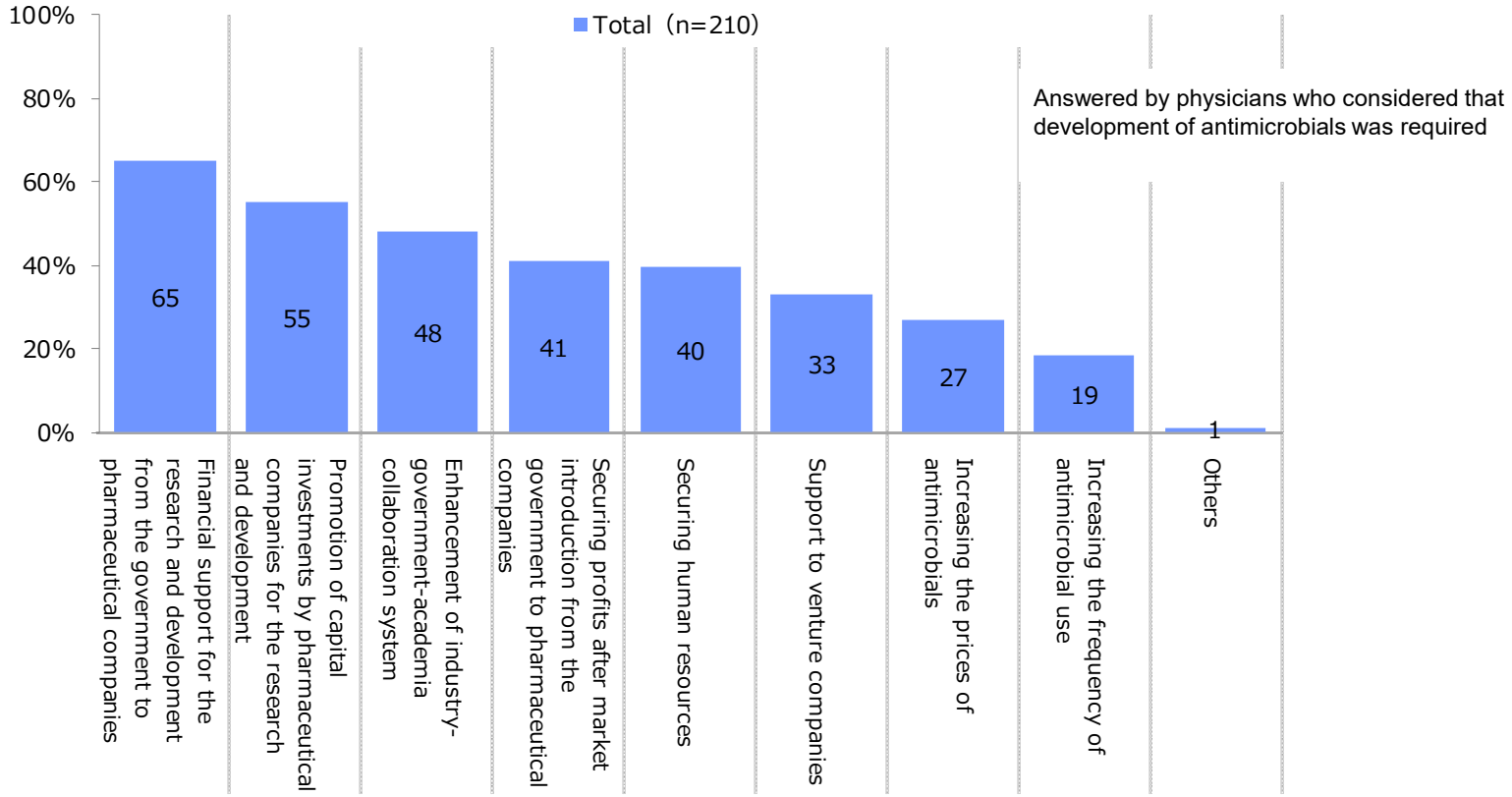
Antimicrobials required	(samples)
Unlikely to gain resistance to bacteria	41
Effective against multidrug-resistant bacteria	33
Have novel MoA	21
Have high/narrow selectivity	19
Effective against Pseudomonas aeruginosa	18
Effective against MRSA	12
Effective against enterococci	8
Effective against ESBL	6
Effective against carbapenem-resistant bacteria	6

