

Evaluation of antimicrobial resistance governance across 193 countries to inform the 2026 Global Action Plan update

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Table S1. 193 countries included in this study

No.	ISO3	Name	WHO region
1	AFG	Afghanistan	Eastern Mediterranean region
2	AGO	Angola	African region
3	ALB	Albania	European region
4	AND	Andorra	European region
5	ARE	United Arab Emirates	Eastern Mediterranean region
6	ARG	Argentina	Region of the Americas
7	ARM	Armenia	European region
8	ATG	Antigua and Barbuda	Region of the Americas
9	AUS	Australia	Western Pacific region
10	AUT	Austria	European region
11	AZE	Azerbaijan	European region
12	BDI	Burundi	African region
13	BEL	Belgium	European region
14	BEN	Benin	African region
15	BFA	Burkina Faso	African region
16	BGD	Bangladesh	South-East Asia region
17	BGR	Bulgaria	European region
18	BHR	Bahrain	Eastern Mediterranean region
19	BHS	Bahamas	Region of the Americas
20	BLR	Belarus	European region
21	BLZ	Belize	Region of the Americas
22	BMU	Bermuda	*Classified under Region of the Americas when analyzing
23	BOL	Bolivia	Region of the Americas
24	BRA	Brazil	Region of the Americas
25	BRB	Barbados	Region of the Americas
26	BRN	Brunei Darussalam	Western Pacific region
27	BTN	Bhutan	South-East Asia region
28	BWA	Botswana	African region
29	CAF	Central African Republic	African region
30	CAN	Canada	Region of the Americas
31	CHE	Switzerland	European region
32	CHL	Chile	Region of the Americas
33	CHN	China	Western Pacific region
34	CIV	Cote d'Ivoire	African region
35	CMR	Cameroon	African region
36	COD	Dem. Rep. Congo	African region
37	COG	Republic of Congo	African region
38	COK	Cook Islands	Western Pacific region
39	COL	Colombia	Region of the Americas
40	COM	Comoros	African region
41	CPV	Cabo Verde	African region
42	CRI	Costa Rica	Region of the Americas
43	CUB	Cuba	Region of the Americas

44	CYP	Cyprus	European region
45	CZE	Czech Republic	European region
46	DEU	Germany	European region
47	DJI	Djibouti	Eastern Mediterranean region
48	DMA	Dominica	Region of the Americas
49	DNK	Denmark	European region
50	DOM	Dominican Republic	Region of the Americas
51	DZA	Algeria	African region
52	ECU	Ecuador	Region of the Americas
53	EGY	Egypt	Eastern Mediterranean region
54	ERI	Eritrea	African region
55	ESP	Spain	European region
56	EST	Estonia	European region
57	ETH	Ethiopia	African region
58	FIN	Finland	European region
59	FJI	Fiji	Western Pacific region
60	FRA	France	European region
61	FSM	Micronesia	Western Pacific region
62	GAB	Gabon	African region
63	GBR	United Kingdom	European region
64	GEO	Georgia	European region
65	GHA	Ghana	African region
66	GIN	Guinea	African region
67	GMB	Gambia	African region
68	GNB	Guinea-Bissau	African region
69	GNQ	Equatorial Guinea	African region
70	GRC	Greece	European region
71	GRD	Grenada	Region of the Americas
72	GTM	Guatemala	Region of the Americas
73	GUY	Guyana	Region of the Americas
74	HND	Honduras	Region of the Americas
75	HRV	Croatia	European region
76	HTI	Haiti	Region of the Americas
77	HUN	Hungary	European region
78	IDN	Indonesia	South-East Asia region
79	IND	India	South-East Asia region
80	IRL	Ireland	European region
81	IRN	Iran	Eastern Mediterranean region
82	IRQ	Iraq	Eastern Mediterranean region
83	ISL	Iceland	European region
84	ISR	Israel	European region
85	ITA	Italy	European region
86	JAM	Jamaica	Region of the Americas
87	JOR	Jordan	Eastern Mediterranean region
88	JPN	Japan	Western Pacific region

89	KAZ	Kazakhstan	European region
90	KEN	Kenya	African region
91	KGZ	Kyrgyzstan	European region
92	KHM	Cambodia	Western Pacific region
93	KNA	Saint Kitts and Nevis	Region of the Americas
94	KOR	South Korea	Western Pacific region
95	KWT	Kuwait	Eastern Mediterranean region
96	LAO	Laos	Western Pacific region
97	LBN	Lebanon	Eastern Mediterranean region
98	LBR	Liberia	African region
99	LBY	Libya	Eastern Mediterranean region
100	LCA	Saint Lucia	Region of the Americas
101	LKA	Sri Lanka	South-East Asia region
102	LSO	Lesotho	African region
103	LTU	Lithuania	European region
104	LUX	Luxembourg	European region
105	LVA	Latvia	European region
106	MAR	Morocco	Eastern Mediterranean region
107	MCO	Monaco	European region
108	MDA	Moldova	European region
109	MDG	Madagascar	African region
110	MDV	Maldives	South-East Asia region
111	MEX	Mexico	Region of the Americas
112	MHL	Marshall Islands	Western Pacific region
113	MKD	North Macedonia	European region
114	MLI	Mali	African region
115	MLT	Malta	European region
116	MMR	Myanmar	South-East Asia region
117	MNE	Montenegro	European region
118	MNG	Mongolia	Western Pacific region
119	MOZ	Mozambique	African region
120	MRT	Mauritania	African region
121	MUS	Mauritius	African region
122	MWI	Malawi	African region
123	MYS	Malaysia	Western Pacific region
124	NAM	Namibia	African region
125	NER	Niger	African region
126	NGA	Nigeria	African region
127	NIC	Nicaragua	Region of the Americas
128	NLD	Netherlands	European region
129	NOR	Norway	European region
130	NPL	Nepal	South-East Asia region
131	NRU	Nauru	Western Pacific region
132	NZL	New Zealand	Western Pacific region
133	OMN	Oman	Eastern Mediterranean region

134	PAK	Pakistan	Eastern Mediterranean region
135	PAN	Panama	Region of the Americas
136	PER	Peru	Region of the Americas
137	PHL	Philippines	Western Pacific region
138	PLW	Palau	Western Pacific region
139	PNG	Papua New Guinea	Western Pacific region
140	POL	Poland	European region
141	PRK	North Korea	South-East Asia region
142	PRT	Portugal	European region
143	PRY	Paraguay	Region of the Americas
144	PSE	State of Palestine	*Classified under Eastern Mediterranean region when analyzing
145	QAT	Qatar	Eastern Mediterranean region
146	ROU	Romania	European region
147	RUS	Russia	European region
148	RWA	Rwanda	African region
149	SAU	Saudi Arabia	Eastern Mediterranean region
150	SDN	Sudan	Eastern Mediterranean region
151	SEN	Senegal	African region
152	SGP	Singapore	Western Pacific region
153	SLB	Solomon Islands	Western Pacific region
154	SLE	Sierra Leone	African region
155	SLV	El Salvador	Region of the Americas
156	SMR	San Marino	European region
157	SOM	Somalia	Eastern Mediterranean region
158	SRB	Serbia	European region
159	SSD	South Sudan	African region
160	STP	Sao Tome and Principe	African region
161	SUR	Suriname	Region of the Americas
162	SVK	Slovakia	European region
163	SVN	Slovenia	European region
164	SWE	Sweden	European region
165	SWZ	Eswatini	African region
166	SYC	Seychelles	African region
167	SYR	Syria	Eastern Mediterranean region
168	TCD	Chad	African region
169	TGO	Togo	African region
170	THA	Thailand	South-East Asia region
171	TJK	Tajikistan	European region
172	TKM	Turkmenistan	European region
173	TLS	Timor-Leste	South-East Asia region
174	TON	Tonga	Western Pacific region
175	TTO	Trinidad and Tobago	Region of the Americas
176	TUN	Tunisia	Eastern Mediterranean region
177	TUR	Türkiye	European region
178	TUV	Tuvalu	Western Pacific region

179	TZA	Tanzania	African region
180	UGA	Uganda	African region
181	UKR	Ukraine	European region
182	URY	Uruguay	Region of the Americas
183	USA	United States of America	Region of the Americas
184	UZB	Uzbekistan	European region
185	VCT	Saint Vincent and the Grenadines	Region of the Americas
186	VEN	Venezuela	Region of the Americas
187	VNM	Viet Nam	Western Pacific region
188	VUT	Vanuatu	Western Pacific region
189	WSM	Samoa	Western Pacific region
190	YEM	Yemen	Eastern Mediterranean region
191	ZAF	South Africa	African region
192	ZMB	Zambia	African region
193	ZWE	Zimbabwe	African region

Note: The WHO European Region (EURO) includes not only the countries of continental Europe but also the five Central Asian countries, reflecting WHO's administrative regional structure rather than strictly political or geographic boundaries. To further distinguish heterogeneity within EURO, we referred to the United Nations Regional Groups framework (<https://www.un.org/dgacm/en/content/regional-groups#>).

Under this UN framework, the Eastern European States group, together with the five Central Asian countries, corresponds to the set of countries we classify as Eastern European and Central Asian (EECA) in this research. Accordingly, all subgroup comparisons within EURO distinguish EECA countries from all other EURO members.

In our study, the EECA group consists of the following countries: Albania, Armenia, Azerbaijan, Bulgaria, Belarus, Czech Republic, Estonia, Georgia, Croatia, Hungary, Kazakhstan, Kyrgyzstan, Lithuania, Latvia, Moldova, North Macedonia, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

Table S2. Summary of countries by WHO region

WHO region (total no. of members per region)	Countries included in this study
African region (47)	47/47 (100)
Eastern Mediterranean region (21)	21/21 (100)
European region (53)	52/53 (98.1)
Region of the Americas (35)	35/35 (100)
South-East Asia region (11)	11/11 (100)
Western Pacific region (27)	25/27 (92.6)

Table S3. Criteria for calculating expert judgment basis and familiarity

Judgment basis (Ca)	Degree			Familiarity (Cs)	Value
	Great deal	Moderate	Little		
Theoretical analysis	0.30	0.20	0.10	Very familiar	0.90
Practical experience	0.50	0.40	0.30	More familiar	0.70
Understanding from peers	0.10	0.10	0.10	Average	0.50
Intuition	0.10	0.10	0.10	Less familiar	0.30
				Unfamiliar	0.10

Delphi consultation results

In the first round, we invited 39 invited experts to respond the Delphi consultation, yielding a response rate of 100%. In the second round, 38 of the 39 experts completed the questionnaire, resulting in a response rate of 97.4%. These high response rates across both rounds indicate strong expert engagement and ensure the reliability and continuity of the consultation process. The average judgment basis (Ca), familiarity (Cs), and authority coefficient (Cr) values across all experts and items were 0.90, 0.78, and 0.84, respectively, indicating high expert reliability ($Cr > 0.70$).

Table S4. Delphi consultation response rates

Delphi consultation	Distributed (n)	Returned (n)	Response rate (%)
Round 1	39	39	100%
Round 2	39	38	97.4%

The mean scores, standard deviation (SD), and coefficient of variation (CV) for all indicators after the two Delphi rounds are summarized in the tables 6, 7 and 8. All indicators had a mean score above 3.5 and a CV below 0.25, indicating that expert consensus was achieved according to the predefined criteria. The Kendall's coefficient of concordance (W) value was 0.181 ($P < 0.001$), indicating a statistically significant level of concordance among experts. Although the W value suggests only a moderate degree of agreement, the significance level confirms that the expert ratings were sufficiently consistent and acceptable for Delphi analysis.

Table S5. Delphi scoring results for AMR governance indicators

AMR governance indicators	Mean	SD	CV
1.1 Strategic vision	4.81	0.40	0.08
1.1.1 NAP progress	4.63	0.59	0.13
1.1.2 Evidence sufficiency	4.63	0.63	0.14
1.1.3 Objective clarity	4.71	0.46	0.10
1.2 Multi-sector engagement	4.81	0.40	0.08
1.2.1 Policy maker	4.68	0.57	0.12
1.2.2 Action participation	4.68	0.57	0.12
1.2.3 Multi-sector coordination	4.66	0.58	0.13
1.3 Sustainability	4.70	0.66	0.14
1.3.1 Participation will	4.53	0.65	0.14
1.3.2 Budget planning	4.63	0.59	0.13
1.3.3 Technical reference	4.61	0.68	0.15
1.3.4 Pre-existing initiatives integration	4.58	0.68	0.15
1.4 Accountability	4.43	0.80	0.18
1.4.1 Explanation	4.24	0.85	0.20
1.4.2 Supervision	4.42	0.68	0.15
2.1 AMU surveillance system	4.57	0.65	0.14
2.1.1 Human AMU surveillance system	4.71	0.46	0.10
2.1.2 Animal AMU surveillance system	4.66	0.53	0.11
2.1.3 Plant production AMU surveillance system	4.29	0.80	0.19
2.2 AMR surveillance system	4.73	0.51	0.11
2.2.1 Human AMR surveillance system	4.79	0.41	0.09
2.2.2 Animal and food AMR surveillance system	4.71	0.57	0.12
2.2.3 Environment AMR surveillance system	4.50	0.73	0.16
2.2.4 Laboratory network	4.66	0.53	0.11
2.3 Optimization of antimicrobial use	4.57	0.65	0.14
2.3.1 Optimization of antimicrobial use in humans	4.62	0.64	0.14
2.3.2 Optimization of antimicrobial use in animals	4.55	0.72	0.16
2.3.3 Optimization of antimicrobial use in plants and environment	4.45	0.83	0.19
2.4 Professional education	4.46	0.77	0.17
2.4.1 Professional education in human health sector	4.51	0.65	0.14
2.4.2 Professional education in veterinary sector	4.53	0.73	0.16
2.4.3 Professional education in farming, food, environment sectors	4.45	0.76	0.17
2.5 Public awareness	4.58	0.65	0.14
2.5.1 Raise awareness in human health field	4.55	0.69	0.15
2.5.2 Raise awareness in animal health, food processing fields	4.55	0.76	0.17
2.5.3 Raise awareness in plant health and environment fields	4.32	0.77	0.18
2.6 Hygiene and prevention	4.73	0.51	0.11
2.6.1 Immunization schedule	4.32	0.84	0.20
2.6.2 Hygiene and prevention in humans	4.66	0.63	0.13
2.6.3 Hygiene and prevention in animals and food	4.53	0.69	0.15
2.6.4 Risk assessment in environment	4.32	0.74	0.17
2.7 Research innovation	4.68	0.53	0.11
2.7.1 Policy support	4.71	0.52	0.11

2.7.2 Scientific research fund	4.76	0.49	0.10
3.1 Reporting	4.49	0.65	0.15
3.1.1 Transparency	4.53	0.60	0.13
3.1.2 Annual reports	4.50	0.60	0.13
3.1.3 International collaboration	4.53	0.65	0.14
3.2 Policy adjustment	4.43	0.69	0.16
3.2.1 Policy adjustment in human health sector	4.39	0.75	0.17
3.2.2 Policy adjustment in animal health and food processing sectors	4.43	0.69	0.16
3.2.3 Policy adjustment in plant and environment health sectors	4.37	0.75	0.17
3.3 Effectiveness	4.61	0.59	0.13
3.3.1 AMU surveillance	4.57	0.65	0.14
3.3.2 AMR surveillance	4.79	0.41	0.09
3.3.3 Antimicrobial optimization	4.57	0.65	0.14
3.3.4 Professional education	4.46	0.77	0.17
3.3.5 Public awareness	4.58	0.65	0.14
3.3.6 Hygiene and prevention	4.73	0.51	0.11

Table S6. Delphi scoring results for AMU indicators

Antimicrobial use	Mean	SD	CV
1 Human AMU	4.62	0.64	0.14
2 Animal AMU	4.58	0.64	0.14
3 Agricultural production AMU	4.45	0.72	0.16

Table S7. Delphi scoring results for AMR prevalence indicators

AMR prevalence	Mean	SD	CV
1 Critical priority group	4.94	0.23	0.05
1.1 Carbapenem-resistant <i>Klebsiella pneumoniae</i>	4.71	0.52	0.11
1.2 Carbapenem-resistant <i>Escherichia coli</i>	4.63	0.49	0.11
1.3 3rd-generation Cephalosporin-resistant <i>Klebsiella pneumoniae</i>	4.47	0.60	0.13
1.4 3rd-generation Cephalosporin-resistant <i>Escherichia coli</i>	4.34	0.67	0.15
1.5 Carbapenem-resistant <i>Acinetobacter baumannii</i>	4.55	0.65	0.14
1.6 Rifampicin-resistant <i>Mycobacterium tuberculosis</i>	4.50	0.60	0.13
2 High priority group	4.64	0.49	0.11
2.1 Methicillin-resistant <i>Staphylococcus aureus</i>	4.55	0.65	0.14
2.2 Fluoroquinolone-resistant <i>Salmonella</i> Typhi	4.37	0.67	0.15
2.3 Fluoroquinolone-resistant Non-typhoidal <i>Salmonella</i>	4.24	0.71	0.17
2.4 Fluoroquinolone-resistant <i>Shigella</i> spp.	4.06	0.71	0.18
2.5 Vancomycin-resistant <i>Enterococcus faecium</i>	4.32	0.70	0.16
2.6 Carbapenem-resistant <i>Pseudomonas aeruginosa</i>	4.42	0.64	0.15
2.7 3rd-generation Cephalosporin-resistant <i>Neisseria gonorrhoeae</i>	4.16	0.75	0.18
2.8 Fluoroquinolone-resistant <i>Neisseria gonorrhoeae</i>	4.03	0.85	0.21
3 Medium priority group	4.11	0.62	0.15
3.1 Macrolide-resistant Group A Streptococci	3.81	0.71	0.19
3.2 Penicillin-resistant Group B Streptococci	4.00	0.76	0.19
3.3 Macrolide-resistant <i>Streptococcus pneumoniae</i>	3.84	0.79	0.21
3.4 Ampicillin-resistant <i>Haemophilus influenzae</i>	3.69	0.79	0.21

Table S8. Basic information of 38 fully participating Delphi experts

Item	Category	Number	Proportion (%)
Gender	Male	25	65.8
	Female	13	34.2
Age	25-30 years	4	10.5
	31-40 years	11	28.9
	41-50 years	14	36.8
	51-60 years	8	21.1
	60+ years	2	5.3
Education level	Bachelor's degree	1	2.6
	Master's degree	1	2.6
	PhD and above	36	94.7
Experience in antimicrobial resistance field	<5 years	2	5.3
	6-10 years	6	15.8
	11-20 years	18	47.4
	20+ years	12	31.6
Location of practice	China Mainland	23	60.5
	Hong Kong, China	2	5.3
	United Kingdom	2	5.3
	Australia	2	5.3
	United States of America	2	5.3
	Bangladesh	1	2.6
	Ethiopia	1	2.6
	Italy	1	2.6
	Netherlands	1	2.6
	Pakistan	1	2.6
	Portugal	1	2.6
	Singapore	1	2.6
Research field (multi-choice)	Infectious diseases	21	55.3
	Microbiology	30	78.9
	Public health	17	44.7
	Clinical medicine	7	18.4
	Veterinary medicine	14	36.8
	Environmental science	7	18.4
	Health policy	3	7.9
	Social sciences	2	5.3
	Epidemiology	7	18.4
	Pharmacy	2	5.3
	Immunology	1	2.6

Sensitivity analysis of Delphi indicator ratings by expert region and income level

To assess potential regional bias in expert judgments, we conducted subgroup comparisons by classifying experts into two independent grouping variables based on their country affiliation: (i) LMIE group—according to the latest World Bank income classification (Yes = LMIE; No = non-LMIE); and (ii) China group—experts based in China (Yes = China; No = Others). Each expert independently rated the importance of 78 indicators on a Likert scale (1 = not important to 5 = essential) in the second round of Delphi.

