

AMR Alliance Japan

Awareness Survey on Reforming Existing Systems to Achieve Sustainable
Antimicrobial Resistance (AMR) Countermeasures:
Looking Beyond the COVID-19 Pandemic
【Overall result】

【Survey overview】

Objectives : To clarify the gap between the awareness of the issue in the field and the related policy by identifying the attitudes of medical professionals (physicians, pharmacists and medical technologists) engaged in infectious disease care toward the Drug Development and Testing system.

Research period : November 1st 2022 ~ November 14th 2022

Subjects : Physicians / Pharmacists / Medical Technologists of eligible society officers and members

Method : Email and website posting

Number of responses : 391 (Physicians 72、Pharmacists 72、 Medical Technologists 247)

※Please note that freeform responses are excluded from this short survey analysis and will be published separately at a later date.

1. Please tell us your occupation

Options	n = 391	n (%)
Physician		72 (18.4%)
Medical Technologist		247 (63.2%)
Pharmacist		72 (18.4%)

1-1. For those who selected “Physician,” please share your main field of specialty.

Options	n = 72	n (%)
Infectious Diseases		14 (19.4%)
Internal Medicine		11 (15.3%)
Pediatrics, Pediatric Infectious Diseases, Neonatology		10 (13.9%)
Respiratory Medicine		9 (12.5%)
General Medicine		5 (6.9%)
Urology		3 (4.2%)
Hematology		3 (4.2%)
Surgery		2 (2.8%)
Laboratory Medicine		2 (2.8%)
Dentistry		2 (2.8%)
Public Health and Occupational Medicine		2 (2.8%)
Respiratory Medicine and Respiratory Infectious Diseases		2 (2.8%)
Rheumatology		1 (1.4%)
Rehabilitation Medicine		1 (1.4%)

1-1. The following question is for respondents who selected “Physician,” please share your main field of specialty.

Options	n = 72	n (%)
Cardiovascular Internal Medicine		1 (1.4%)
Emergency Care		1 (1.4%)
Geriatrics		1 (1.4%)
Nephrology		1 (1.4%)
Dialysis		1 (1.4%)

1-2. The following question is for respondents who selected “clinical laboratory technician.” Please select all the tests you perform. (Select all that apply)

Options	n=247	n (%)
Microbiological tests		138 (55.9%)
Immunological tests		68 (27.5%)
Hematological test		85 (34.4%)
Pathological tests		15 (6.1%)
Biochemical tests		93 (37.7%)
General tests (urine, stool, etc.)		90 (36.4%)
Gene-related tests, chromosome tests		61 (24.7%)
N/A		24 (9.7%)

1-3. The following question is for respondents who selected “pharmacist.” Do you possess a recognized specialty certification in infectious disease control (including “Board Certified Infection Control Pharmacy Specialist” or “Board Certified Pharmacist in Infection Control” from the Japanese Society of Hospital Pharmacists (JSHP); “Antimicrobial Chemotherapy Pharmacist” from the Japanese Society of Chemotherapy; “Infection Control Doctor” from the ICD System Council, etc.)?

Options	n=72	n (%)
Yes		51 (70.8%)
No		21 (29.2%)

1-4. Please share how many years you have served in the role you selected.

	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
Years of experience (mean±SD)	26 year (±10 years)	20 years (±11years)	18 years (±9years)

2. Please select the type of healthcare facility that is your main affiliation.

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
Clinic or medical office	7 (9.7%)	8 (3.2%)	0 (0.0%)
Hospital (other than university hospital) 20 to 399 care beds	29 (40.3%)	158 (64.0%)	30 (41.7%)
Hospital (other than university hospital) 400 or more care beds	14 (19.4%)	55 (22.3%)	23 (31.9%)
University hospital or research institution	20 (27.8%)	18 (7.3%)	14 (19.4%)
Health insurance pharmacy	0 (0.0%)	0 (0.0%)	2 (2.8%)
Other	2 (2.8%)	8 (3.2%)	3 (4.2%)

3. Please share the postal code of your main affiliated institution. (This will be used for screening in order to avoid gathering multiple responses from the same institutions. It will not be used to identify any individual or to contact your affiliated institution, nor will it be presented publicly or be used for any other purpose.)