Solutions for development of antimicrobials

- The most selected measure was “financial support for the research and development from the government to pharmaceutical companies,” in 65% of physicians.

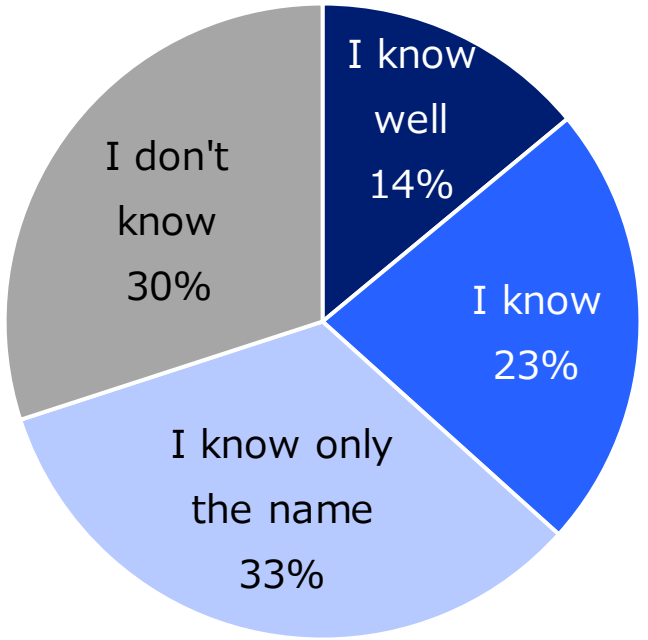
Q7. Although it is desired to develop new effective antimicrobials against antimicrobial-resistant bacteria, the development is currently not promoted because of lack of promising business prospects. What solutions do you have in mind?



Degree of recognition of National Action Plan on Antimicrobial Resistance (AMR) 2016–2020

- Regarding National Action Plan on Antimicrobial Resistance (AMR) 2016–2020, 37% of physicians answered as “I know well” or “I know,” while 30% “I don’t know.”

Q8. Do you know National Action Plan on Antimicrobial Resistance (AMR) 2016–2020?