Given the non-normal, skewed distributions of ratings, we used non-parametric methods. For each indicator, scores were summarized as median (IQR), with *n* reflecting the number of experts contributing to each subgroup. Between-group comparisons (LMIE vs non-LMIE; China vs Others) used the Wilcoxon rank-sum (Mann–Whitney U) test with two-sided $\alpha = 0.05$. To account for multiple comparisons across 78 indicators per subgroup family, we report both unadjusted p-values and multiplicity-adjusted p-values using Bonferroni correction and false discovery rate (FDR) control (Benjamini–Hochberg, target $q = 0.05$). Primary inference was based on adjusted p-values; unadjusted p-values are presented descriptively. Missing item responses were handled by pairwise deletion at the indicator level. Analyses were performed in Python.

Results

As shown in Table S9, in LMIE versus non-LMIE comparisons, median ratings were uniformly high and 77 of 78 indicators (98.7%) showed no nominal between-group differences. For 2.1.1 Carbapenem-resistant *Klebsiella pneumoniae*, a nominal between-group difference (unadjusted $p = 0.042$) did not survive Bonferroni or FDR correction (both p-values > 0.93). Results collectively indicate near-universal cross-regional concordance, supporting the global relevance and generalizability of the Delphi-derived framework.

When comparing experts based in China versus Others, three indicators exhibited significant differences showed unadjusted $p < 0.05$ but lost significance after multiple-testing correction (Bonferroni and FDR both p-values > 0.6): 1.3.4 Integration of pre-existing initiatives, 2.6.3 Hygiene and prevention in animals and food systems, 2.1.1 Carbapenem-resistant *Klebsiella pneumoniae*. After multiplicity correction (Bonferroni and FDR), no indicators remained significant (78/78, 100%), indicating substantial cross-regional concordance and supporting the global relevance and generalizability of the Delphi-derived framework.

Taken together, LMIE vs non-LMIE and China vs Others comparisons indicate that nearly all indicators were rated equivalently across regions, supporting the global relevance and generalizability of the Delphi-derived AMR governance indicator framework (See supplementary Table S10-11 for complete statistical results).

Table S9. Summary of Delphi subgroup sensitivity analyses

Analysis type	Indicators tested (n)	Experts included (n)	Groups compared	Indicators with nominal significance ($p < 0.05$, unadjusted)	Indicators significant after Bonferroni correction	Indicators significant after FDR correction
Income level (LMIE vs non-LMIE)	78	38	2 groups	1 / 78 (1.3%)	0 / 78 (0%)	0 / 78 (0%)
Region (China vs Others)	78	38	2 groups	3 / 78 (3.8%)	0 / 78 (0%)	0 / 78 (0%)

Table S10. Delphi sensitivity analysis, comparing experts from LMIE and non-LMIE

Second round indicator	Non-LMIE [Median (IQR), n]	LMIE [Median (IQR), n]	P-value (unadjusted)	P-value (Bonferroni)	P-value (FDR)
1.1 Strategic vision	5.00 (4.50-5.00) (n=11)	5.00 (5.00-5.00) (n=28)	0.2203	1.0000	0.9372
1.1.1 NAP progress	5.00 (4.75-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	1.0000	1.0000	1.0000
1.1.2 Evidence sufficiency	5.00 (3.75-5.00) (n=12)	5.00 (4.75-5.00) (n=28)	0.2876	1.0000	0.9372
1.1.3 Objective clarity	5.00 (5.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.4864	1.0000	0.9372
1.2 Multi-sector engagement	5.00 (4.50-5.00) (n=11)	5.00 (5.00-5.00) (n=28)	0.7942	1.0000	0.9700
1.2.1 Policy maker	5.00 (4.75-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.7139	1.0000	0.9700
1.2.2 Action participation	5.00 (4.00-5.00) (n=12)	5.00 (5.00-5.00) (n=28)	0.2531	1.0000	0.9372
1.2.3 Multi-sector coordination	5.00 (4.00-5.00) (n=12)	5.00 (4.75-5.00) (n=28)	0.2501	1.0000	0.9372
1.3 Sustainability	5.00 (4.50-5.00) (n=11)	5.00 (5.00-5.00) (n=28)	0.2037	1.0000	0.9372
1.3.1 Participation will	5.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.5781	1.0000	0.9372
1.3.2 Budget planning	5.00 (4.00-5.00) (n=12)	5.00 (4.75-5.00) (n=28)	0.1480	1.0000	0.9372
1.3.3 Technical reference	5.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.7867	1.0000	0.9700
1.3.4 Pre-existing initiatives integration	5.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.1349	1.0000	0.9372
1.4 Accountability	5.00 (4.00-5.00) (n=11)	5.00 (4.00-5.00) (n=28)	0.8721	1.0000	0.9700
1.4.1 Explanation	4.00 (3.00-5.00) (n=12)	4.50 (4.00-5.00) (n=28)	0.1714	1.0000	0.9372
1.4.2 Supervision	4.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.4214	1.0000	0.9372
2.1 AMU surveillance system	5.00 (4.00-5.00) (n=11)	5.00 (4.00-5.00) (n=28)	0.5170	1.0000	0.9372
2.1.1 Human AMU surveillance system	5.00 (4.00-5.00) (n=12)	5.00 (4.75-5.00) (n=28)	0.3871	1.0000	0.9372
2.1.2 Animal AMU surveillance system	5.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.8699	1.0000	0.9700
2.1.3 Plant production AMU surveillance system	5.00 (3.75-5.00) (n=12)	4.00 (4.00-5.00) (n=28)	0.5511	1.0000	0.9372
2.2 AMR surveillance system	5.00 (4.50-5.00) (n=11)	5.00 (5.00-5.00) (n=28)	0.4065	1.0000	0.9372
2.2.1 Humans AMR surveillance system	5.00 (5.00-5.00) (n=12)	5.00 (5.00-5.00) (n=28)	0.9439	1.0000	1.0000
2.2.2 Animals and food AMR surveillance system	5.00 (4.00-5.00) (n=12)	5.00 (5.00-5.00) (n=28)	0.7039	1.0000	0.9700
2.2.3 Environment AMR surveillance system	5.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.8630	1.0000	0.9700
2.2.4 Laboratory network	5.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.8699	1.0000	0.9700
2.3 Optimization of antimicrobial use	5.00 (4.50-5.00) (n=11)	5.00 (4.00-5.00) (n=28)	0.3124	1.0000	0.9372
2.3.1 Optimization of antimicrobial use in Humans	5.00 (5.00-5.00) (n=11)	5.00 (4.00-5.00) (n=28)	0.1577	1.0000	0.9372
2.3.2 Optimization of antimicrobial use in animals	5.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.6858	1.0000	0.9700
2.3.3 Optimization of antimicrobial use in plants and environment	5.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.4064	1.0000	0.9372
2.4 Professional education	5.00 (4.50-5.00) (n=11)	5.00 (4.00-5.00) (n=28)	0.6706	1.0000	0.9700

2.4.1 Professional education					
in human health sector	5.00 (4.00-5.00) (n=11)	5.00 (4.00-5.00) (n=28)	1.0000	1.0000	1.0000
2.4.2 Professional education					
in veterinary sector	5.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.5078	1.0000	0.9372
2.4.3 Professional education					
in farming, food, environment					
sectors	5.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.4289	1.0000	0.9372
2.5 Public awareness	5.00 (4.50-5.00) (n=11)	5.00 (4.00-5.00) (n=27)	0.9649	1.0000	1.0000
2.5.1 Raise awareness in					
human health field	5.00 (4.75-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.9842	1.0000	1.0000
2.5.2 Raise awareness in					
animal health, food					
processing fields	5.00 (5.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.6128	1.0000	0.9372
2.5.3 Raise awareness in					
plant health and environment					
fields	4.50 (4.00-5.00) (n=12)	4.00 (4.00-5.00) (n=28)	0.7851	1.0000	0.9700
2.6 Hygiene and prevention	5.00 (5.00-5.00) (n=11)	5.00 (4.75-5.00) (n=28)	0.8495	1.0000	0.9700
2.6.1 Immunization schedule	5.00 (4.00-5.00) (n=12)	4.00 (4.00-5.00) (n=28)	0.4204	1.0000	0.9372
2.6.2 Hygiene and prevention					
in humans	5.00 (4.75-5.00) (n=12)	5.00 (4.75-5.00) (n=28)	0.6056	1.0000	0.9372
2.6.3 Hygiene and prevention					
in animals and food.	5.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.2686	1.0000	0.9372
2.6.4 Risk assessment in					
environment	4.00 (4.00-5.00) (n=12)	4.00 (4.00-5.00) (n=28)	0.5461	1.0000	0.9372
2.7 Research innovation	5.00 (4.00-5.00) (n=11)	5.00 (4.75-5.00) (n=28)	0.3279	1.0000	0.9372
2.7.1 Policy support	5.00 (4.75-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.5886	1.0000	0.9372
2.7.2 Scientific research fund	5.00 (4.75-5.00) (n=12)	5.00 (5.00-5.00) (n=28)	0.3740	1.0000	0.9372
3.1 Reporting	4.00 (3.50-5.00) (n=11)	5.00 (4.00-5.00) (n=28)	0.0671	1.0000	0.9372
3.1.1 Transparency	4.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.1760	1.0000	0.9372
3.1.2 Annual reports	4.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.0642	1.0000	0.9372
3.1.3 International					
collaboration	5.00 (3.75-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.7883	1.0000	0.9700
3.2 Policy adjustment	5.00 (3.50-5.00) (n=11)	5.00 (4.00-5.00) (n=28)	0.8121	1.0000	0.9700
3.2.1 Policy adjustment in					
human health sector.	4.50 (3.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.4595	1.0000	0.9372
3.2.2 Policy adjustment in					
animal health and food					
processing sectors.	4.00 (4.00-5.00) (n=11)	5.00 (4.00-5.00) (n=28)	0.3726	1.0000	0.9372
3.2.3 Policy adjustment in					
plant and environment health					
sectors.	5.00 (4.00-5.00) (n=12)	4.00 (4.00-5.00) (n=28)	0.3894	1.0000	0.9372
3.3 Effectiveness	5.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.8733	1.0000	0.9700
1.1 AMU in human	5.00 (4.50-5.00) (n=11)	5.00 (4.00-5.00) (n=28)	0.5962	1.0000	0.9372
1.2 AMU in animal	5.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.2578	1.0000	0.9372
1.3 AMU in agricultural					
production	4.50 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.7077	1.0000	0.9700

2.1 Critical Priority Pathogens	5.00 (5.00-5.00) (n=10)	5.00 (5.00-5.00) (n=28)	0.3624	1.0000	0.9372
2.1.1 Carbapenem-resistant					
<i>Klebsiella pneumoniae</i>	5.00 (4.00-5.00) (n=12)	5.00 (5.00-5.00) (n=28)	0.0420	1.0000	0.9372
2.1.2 Carbapenem-resistant					
<i>Escherichia coli</i>	5.00 (4.75-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.2115	1.0000	0.9372
2.1.3 3rd-generation					
Cephalosporin-resistant					
<i>Klebsiella pneumoniae</i>	5.00 (4.00-5.00) (n=12)	4.50 (4.00-5.00) (n=28)	0.5113	1.0000	0.9372
2.1.4 3rd-generation					
Cephalosporin-resistant					
<i>Escherichia coli</i>	5.00 (4.00-5.00) (n=12)	4.00 (4.00-5.00) (n=28)	0.3413	1.0000	0.9372
2.1.5 Carbapenem-resistant					
<i>Acinetobacter baumannii</i>	5.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.8001	1.0000	0.9700
2.1.6 Rifampicin-resistant					
<i>Mycobacterium tuberculosis</i>	5.00 (4.00-5.00) (n=12)	4.50 (4.00-5.00) (n=28)	0.4059	1.0000	0.9372
2.2 High Priority Pathogens	5.00 (4.00-5.00) (n=10)	5.00 (4.00-5.00) (n=28)	0.3726	1.0000	0.9372
2.2.1 Methicillin-resistant					
<i>Staphylococcus aureus</i>	5.00 (4.75-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.5077	1.0000	0.9372
2.2.2 Fluoroquinolone-resistant					
<i>Salmonella</i> Typhi	4.00 (4.00-5.00) (n=12)	4.50 (4.00-5.00) (n=28)	0.9562	1.0000	1.0000
2.2.3 Fluoroquinolone-resistant					
Non-typhoidal					
<i>Salmonella</i>	4.00 (4.00-5.00) (n=12)	4.00 (4.00-5.00) (n=28)	0.5048	1.0000	0.9372
2.2.4 Fluoroquinolone-resistant					
<i>Shigella</i> spp.	4.00 (3.25-4.75) (n=10)	4.00 (4.00-5.00) (n=28)	0.8197	1.0000	0.9700
2.2.5 Vancomycin-resistant					
<i>Enterococcus faecium</i>	4.00 (4.00-5.00) (n=12)	4.50 (4.00-5.00) (n=28)	0.4568	1.0000	0.9372
2.2.6 Carbapenem-resistant					
<i>Pseudomonas aeruginosa</i>	4.00 (4.00-5.00) (n=12)	5.00 (4.00-5.00) (n=28)	0.1762	1.0000	0.9372
2.2.7 3rd-generation					
Cephalosporin-resistant					
<i>Neisseria gonorrhoeae</i>	4.00 (3.75-5.00) (n=12)	4.00 (4.00-5.00) (n=28)	0.7030	1.0000	0.9700
2.2.8 Fluoroquinolone-resistant					
<i>Neisseria gonorrhoeae</i>	4.00 (3.75-5.00) (n=12)	4.00 (3.75-5.00) (n=28)	0.8872	1.0000	0.9700
2.3 Medium Priority					
Pathogens	4.00 (4.00-4.75) (n=10)	4.00 (4.00-4.00) (n=28)	0.8954	1.0000	0.9700
2.3.1 Macrolide-resistant					
Group A Streptococci	3.50 (3.00-4.00) (n=10)	4.00 (3.75-4.00) (n=28)	0.4974	1.0000	0.9372
2.3.2 Penicillin-resistant					
Group B Streptococci	4.00 (3.00-4.75) (n=10)	4.00 (4.00-4.25) (n=28)	0.6101	1.0000	0.9372
2.3.3 Macrolide-resistant					
<i>Streptococcus pneumoniae</i>	3.00 (3.00-4.00) (n=12)	4.00 (3.75-4.00) (n=28)	0.1265	1.0000	0.9372
2.3.4 Ampicillin-resistant					
<i>Haemophilus influenzae</i>	3.00 (3.00-4.75) (n=10)	4.00 (3.00-4.00) (n=28)	0.4843	1.0000	0.9372

Table S11. Delphi sensitivity analysis, comparing experts from China and other countries