→excluded

4. Were the antimicrobial shortages that occurred starting in March 2019 an obstacle for your everyday activities?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
Yes	36 (50.0%)	68 (27.5%)	53 (73.6%)
No	36 (50.0%)	179 (72.5%)	19 (26.4%)

5. As of 2020, the prices assigned to antimicrobials designated as “Key Drugs” (which are essential pharmaceuticals for treating infectious diseases) by the Japanese Society of Chemotherapy, the Japanese Association for Infectious Diseases, the Japanese Society for Clinical Microbiology, and the Japanese Society for Infection Prevention and Control were as follows. Do you think that the prices currently assigned to antimicrobials are appropriate overall?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
They are extremely high	1 (1.4%)	2 (0.8%)	1 (1.4%)
They are high	3 (4.2%)	63 (25.5%)	9 (12.5%)
They are appropriate	29 (40.3%)	155 (62.8%)	14 (19.4%)
They are low	33 (45.8%)	26 (10.5%)	30 (41.7%)
They are extremely low	6 (8.3%)	1 (0.4%)	18 (25.0%)

Key drug list :

	Units	NHI price (Original product)	NHI price (generics)
Benzylpenicillin	200,000 units	-	234 yen
	1,000,000 units	-	323 yen
Ampicillin / Sulbactam	0.75g	407 yen	315 yen
	1.5g	522 yen	422 yen
	3g	656 yen	518 yen
Tazobactam / piperacillin	2.25g	1079 yen	591 yen
	4.5g	1434 yen	883 yen
Cefazolin	250mg	230 yen	230 yen
	500mg	234 yen	234 yen
	1g	263 yen	263 yen
	2g	444 yen	356 yen
Cefmetazole	250mg	185 yen	180 yen
	500mg	271 yen	271 yen
	1g	441 yen	441 yen
	2g	836 yen	740 yen
Ceftriaxone	500mg	343 yen	239 yen
	1g	380 yen	250 yen
Cefepim	500mg	432 yen	369 yen
	1g	415 yen	395 yen
Meropenem	250mg	622 yen	391 yen
	500mg	691 yen	487 yen
	1g	-	863 yen
Levofloxacin	500mg/20mL	3556 yen	1946 yen
	500mg/100mL (kit)	3659 yen	1431 yen
Vancomycin	0.5g	1022 yen	681 yen
	1g	-	834 yen

6. In the future, do you think it will be necessary to assign higher prices to antimicrobials in order to create an environment in which they can be used in a stable manner?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
I think it will be necessary	39 (54.2%)	58 (23.5%)	47 (65.3%)
I think measures other than increasing the prices assigned to antimicrobials will be necessary	33 (45.8%)	189 (76.5%)	25 (34.7%)

7. Did you know that several major pharmaceutical companies have withdrawn from the antimicrobial market due to poor revenue outlook or that certain companies in the U.S. declared bankruptcy, even when their products cost 100,000 yen or more per dose?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
Yes	42 (58.3%)	67 (27.1%)	42 (58.3%)
No	30 (41.7%)	180 (72.9%)	30 (41.7%)

8. Did you know that countries like the U.K. and Sweden have launched pilot programs aiming to create new incentives for antimicrobial development?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
I knew that	13 (18.1%)	12 (4.9%)	16 (22.2%)
I did not know that	59 (81.9%)	235 (95.1%)	56 (77.8%)

9. There are currently discussions being held on the need to establish a pull incentive system in Japan that delinks the volume of antimicrobials sold and the profits from their sales to optimize the antimicrobial business while ensuring access. Do you think such a system is necessary in Japan?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
It is necessary	48 (66.7%)	77 (31.2%)	45 (62.5%)
It is unnecessary	2 (2.8%)	4 (1.6%)	1 (1.4%)
I don't know	22 (30.6%)	166 (67.2%)	26 (36.1%)

10. The budgetary requests from the Ministry of Health, Labor and Welfare (MHLW) for FY2023 include a request for 1.8 billion yen for introducing a pull incentive called the "income compensation system" on a trial basis. What do you think about this amount? (Reference: In the U.K., where a pull incentive system has already been introduced, the amount provided as an incentive is 10 million pounds per drug per year (which, at 160 yen per pound, amounts to 1.6 billion yen) over ten years.)

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
It is very high	3 (4.2%)	12 (4.9%)	1 (1.4%)
It is high	10 (13.9%)	56 (22.7%)	3 (4.2%)
It is appropriate	22 (30.6%)	116 (47.0%)	25 (34.7%)
It is low	27 (37.5%)	54 (21.9%)	32 (44.4%)
It is very low	10 (13.9%)	9 (3.6%)	11 (15.3%)