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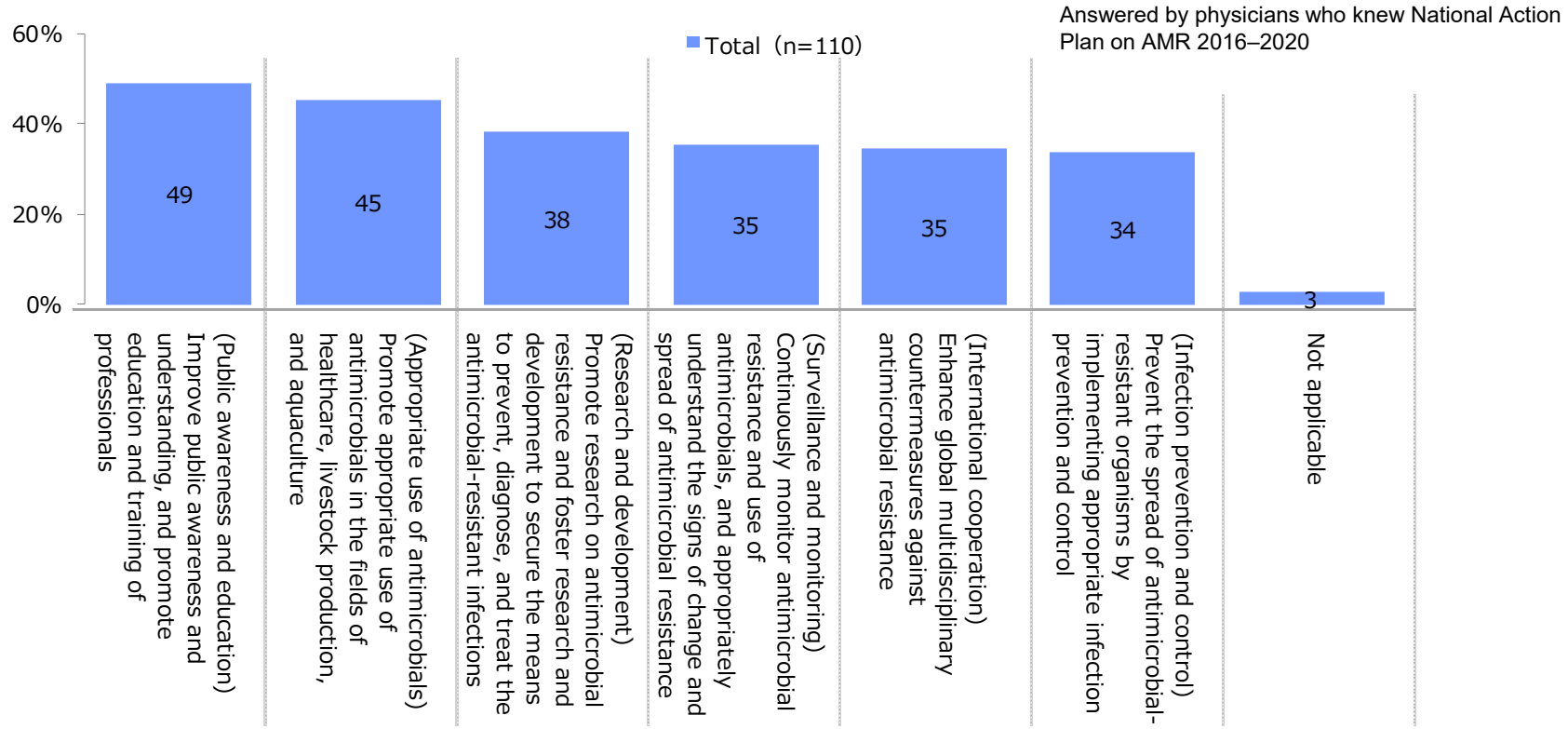
Countermeasures in Action Plan that are Lagging

- Regarding the delayed countermeasures, the most common answer was “Improve public awareness and understanding on AMR, and promote education and training of professionals” in 49% of physicians.

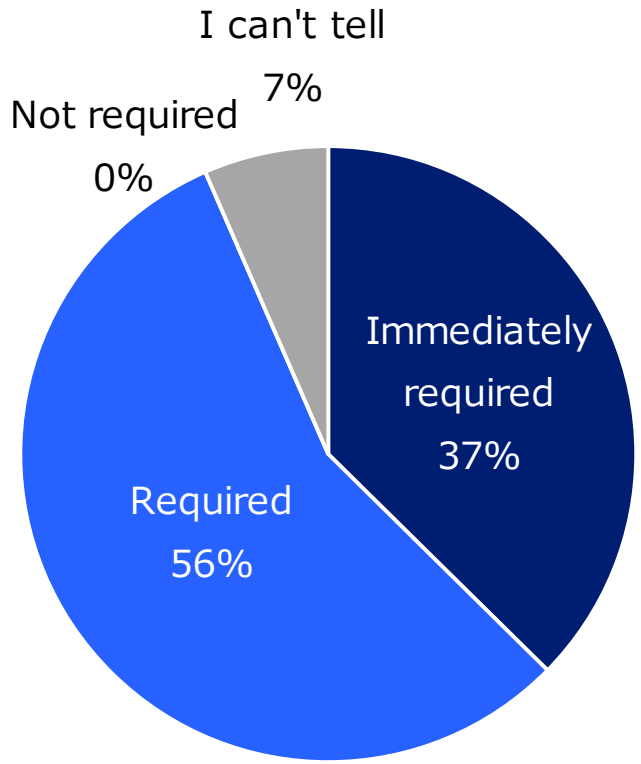
Q9. Among the 6 countermeasures described in National Action Plan on Antimicrobial Resistance (AMR) 2016–2020, which ones do you think are particularly delayed?