Second round indicator	China [Median (IQR), n]	Others [Median (IQR), n]	P-value (unadjusted)	P-value (Bonferroni)	P-value (FDR)
1.1 Strategic vision	5.00 (5.00-5.00) (n=25)	5.00 (4.00-5.00) (n=12)	0.1321	1.0000	0.7969
1.1.1 NAP progress	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.5080	1.0000	0.9005
1.1.2 Evidence sufficiency	5.00 (5.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.3050	1.0000	0.7969
1.1.3 Objective clarity	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.8755	1.0000	1.0000
1.2 Multi-sector engagement	5.00 (5.00-5.00) (n=25)	5.00 (4.00-5.00) (n=12)	0.1321	1.0000	0.7969
1.2.1 Policy maker	5.00 (4.00-5.00) (n=25)	5.00 (5.00-5.00) (n=13)	0.3469	1.0000	0.7969
1.2.2 Action participation	5.00 (5.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.2377	1.0000	0.7969
1.2.3 Multi-sector coordination	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.6694	1.0000	0.9178
1.3 Sustainability	5.00 (5.00-5.00) (n=25)	5.00 (3.75-5.00) (n=12)	0.1059	1.0000	0.7969
1.3.1 Participation will	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.8727	1.0000	1.0000
1.3.2 Budget planning	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.5080	1.0000	0.9005
1.3.3 Technical reference	5.00 (5.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.2544	1.0000	0.7969
1.3.4 Pre-existing initiatives integration	5.00 (5.00-5.00) (n=25)	4.00 (4.00-5.00) (n=13)	0.0077	0.6006	0.6006
1.4 Accountability	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=12)	0.9412	1.0000	1.0000
1.4.1 Explanation	5.00 (4.00-5.00) (n=25)	4.00 (3.00-5.00) (n=13)	0.1088	1.0000	0.7969
1.4.2 Supervision	5.00 (4.00-5.00) (n=25)	4.00 (4.00-5.00) (n=13)	0.3142	1.0000	0.7969
2.1 AMU surveillance system	5.00 (4.00-5.00) (n=25)	4.50 (4.00-5.00) (n=12)	0.2425	1.0000	0.7969
2.1.1 Human AMU surveillance system	5.00 (5.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.3678	1.0000	0.7969
2.1.2 Animal AMU surveillance system	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.9546	1.0000	1.0000
2.1.3 Plant production AMU surveillance system	4.00 (4.00-5.00) (n=25)	5.00 (3.00-5.00) (n=13)	0.8275	1.0000	1.0000
2.2 AMR surveillance system	5.00 (5.00-5.00) (n=25)	5.00 (4.00-5.00) (n=12)	0.3388	1.0000	0.7969
2.2.1 Humans AMR surveillance system	5.00 (5.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.3060	1.0000	0.7969
2.2.2 Animals and food AMR surveillance system	5.00 (5.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.4676	1.0000	0.8896
2.2.3 Environment AMR surveillance system	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.5811	1.0000	0.9178
2.2.4 Laboratory network	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.8942	1.0000	1.0000
2.3 Optimization of antimicrobial use	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=12)	0.7140	1.0000	0.9178
2.3.1 Optimization of antimicrobial use in Humans	5.00 (4.00-5.00) (n=25)	5.00 (4.75-5.00) (n=12)	0.5574	1.0000	0.9178
2.3.2 Optimization of antimicrobial use in animals	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.7073	1.0000	0.9178
2.3.3 Optimization of antimicrobial use in plants and environment	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.9571	1.0000	1.0000
2.4 Professional education	5.00 (4.00-5.00) (n=25)	4.50 (4.00-5.00) (n=12)	0.3630	1.0000	0.7969

2.4.1 Professional education in human health sector	5.00 (4.00-5.00) (n=25)	4.00 (4.00-5.00) (n=12)	0.1791	1.0000	0.7969
2.4.2 Professional education in veterinary sector	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.4369	1.0000	0.8520
2.4.3 Professional education in farming, food, environment sectors	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.6122	1.0000	0.9178
2.5 Public awareness	5.00 (4.00-5.00) (n=24)	5.00 (4.00-5.00) (n=12)	1.0000	1.0000	1.0000
2.5.1 Raise awareness in human health field	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.9122	1.0000	1.0000
2.5.2 Raise awareness in animal health, food processing fields	5.00 (4.00-5.00) (n=25)	5.00 (5.00-5.00) (n=13)	0.6119	1.0000	0.9178
2.5.3 Raise awareness in plant health and environment fields	4.00 (4.00-5.00) (n=25)	4.00 (4.00-5.00) (n=13)	0.8264	1.0000	1.0000
2.6 Hygiene and prevention	5.00 (5.00-5.00) (n=25)	5.00 (4.75-5.00) (n=12)	1.0000	1.0000	1.0000
2.6.1 Immunization schedule	4.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.2341	1.0000	0.7969
2.6.2 Hygiene and prevention in humans	5.00 (5.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.2013	1.0000	0.7969
2.6.3 Hygiene and prevention in animals and food.	5.00 (5.00-5.00) (n=25)	4.00 (4.00-5.00) (n=13)	0.0183	1.0000	0.7137
2.6.4 Risk assessment in environment	4.00 (4.00-5.00) (n=25)	4.00 (4.00-5.00) (n=13)	0.2925	1.0000	0.7969
2.7 Research innovation	5.00 (5.00-5.00) (n=25)	5.00 (4.00-5.00) (n=12)	0.3382	1.0000	0.7969
2.7.1 Policy support	5.00 (4.00-5.00) (n=25)	5.00 (5.00-5.00) (n=13)	0.7178	1.0000	0.9178
2.7.2 Scientific research fund	5.00 (5.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.2681	1.0000	0.7969
3.1 Reporting	5.00 (4.00-5.00) (n=25)	4.00 (4.00-5.00) (n=12)	0.1556	1.0000	0.7969
3.1.1 Transparency	5.00 (4.00-5.00) (n=25)	4.00 (4.00-5.00) (n=13)	0.2966	1.0000	0.7969
3.1.2 Annual reports	5.00 (4.00-5.00) (n=25)	4.00 (4.00-5.00) (n=13)	0.0796	1.0000	0.7969
3.1.3 International collaboration	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.6692	1.0000	0.9178
3.2 Policy adjustment	5.00 (4.00-5.00) (n=25)	4.50 (4.00-5.00) (n=12)	0.6239	1.0000	0.9178
3.2.1 Policy adjustment in human health sector.	5.00 (4.00-5.00) (n=25)	4.00 (4.00-5.00) (n=13)	0.3630	1.0000	0.7969
3.2.2 Policy adjustment in animal health and food processing sectors.	5.00 (4.00-5.00) (n=25)	4.00 (3.75-5.00) (n=12)	0.1620	1.0000	0.7969
3.2.3 Policy adjustment in plant and environment health sectors.	4.00 (4.00-5.00) (n=25)	5.00 (3.00-5.00) (n=13)	0.9864	1.0000	1.0000
3.3 Effectiveness	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.6704	1.0000	0.9178
1.1 AMU in human	5.00 (5.00-5.00) (n=25)	5.00 (4.00-5.00) (n=12)	0.2326	1.0000	0.7969
1.2 AMU in animal	5.00 (5.00-5.00) (n=25)	4.00 (4.00-5.00) (n=13)	0.0627	1.0000	0.7969
1.3 AMU in agricultural production	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.6890	1.0000	0.9178
2.1 Critical Priority Pathogens	5.00 (5.00-5.00) (n=25)	5.00 (5.00-5.00) (n=11)	0.5738	1.0000	0.9178
2.1.1 Carbapenem-resistant <i>Klebsiella pneumoniae</i>	5.00 (5.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.0426	1.0000	0.7969

2.1.2 Carbapenem-resistant					
<i>Escherichia coli</i>	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.5935	1.0000	0.9178
2.1.3 3rd-generation					
Cephalosporin-resistant					
<i>Klebsiella pneumoniae</i>	4.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.1210	1.0000	0.7969
2.1.4 3rd-generation					
Cephalosporin-resistant					
<i>Escherichia coli</i>	4.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.1689	1.0000	0.7969
2.1.5 Carbapenem-resistant					
<i>Acinetobacter baumannii</i>	5.00 (4.00-5.00) (n=25)	4.00 (4.00-5.00) (n=13)	0.1693	1.0000	0.7969
2.1.6 Rifampicin-resistant					
<i>Mycobacterium tuberculosis</i>	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.6868	1.0000	0.9178
2.2 High Priority Pathogens	5.00 (4.00-5.00) (n=25)	4.00 (4.00-5.00) (n=11)	0.1374	1.0000	0.7969
2.2.1 Methicillin-resistant					
<i>Staphylococcus aureus</i>	5.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.9136	1.0000	1.0000
2.2.2 Fluoroquinolone-resistant					
<i>Salmonella</i> Typhi	4.00 (4.00-5.00) (n=25)	5.00 (4.00-5.00) (n=13)	0.3496	1.0000	0.7969
2.2.3 Fluoroquinolone-resistant					
Non-typhoidal <i>Salmonella</i>	4.00 (4.00-5.00) (n=25)	4.00 (4.00-5.00) (n=13)	0.3935	1.0000	0.7996
2.2.4 Fluoroquinolone-resistant					
<i>Shigella</i> spp.	4.00 (4.00-5.00) (n=25)	4.00 (3.50-4.50) (n=11)	0.7791	1.0000	0.9802
2.2.5 Vancomycin-resistant					
<i>Enterococcus faecium</i>	4.00 (4.00-5.00) (n=25)	4.00 (4.00-5.00) (n=13)	0.5899	1.0000	0.9178
2.2.6 Carbapenem-resistant					
<i>Pseudomonas aeruginosa</i>	5.00 (4.00-5.00) (n=25)	4.00 (4.00-5.00) (n=13)	0.3805	1.0000	0.7996
2.2.7 3rd-generation					
Cephalosporin-resistant					
<i>Neisseria gonorrhoeae</i>	4.00 (4.00-5.00) (n=25)	4.00 (4.00-5.00) (n=13)	0.9731	1.0000	1.0000
2.2.8 Fluoroquinolone-resistant					
<i>Neisseria gonorrhoeae</i>	4.00 (4.00-5.00) (n=25)	4.00 (4.00-5.00) (n=13)	0.9475	1.0000	1.0000
2.3 Medium Priority Pathogens	4.00 (4.00-4.00) (n=25)	4.00 (4.00-4.50) (n=11)	0.9370	1.0000	1.0000
2.3.1 Macrolide-resistant Group					
A Streptococci	4.00 (4.00-4.00) (n=25)	4.00 (3.00-4.00) (n=11)	0.3998	1.0000	0.7996
2.3.2 Penicillin-resistant Group B					
Streptococci	4.00 (4.00-4.00) (n=25)	4.00 (3.00-5.00) (n=11)	0.6454	1.0000	0.9178
2.3.3 Macrolide-resistant					
<i>Streptococcus pneumoniae</i>	4.00 (4.00-4.00) (n=25)	3.00 (3.00-4.00) (n=13)	0.0991	1.0000	0.7969
2.3.4 Ampicillin-resistant					
<i>Haemophilus influenzae</i>	4.00 (3.00-4.00) (n=25)	3.00 (3.00-4.50) (n=11)	0.5039	1.0000	0.9005

Table S12. Framework of the AMR governance index and AMR-related outcomes

	Domain	Subdomain	Indicators
AMR Governance	1 Policy Design	1.1 Strategic vision	1.1.1 NAP progress
			1.1.2 Evidence sufficiency
			1.1.3 Objective clarity
		1.2 Multi-sector engagement	1.2.1 Policy maker
			1.2.2 Action participation
			1.2.3 Multi-sector coordination
		1.3 Sustainability	1.3.1 Participation will
			1.3.2 Budget planning
			1.3.3 Technical reference
			1.3.4 Pre-existing initiatives integration
		1.4 Accountability	1.4.1 Explanation
			1.4.2 Supervision
	2 Implementation	2.1 AMU surveillance system	2.1.1 Human AMU surveillance system
			2.1.2 Animal AMU surveillance system
			2.1.3 Plant production AMU surveillance system
		2.2 AMR surveillance system	2.2.1 Humans AMR surveillance system
			2.2.2 Animals and food AMR surveillance system
			2.2.3 Environmental AMR surveillance system
			2.2.4 Laboratory network
		2.3 Optimization of antimicrobial use	2.3.1 Antimicrobial optimization in humans
			2.3.2 Antimicrobial optimization in animals
			2.3.3 Antimicrobial optimization in plants and environment
		2.4 Professional education	2.4.1 Professional education in human health sector
			2.4.2 Professional education in veterinary sector
			2.4.3 Professional education in farming, food, environment sectors
		2.5 Public awareness	2.5.1 Raise awareness in human health field
			2.5.2 Raise awareness in animal health, food processing fields
			2.5.3 Raise awareness in plant health and environment fields
		2.6 Hygiene and prevention	2.6.1 Immunization schedule
			2.6.2 Hygiene and prevention in humans
		2.7 Research innovation	2.6.3 Hygiene and prevention in animals and food
			2.6.4 Risk assessment in environment
AMR-related outcomes	3 Monitoring	3.1 Reporting	2.7.1 Policy support
			2.7.2 Scientific research fund
			3.1.1 Transparency
		3.2 Policy adjustment	3.1.2 Annual reports
			3.1.3 International collaboration
			3.2.1 Policy adjustment in human health sector
		3.3 Effectiveness	3.2.2 Policy adjustment in animal health and food processing sectors
			3.2.3 Policy adjustment in plant and environment health sectors
			3.3.1 AMU surveillance
			3.3.2 AMR surveillance
			3.3.3 Antimicrobial optimization
			3.3.4 Professional education
AMR-related outcomes	AMU	1 Human AMU	3.3.5 Public awareness
		2 Animal AMU	3.3.6 Hygiene and prevention
		3 Agricultural production AMU	-
	AMR prevalence	1 Critical priority pathogens	1.1 Carbapenem-resistant <i>Klebsiella pneumoniae</i>
			1.2 Carbapenem-resistant <i>Escherichia coli</i>
			1.3 3rd-generation Cephalosporin-resistant <i>Klebsiella pneumoniae</i>
			1.4 3rd-generation Cephalosporin-resistant <i>Escherichia coli</i>
			1.5 Carbapenem-resistant <i>Acinetobacter baumannii</i>
			1.6 Rifampicin-resistant <i>Mycobacterium tuberculosis</i>
		2 High priority pathogens	2.1 Methicillin-resistant <i>Staphylococcus aureus</i>
			2.2 Fluoroquinolone-resistant <i>Salmonella</i> Typhi
		3 Medium priority pathogens	2.3 Fluoroquinolone-resistant Non-typhoidal <i>Salmonella</i>
			2.4 Fluoroquinolone-resistant <i>Shigella</i> spp.
			2.5 Vancomycin-resistant <i>Enterococcus faecium</i>
			2.6 Carbapenem-resistant <i>Pseudomonas aeruginosa</i>
			2.7 3rd-generation Cephalosporin-resistant <i>Neisseria gonorrhoeae</i>
			2.8 Fluoroquinolone-resistant <i>Neisseria gonorrhoeae</i>
AMR-related outcomes	Disease burden	AMR-associated deaths AMR-attributed deaths	3.1 Macrolide-resistant Group A Streptococci
			3.2 Penicillin-resistant Group B Streptococci
			3.3 Macrolide-resistant <i>Streptococcus pneumoniae</i>
			3.4 Ampicillin-resistant <i>Haemophilus influenzae</i>

Table S13. Data sources of AMR governance indicators

Domains	Subdomains	Indicators	Source
1 Policy Design	1.1 Strategic vision	1.1.1 NAP progress	TrACSS
		1.1.2 Evidence sufficiency	NAPs
		1.1.3 Objective clarity	NAPs
	1.2 Multi-sector engagement	1.2.1 Policy maker	TrACSS
		1.2.2 Action participation	TrACSS
		1.2.3 Multi-sector coordination	TrACSS
	1.3 Sustainability	1.3.1 Participation will	TrACSS
		1.3.2 Budget planning	TrACSS
		1.3.3 Technical reference	NAPs
		1.3.4 Pre-existing initiatives integration	TrACSS
	1.4 Accountability	1.4.1 Explanation	NAPs
		1.4.2 Supervision	NAPs
2 Implementation	2.1 AMU surveillance system	2.1.1 Human AMU surveillance system	TrACSS
		2.1.2 Animal AMU surveillance system	TrACSS
		2.1.3 Plant production AMU surveillance system	TrACSS
	2.2 AMR surveillance system	2.2.1 Humans AMR surveillance system	TrACSS
		2.2.2 Animals and food AMR surveillance system	TrACSS
		2.2.3 Environmental AMR surveillance system	TrACSS
		2.2.4 Laboratory network	TrACSS
	2.3 Optimization of antimicrobial use	2.3.1 Antimicrobial optimization in humans	TrACSS
		2.3.2 Antimicrobial optimization in animals	TrACSS
		2.3.3 Antimicrobial optimization in plants and environment	TrACSS
	2.4 Professional education	2.4.1 Professional education in human health sector	TrACSS
		2.4.2 Professional education in veterinary sector	TrACSS
		2.4.3 Professional education in farming, food, environment sectors	TrACSS
	2.5 Public awareness	2.5.1 Raise awareness in human health field	TrACSS
		2.5.2 Raise awareness in animal health, food processing fields	TrACSS
		2.5.3 Raise awareness in plant health and environment fields	TrACSS
	2.6 Hygiene and prevention	2.6.1 Immunization schedule	Unicef Immunization data
		2.6.2 Hygiene and prevention in humans	TrACSS
		2.6.3 Hygiene and prevention in animals and food	TrACSS
		2.6.4 Risk assessment in environment	TrACSS
	2.7 Research innovation	2.7.1 Policy support	NAPs
		2.7.2 Scientific research fund	Global AMR R&D Hub-Projects
3 Monitoring	3.1 Reporting	3.1.1 Transparency	NAPs
		3.1.2 Annual reports	Multiple sources (<i>Supplementary Table S14</i>)

	3.1.3 International collaboration	GLASS
3.2 Policy adjustment	3.2.1 Policy adjustment in human health sector.	TrACSS
	3.2.2 Policy adjustment in animal health and food processing sectors.	TrACSS
	3.2.3 Policy adjustment in plant and environment health sectors.	TrACSS
3.3 Effectiveness	3.3.1 AMU surveillance	TrACSS
	3.3.2 AMR surveillance	TrACSS
	3.3.3 Antimicrobial optimization	TrACSS
	3.3.4 Professional education	TrACSS
	3.3.5 Public awareness	TrACSS
	3.3.6 Hygiene and prevention	TrACSS and Unicef Immunization data

Note: The indicator “3.1.2 Annual reports” was based on a manual search of national AMR reports, with detailed sources listed in Table S14. TrACSS survey data from 2018 to 2023, corresponding to performance years 2017 through 2022 (excluding 2017 due to limited content) were incorporated.