11. A group called the AMED Drug Discovery Promotion Review Committee (which includes the Japan Agency for Medical Research and Development (AMED), the President of the Japanese Association for Infectious Diseases, the President of the Japanese Society of Chemotherapy, and members of the Japan Pharmaceutical Manufacturers Association (JPMA)) created the “List of Target Pathogens for AMR Drug Discovery Research (2021 version).” Are there any AMR bacteria included on that list that you have found difficult to treat? Also, have you encountered any infections caused by AMR bacteria that are not on the list but were difficult to treat?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
MDR <i>Acinetobacter</i>	18 (25.0%)	56 (22.7%)	15 (20.8%)
MDR <i>Pseudomonas aeruginosa</i>	49 (68.1%)	138 (55.9%)	43 (59.7%)
Carbapenem-R <i>Enterobacterales</i>	26 (36.1%)	53 (21.5%)	13 (18.1%)
Ceph-R (ESBL+) <i>Enterobacterales</i>	25 (34.7%)	58 (23.5%)	27 (37.5%)
Drug-R <i>Neisseria gonorrhoeae</i>	4 (5.6%)	5 (2.0%)	1 (1.4%)
MDR/XDR <i>Mycobacterium tuberculosis</i>	8 (11.1%)	32 (13.0%)	9 (12.5%)
Nontuberculous Mycobacterium (NTM)	29 (40.3%)	43 (17.4%)	16 (22.2%)
<i>Clostridioides difficile</i>	25 (34.7%)	47 (19.0%)	28 (38.9%)
Vancomycin-R <i>Enterococci</i> (VRE)	9 (12.5%)	20 (8.1%)	11 (15.3%)
Methicillin-R <i>Staphylococcus aureus</i> (MRSA)	34 (47.2%)	73 (29.6%)	41 (56.9%)
Vancomycin-R <i>Staphylococcus aureus</i>	5 (6.9%)	11 (4.5%)	6 (8.3%)
Penicillin non-susceptible <i>Streptococcus pneumoniae</i> (PNSP)	7 (9.7%)	11 (4.5%)	3 (4.2%)
Drug-R <i>Mycoplasma genitalium</i>	4 (5.6%)	2 (0.8%)	1 (1.4%)
<i>Candida auris</i>	0 (0.0%)	7 (2.8%)	2 (2.8%)
Drug-R <i>Candida</i>	7 (9.7%)	15 (6.1%)	8 (11.1%)
Azole-R <i>Aspergillus fumigatus</i>	4 (5.6%)	7 (2.8%)	3 (4.2%)
Drug-R <i>Helicobacter pylori</i>	6 (8.3%)	10 (4.0%)	3 (4.2%)
Multi-drug resistant <i>Bacteroides fragilis</i>	5 (6.9%)	3 (1.2%)	1 (1.4%)
Drug-R <i>Campylobacter</i>	1 (1.4%)	3 (1.2%)	2 (2.8%)
Drug-R <i>Salmonella</i>	2 (2.8%)	4 (1.6%)	1 (1.4%)
Fluoroquinolone-resistant <i>Shigella</i>	1 (1.4%)	1 (0.4%)	1 (1.4%)
β – lactamase-nonproducing ampicillin resistant <i>Haemophilus influenzae</i> (BLNAR)	15 (20.8%)	12 (4.9%)	8 (11.1%)
Erythromycin-R group A <i>Streptococcus</i>	0 (0.0%)	3 (1.2%)	5 (6.9%)
Erythromycin-R group A <i>Streptococcus</i>	1 (1.4%)	4 (1.6%)	2 (2.8%)
AMR bacteria not on list	4 (5.6%)	21 (8.5%)	4 (5.6%)

12. Please tell us if the facility you are affiliated with receives medical fee reimbursements for implementing infection control measures.

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
Premium for enhancing infection prevention countermeasures I	38 (52.8%)	118 (47.8%)	47 (65.3%)
Premium for enhancing infection prevention countermeasures II	13 (18.1%)	35 (14.2%)	8 (11.1%)
Premium for enhancing infection prevention countermeasures III	6 (8.3%)	32 (13.0%)	6 (8.3%)
Premium for enhancing outpatient infection prevention measures	1 (1.4%)	5 (2.0%)	0 (0.0%)
Application pending	0 (0.0%)	1 (0.4%)	0 (0.0%)
Reimbursement was eliminated in the FY2022 revision	0 (0.0%)	4 (1.6%)	0 (0.0%)
Unknown	5 (6.9%)	31 (12.6%)	5 (6.9%)
N/A	9 (12.5%)	21 (8.5%)	6 (8.3%)

13. Are current medical fee reimbursements sufficient to cover the costs of infection control measures for AMR bacteria?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
They are sufficient	23 (31.9%)	143 (57.9%)	33 (45.8%)
They are insufficient	49 (68.1%)	104 (42.1%)	39 (54.2%)