Need for new National Action Plan on AMR

- Of the physicians who were aware of National Action Plan on AMR 2016–2020, 93% considered that a new action plan was required.

Q10. The current Action Plan describes the plan up to 2020. Do you think that a new action plan should be prepared to accelerate the delayed countermeasures you answered in the previous question?



Answered by physicians who knew National Action Plan on AMR 2016–2020
(Excluding those who answered “not applicable” to delayed countermeasures)

n=107

How we can make people consider the spread of AMR as their own issue

- Media: TV, YouTube, newspaper, SNS, and public lecture
- Methods: Animation, lecture show, and use of influencers for making people understand
- What should we tell them?: Risk of AMR, comparison with other countries, mechanism of development of AMR, and actual condition in clinical practice

Q11. What do you think can make people consider the spread of antimicrobial-resistant bacteria as their own issue?
What explanation is effective?

Media	Methods	What should we tell them?
TV, TVCM	Animation	About risk of AMR
YouTube	Lecture show	Information leading people to think the case where their children got infected
Newspaper	Influencer	Rate of death from AMR
Internet		Fact that antibiotics are not required for common cold and minor wounds
SNS		Comparison with other countries
Leaflet, advertisement, poster		Simple explanation of mechanism of development of AMR
Public lecture, seminar		Fact that antimicrobials are ineffective for viruses
		Actual condition in clinical practice

Issues in infection treatment other than lack of effective antimicrobials

- Physicians pointed out various issues including patients' knowledge, health conditions, healthcare professionals' knowledge, test/treatment aspect, and regulatory aspect.

Q12. What issues/difficulties do you see in the treatment of infection other than lack of effective antimicrobials?

Patient side issues
Misunderstanding about antimicrobials
Lack of drug adherence
Abuse of antibiotics, requesting for antibiotics when unnecessary
Poor nutrition status
Allowing for zero risk

Physician side issues
Use of antimicrobials in excessive amount, or without reasonable cause
Inconsistent use among physicians
Inadequate education for infectious disease specialists
Non-adherence to basic hygiene practices even in healthcare professionals
Some physicians not acquiring current knowledge

Test/treatment aspect
Determining if the infection requires treatment
Identification of causative bacteria, test for rapid determination of antimicrobial susceptibility
Definitive diagnosis of infection

Regulatory aspect
Limitation of treatment duration in insurance system
Issues on medical expenses, high drug price

Others
Low domestic production of antimicrobials
Sharing of AMR data
Manufacturers unenthusiastic about development