Table S14. Data sources of indicator “3.1.2 Annual reports”

No.	Report sources	Websites
1	Global Antimicrobial Resistance Surveillance System (GLASS)	https://www.who.int/data/gho/data/themes/antimicrobial-resistance-(amr)
2	The Gonococcal Antimicrobial Surveillance Programme (GASP)	https://www.who.int/initiatives/gonococcal-antimicrobial-surveillance-programme
3	European Antimicrobial Resistance Surveillance Network (EARS-Net)	https://www.ecdc.europa.eu/en/about-us/networks/disease-networks-and-laboratory-networks/ears-net-data
4	European Gonococcal Antimicrobial Surveillance Programme (Euro-GASP)	https://www.ecdc.europa.eu/en/about-us/partnerships-and-networks/disease-and-laboratory-networks/euro-gasp
5	European Food- and Waterborne Diseases and Zoonoses Network (FWD-Net)	https://www.ecdc.europa.eu/en/about-us/partnerships-and-networks/disease-and-laboratory-networks/fwd-net
6	Central Asian and European Surveillance of Antimicrobial Resistance (CAESAR)	https://www.who.int/europe/groups/central-asian-and-european-surveillance-of-antimicrobial-resistance-(caesar)
7	The Latin American Network for Antimicrobial Resistance Surveillance (ReLAVRA, Spanish acronym)	https://www3.paho.org/data/index.php/es/temas/resistencia-antimicrobiana.html
8	Surveillance Network System of Agents Responsible for Bacterial Pneumonia and Meningitis (SIREVA, Spanish acronym)	https://redsirevanetwork.com/
9	Mapping Antimicrobial Resistance and Antimicrobial Use Partnership (MAAP) Country Reports	https://africacdc.org/download/mapping-antimicrobial-resistance-and-antimicrobial-use-partnership-maap-country-reports/
10	Antimicrobial Use and Resistance in Australia (AURA)	https://www.safetyandquality.gov.au/our-work/antimicrobial-resistance/antimicrobial-use-and-resistance-australia-aura
11	China Antimicrobial Resistance Surveillance System	https://www.carss.cn/sys/Htmls/dist/index.html#/resistance
12	The China Antimicrobial Surveillance Network (CHINET)	http://chinets.com/Data/Map
13	Antimicrobial Resistance & Patient Safety Portal, USA	https://arpsp.cdc.gov/profile/antibiotic-resistance?tab=antibiotic-resistance

14	National Antimicrobial Resistance Monitoring System for Enteric Bacteria (NARMS), USA	https://wwwn.cdc.gov/narmsnow/
15	Active Bacterial Core surveillance (ABCs), USA	https://www.cdc.gov/abcs/bact-facts/data-dashboard.html
16	Canadian Antimicrobial Resistance Alliance (CARA)	http://www.can-r.com/index.php
17	Canadian Antimicrobial Resistance Surveillance System	https://health-infobase.canada.ca/carss/amr/
18	Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS)	https://health-infobase.canada.ca/cipars/antimicrobial-resistance/
19	Interinstitutional Group for the Surveillance of Vaccine-Preventable Bacterial Diseases (GIVEBPVAc), Mexico	https://www.insp.mx/lineas-de-investigacion/medicamentos-en-salud-publica/sireva.html
20	One Health Report on Antimicrobial Utilisation and Resistance, Singapore	https://www.ncid.sg/Health-Professionals/Pages/Antimicrobial-Resistance.aspx
21	AMR Surveillance Bulletin, Cambodia	http://www.cdcmoh.gov.kh/prevention-control/amr
22	South Korean AMR Surveillance System (Kor-GLASS)	https://nih.go.kr/nohas/en/aboutOH/antibiotics.do
23	Japan Nosocomial Infections Surveillance (JANIS)	https://janis.mhlw.go.jp/english/report/index.html
24	National AMR Surveillance Network (NARS-Net), India	https://ncdc.mohfw.gov.in/reports/
25	Antimicrobial Resistance Surveillance Reference Laboratory, Philippines	https://arisp.com.ph/publications/
26	Malaysian One Health Antimicrobial Resistance	https://imr.nih.gov.my/MyOHAR/index.php/site/archive_rpt
27	Antimicrobial resistance surveillance reports, New Zealand	https://www.esr.cri.nz/expertise/public-health/antimicrobial-resistance/
28	Ethiopia Antimicrobial Resistance Surveillance	https://ephi.gov.et/download/other-documents/
29	Pakistan Antimicrobial Resistant Network	https://parn.org.pk/
30	Alliance for the Prudent Use of Antibiotics, Nepal	https://apua.org/nepal
31	South Africa National Institute for Communicable Diseases (NICD) AMR	https://www.nicd.ac.za/diseases-a-z-index/antimicrobial-resistance/
32	Chilean Society of infectious diseases	https://www.ispch.gob.cl/boletin/
33	National Surveillance of Antimicrobial Resistance (RED WHONET), Argentina	http://antimicrobianos.com.ar/category/analisis-de-ram/
34	Healthcare-Associated Infections (IAAS, Spanish acronym), Colombia	https://www.ins.gov.co/buscador-eventos/Informacin%20de%20laboratorio/Forms/AllItems.aspx
35	National Action Plan, Cayman Islands	https://www.who.int/publications/m/item/cayman-islands-national-strategy-and-action-plan
36	National Action Plan, Burkina Faso	https://www.who.int/publications/m/item/burkina-faso-national-multisectoral-strategic-plan-to-combat-antimicrobial-resistance-(french)
37	SENTRY Antimicrobial Surveillance Program	https://mvp.jmilabs.com/
38	Pfizer Antimicrobial Testing Leadership and Surveillance	https://atlas-surveillance.com
39	One HealthTrust ResistanceMap	https://resistancemap.onehealthtrust.org/AntibioticResistance.php

Note: To systematically determine whether countries produced publicly available national AMR surveillance reports that presented AMR rates, we followed a structured multi-step identification approach. The detailed workflow is outlined below.

Step 1: Identification via international AMR surveillance platforms

We first screened GLASS, GASP, EARS-Net, Euro-GASP, FWD-Net, ReLAVRA, and CAESAR to determine participation status, initial reporting year, and latest available reporting year per country. Only human AMR surveillance data were included, as these are more accessible and standardized across countries. During the

study period, global AMR datasets for the animal and environmental sectors remained limited, fragmented, and lacked harmonized reporting standards.; therefore, human AMR surveillance reports were used as the basis for assessing public data availability and generating the indicator 3.1.2 score.

For countries not reporting to any of these international or regional platforms, we proceeded to *Step 2*, conducting a country-by-country search to identify national AMR surveillance outputs.

Step 2: Screening of national AMR surveillance maturity using TrACSS

For 2017–2020, national surveillance capacity was classified using TrACSS Question 7.4 “National surveillance system for AMR in humans”, classified A–E as follows:

A—No capacity for generating or reporting AMR data

B—AMR data collated locally, but without standardized national coordination

C—AMR data collated nationally, but without standardized coordination or quality management

D—Standardized national AMR surveillance system with a national coordinating center and national AMR reports produced

E—National AMR surveillance system linking AMR surveillance with antimicrobial consumption/use data

For 2021–2022, the equivalent item (Question 3.3 “National AMR surveillance system”) with the same A–E scoring rubric was used.

Countries classified as *D* or *E* were classified as expected to produce national AMR surveillance reports, and were therefore included in *Step 3*.

Step 3: Structured search for national AMR surveillance reports

The following search string was applied:

“[Country name]” AND (“antimicrobial resistance” OR “antibiotic resistance” OR “AMR”) AND (“surveillance” OR “monitoring” OR “report” OR “bulletin”)

Searches were conducted across government health domains and national public health institute websites. If no reports were identified through this process, countries proceeded to *Step 4*.

Step 4: Ministry of Health website verification

For countries classified as D/E but no public report identified in Step 3, the Ministry of Health websites were manually reviewed to confirm absence or alternative publication locations.

All searches were completed in December 2024.

Table S15. Overview of 269 policy documents selected for formal analysis

ISO3	Name	Title	Language	Original title	Start year	End year	FAO AMR-LEX (Policies, institutional frameworks and other cross-sectoral responses)	WHO Library of AMR NAPs	AMR NAP Translation Project	Manual retrieval	NAPs Included in the study	Alternative file Analyzed in the Study
AFG	Afghanistan	National Action Plan on Antimicrobial Resistance	English		2017	2021	4	1	0	0	1	0
AGO	Angola	National Health Development Plan 2012-2025	Portuguese	Plano Nacional de, Desenvolvimento Sanitário, 2012-2025	2012	2025	1	0	0	0	0	1
ALB	Albania	Albania National action plan against anti-microbial resistance (NAP-AMR)	English		2017		4	1	0	0	1	0
AND	Andorra	Decree 48/2025, of 19-2-2025, approving the regulations for the creation, composition, operation and organization of the Interministerial Commission One Health	Catalan	Decret 48/2025, del 19-2-2025, d'aprovació del Reglament de creació, composició, funcionament i organització de la Comissió Interministerial Una Sola Salut.	2025		1	0	0	0	0	1
ARE	United Arab Emirates	National Strategy and Action Plan for Combating Antimicrobial Resistance (NAP-AMR)	Arabic; English	الاستراتيجية الوطنية وخطة العمل لمكافحة مقاومة مضادات الميكروبات	2019	2023	1	1	0	0	1	0
ARG	Argentina	Strategy for the control of antimicrobial resistance	Spanish	Estrategia Argentina para el Control de la Resistencia Antimicrobiana	2015		9	1	1	0	1	0
ARM	Armenia	Joint Order approving the Antimicrobial Resistance Control and Prevention Program and interagency Action Plan 2024-2027	English		2024	2027	2	1	1	0	1	0
ARM	Armenia	Strategy for control and prevention of anti-microbial resistance (AMR) for the period of 2015-2020.	Armenian	հակամանրէային դեղերի նկատմամբ կայունության հսկողության և	2015	2020					1	0

				կանխարգելման ռազմավարության 2015-2020 թվականների Հայ աստանի								
ATG	Antigua and Barbuda	-	-	-			0	0	0	0	0	0
AUS	Australia	One Health Master Action Plan for Australia's National Antimicrobial Resistance Strategy 2020 & Beyond	English		2020		14	2	0	0	1	0
AUS	Australia	Implementation Plan of Australia's First National Antimicrobial Resistance Strategy 2015-2019.	English		2015	2019					1	0
AUS	Australia	Responding to Antimicrobial Resistance - Australian Animal Sector - National Antimicrobial Resistance Plan 2018	English		2018						0	1
AUT	Austria	National Action Plan on Antibiotic Resistance (2021)	German	Nationaler Aktionsplan zur Antibiotikaresistenz (2021)	2021		2	2	2	0	1	0
AUT	Austria	National Action Plan on Antibiotic Resistance (2017)	German	Nationaler Aktionsplan zur Antibiotikaresistenz (2017)	2017	2020					1	0
AUT	Austria	National Action Plan on Antibiotic Resistance (2014)	German	Nationaler Aktionsplan zur Antibiotikaresistenz (2014)	2014	2016					1	0
AZE	Azerbaijan	Resolution No. 18 of the Board of the Food Safety Agency on approving the Regulations of the Animal Health and Biosecurity Department of the Office of the Food Safety Agency	Azerbaijani	Azərbaycan Respublikası Qida Təhlükəsizliyi Agentliyinin Aparatının Heyvan sağlamlığı və bioloji təhlükəsizlik şöbəsinin Əsasnaməsi" təsdiq edilməsi barədə Azərbaycan Respublikasının Qida Təhlükəsizliyi Agentliyinin Kollegiyası Qərarı № 18	2020		4	0	0	0	0	1

BDI	Burundi	Multi-sectoral National action Plan to combat antimicrobial resistance 2020-2023	French	Plan d'Action National Multisectoriel de Lutte contre la Résistance aux Anti-Microbiens 2020-2023	2020	2023	2	1	1	0	1	0
BEL	Belgium	Belgian "One Health" National Action Plan on the Fight Against Antimicrobial Resistance (AMR) 2020-2024	English		2020	2024	1	2	1	0	1	0
BEL	Belgium	Belgian Antibiotic Policy Coordination Committee Policy Note for the 2014-2019 legislature	French	Belgian Antibiotic Policy Coordination Committee Note de politique pour la législature 2014-2019	2014	2019					1	0
BEN	Benin	Multi-sectoral National action Plan to combat antimicrobial resistance in the republic of benin	French	Plan d'Action National multisectoriel de lutte contre la Résistance aux Antimicrobiens en République du Bénin	2019	2024	2	1	0	0	1	0
BFA	Burkina Faso	Multi-sectoral national strategic Plan to fight antimicrobial resistance 2018-2020	French	Plan stratégique national multisectoriel de lutte contre la résistance antimicrobienne 2018-2020	2018	2020	8	1	1	0	1	0
BFA	Burkina Faso	Multi-sectoral National action Plan to combat antimicrobial resistance 2017-2020	French	Plan d'Action National Multisectoriel de Lutte Contre la Résistance aux Antimicrobiens 2017-2020	2017	2020					1	0
BGD	Bangladesh	National Action Plan for Antimicrobial Resistance Containment in Bangladesh 2017-2022	English		2017	2022	10	1	0	0	1	0
BGD	Bangladesh	Strategic Framework and Action Plan for the Application of a One Health Approach in Bangladesh	English		2017	2021					0	1
BGR	Bulgaria	Project on National Programme for Rational Use of Antibiotics and Control of Antibiotic Resistance	Bulgarian	ПРОЕКТ НА НАЦИОНАЛНА ПРОГРАМА ЗА РАЦИОНАЛНА УПОТРЕБА НА АНТИБИОТИЦИТЕ И НАДЗОР НА АНТИБИОТИЧНАТА РЕЗИСТЕНТНОСТ	2017	2021	2	0	1	0	1	0

BHR	Bahrain	National Action Plan on Antimicrobial Resistance	English		2019	2025	1	1	0	0	1	0
BHS	Bahamas	-	-	-			0	0	0	0	0	0
BLR	Belarus	-	-	-			2	0	0	0	0	0
BLZ	Belize	-	-	-			0	0	0	0	0	0
BMU	Bermuda	-	-	-			0	0	0	0	0	0
BOL	Bolivia	Administrative resolution no. 383/2023 - establishment of AMR containment committee on agricultural health and food safety	Spanish	Resolución Administrativa N° 383/2023 - Créase el Comité de Contención de la RAM en Sanidad Agropecuaria e Inocuidad Alimentaria	2023		3	0	0	0	0	1
BRA	Brazil	National Action Plan for the Prevention and Control of Antimicrobial Resistance in the Unified Healthcare System (2018-2022)	Portuguese	Plano de Ação Nacional de Prevenção e Controle da Resistência aos Antimicrobianos no Âmbito da Saúde Única (2018-2022)	2018	2022	6	1	1	0	1	0
BRA	Brazil	National Action Plan for the Prevention and Control of Antimicrobial Resistance in Agriculture and Livestock (PAN-BR AGRO) Phase II	Portuguese	Plano de Ação Nacional de Prevenção e Controle da Resistência aos Antimicrobianos no âmbito da Agropecuária (PAN-BR AGRO) 2a Etapa	2023	2027					0	1
BRA	Brazil	National Action Plan for the Prevention and Control of Antimicrobial Resistance in Agriculture and Livestock (PAN-BR AGRO)	Portuguese	Plano de Ação Nacional de Prevenção e Controle da Resistência aos Antimicrobianos no âmbito da Agropecuária (PAN-BR AGRO)	2018	2022					0	1
BRB	Barbados	Barbados National Action Plan on Combating Antimicrobial Resistance 2017-2022	English		2017	2022	2	1	0	0	1	0
BRN	Brunei Darussalam	Antimicrobial Resistance National Action Plan 2019-2023	English		2019	2023	1	1	0	0	1	0

BTN	Bhutan	National Action Plan on Antimicrobial Resistance (2018-2022)	English		2018	2022	3	1	0	0	1	0
BWA	Botswana	-	-	-			2	0	0	0	0	0
CAF	Central African Republic	-	-	-			0	0	0	0	0	0
CAN	Canada	Pan-Canadian Action Plan on Antimicrobial Resistance	English		2023	2028	4	2	0	0	1	0
CAN	Canada	Tackling Antimicrobial Resistance and Antimicrobial Use: A Pan-Canadian Framework for Action	English		2017	2022					1	0
CAN	Canada	Antimicrobial Resistance and Use in Canada: A Federal Framework for Action	English		2014	2016					1	0
CHE	Switzerland	Strategy on Antibiotic Resistance	English		2015		4	1	0	0	1	0
CHL	Chile	National Plan against Antimicrobial Resistance Chile 2021-2025	Spanish	Plan Nacional contra la Resistencia a los Antimicrobianos Chile 2021-2025	2021	2025	5	1	0	1	1	0
CHL	Chile	National Plan against Antimicrobial Resistance Chile	Spanish	Plan Nacional contra la Resistencia a los Antimicrobianos Chile	2017	2020					1	0
CHN	China	National Action Plan to Curb Microbial Resistance (2022-2025)	Chinese	遏制微生物耐药国家行动计划 (2022-2025 年)	2022	2025	15	2	0	0	1	0
CHN	China	National Action Plan to Contain Antimicrobial Resistance (2016-2020)	Chinese	遏制细菌耐药国家行动计划 (2016-2020 年)	2016	2020					1	0
CIV	Cote d'Ivoire	National Multisectoral Action Plan to Combat Antimicrobial Resistance (PAN-RAM) 2021-2025	French	Plan d'Action National multisectoriel de lutte contre les Résistances aux Antimicrobiens (PAN-RAM) 2021-2025	2021	2025	6	1	0	0	1	0