14. To build or maintain systems for detecting and monitoring AMR bacteria, which of the following items does your institution require the most?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
Tighten standards for calculating infection control reimbursements (such as by clarifying full-time staff in writing)	21 (29.2%)	80 (32.4%)	36 (50.0%)
Increase the number of microbiology technicians on staff	28 (38.9%)	75 (30.4%)	16 (22.2%)
Expand testing equipment	8 (11.1%)	37 (15.0%)	6 (8.3%)
Other	7 (9.7%)	18 (7.3%)	5 (6.9%)
N/A	8 (11.1%)	37 (15.0%)	9 (12.5%)

15. Does your facility conduct its own nucleic acid amplification testing?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
Yes	50 (69.4%)	198 (80.2%)	55 (76.4%)
No (It is outsourced)	14 (19.4%)	34 (13.8%)	5 (6.9%)
No (It is not conducted)	7 (9.7%)	11 (4.5%)	4 (5.6%)
I don't know	1 (1.4%)	4 (1.6%)	8 (11.1%)

16. Since December 2019, has your institution made any investments to improve its testing infrastructure to respond to COVID-19 (by purchasing more NAAT equipment, hiring more clinical technologists, etc.)?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
It has	60 (83.3%)	210 (85.0%)	58 (80.6%)
It has not	9 (12.5%)	28 (11.3%)	4 (5.6%)
I don't know	3 (4.2%)	9 (3.6%)	10 (13.9%)

17. For those who answered "Yes," please share the source of the investment.

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
Subsidies	22 (36.7%)	100 (47.6%)	21 (36.2%)
Self-funded	2 (3.3%)	18 (8.6%)	3 (5.2%)
Both	28 (46.7%)	76 (36.2%)	26 (44.8%)
I don't know	8 (13.3%)	16 (7.6%)	8 (13.8%)

18. For those who answered "Yes," please share how the investments were used.

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
Purchase of stand-alone testing equipment for the sole purpose of COVID-19	37 (51.4%)	126 (51.0%)	25 (34.7%)
Purchase of multipurpose NAAT devices (COVID-19 and influenza, etc.)	32 (44.4%)	110 (44.5%)	18 (25.0%)
Purchase of multi-parameter NAAT devices (multiplex PCR)	21 (29.2%)	44 (17.8%)	17 (23.6%)
Increasing the number of Medical Technologists on staff	8 (11.1%)	30 (12.1%)	3 (4.2%)
Other	2 (2.8%)	22 (8.9%)	2 (2.8%)
I don't know	6 (8.3%)	2 (0.8%)	13 (18.1%)

19. Please tell us how frequently each NAAT device at your facility was used to test for COVID-19 over the past four months.

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
25 or more samples per day	25 (34.7%)	56 (22.7%)	16 (22.2%)
12 to 24 samples per day	8 (11.1%)	48 (19.4%)	8 (11.1%)
1 to 11 samples per day	14 (19.4%)	71 (28.7%)	11 (15.3%)
4 to 6 samples per week	4 (5.6%)	21 (8.5%)	2 (2.8%)
1 to 3 samples per week	1 (1.4%)	0 (0.0%)	0 (0.0%)
1 to 4 samples per month	1 (1.4%)	8 (3.2%)	0 (0.0%)
0 to 3 samples per month	0 (0.0%)	0 (0.0%)	0 (0.0%)
I don't know	9 (12.5%)	8 (3.2%)	31 (43.1%)
Testing is not conducted	10 (13.9%)	35 (14.2%)	4 (5.6%)

20. Is your facility using that infrastructure to test for infectious diseases other than COVID-19?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
Yes	27 (37.5%)	85 (34.4%)	20 (27.8%)
No	33 (45.8%)	129 (52.2%)	20 (27.8%)
I don't know	12 (16.7%)	33 (13.4%)	32 (44.4%)

21. In the future, if the number of tests your facility conducts for COVID-19 decreases, are there plans to use the NAAT devices for AMR control?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
Yes	15 (20.8%)	47 (19.0%)	14 (19.4%)
It is unclear	57 (79.2%)	200 (81.0%)	58 (80.6%)

22. Are there any tests you would like to see introduced in the future that utilize NAAT devices for AMR control?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
Yes	23 (31.9%)	53 (21.5%)	14 (19.4%)
None in particular	49 (68.1%)	194 (78.5%)	58 (80.6%)

23. Do you think establishing a system utilizing NAATs for rapid antibiotic susceptibility testing (AST) will contribute to antimicrobial stewardship?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
I think it will	54 (75.0%)	162 (65.6%)	57 (79.2%)
I don't think it will	4 (5.6%)	17 (6.9%)	4 (5.6%)
I don't know	14 (19.4%)	68 (27.5%)	11 (15.3%)