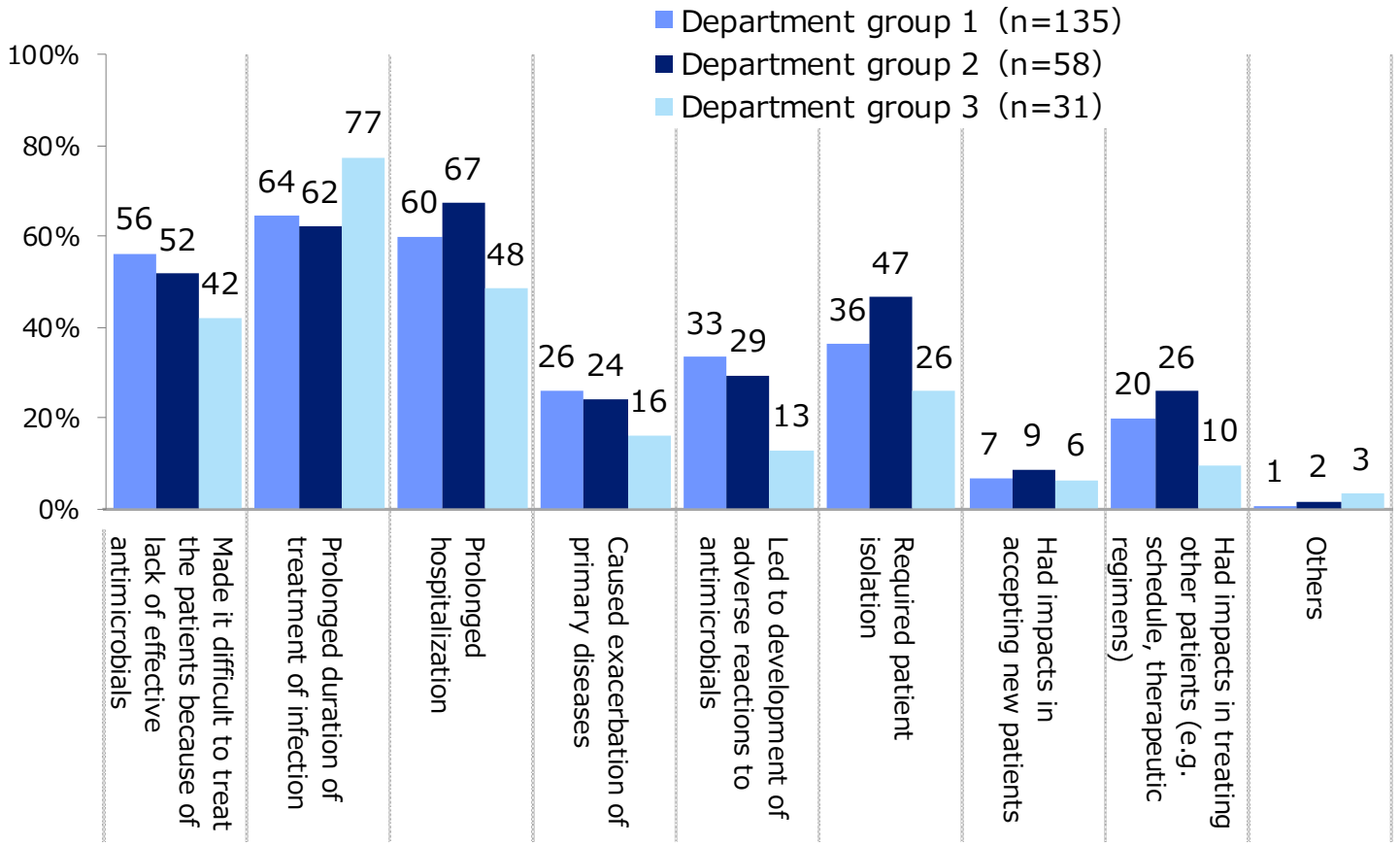
Supplemental Data

Breakdown of departments by antimicrobial use: treatment and/or prevention

Upper: Number of physicians Lower: Ratio (%)	n	Internal medicine	Respiratory medicine	Gastro-enterology	Endocrinology & metabolism /Diabetes	Nephrology	Hematology	Neurology	Medical oncology	Other internal medicine	Cardiovascular surgery	Respiratory surgery	Gastro-intestinal surgery	Neurosurgery	Pediatric surgery	Surgery	Orthopedics	Plastic surgery
Total	300	26	14	9	7	9	5	11	9	4	5	16	16	7	5	14	9	5
	100.0	8.7	4.7	3.0	2.3	3.0	1.7	3.7	3.0	1.3	1.7	5.3	5.3	2.3	1.7	4.7	3.0	1.7
For treatment (total)	289	26	14	9	7	8	5	11	9	4	5	15	14	6	5	14	8	5
	100.0	9.0	4.8	3.1	2.4	2.8	1.7	3.8	3.1	1.4	1.7	5.2	4.8	2.1	1.7	4.8	2.8	1.7
Treatment only (not for prevention)	70	13	3	2	2	1	1	5	1	2	0	1	0	0	0	1	0	0
	100.0	18.6	4.3	2.9	2.9	1.4	1.4	7.1	1.4	2.9	0.0	1.4	0.0	0.0	0.0	1.4	0.0	0.0
For prevention (total)	230	13	11	7	5	8	4	6	8	2	5	15	16	7	5	13	9	5
	100.0	5.7	4.8	3.0	2.2	3.5	1.7	2.6	3.5	0.9	2.2	6.5	7.0	3.0	2.2	5.7	3.9	2.2
Prevention only (not for treatment)	11	0	0	0	0	1	0	0	0	0	0	1	2	1	0	0	1	0
	100.0	0.0	0.0	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0	9.1	18.2	9.1	0.0	0.0	9.1	0.0