CMR	Cameroon	2021-2023 action Plan for good antimicrobial management in Cameroon	French	Plan d'Action 2021-2023 pour la bonne gestion des antimicrobiens au Cameroun	2021	2023	4	2	2	0	1	0
CMR	Cameroon	Cameroon national action Plan to combat antimicrobial resistance	French	Cameroun Plan d'action national de lutte contre la résistance aux antimicrobiens	2018	2020					1	0
COD	Dem. Rep. Congo	National plan to combat antimicrobial resistance	French	Plan national de lutte contre la résistance aux antimicrobiens	2018	2022	1	1	1	0	1	0
COG	Republic of Congo	-	-	-			0	0	0	0	0	0
COK	Cook Islands	Cook Islands Antimicrobial Resistance National Action Plan (2017-2020)	English		2017	2020	2	1	0	0	1	0
COL	Colombia	National Response Plan to Antimicrobial Resistance	Spanish	Plan Nacional de Respuesta a la Resistencia a los Antimicrobianos	2018		3	1	0	0	1	0
COM	Comoros	National Multisectoral Action Plan to Combat Antimicrobial Resistance in the Union of the Comoros 2022-2026	French	Plan d'Action National Multisectoriel de lutte contre la Résistance aux antimicrobiens en Union des Comores 2022-2026	2022	2026	1	1	0	0	1	0
CPV	Cabo Verde	National Action Plan to Fight Antimicrobial Resistance 2018-2022	Portuguese	Plano de Ação Nacional de Luta Contra a Resistência Antimicrobiana 2018-2022	2018	2022	2	1	1	0	1	0
CRI	Costa Rica	National Action Plan to Combat Antimicrobial Resistance in Costa Rica 2018-2025	Spanish	Plan de Acción Nacional de Lucha contra la Resistencia a los Antimicrobianos Costa Rica 2018-2025	2018	2025	5	1	1	0	1	0
CRI	Costa Rica	Strategic and Operational Livestock Plan to Combat Antimicrobial Resistance 2017-2022	Spanish	Plan Estratégico y Operacional Pecuário de Lucha Contra la Resistencia a los Antimicrobianos 2017-2022	2017	2022					0	1
CUB	Cuba	Containment of antimicrobial resistance by the Cuban Regulatory Authority, 2019	Spanish	Contención de la resistencia antimicrobiana desde la Autoridad Reguladora Cubana, 2019	2019		0	0	0	1	0	1
CYP	Cyprus	Cyprus National Strategy on Antimicrobial Resistance to Antibiotics	Greek	Εθνική Στρατηγική Κύπρου για την Αντιμετώπιση της Μικροβιακής Αντοχής στα Αντιβιοτικά	2012		3	1	1	0	1	0

CZE	Czech Republic	Action plan for the national antibiotic program 2019-2022	Czech	Akční plán Národního antibiotického programu České republiky (AP NAP) na období 2019-2022	2019	2022	2	2	2	0	1	0
CZE	Czech Republic	Action Plan of the National Antibiotic Programme for the period 2011-2013	Czech	Akční plán Národního antibiotického programu pro období 2011-2013	2011	2013					1	0
CZE	Czech Republic	Establishment of the National Antibiotic Programme 2009	English		2009						1	0
DEU	Germany	DART 2030 German Antimicrobial Resistance Strategy	English		2023	2030	4	1	0	0	1	0
DEU	Germany	DART 2020 – Fighting antibiotic resistance for the good of both humans and animals	English		2015	2020					1	0
DJI	Djibouti	-	-	-			3	0	0	0	0	0
DMA	Dominica	-	-	-			0	0	0	0	0	0
DNK	Denmark	National One Health Strategy against Antibiotic Resistance	English		2017		3	1	0	0	1	0
DNK	Denmark	Joint antibiotics and resistance action plan 2010	English		2010						1	0
DNK	Denmark	National Action Plan on Antibiotics in Human Healthcare: Three measurable goals for a reduction of antibiotic consumption towards 2020	English		2017	2020					0	1
DOM	Dominican Republic	-	-	-			2	0	0	0	0	0
DZA	Algeria	National strategic Plan to address antimicrobial resistance 2024-2028	French	Plan National Stratégique de lutte contre la résistance aux antimicrobiens 2024-2028	2024	2028	3	1	0	0	1	0
DZA	Algeria	Executive decree no. 17-310 of 4 Safar 1439 corresponding to 24 October 2017 on the creation, missions, organization and	French	Décret exécutif n° 17-310 du 4 Safar 1439 correspondant au 24 octobre 2017 portant création, missions, organisation et fonctionnement du comité national	2017						0	1

		functioning of the national multisectoral committee for the fight against antimicrobial resistance		multisectoriel de lutte contre la résistance aux antimicrobiens								
ECU	Ecuador	Agreement No. 00011-2019 - National Plan for the Prevention and Control of Antimicrobial Resistance 2019-2023	Spanish	Acuerdo N° 00011-2019 - Plan Nacional para la Prevención y Control de la Resistencia Antimicrobiana 2019-2023	2019	2023	3	1	1	0	1	0
ECU	Ecuador	Interinstitutional Agreement No. 00001-2020 — Creates the National Committee for the Prevention and Control of Antimicrobial Resistance	Spanish	Acuerdo Interinstitucional N° 00001-2020 — Crea el Comité Nacional de Prevención y Control de la Resistencia Antimicrobiana	2020						0	1
EGY	Egypt	One Health Communication Strategy for Antimicrobial Resistance 2024 - 2027	English		2024	2027	4	1	0	0	1	0
EGY	Egypt	National Action Plan for Antimicrobial Resistance 2018-2022	English		2018	2022					1	0
ERI	Eritrea	ritrean National Action Plan for combating Antimicrobial Resistance 2021-2025	English		2021	2025	2	1	0	0	1	0
ERI	Eritrea	National Action Plan for Health Security (NAPHS), 2017-2021	English		2017	2021					0	1
ESP	Spain	National Plan against Antibiotic Resistance 2022-2024	Spanish	Plan Nacional frente a la Resistencia a los Antibióticos 2022-2024	2022	2024	7	2	1	0	1	0
ESP	Spain	National Plan against Antibiotic Resistance 2019–2021	Spanish	Plan Nacional frente a la Resistencia a los Antibióticos 2019–2021	2019	2021					1	0
ESP	Spain	Strategic and action plan to reduce the risk of selection and spread of antibiotic resistance	Spanish	Plan estratégico y de acción para reducir el riesgo de selección y diseminación de la resistencia a los antibióticos	2014	2018					1	0

EST	Estonia	Action plan for reducing anti-microbial resistance in veterinary medicine 2021-2026	Estonian	Mikroobide antibiootikumiresistentsuse vähendamise tegevuskava veterinaarmeditsiini valdkonnas aastateks 2021–2026	2021	2026	5	0	0	0	1	0
EST	Estonia	Action plan for reducing microbial antibiotic resistance in veterinary medicine for 2019-2023	Estonian	Mikroobide antibiootikumiresistentsuse vähendamise tegevuskava veterinaarmeditsiini valdkonnas aastateks 2019–2023	2019	2023					1	0
EST	Estonia	Action Plan for Reducing the Antimicrobial Resistance of Microbes in the field of Veterinary Medicine 2017-2021	Estonian	Mikroobide antibiootikumiresistentsuse vähendamise tegevuskava veterinaarmeditsiini valdkonnas aastateks 2017–2021	2017	2021					1	0
ETH	Ethiopia	Antimicrobial Resistance Prevention and Containment Strategic Plan - The One Health Approach - 2021-2025 Third Edition	English		2021	2025	12	2	0	1	1	0
ETH	Ethiopia	Strategy for the Prevention and Containment of Antimicrobial Resistance for Ethiopia Second Edition, 2015 to 2020	English		2015	2020					1	0
ETH	Ethiopia	National Strategic Framework for Prevention and Containment of Antimicrobial Resistance	English		2012						1	0
ETH	Ethiopia	Ethiopia National One Health Strategic Plan (2018 – 2022)	English		2018	2022					0	1

FIN	Finland	Finland National Action Plan on Antimicrobial Resistance 2017-2021	English		2017	2021	1	1	0	0	0	0
FJI	Fiji	One Health National Action Plan on Antimicrobial Resistance 2022 to 2025	English		2022	2025	3	2	0	0	1	0
FJI	Fiji	Fiji National Antimicrobial Resistance Action Plan 2015	English		2015						1	0
FRA	France	2022-2025 National Strategy for Preventing Infections and Antibiotic Resistance	English		2022	2025	21	2	0	0	1	0
FRA	France	National antibiotic alert plan 2011-2016	French	Plan national d'alerte sur les antibiotiques 2011-2016	2011	2016					1	0
FRA	France	Roadmap of Cross-Sectoral Actions to Control Antibiotic Resistance	French; English	Feuille de Route d'Actions Trans-Sectorielles Visant à Maîtriser l'Antibiorésistance	2016						0	1
FRA	France	Priority Antibiotic Resistance Research Program (PPR Antibiotic Resistance)	French	Programme prioritaire de recherche Antibiorésistance (PPR Antibiorésistance)	2019						0	1
FRA	France	National Plan for Reducing the Risks of Antibiotic Resistance in Veterinary Medicine 2017-2021 (ECOANTIBIO2)	French	Plan National de Réduction des Risques d'Antibiorésistance en Médecine Vétérinaire 2017-2021 (ECOANTIBIO2)	2017	2021					0	1

FRA	France	National Plan for Reducing the Risks of Antibiotic Resistance in Veterinary Medicine 2012-2017 (ECOANTIBIO)	French	Plan National de Réduction des Risques d'Antibiorésistance en Médecine Vétérinaire 2012-2017 (ECOANTIBIO)	2012	2017					0	1
FSM	Micronesia	National Multisectoral Action Plan on antimicrobial resistance for Micronesia 2019-2023	English		2019	2023	1	1	0	0	1	0
GAB	Gabon	Antimicrobial Resistance (AMR) 2018 Edition	French	Résistance aux antimicrobiens (RAM) Edition 2018	2018	2023	4	1	0	0	1	0
GBR	United Kingdom	United Kingdom of Great Britain and Northern Ireland: Confronting antimicrobial resistance (2024-2029)	English		2024	2029	13	2	0	0	1	0
GBR	United Kingdom	Tackling antimicrobial resistance 2019 to 2024: the UK's 5-year national action plan.	English		2019	2024					1	0
GBR	United Kingdom	UK Five Year Antimicrobial Resistance Strategy 2013 to 2018	English		2013	2018					1	0
GBR	United Kingdom	Contained and controlled: the UK's 20-year vision for antimicrobial resistance	English		2019	2040					0	1
GBR	United Kingdom	Changing the Culture 2019-2024: One Health. Tackling Antimicrobial Resistance in Northern Ireland - A Five-Year Action Plan	English		2019	2024					0	1

GEO	Georgia	National Strategy for Combating Antimicrobial Resistance for 2017-2020	Georgian	ანტიმიკრობული რეზისტენტობის საწინააღმდეგო 2017-2020 წლების ეროვნული სტრატეგია	2017	2020	5	0	1	0	1	0
GEO	Georgia	Government Decree No. 29 validating National Strategy against Anti-microbial resistance for the period 2017-2020	Georgian	საქართველოს მთავრობის განკარგულება №29 2017 წლის 11 იანვარი ქ. თბილისი ანტიმიკრობული რეზისტენტობის საწინააღმდეგო 2017-2020 წლების ეროვნული სტრატეგიის დამტკიცების შესახებ	2017						0	1
GHA	Ghana	Ghana National Action Plan for Antimicrobial Use and Resistance 2017-2021	English		2017	2021	4	1	0	0	1	0
GIN	Guinea	National Multisectoral Action Plan to Combat Antimicrobial Resistance in Guinea	French	Plan d'Action National Multisectoriel de lutte contre la Résistance aux antimicrobiens en Guinée	2020	2024	5	1	1	0	1	0
GIN	Guinea	Order A/2021/1238/MS/SGG on the Creation, Organization, Composition and Operation of the National Steering Committee for the Fight Against Antimicrobial Resistance	French	Arrêté A/2021/1238/MS/SGG portant Création, Organisation, Composition et Fonctionnement du Comité National de Pilotage de la Lutte Contre la Résistance aux Antimicrobiens	2021						0	1
GIN	Guinea	Integrated operational action plan of the "one health" platform 2021	French	Plan d'action opérationnelle intégré de la plateforme « une seule santé » 2021	2021						0	1
GMB	Gambia	The Gambia National Medicines Policy 2022-2025	English		2022	2025	6	0	0	0	0	1
GNB	Guinea-Bissau	National Action Plan Against Antimicrobial Resistance 2023-2028	Portuguese	Plano de Ação Nacional Contra a Resistência Antimicrobiana 2023-2028	2023	2028	1	1	0	0	1	0

GNQ	Equatorial Guinea	-	-	-			0	0	0	0	0	0
GRC	Greece	National Action Plan for Combating Antimicrobial Resistance in Greece in the Framework of Unified Health 2019-2023	Greek	Εθνικό Σχέδιο Δράσης για την Αντιμετώπιση της Μικροβιακής Αντοχής στην Ελλάδα στο Πλαίσιο της Ενιαίας Υγείας 2019-2023	2019	2023	2	1	2	0	1	0
GRC	Greece	National Action Plan for the Treatment of Antimicrobial Resistance to Antibiotics and Infectious Diseases 2008-2012	Greek	Εθνικό Σχέδιο Δράσης για την Αντιμετώπιση της Μικροβιακής Αντοχής στα Αντιβιοτικά και των Λοιμώξεων σε Χώρους Παροχής Υπηρεσιών Υγείας 2008 - 2012	2008	2012					1	0
GRD	Grenada	-	-	-			0	0	0	0	0	0
GTM	Guatemala	-	-	-			0	0	0	0	0	0
GUY	Guyana	-	-	-			0	0	0	0	0	0
HND	Honduras	-	-	-			0	0	0	0	0	0
HRV	Croatia	National program for the control of bacterial resistance to antibiotics 2017–2021	Croatian	Nacionalni program za kontrolu otpornosti bakterija na antibiotike 2017–2021	2017	2021	1	1	1	0	1	0
HTI	Haiti	-	-	-			1	0	0	0	0	0
HUN	Hungary	-	-	-			0	0	0	0	0	0
IDN	Indonesia	National Action Plan on Antimicrobial Resistance Control, years 2020-2024	English		2020	2024	6	2	0	0	1	0
IDN	Indonesia	National Action Plan on Antimicrobial Resistance Indonesia 2017-2019	English		2017	2019					1	0
IND	India	National Action Plan on Antimicrobial Resistance (NAP-AMR) 2017 – 2021	English		2017	2021	6	1	0	0	1	0

IND	India	National Policy for Containment of Antimicrobial Resistance	English		2011						1	0
IRL	Ireland	Ireland's Second One Health National Action Plan on Antimicrobial Resistance 2021-2025	English		2021	2025	5	2	0	0	1	0
IRL	Ireland	Ireland's National Action Plan on Antimicrobial Resistance 2017-2020	English		2017	2020					1	0
IRN	Iran	National Action Plan for combating antimicrobial resistance 2016 – 2021	English; Farsi		2016	2021	1	1	0	0	1	0
IRQ	Iraq	Iraq Action Plan of Antimicrobial Resistance (2018-2022)	English		2018	2022	1	1	0	0	1	0
ISL	Iceland	Analysis of the task force on actions to reduce the spread of antibiotic-resistant bacteria in Iceland	Icelandic	Greinargerð starfshóps um aðgerðir til að draga úr útbreiðslu sýklalyfjaónæmra baktería á Íslandi	2017		3	1	2	0	1	0
ISL	Iceland	Final report Working group on action plans etc. antibiotic-resistant bacteria in animals, slaughter products and foodstuffs	Icelandic	Lokaskýrsla Starfshópur um aðgerðaaáætlanir o.fl. vegna sýklalyfjaónæmra baktería í dýrum, sláturafurðum og matvælum	2021						0	1
ISR	Israel	A national program for educated use of antibiotics	Hebrew	הנדון: תוכנית לאומית לשימוש מושכל באנטיביוטיקה	2012		0	0	1	0	0	1
ITA	Italy	National Plan for Combatting Antibiotic-Resistance (PNCAR) 2022-2025	Italian	Piano Nazionale di Contrasto all'Antibiotico-Resistenza (PNCAR) 2022-2025	2022	2025	7	2	1	0	1	0
ITA	Italy	National Plan to Combat Antimicrobial Resistance (PNCAR) 2017-2020	Italian	Piano Nazionale di Contrasto dell'Antimicrobico-Resistenza (PNCAR) 2017-2020	2017	2020					1	0

ITA	Italy	Implementation Action Plan (2020-2025) for the Italian Microbiome Initiative	English		2020	2025					0	1
JAM	Jamaica	-	-	-			0	0	0	0	0	0
JOR	Jordan	Monitoring and Evaluation (M&E) Plan for the National Action Plan (NAP) for Combating Antimicrobial Resistance (AMR) 2023-2025	English		2023	2025	4	2	0	0	1	0
JOR	Jordan	National Action Plan to Combat Antimicrobial Resistance in Hashemite Kingdom of Jordan 2018-2022	English		2018	2022					1	0
JPN	Japan	National Action Plan on Antimicrobial Resistance (AMR) 2023-2027	English; Japanese		2023	2027	2	2	0	0	1	0
JPN	Japan	National Action Plan on Antimicrobial Resistance (AMR) 2016-2020	English		2016	2020					1	0
KAZ	Kazakhstan	Decree of the Ministry of Agriculture validating Strategic Plan of the Ministry of Agriculture for the period of 2020-2024	Russian	О Стратегическом плане Министерства сельского хозяйства Республики Казахстан на 2020-2024 годы	2020	2024	2	0	0	0	0	1
KEN	Kenya	National Action Plan on Prevention and Containment of Antimicrobial Resistance 2017–2022	English		2017	2022	13	1	0	0	1	0
KEN	Kenya	National Policy on Prevention and Containment of Antimicrobial Resistance	English		2017						0	1