24. Are results from rapid tests performed at your facility being reported to the clinic smoothly?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
They are	58 (80.6%)	223 (90.3%)	52 (72.2%)
They are not	3 (4.2%)	4 (1.6%)	8 (11.1%)
I don't know	11 (15.3%)	20 (8.1%)	12 (16.7%)

25. Do you think establishing a system utilizing NAATs for rapid AMR bacteria testing will contribute to decreasing the number of AMR infections?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
I think it will	51 (70.8%)	135 (54.7%)	50 (69.4%)
I don't think it will	8 (11.1%)	32 (13.0%)	5 (6.9%)
I think we already have effective testing methods	0 (0.0%)	0 (0.0%)	0 (0.0%)
I don't know	13 (18.1%)	80 (32.4%)	17 (23.6%)

26. Regarding NAAT-based systems currently in use at your facility, is there anything that you are dissatisfied with or find concerning?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
Yes	33 (45.8%)	86 (34.8%)	17 (23.6%)
No	39 (54.2%)	161 (65.2%)	55 (76.4%)

27. (For those who answered "Yes") If possible, please tell us about the main problem that concerns you.

→Free-form responses will be published later.

28. Does your facility utilize NAATs to conduct active surveillance for AMR bacteria?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
Active surveillance is effective, so we do	9 (12.5%)	14 (5.7%)	9 (12.5%)
Active surveillance is effective, so we are conducting it with a method that does not utilize NAATs	6 (8.3%)	19 (7.7%)	1 (1.4%)
I think active surveillance is effective and would like to conduct it, but cannot	26 (36.1%)	47 (19.0%)	23 (31.9%)
I do not think active surveillance is effective	9 (12.5%)	17 (6.9%)	1 (1.4%)
I do not know about active surveillance	22 (30.6%)	150 (60.7%)	38 (52.8%)

Did you know that NAATs are not suitable for detecting AMR organisms for certain types of infections (endemic fungi, asymptomatic bacteriuria, etc.)?

Options	Physicians, n = 72	Medical Technologists n = 247	Pharmacists, n = 72
Yes	49 (68.1%)	129 (52.2%)	33 (45.8%)
No	23 (31.9%)	118 (47.8%)	39 (54.2%)

About Health and Global Policy Institute

Health and Global Policy Institute (HGPI) is a non-profit, independent, non-partisan health policy think tank established in 2004. In its capacity as a neutral think-tank, HGPI involves stakeholders from wide-ranging fields of expertise to provide policy options to the public to successfully create citizen-focused healthcare policies. Looking to the future, HGPI produces novel ideas and values from a standpoint that offers a wide perspective. It aims to realize a healthy and fair society while holding fast to its independence to avoid being bound to the specific interests of political parties and other organizations. HGPI intends for its policy options to be effective not only in Japan, but also in the wider world, and in this vein the institute will continue to be very active in creating policies for resolving global health challenges. HGPI’s activities have received global recognition. It was ranked second in the “Domestic Health Policy Think Tanks” category and third in the “Global Health Policy Think Tanks” category in the Global Go To Think Tank Index Report presented by the University of Pennsylvania (as of January 2021, the most recent report).

About AMR Alliance Japan

AMR Alliance Japan was established in November 2018 as a multi-stakeholder, collaborative organization dedicated to the improvement of public health through the promotion of AMR countermeasures. As of March 2023, its members include MSD K.K., The Children and Healthcare Project, Shionogi & Co., Ltd., Sumitomo Pharma Co., Ltd., The Japanese Society of Antimicrobials for Animals, NISSUI Pharmaceutical Co., Ltd., Nippon Becton Dickinson Co., Ltd., The Japan Medical Association, The Japanese Society for Medical Mycology, The Japanese Society of Pharmaceutical Health Care and Sciences, The Japanese Society of Chemotherapy, The Japanese Society for Infection Prevention and Control, The Japanese Association for Infectious Diseases, The Japanese Society for Pediatric Infectious Diseases, The Japan Pharmaceutical Manufacturers Association, The Japanese Society of Therapeutic Drug Monitoring, The Japan Society of Hospital Pharmacists, The Pharmaceutical Society of Japan, The Japan Pharmaceutical Association, The Japanese Society for Clinical Microbiology, bioMérieux Japan Ltd., Himeji City, Pfizer Japan Inc., and Meiji Seika Pharma Co., Ltd. Health and Global Policy Institute (HGPI) serves as its secretariat.