For both treatment and prevention	219	13	11	7	5	7	4	6	8	2	5	14	14	6	5	13	8	5
	100.0	5.9	5.0	3.2	2.3	3.2	1.8	2.7	3.7	0.9	2.3	6.4	6.4	2.7	2.3	5.9	3.7	2.3

Oral surgery	Other surgery	Cardiology	Allergy	Rheumatology	Geriatrics	General medicine	Pediatrics	Obstetrics & gynecology	Breast care	Ophthalmology	Otorhino-laryngology	Dermatology	Urology	Radiology	Palliative care	Emergency/ICU	Venereology	Proctology	Others
0	0	11	5	9	7	12	7	7	7	11	14	7	7	7	7	7	0	2	2
0.0	0.0	3.7	1.7	3.0	2.3	4.0	2.3	2.3	2.3	3.7	4.7	2.3	2.3	2.3	2.3	2.3	0.0	0.7	0.7
0	0	11	5	9	7	11	7	7	5	11	13	7	7	6	7	7	0	2	2
0.0	0.0	3.8	1.7	3.1	2.4	3.8	2.4	2.4	1.7	3.8	4.5	2.4	2.4	2.1	2.4	2.4	0.0	0.7	0.7
0	0	5	2	3	2	3	4	1	0	0	3	2	2	3	6	1	0	0	1
0.0	0.0	7.1	2.9	4.3	2.9	4.3	5.7	1.4	0.0	0.0	4.3	2.9	2.9	4.3	8.6	1.4	0.0	0.0	1.4
0	0	6	3	6	5	9	3	6	7	11	11	5	5	4	1	6	0	2	1
0.0	0.0	2.6	1.3	2.6	2.2	3.9	1.3	2.6	3.0	4.8	4.8	2.2	2.2	1.7	0.4	2.6	0.0	0.9	0.4
0	0	0	0	0	0	1	0	0	2	0	1	0	0	1	0	0	0	0	0
0.0	0.0	0.0	0.0	0.0	0.0	9.1	0.0	0.0	18.2	0.0	9.1	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0
0	0	6	3	6	5	8	3	6	5	11	10	5	5	3	1	6	0	2	1
0.0	0.0	2.7	1.4	2.7	2.3	3.7	1.4	2.7	2.3	5.0	4.6	2.3	2.3	1.4	0.5	2.7	0.0	0.9	0.5