KEN	Kenya	National Strategic Plan for the implementation of One-Health in Kenya 2012-2017	English		2012	2017					0	1
KGZ	Kyrgyzstan	Joint Order No. 14 of the Ministry of Health and the Ministry of Agriculture validating Intersectoral Program "Containing antimicrobial resistance in the Kyrgyz Republic for 2022-2025."	Kyrgyz; Russian	МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ КЫРГЫЗСКОЙ РЕСПУБЛИКИ МИНИСТЕРСТВО СЕЛЬСКОГО ХОЗЯЙСТВА КЫРГЫЗСКОЙ РЕСПУБЛИКИ МЕЖВЕДОМСТВЕННАЯ ПРОГРАММА «Сдерживание устойчивости к противомикробным препаратам в Кыргызской Республике на 2022-2025 гг.»	2022	2025	3	1	1	0	1	0
KHM	Cambodia	Multi-Sectoral Action Plan on Antimicrobial Resistance 2019-2023	English; Khmer		2019	2023	6	1	0	0	1	0
KHM	Cambodia	National Strategy To Combat Antimicrobial Resistance 2015-2017	English		2015	2017					1	0
KNA	Saint Kitts and Nevis	-	-	-			0	0	0	0	0	0
KOR	South Korea	National Antimicrobial Resistance (AMR) Management Plan (2021-2025)	Korean	국가 항생제 내성 관리대책(2021~2025)	2021	2025	3	2	1	0	1	0
KOR	South Korea	National Action Plan on Antimicrobial Resistance (2016-2020)	Korean	국가 항생제 내성 관리대책(2016~2020)	2016	2020					1	0
KWT	Kuwait	Kuwait National Action Plan on Antimicrobial Resistance 2022	English		2022	2027	1	1	0	0	1	0
LAO	Laos	National Strategic Plan on Antimicrobial Resistance in Lao PDR 2019 – 2023	English; Laotian		2019	2023	2	1	0	0	1	0
LBN	Lebanon	National Action Plan on Combating Antimicrobial Resistance	English		2020	2025	1	1	0	0	1	0

LBR	Liberia	National Action Plan on Prevention and Containment of Antimicrobial Resistance in Liberia 2018 – 2022	English		2018	2022	7	1	0	0	1	0
LBR	Liberia	National One Health Strategic Plan, 2019 - 2023	English		2019	2023					0	1
LBY	Libya	National Action Plan on Prevention and containment of Antimicrobial Resistance 2019 - 2023	English		2019	2023	1	1	0	0	1	0
LCA	Saint Lucia	-	-	-			0	0	0	0	0	0
LKA	Sri Lanka	National Strategic Plan for Combating Antimicrobial Resistance in Sri Lanka 2023-2028	English		2023	2028	3	2	0	0	1	0
LKA	Sri Lanka	National Strategic Plan for Combating Antimicrobial Resistance in Sri Lanka 2017 – 2022	English		2017	2022					1	0
LSO	Lesotho	-	-	-			0	0	0	0	0	0
LTU	Lithuania	Order No. V-857 of the Minister of Health validating Action Plan 2017-2021 on antimicrobial resistant micro-organisms spread prevention and control	Lithuanian	LIETUVOS RESPUBLIKOS SVEIKATOS APSAUGOS MINISTRAS ĮSAKYMAS DĖL ANTIMIKROBINĖMS MEDŽIAGOMS ATSPARIŲ MIKROORGANIZMŲ PLITIMO PREVENCIJOS IR KONTROLĖS 2017–2021 METŲ VEIKSMŲ PLANO PATVIRTINIMO 2017 m. liepos 7 d. Nr. V-857 Vilnius	2017	2021	1	1	1	0	1	0
LUX	Luxembourg	National Antibiotics Plan 2018-2022	French	Plan National Antibiotiques 2018-2022	2018	2022	2	1	0	0	1	0
LUX	Luxembourg	Regulation of the Government in Council of February 2, 2018 establishing a National Antibiotics Committee	French	Règlement du Gouvernement en Conseil du 2 février 2018 portant institution d'un Comité National Antibiotiques	2018						0	1

LVA	Latvia	Latvia "One Health" Plan for Containing Antimicrobial Resistance and Prudent Use of Antibiotics for 2019-2020	Latvian	Antimikrobiālās rezistences ierobežošanas un piesardzīgas antibiotiku lietošanas plānu "Viena veselība" 2019.-2020. gadam	2019	2020	2	1	1	0	1	0
MAR	Morocco	National Strategic Plan for the Prevention and Control of Antimicrobial Resistance	French	Plan Stratégique national de prévention et de contrôle de la résistance aux antimicrobiens	2019	2025	1	1	1	0	1	0
MCO	Monaco	-	-	-			1	0	0	0	0	0
MDA	Moldova	Government Decree No. HG697/2023 validating the National Program for the surveillance and combating of antimicrobial resistance for the years 2023-2027	Romanian; Russian	Republica Moldova GUVERNUL HOTĂRÂRE Nr. HG697/2023 din 20.09.2023 cu privire la aprobarea Programului național pentru supravegherea și combaterea rezistenței la antimicrobiene pe anii 2023-2027	2023	2027	5	1	1	0	1	0
MDA	Moldova	National Program for surveillance and anti-microbial resistance for the period of 2019-2028	Romanian	Chișinău cu privire la aprobarea Programului național pentru supravegherea și combaterea rezistenței antimicrobiene pentru anii 2019-2028	2019	2028					1	0
MDA	Moldova	Joint Order No. 1253/492/187 "On the establishment of the monitoring system of antimicrobial resistance of zoonotic and commensal bacteria in the context of the implementation of the "One Health" approach	Romanian	Ministerul Sănătății al Republicii Moldova AGENTIA NATIONALA PENTRU SIGURANTA ALIMENTELOR ITNSTITUTIA PUBLICA CENTRUL REPUBLICAN DE DIAGNOSTIC VETERINAR ORDIN No. 1253/492/187 Cu privire la instituirea sistemului de monitorizare a rezistenței la antimicrobiene a bacteriilor zoonotice și comensale în contextul implementării abordării „O singuri sinitate"	2022						0	1
MDG	Madagascar	National Action Plan to Combat Antimicrobial Resistance	French	Plan d'action National pour Combattre la Résistance aux Antimicrobiens	2019		2	1	1	0	1	0

MDV	Maldives	National Action Plan for Containment of Antimicrobial Resistance 2017-2022	English		2017	2022	2	1	0	0	1	0
MEX	Mexico	Agreement declaring the National Action Strategy against Antimicrobial Resistance mandatory	Spanish	Acuerdo por el que se declara la obligatoriedad de la Estrategia Nacional de Acción contra la Resistencia a los Antimicrobianos	2018		1	0	1	0	1	0
MHL	Marshall Islands	National Multisectoral Plan on antimicrobial resistance 2019-2023	English		2019	2023	2	1	0	0	1	0
MKD	North Macedonia	National Strategy For Containment of Antimicrobial Resistance 2012-2016	English		2012	2016	1	1	0	0	1	0
MLI	Mali	National Action Plan (NAP) to combat Antimicrobial Resistance (AMR) in Mali - NAP-RAM 2019-2023	French	Plan d'Action National (PAN) de lutte contre la Résistance aux Antimicrobiens (RAM) au Mali - PAN-RAM 2019-2023	2019	2023	2	1	1	0	1	0
MLI	Mali	Decree 2018-0369/PR-RM of April 12, 2018 establishing the creation, attributions, organization and operation of the "One Health" Platform in Mali	French	Décret 2018-0369/PR-RM du 12 avril 2018 portant création, attributions, organisation et fonctionnement de la Plateforme « Une seule santé » au Mali	2018						0	1
MLT	Malta	A Strategy and Action Plan for the Prevention and Containment of Antimicrobial Resistance in Malta (2020-2028)	English		2020	2028	3	1	0	0	1	0
MLT	Malta	A Strategy and Action Plan for the Prevention and Containment of Antimicrobial Resistance in MALTA 2018 - 2025	English		2018	2025					1	0
MLT	Malta	National Antimicrobial Resistance Committee Regulations, 2023 (L.N. 105 of 2023)	English		2023						0	1

MMR	Myanmar	Myanmar National Action Plan for Containment of Antimicrobial Resistance (2017-2022)	English		2017	2022	3	1	0	0	1	0
MNE	Montenegro	Action plan for the implementation of the National Strategy for the control of bacterial resistance to antibiotics 2017-2021	Montenegri n	Akcioni plana za sprovođenje Nacionalne strategija za kontrolu rezistencije bakterija na antibiotike 2017-2021. godinu	2017	2021	3	1	1	0	1	0
MNE	Montenegro	National Strategy for antibiotic resistance control for the period from 2017 to 2021	Montenegri n	Nacionalna strategija za kontrolu rezistencije bakterija na antibiotike za period od 2017 do 2021 godine	2017	2021				0	0	1
MNG	Mongolia	Multi-sectoral National Action Plan on Antimicrobial Resistance Mongolia, 2022-2025	English; Mongolian		2022	2025	2	2	0	0	1	0
MNG	Mongolia	National multi-sectoral action plan on combatting antimicrobial resistance	English		2017	2020					1	0
MOZ	Mozambique	National Action Plan to Fight Antimicrobial Resistance 2019-2023	Portuguese	Plano Nacional de Acção Contra a Resistência Antimicrobiana 2019-2023	2019	2023	1	1	1	0	1	0
MRT	Mauritania	Order No. 000346 bis of May 14, 2020 establishing the Creation, Organization and Operation of the National Steering Committee for Health Security "One Health"	French	Arrêté n°000346 bis du 14 mai 2020 portant Création, Organisation et Fonctionnement du Comité National de Pilotage de la Sécurité Sanitaire « Une Seule Santé »	2020		4	0	0	0	0	1
MUS	Mauritius	National Action Plan on Antimicrobial Resistance 2017-2021	English		2017	2021	2	1	0	0	1	0
MWI	Malawi	Antimicrobial Resistance Strategy 2017 – 2022	English		2017	2022	5	1	0	0	1	0
MYS	Malaysia	Malaysian Action Plan on Antimicrobial Resistance (MyAP-AMR) 2022-2026	English		2022	2026	2	2	0	0	1	0

MYS	Malaysia	Malaysian Action Plan on Antimicrobial Resistance (MyAP-AMR) 2017-2021	English		2017	2021					1	0
NAM	Namibia	Namibian Antimicrobial Resistance National Action Plan (NAAP)	English		2017		3	1	0	0	1	0
NER	Niger	National Action Plan to Combat Antimicrobial Resistance (2025–2027)	French	Plan d'action national de lutte contre la résistance aux antimicrobiens (2025-2027)	2025	2027	1	1	0	0	1	0
NGA	Nigeria	Second One Health antimicrobial resistance national action plan 2024-2028	English		2024	2028	12	2	0	0	1	0
NGA	Nigeria	National Action Plan for Antimicrobial Resistance 2017-2022	English		2017	2022					1	0
NGA	Nigeria	One Health Strategic Plan 2019-2023	English		2019	2023					0	1
NIC	Nicaragua	National Action Plan for the Containment of Antimicrobial Resistance: 2020–2024	Spanish	Plan de Acción Nacional para la Contención de la Resistencia Antimicrobiana: 2020–2024	2020	2024	0	0	1	0	1	0
NLD	Netherlands	Letter to Parliament about the Approach to Antibiotic Resistance	English		2015		1	1	0	0	1	0
NOR	Norway	National Strategy against Antibiotic Resistance 2015–2020	English		2015	2020	9	1	0	0	1	0
NOR	Norway	Ministry of Agriculture and Food – Action Plan on Antibiotic Resistance	Norwegian	Handlingsplan mot antibiotikaresistens innenfor Landbruks- og matdepartementets sektoransvar	2018	2020					0	1
NPL	Nepal	National Action Plan on Antimicrobial Resistance (2024-2028)	English; Nepali		2024	2028	3	2	0	0	1	0

NPL	Nepal	National Antimicrobial Resistance Containment Action Plan Nepal 2016	English		2016	2025					1	0
NRU	Nauru	National Multi-sectoral Plan on Antimicrobial Resistance for Nauru 2021-2025	English		2021	2025	1	1	0	0	1	0
NZL	New Zealand	New Zealand Antimicrobial Resistance Action Plan	English		2017		1	1	0	0	1	0
OMN	Oman	Antimicrobial Resistance National Action Plan	English		2017		2	1	0	0	1	0
PAK	Pakistan	Pakistan Antimicrobial Resistance National Action Plan	English		2017		6	1	0	0	1	0
PAK	Pakistan	National Strategic Framework for Containment of Antimicrobial Resistance (AMR)	English		2018						0	1
PAN	Panama	-	-	-			1	0	0	0	0	0
PER	Peru	National Plan to Combat Antimicrobial Resistance 2017–2021	Spanish	Plan Nacional para enfrentar la resistencia a los antimicrobianos 2017–2021	2017	2021	7	1	1	0	1	0
PER	Peru	Supreme Decree No. 010-2019-SA — Multisectoral Plan to Combat Antimicrobial Resistance 2019 - 2021	Spanish	Decreto Supremo N° 010-2019-SA — Plan Multisectorial para enfrentar la Resistencia a los Antimicrobianos 2019 - 2021	2019	2021					0	1
PER	Peru	Resolution No. 769-2019-MINSA — Internal Regulations of the Multisectoral Commission on Antimicrobial Resistance	Spanish	Resolución N° 769-2019-MINSA — Reglamento interno de la Comisión Multisectorial sobre Resistencia Antimicrobianos	2019						0	1
PHL	Philippines	Philippine National Action Plan on Antimicrobial Resistance 2019-2023	English		2019	2023	3	1	0	0	1	0
PHL	Philippines	Philippine Action Plan to Combat Antimicrobial Resistance: One Health Approach	English		2014	2016					1	0

PHL	Philippines	Administrative Order No. 42 creating an Inter-Agency Committee for the formulation and implementation of a National Plan to Combat Antimicrobial Resistance in the Philippines	English		2014						0	1
PLW	Palau	-	-	-			0	0	0	0	0	0
PNG	Papua New Guinea	National Action Plan on Antimicrobial Resistance (AMR) 2019 - 2023	English		2019	2023	3	1	0	0	1	0
POL	Poland	National antibiotic protection program 2016-2020	Polish	Narodowy program ochrony antybiotyków na lata 2016-2020	2016	2020	1	1	1	0	1	0
PRK	North Korea	National Strategic Plan on Antimicrobial Resistance (2018-2020)	English		2018	2020	2	1	0	0	1	0
PRT	Portugal	National Plan to Fight Antimicrobial Resistance 2019-2023. Scope of the Concept: One Health Approach	Portuguese	Plano Nacional de Combate à Resistência aos Antimicrobianos 2019-2023 - Âmbito do Conceito: Uma Só Saúde	2019	2023	3	2	1	0	1	0
PRT	Portugal	Programme for the Prevention and Control of Infection and Antimicrobial Resistance - Programmatic Guidelines 2013	Portuguese	Programa de Prevenção e Controlo de Infecções e Resistências aos Antimicrobianos - Orientações Programáticas 2013	2013						1	0

PRY	Paraguay	Resolution No. 606 - Approving the National Plan against Antimicrobial Resistance 2024-2028 and providing for its implementation and dissemination throughout the country	Spanish	Resolución N° 606 - Por la cual se aprueba el Plan Nacional contra la Resistencia a los Antimicrobianos 2024-2028; y se dispone su implementación y difusión en todo el territorio nacional	2024	2028	3	1	1	0	1	0
PRY	Paraguay	National Action Plan on Antimicrobial Resistance 2019-2023	Spanish	Plan de Acción Nacional de Resistencia Antimicrobiana 2019-2023	2019	2023					1	0
PSE	State of Palestine	Palestine: National action plan for antimicrobial resistance	English		2020	2024	0	1	0	0	1	0
QAT	Qatar	Qatar National antimicrobial resistance action plan 2024-2030	English		2024	2030	0	1	0	0	1	0
ROU	Romania	National Strategy preventing and limiting healthcare-associated infections and combating the phenomenon of antimicrobial resistance in Romania for the period 2023-2030	Romanian	STRATEGIA NAȚIONALĂ prevenirea și limitarea infecțiilor asociate asistenței medicale și combaterea fenomenului de rezistență la antimicrobiene în România pentru perioada 2023-2030	2023	2030	3	0	0	0	1	0
ROU	Romania	Government Resolution No. 879 constituting the National Committee for Limiting Antimicrobial Resistance	Romanian	HOTĂRÂRE nr. 879 din 9 noiembrie 2018 privind înființarea Comitetului Național pentru Limitarea Rezistenței la Antimicrobiene	2018						0	1
RUS	Russia	Plan for 2019–2024 to implement the Strategy for the prevention of the spread of antimicrobial resistance in Russia, adopted by the Governmental Order No. 604-p of 30 March 2019	Russian	УТВЕРЖДЕН распоряжением Правительства Российской Федерации от 30 марта 2019 г. № 604-р ПЛАН МЕРОПРИЯТИЙ на 2019 - 2024 годы по реализации Стратегии предупреждения распространения антимикробной	2019	2024	12	1	0	0	1	0