Impact of AMR by department



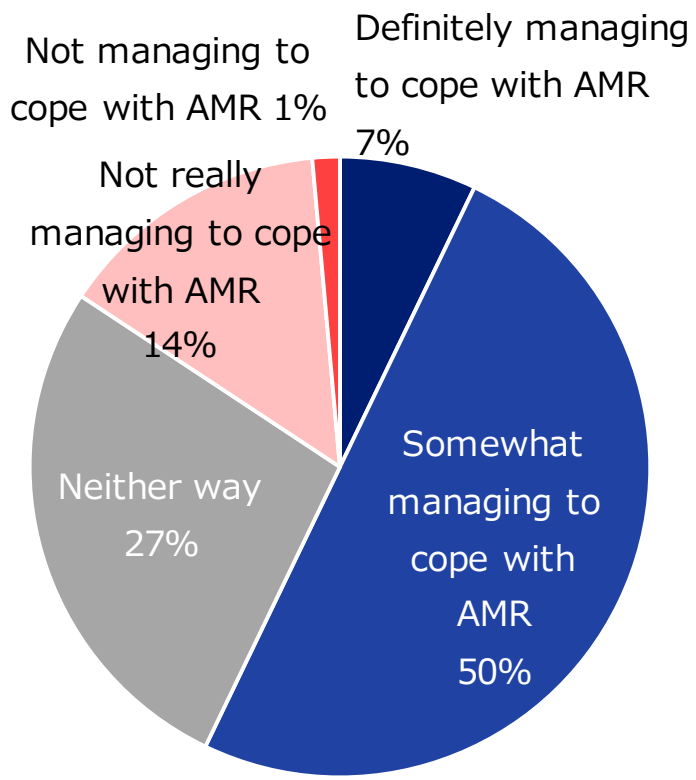
Department group 1 (internal medicine): Internal medicine, respiratory medicine, gastroenterology, endocrinology & metabolism/diabetes, nephrology, hematology, neurology, medical oncology, other internal medicine, cardiology, rheumatology, geriatrics, urology, palliative care

Department group 2 (surgery): Cardiovascular surgery, respiratory surgery, gastrointestinal surgery, neurosurgery, surgery

Department group 3 (pediatric care): Pediatric surgery, allergy, pediatrics, otorhinolaryngology

AMR experience

Having AMR cases in the past 1 year



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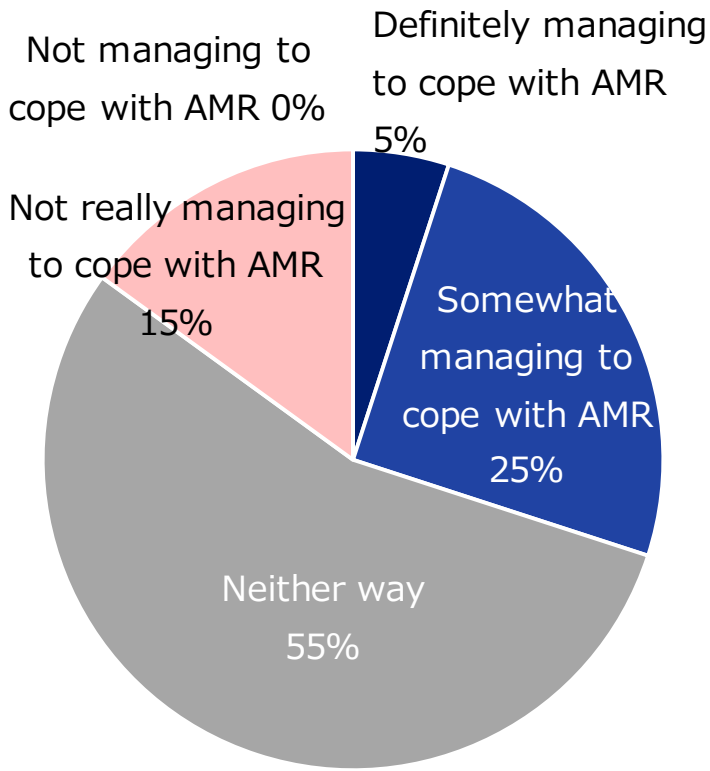
Having no AMR cases in the past 1 year



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