				резистентности в Российской Федерации на период до 2030 года								
RUS	Russia	Strategy on prevention of the spread of antimicrobial resistance in the Russian Federation for the period until 2030	Russian	СТРАТЕГИЯ предупреждения распространения антимикробной резистентности в Российской Федерации на период до 2030 года	2017	2030					0	1
RUS	Russia	Order No. 302 of the Ministry validating the Regulation on the Federal Scientific and Methodological Center for Monitoring Resistance to Antimicrobial Drugs	Russian	МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ (Минздрав России) ПРИКАЗ № 302 О федеральном научно-методическом центре мониторинга резистентности к антимикробным препаратам	2015						0	1
RWA	Rwanda	National Action Plan on Anti-Microbial Resistance (NAPAMR) 2020-2024	English		2020	2024	8	1	0	0	1	0
RWA	Rwanda	One Health Strategic Plan 2021-2026	English		2021	2026					0	1
SAU	Saudi Arabia	Antimicrobial Resistance (AMR) Action Plan 2022-2025	English		2022	2025	3	2	0	0	1	0
SAU	Saudi Arabia	Kingdom Saudi Arabia National Action Plan on Combating Antimicrobial Resistance	English		2017						1	0
SDN	Sudan	National action plan on antimicrobial resistance	English		2018	2020	1	1	0	0	1	0
SEN	Senegal	National multisectoral action plan for monitoring and combating antimicrobial resistance	French	Plan d'action national multisectoriel de surveillance et de lutte contre les résistances aux antimicrobiens	2017	2023	9	1	0	0	1	0

SEN	Senegal	Order No. 21787 of December 11, 2017 establishing and setting the rules for the organization and operation of the Multisectoral Coordination Structure for Global Health Security (SSM) One Health	French	Arrete n°21787 du 11 décembre 2017 portant creation et fixant les regles d'organisation et de fonctionnement de la Structure de Coordination multisectorielle de la Securite Sanitaire Mondiale (SSM) One Health	2017						0	1
SGP	Singapore	National Strategic Action Plan on Antimicrobial Resistance	English		2017		1	1	0	0	1	0
SLB	Solomon Islands	Solomon Islands National Multi-sectoral Plan on Antimicrobial Resistance 2023-2026	English		2023	2026	1	1	0	0	1	0
SLE	Sierra Leone	Sierra Leone National Strategic Plan for Combating Antimicrobial Resistance 2018-2022	English		2018	2022	6	1	0	0	1	0
SLE	Sierra Leone	One Health National Emergency Risk Communication Strategic Plan	English		2019						0	1
SLV	El Salvador	National Plan against Antimicrobial Resistance in Human Health 2022-2024	Spanish	Plan Nacional contra la resistencia a los antimicrobianos en salud humana 2022-2024	2022	2024	3	1	0	0	1	0
SLV	El Salvador	Technical guidelines for the prevention, surveillance, and containment of bacterial resistance to antimicrobials	Spanish	Lineamientos técnicos para la prevención, vigilancia y contención de resistencia bacteriana a los antimicrobianos	2015						0	1
SMR	San Marino	-	-	-			0	0	0	0	0	0
SOM	Somalia	Somalia National Action Plan (NAP) on combating Antimicrobial Resistance (AMR)	English		2020		1	1	0	0	1	0
SRB	Serbia	National antibiotic resistance control Programme for the period 2019-2021	Serbian	Национални програм за контролу резистенције бактерија на антибиотике 2019-2021	2019	2021	2	1	0	0	1	0

SSD	South Sudan	South Sudan National Action Plan for Health Security (NAPHS) 2020-2024	English		2020	2024	4	0	0	0	0	1
STP	Sao Tome and Principe	-	-	-			0	0	0	0	0	0
SUR	Suriname	-	-	-			0	0	0	0	0	0
SVK	Slovakia	National program to protect antibiotics 2019-2021	Slovak	Národný akčný plán antimikrobiálnej rezistencie v Slovenskej republike na obdobie rokov 2019-2021	2019	2021	2	1	1	0	1	0
SVN	Slovenia	"One Health" National Strategy for managing antimicrobial resistance 2019-2024	Slovenian	Nacionalna Strategija "Eno zdravje" za obvladovanje mikrobne odpornosti 2019-2024	2019	2024	2	1	1	0	1	0
SWE	Sweden	Swedish Strategy to Combat Antibiotic Resistance 2020–2023	English		2020	2023	1	1	0	1	1	0
SWE	Sweden	Swedish Strategy to Combat Antibiotic Resistance	English		2016	2019					1	0
SWZ	Eswatini	Implementation Plan: National Antimicrobial Resistance Containment Strategic Plan (2018-2022)	English		2018	2022	2	1	0	0	1	0
SYC	Seychelles	National Health Strategic Plan 2022-2026	English		2022	2026	1	0	0	0	0	1
SYR	Syria	Syria National Action Plan on Combating Antimicrobial Resistance	English		2019	2024	1	1	0	0	1	0
TCD	Chad	National strategic Plan for antimicrobial resistance control	French	Plan National Stratégique de la Lutte contre l'Antibiorésistance	2018		2	1	1	0	1	0
TGO	Togo	National action plan to combat antimicrobial resistance in Togo 2019-2023	French	Plan d'action national de lutte contre la résistance aux antimicrobiens au Togo 2019-2023	2019	2023	3	1	0	0	1	0

THA	Thailand	Thailand's National Strategic Plan on Antimicrobial Resistance 2017-2021	English		2017	2021	2	1	0	0	1	0
TJK	Tajikistan	National Action Plan to Tackle Antimicrobial Resistance in the Republic of Tajikistan	English		2018		2	1	0	0	1	0
TKM	Turkmenistan	National Strategy for Containment of Antimicrobial Resistance in Turkmenistan, 2017-2025	Turkish; English		2017	2025	1	1	0	0	1	0
TLS	Timor-Leste	National Action Plan on Antimicrobial Resistance Containment 2022-2026	English		2022	2026	2	2	0	0	1	0
TLS	Timor-Leste	National Action Plan on Antimicrobial Resistance: Timor-Leste 2017 - 2020	English		2017	2020					1	0
TON	Tonga	Tonga National Multisectoral Plan on Antimicrobial Resistance 2017-2022	English		2017	2022	2	1	0	0	1	0
TTO	Trinidad and Tobago	-	-	-			3	0	0	0	0	0
TUN	Tunisia	National Action Plan to Combat Antimicrobial Resistance in Tunisia 2019-2023	French	Plan d'action National de Lutte Contre la Resistance aux Antimicrobiens en Tunisie 2019-2023	2019	2023	1	1	1	0	1	0
TUR	Türkiye	Antimicrobial Resistance Strategic Action Plan (2018–2023)	Turkish	Antimikrobiyal Direnç Stratejik Eylem Planı (2018-2023)	2018	2023	6	0	1	0	1	0
TUR	Türkiye	Strategic Plan 2018 – 2022 of the Ministry of Food, Agriculture and Livestock	Turkish	Gıda Tarım ve Hayvancılık Bakanlığı Stratejik Plan 2018 - 2022	2018	2022					0	1
TUV	Tuvalu	National Multi-sectoral Plan to Combat Antimicrobial Resistance for Tuvalu 2021-2025	English		2021	2025	1	1	0	0	1	0

TZA	Tanzania	National Action Plan on Antimicrobial Resistance (NAP-AMR) 2023 -2028	English		2023	2028	8	2	0	0	1	0
TZA	Tanzania	The national action plan on antimicrobial resistance 2017-2022	English		2017	2022					1	0
TZA	Tanzania	National Antimicrobial Resistance (AMR) Surveillance Framework	English		2018						0	1
UGA	Uganda	Antimicrobial Resistance National Action Plan 2018-2023	English		2018	2023	7	1	0	0	1	0
UGA	Uganda	Antimicrobial Resistance Surveillance Plan for Human Health	English		2023						0	1
UGA	Uganda	Uganda One Health Strategic Plan, 2018-2022	English		2018	2022					0	1
UKR	Ukraine	National Action Plan to Combat Antimicrobial Resistance (approved by Governmental Order N116-p of 6 March 2019)	Ukrainian	ЗАТВЕРДЖЕНО розпорядженням Кабінету Міністрів України від 6 березня 2019 р. № 116-р НАЦІОНАЛЬНИЙ ПЛАН ДІЙ щодо боротьби із стійкістю до протимікробних препаратів	2019		1	0	1	0	1	0
UKR	Ukraine	Amend the National Action Plan to Combat Antimicrobial Resistance, approved by the Cabinet of Ministers of Ukraine as of March 6, 2019, No. 116-p (Official Bulletin of Ukraine, 2019, No. 22, p. 785), setting it out in the amendment attached	Ukrainian	Внести зміни до Національного плану дій щодо боротьби із стійкістю до протимікробних препаратів, затвердженого розпорядження Кабінету Міністрів України від 6 березня 2019 р. № 116-р (Офіційний вісник України, 2019 р., № 22, ст. 785), виклавши його в редакції, що додається	2022						1	0
URY	Uruguay	National Action Plan against Antimicrobial Resistance	Spanish	Plan Nacional de Acción contra la Resistencia Antimicrobiana	2018		2	1	1	0	1	0

USA	United States of America	National Action Plan for Combating Antibiotic-Resistant Bacteria 2020-2025	English		2020	2025	26	2	0	0	1	0
USA	United States of America	National Action Plan for Combating Antibiotic-Resistant Bacteria	English		2015						1	0
USA	United States of America	The National Antimicrobial resistance monitoring system Strategic Plan 2021-2025	English		2021	2025					0	1
USA	United States of America	Interagency Strategic Plan for Microbiome Research FY 2018-2022	English		2018	2022					0	1
USA	United States of America	Supporting Antimicrobial Stewardship in Veterinary Settings - Goals for Fiscal Years 2019 – 2023	English		2019	2023					0	1
USA	United States of America	Executive Order - Combating Antibiotic-Resistant Bacteria	English		2014						0	1
USA	United States of America	National Strategy for Combating Antibiotic Resistant Bacteria	English		2014						0	1
USA	United States of America	USDA Antimicrobial Resistance Action Plan	English		2014						0	1
UZB	Uzbekistan	-	-	-			0	0	0	0	0	0
VCT	Saint Vincent and the Grenadines	-	-	-			0	0	0	0	0	0
VEN	Venezuela	-	-	-			0	0	0	0	0	0

VNM	Viet Nam	National Action Plan on Combating Drug Resistance in the period of 2013–2020	English		2013	2020	10	2	0	0	1	0
VNM	Viet Nam	Action Plan for Prevention and Control of Antimicrobial Resistance” in healthcare in the period 2024-2025	English		2024	2025					0	1
VNM	Viet Nam	National Action Plan on Prevention and Control of Antimicrobial Resistance in the Agricultural Sector, 2021–2025	Vietnamese	Kế hoạch hành động quốc gia về phòng, chống kháng kháng sinh trong lĩnh vực nông nghiệp giai đoạn 2021-2025	2021	2025					0	1
VNM	Viet Nam	National Action Plan on Antimicrobial Use Management and Antimicrobial Resistance Prevention in Animal Husbandry and Aquaculture in the 2017–2020 Period	Vietnamese ; English		2017	2020					0	1
VUT	Vanuatu	-	-	-			1	0	0	0	0	0
WSM	Samoa	Samoa's National Action Plan on Antimicrobial Resistance 2023-2028	English		2023	2028	1	1	0	0	1	0
YEM	Yemen	Final National Action Plan to Combat Antimicrobial Resistance in Yemen approved by MOPHP	English		2022	2026	2	1	0	0	1	0
ZAF	South Africa	Antimicrobial Resistance National Strategy Framework 2018 – 2024	English		2018	2024	4	1	0	0	1	0
ZAF	South Africa	Antimicrobial Resistance National Strategy Framework 2014-2024	English		2014	2024					1	0
ZMB	Zambia	Multi-sectoral National Action Plan on Antimicrobial Resistance	English		2017		6	1	0	0	1	0

ZMB	Zambia	National One Health Strategic Plan (OHSP) 2022-2026	English		2022	2026					0	1
ZWE	Zimbabwe	Zimbabwe One Health Antimicrobial Resistance National Action Plan 2017-2021	English		2017	2021	5	1	0	0	1	0
ZWE	Zimbabwe	National Health Strategy (NHS) 2021-2025	English		2021	2025					0	1
ZWE	Zimbabwe	National Health Strategy for Zimbabwe, 2016-2020	English		2016	2020					0	1
Documents count							607	170	51	4	200	69
Total documents identified and used							832				269	

Governance Indicators definition and standardization rubrics

1.1.1 NAP progress

Definition: Countries must develop NAPs to combat AMR, incorporating comprehensive resource assessments to ensure effective and sustainable actions. Additionally, it is crucial to link NAP funding with monitoring and evaluation processes.

Indicators	TrACSS Questions & Responses						
1.1.1 NAP Progress	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)	
	5.1 Country progress with development of a national action plan on AMR				2.3 Country progress with development of a national action plan on AMR		
	A - No national AMR action plan.				0	A - No national AMR action plan or plan under development.	0
	B - National AMR action plan under development.				0	B - National AMR action plan developed.	33
	C - National AMR action plan developed.				33	C - National AMR action plan approved by government and is being implemented.	67
	D - National AMR action plan approved by government that reflects Global Action Plan objectives, with an operational plan and monitoring arrangements. (TrACSS-2018, TrACSS-2019) D - National AMR action plan approved by government that reflects Global Action Plan objectives, with a budgeted operational plan and monitoring arrangements. (TrACSS-2020) D - National AMR action plan being implemented. (TrACSS-2021)				67	D - National AMR action plan has costed and budgeted operational plan and has monitoring mechanism in place.	100
	E - National AMR action plan has funding sources identified, is being implemented and has relevant sectors involved with a defined monitoring and evaluation process in place. (TrACSS-2018, TrACSS-2019, TrACSS-2020) E - National AMR action plan being implemented and actively monitored through a monitoring and evaluation framework. (TrACSS-2021)				100	E - Financial provision for the National AMR action plan implementation is included in the national plans and budgets.	100

1.1.2 Evidence sufficiency

Definition: Policy decisions and interventions on AMR require a strong evidence base. Policymakers can make informed decisions and effectively implement strategies by leveraging robust evidence to strengthen AMR control measures.

Indicator	Criteria for Group Evaluation	
1.1.2 Evidence sufficiency	2017-2022	
	No review of the country's past AMR situation is present in the NAP.	0
	The NAP mentions past AMR situations but lacks data on resistance rates or antibiotic consumption.	50
	The NAP provides a review of the past AMR situation, supported by various types of survey data.	100

1.1.3 Objective clarity

Definition: Controlling AMR should focus on setting precise, measurable objectives, enabling policymakers to allocate resources efficiently. Clear timelines and expected outcomes will facilitate monitoring and evaluation, aiding in the identification of areas for improvement.

Indicator	Criteria for Group Evaluation	
1.1.3 Objective clarity	2017-2022	
	The objectives are vague, lacking quantifiable targets and specific timelines; no final timeline is provided.	0
	The NAP includes a multi-year plan with general tasks and quantifiable final objectives but lacks interim milestones or detailed action points.	50
	The NAP presents clear tasks with a detailed timeline, including intermediate steps.	100

1.2.1 Policy maker

Definition: Involving representatives from various One Health sectors during the NAP formulation phase ensures that diverse perspectives and expertise inform decision-making.

Indicator	Criteria for Group Evaluation	
1.2.1 Policy maker	2017-2022	
	Representatives from only one of the three sectors (human, animal, or environmental health) were engaged in the NAP development process.	0
	Representatives from two of the three sectors (human, animal, or environmental health) were engaged in the NAP development process.	50
	Representatives from all three sectors (human, animal, and environmental health) were actively engaged in the NAP development process.	100

1.2.2 Action participation

Definition: Effective action requires the involvement of multiple sectors in implementing policy initiatives, fostering a collaborative approach to combating AMR.

Indicator	Criteria for Group Evaluation	
1.2.2 Action participation	2017-2022	
	Only one of the three sectors (human, animal, or environmental health) was involved in NAP implementation.	0
	Two of the three sectors (human, animal, or environmental health) sectors were involved in the NAP implementation.	50
	All three sectors (human, animal, and environment) participated in NAP implementation.	100

1.2.3 Multi-sector coordination

Definition: Beyond individual actions, multi-sector coordination underscores the importance of collaboration and communication among sectors to align strategies, share resources, and effectively implement AMR control measures.

Indicator	TrACSS Questions & Responses					
1.2.3 Multi-sector coordination	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
	4.1 Multi-sector and One Health collaboration/coordination				2.1 Multi-sector and One Health collaboration/coordination	
	A - No formal multi-sectoral governance or coordination mechanism exists. (TrACSS-2018) A - No formal multi-sectoral governance or coordination mechanism on AMR exists. (TrACSS-2019, TrACSS-2020, TrACSS-2021)			0	A - No formal multi-sectoral governance or coordination mechanism on AMR exists.	0
	B - Multi-sectoral working group(s) or coordination committee on AMR established with Government leadership.			25	B - Multi-sectoral coordination mechanism on AMR established with Government leadership.	25
	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.			50	C - Formalized multisector coordination mechanism with technical working groups established with clear terms of reference, regular meetings, and funding for working group(s) with activities and reporting/accountability arrangements defined.	50
	D - Joint working on issues including agreement on common objectives, including restriction of use of critically important antimicrobials. (TrACSS-2018) D - Joint working on issues including agreement on common objectives. (TrACSS-2019, TrACSS-2020, TrACSS-2021)			75	D - Joint working on issues including agreement on common objectives.	75
	E - Integrated approaches used to implement the national AMR action plan. (TrACSS-2018) E - Integrated approaches used to implement the national AMR action plan with relevant data and lessons learned from all sectors used to adapt implementation of the action plan. (TrACSS-2019, TrACSS-2020, TrACSS-2021)			100	E - Integrated approaches used to implement the national AMR action plan with relevant data and lessons learned from all sectors used to adapt implementation of the action plan.	100

1.3.1 Participation will

Definition: Achieving sustainability requires active participation from all sectors in policy-making. Engaging all relevant departments and stakeholders is essential to ensure the long-term effectiveness and acceptance of AMR policies.

Indicator	TrACSS Questions & Responses					
1.3.1 Participation will	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
	4.2 Which sectors are actively involved in developing and implementing the AMR National Action Plan				2.2 Which sectors are actively involved in the multisector coordination mechanism	

	[Human Health] (<i>TrACSS-2018, TrACSS-2019, TrACSS-2021</i>) [Human Health including WASH] (<i>TrACSS-2020</i>)	40	[Human Health]	40
	[Animal Health (terrestrial and aquatic)]	15	[Terrestrial animal health] or [Aquatic animal health]	15
	[Food Production] or [Food Safety]	15	[Food Production] or [Food Safety]	15
	[Plant Health]	15	[Plant health]	15
	[Environment] (<i>TrACSS-2018, TrACSS-2020, TrACSS-2021</i>) [Environment including WASH] (<i>TrACSS-2019</i>)	15	[Environment]	15
	1. For each sub-question, score the corresponding points if the answer is "yes"; 2. For [Food Production] and [Food Safety]: Score if the answer to either question is "yes"; 3. For [Terrestrial animal health] and [Aquatic animal health]: Score if the answer to either question is "yes"; 4. The total score for "1.3.1 Participating will" is the sum of the scores from each sub-question.			

1.3.2 Budget planning

Definition: Effective implementation of sustainable policies requires adequate financial resources. Budget planning should be integrated into policy development to ensure the proper allocation of funds for long-term AMR control.

Indicator	TrACSS Questions & Responses					
1.3.2 Budget planning	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
	5.1 Country progress with development of a national action plan on AMR				2.3 Country progress with development of a national action plan on AMR	
	A - No national AMR action plan.			0	A - No national AMR action plan or plan under development.	0
	B - National AMR action plan under development.			0	B - National AMR action plan developed.	0
	C - National AMR action plan developed.			0	C - National AMR action plan approved by government and is being implemented.	0
	D - National AMR action plan approved by government that reflects Global Action Plan objectives, with an operational plan and monitoring arrangements. (<i>TrACSS-2018, TrACSS-2019</i>) D - National AMR action plan approved by government that reflects Global Action Plan objectives, with a budgeted operational plan and monitoring arrangements. (<i>TrACSS-2020</i>) D - National AMR action plan being implemented. (<i>TrACSS-2021</i>)			100	D - National AMR action plan has costed and budgeted operational plan and has monitoring mechanism in place.	100

	E - National AMR action plan has funding sources identified, is being implemented and has relevant sectors involved with a defined monitoring and evaluation process in place. (<i>TrACSS-2018, TrACSS-2019, TrACSS-2020</i>) E - National AMR action plan being implemented and actively monitored through a monitoring and evaluation framework. (<i>TrACSS-2021</i>)	100	E - Financial provision for the National AMR action plan implementation is included in the national plans and budgets.	100
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1.3.3 Technical reference

Definition: Policy practice should prioritize ongoing technical input from AMR and One Health experts, ensuring decisions are grounded in the latest scientific evidence and technical knowledge. Engaging experienced technical professionals long-term can provide valuable insights to enhance the quality and effectiveness of the NAP.

Indicator	Criteria for Group Evaluation		
1.3.3 Technical reference	2017-2022		
	The NAP does not mention the existence of any advisory committee or technical group.		0
	No existing technical advisory group is currently in place, but there are plans to establish one in the future.		50
	An advisory group or committee is already established and actively providing technical input.		100

1.3.4 Pre-existing initiatives integration

Definition: The NAP for AMR can be integrated with other existing action plans to reinforce them, reducing resistance in policy implementation and acceptance.

Indicator	TrACSS Questions & Responses						
1.3.4 Pre-existing initiatives integration	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)	
	5.2 Is your country’s national action plan on AMR linked to any other existing action plans, strategies or targets related to HIV, tuberculosis, malaria or neglected tropical diseases				2.6 Is your country’s national planning on AMR integrated with other existing action plans or, strategies		
	[HIV]			100	[One Health Strategy or One Health mechanism]		100
	[Tuberculosis]				[Water, Sanitation and Hygiene (WASH)]		
	[Malaria]				[National health sector plan]		
	[Neglected tropical diseases]				[National action plan on health security]		
	[Sexually Transmitted Diseases (STIs)] (<i>TrACSS-2020, TrACSS-2021</i>)				[National development plans; United Nations Sustainable Development Cooperation Framework (UNSDCF)]		
	[Water, Sanitation and Hygiene (WASH)] (<i>TrACSS-2021</i>)				[National Food Safety strategy and policies]		
	[Immunization] (<i>TrACSS-2021</i>)				[National Agriculture development plans and policies]		
	[National action plan on health security] (<i>TrACSS-2021</i>)				[Climate change and environmental planning]		
	[National Food Safety and/or food security strategy and policies] (<i>TrACSS-2021</i>)				[Other]		
	[National Environmental plans] (<i>TrACSS-2021</i>)				[Other]		
Scoring Rule	From 2017 to 2022, for each question, score the corresponding points if one of the answers is "yes".						

1.4.1 Explanation

Definition: Accountability systems include bottom-up mechanisms for explanation and reporting. Stakeholders, from frontline workers to communities and local organizations, should be empowered to provide input, raise concerns, and offer feedback on policy implementation. A bottom-up approach fosters transparency, inclusivity, and the integration of feedback in decision-making.

Indicator	Criteria for Group Evaluation	
1.4.1 Explanation	2017-2022	
	No responsible entities are identified for any of the NAP objectives.	0
	Responsible entities are designated for only some of the NAP objectives.	50
	Responsible entities are clearly designated for all NAP objectives.	100

1.4.2 Supervision

Definition: Accountability also includes top-down supervision mechanisms, ensuring that government officials, policymakers, and decision-makers are held responsible for their actions in policy formulation and implementation. These mechanisms involve measures to address non-compliance, such as disciplinary actions, penalties, or legal consequences. Implementing top-down accountability ensures effective and efficient policy execution aligned with established standards and principles.

Indicator	Criteria for Group Evaluation	
1.4.2 Supervision	2017-2022	
	No department or organization is identified as responsible for overseeing the progress and operations of the NAP.	0
	A specific department or organization is designated to coordinate and supervise the implementation progress of the NAP, managing the overall execution.	100

2.1.1 Human AMU surveillance system

Definition: A national monitoring system for antimicrobial use in human health can reflect the rationality of antimicrobial use in a region, thus influencing the degree of AMR in that area.

Indicator	TrACSS Questions & Responses					
2.1.1 Human AMU surveillance system	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
	7.1 National monitoring system for consumption and rational use of antimicrobials in human health				3.2 National monitoring system for consumption and rational use of antimicrobials in human health	
	A - No national plan or system for monitoring use of antimicrobials.					0
	B - System designed for surveillance of antimicrobial use, that includes monitoring national level sales or consumption of antibiotics in health services.					25
	C - Total sales of antimicrobials are monitored at national level and/or some monitoring of antibiotic use at sub-national level.					50
	D - Prescribing practices and quality of antibiotic use are monitored in a national sample of healthcare settings. (TrACSS 2018) D - Prescribing practices and appropriate antibiotic use are monitored in a national sample of healthcare settings. (TrACSS-2019, TrACSS-2020, TrACSS-2021, TrACSS-2022, TrACSS-2023)					75

	E - On a regular basis (every year/two years) data is collected and reported on: a) Antimicrobial sales or consumption at national level for human use; and b) Antibiotic prescribing and appropriate/rational use, in a representative sample of health facilities, public and private.	100
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2.1.2 Animal AMU surveillance system

Definition: A national monitoring system for antimicrobial use in animal health can reflect the rationality of antimicrobial use in a region, thus influencing the degree of AMR in that area.

Indicator	TrACSS Questions & Responses					
	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
2.1.2 Animal AMU surveillance system	7.2 National monitoring system for antimicrobials intended to be used in animals (sales/use)				4.5 a Do you have a national plan or system in place for monitoring sales/use of antimicrobials in animals?	
	A - No national plan or system for monitoring sales/use of antimicrobials in animals.	0	No	0	No	0
	B - Plan agreed for monitoring quantities of antimicrobials sold for/used in animals, based on OIE standards.	100	Yes	100	Yes, both aquatic and terrestrial	100
	C - Data collected and reported on total quantity of antimicrobials sold for/used in animals and their intended type of use (therapeutic or growth promotion).				Yes, terrestrial animals only	
	D - On a regular basis, data is collected and reported to the OIE on the total quantity of antimicrobials sold for/used in animals nationally, by antimicrobial class, by species (aquatic or terrestrial), method of administration, and by type of use (therapeutic or growth promotion).				Yes, aquatic animals only	
	E - Data on antimicrobials used under veterinary supervision in animals are available at farm level, for individual animal species.					

2.1.3 Plant production AMU surveillance system

Definition: A national monitoring system for fungicide and bactericide use in plant production can assess the rationality of pesticide use in a region, thereby impacting environmental AMR levels.

Indicator	TrACSS Questions & Responses					
	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
2.1.3 Plant production AMU surveillance system	7.3 National monitoring system for antimicrobial use (antibiotic and antifungal agents) in plant production	7.3 National monitoring system for pesticide use in plant production	7.3 National monitoring system for pesticide use in plant production including antimicrobial pesticides such as bactericides and fungicides		5.2 National monitoring system for antimicrobial-pesticide use in plant production including bactericides and fungicides	

	A - No national plan or system for monitoring use of antimicrobials in plants.	0	A - No national plan or system for monitoring use of pesticides used for the purpose of controlling bacteria or fungal diseases. (<i>TrACSS-2019</i>) A - No national plan or system for monitoring use of pesticides including antimicrobial pesticides such as bactericides and fungicides used for the purpose of controlling bacteria or fungal diseases. (<i>TrACSS-2020</i>) A - No national plan or system for monitoring use of pesticides including antimicrobial pesticides such as bactericides and fungicides used for controlling bacteria or fungal diseases. (<i>TrACSS-2021</i>)	0	A - No national plan or system for monitoring use of pesticides including antimicrobial pesticides such as bactericides and fungicides.	0
	B - Plan agreed for monitoring quantities of antimicrobial sales or use in plant production.	50	B - Plan agreed for monitoring quantities of pesticides used for the purpose of controlling bacteria or fungal diseases. (<i>TrACSS-2019</i>) B - Plan agreed for monitoring quantities of pesticides including antimicrobial pesticides such as bactericides and fungicides used for the purpose of controlling bacteria or fungal diseases. (<i>TrACSS-2020</i>) B - Plan agreed for monitoring quantities of pesticides including antimicrobial pesticides such as bactericides and fungicides used for controlling bacteria or fungal diseases. (<i>TrACSS-2021</i>)	50	B - National plan or system under development for monitoring amount of pesticides used including antimicrobial pesticides applied such as bactericides and fungicides.	50
	C - Data collected and reported on quantity of antimicrobial used in some subsectors of plant production. D - Data collected and reported on total quantity of antimicrobial used nationally in plant production.	100	C - Data collected and reported on total quantity of pesticides sold/ used nationally for the purpose of controlling bacteria or fungal diseases. (<i>TrACSS-2019</i>) C - Data collected and reported on total quantity of pesticides including antimicrobial pesticides such as bactericides and fungicides sold/ used nationally for the purpose of controlling bacteria or fungal diseases. (<i>TrACSS-2020</i>) C - Data collected and reported on total quantity of pesticides including antimicrobial pesticides such as bactericides and fungicides sold/ used nationally for controlling bacteria or fungal diseases. (<i>TrACSS-2021</i>)	100	C - National plan or system in place to collect data and report on the amount of pesticides sold/used nationally, including including antimicrobial pesticides such as bactericides and fungicides.	100

	E - On a regular basis, data is collected and reported on total quantity of antimicrobial use in crop production, by antimicrobial class.	D - On a regular basis, data is collected and reported on quantity of pesticides sold/used in plant production for the purpose of controlling bacteria or fungal diseases, disaggregated by class of active ingredient. (<i>TrACSS-2019</i>) D - On a regular basis, data is collected and reported on quantity of pesticides including antimicrobial pesticides such as bactericides and fungicides sold/used in plant production for the purpose of controlling bacteria or fungal diseases, disaggregated by class of active ingredient and plant type/species. (<i>TrACSS-2020</i>) D - On a regular basis, data is collected and reported on quantity of pesticides including antimicrobial pesticides such as bactericides and fungicides sold/used in plant production for controlling bacteria or fungal diseases, disaggregated by class of active ingredient and plant type/species. (<i>TrACSS-2021</i>)			
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2.2.1 Human AMR surveillance system

Definition: The AMR surveillance system integrates data to track AMR prevalence in humans, informing research and policy decisions.

Indicator	TrACSS Questions & Responses					
	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
2.2.1 Human AMR surveillance system	7.4 National surveillance system for antimicrobial resistance (AMR) in humans				3.3 National surveillance system for antimicrobial resistance (AMR) in humans	
	A - No capacity for generating data and reporting on antibiotic resistance (antibiotic susceptibility testing and accompanying clinical and epidemiological data collection). (<i>TrACSS-2018</i>) A - No capacity for generating data (antibiotic susceptibility testing and accompanying clinical and epidemiological data) and reporting on antibiotic resistance. (<i>TrACSS-2019, TrACSS-2020</i>)			0	A - No capacity for generating data (antibiotic susceptibility testing and accompanying clinical and epidemiological data) and reporting on antibiotic resistance.	0
	B - AMR data is collated locally for common bacteria, but may not use a standardized approach and lacks national coordination and/or quality management. (<i>TrACSS-2018</i>) B - AMR data is collated locally for common bacteria, but data collection may not use a standardized approach and lacks national coordination and/or quality management. (<i>TrACSS-2019, TrACSS-2020</i>)			25	B - AMR data is collated locally for common bacterial infections in hospitalized and community patients, but data collection may not use a standardized approach and lacks national coordination and/or quality management.	25
	C - National AMR surveillance activities are in place for common bacterial pathogens that link patient information with susceptibility testing, with a national reference laboratory that participates in external quality assurance. (<i>TrACSS-2018</i>) C - National AMR surveillance activities for common bacterial infections follow national standards, and a national reference laboratory that participates in external quality assurance. (<i>TrACSS-2019, TrACSS-2020</i>)			50	C - AMR data are collated nationally for common bacterial infections in hospitalized and community patients, but national coordination and standardization are lacking.	50

	D - There is a functioning national AMR surveillance system covering antibiotics in hospitals and outpatient clinics, with external quality assurance, and a national coordinating centre producing reports on resistance levels. (<i>TrACSS-2018</i>) D - There is a functioning national AMR surveillance system covering common bacterial infections in hospitalized and community patients, with external quality assurance, and a national coordinating centre producing reports on AMR. (<i>TrACSS-2019, TrACSS-2020</i>)	75	D - There is a standardized national AMR surveillance system collecting data on common bacterial infections in hospitalized and community patients, with established network of surveillance sites, designated national reference laboratory for AMR, and a national coordinating centre producing reports on AMR.	75
	E - The national AMR surveillance system integrates surveillance of AMR across sectors, and generates regular reports. (<i>TrACSS-2018</i>) E - The national AMR surveillance system integrates surveillance of AMR across sectors, and generates regular reports covering at least one common indicator. (<i>TrACSS-2019, TrACSS-2020</i>)	100	E - The national AMR surveillance system links AMR surveillance with antimicrobial consumption and/or use data for human health.	100

2.2.2 Animal and food AMR surveillance system

Definition: The AMR surveillance system integrates data to track AMR prevalence in animals and food, informing research and policy decisions.

Indicator	TrACSS Questions & Responses					
2.2.2 Animal and food AMR surveillance system	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
	7.5.1 For each of the following sources of bacteria, please indicate which statement in 7.5 above (A-E) is applicable: [Animals (terrestrial and aquatic)]	7.5 (a) National surveillance system for antimicrobial resistance (AMR) in animals (terrestrial and aquatic)			4.7 National surveillance system for antimicrobial resistance (AMR) in live terrestrial animals	
					4.8 National surveillance system for antimicrobial resistance (AMR) in live aquatic animals	
	A - No national plan for a system of monitoring of AMR is available. (TrACSS-2018) A - No national plan for a system of surveillance of AMR. (TrACSS-2019, TrACSS-2020) A - No national plan for an AMR surveillance system. (TrACSS-2021)				0	A - There are no local or national strategies/plans for generating AMR surveillance data from (aquatic) animals for an AMR surveillance system.
	B - National plan for monitoring AMR but capacity (including laboratory) for surveillance and reporting data on AMR is lacking. (TrACSS-2018) B - National plan for surveillance of AMR but capacity (including laboratory and for reporting data on AMR) is lacking. (TrACSS-2019) B - National plan for AMR surveillance in place but capacity (including laboratory and for reporting data on AMR) is lacking. (TrACSS-2020)				12.5	B - National plan for AMR surveillance in place but laboratory and epidemiology capacities for generating, analysing and reporting data are lacking.

	B - National plan for AMR surveillance in place but capacity (including laboratory and reporting) is lacking. (TrACSS-2021)			
	C - Some AMR data is collected locally but may not use a standardised approach and lacks national coordination and/or quality management. (TrACSS-2018, TrACSS-2019) C - Some AMR data is collected locally but a standardized approach is not used. National coordination and/or quality management is lacking. (TrACSS-2020) C - Some AMR data is collected but a standardized approach is not used. National coordination and/or quality management is lacking. (TrACSS-2021)	25	C - Some AMR data is collected at local levels but a nationally standardized approach is not used. National coordination and/or quality management is lacking.	25
	D - Priority pathogenic/ commensal bacterial species have been identified for surveillance. Data systematically collected and reported on levels of resistance in at least 2 of those bacterial species, involving a laboratory that follows quality management processes, e.g. proficiency testing. (TrACSS-2018) D - Priority pathogenic/ commensal bacterial species have been identified for surveillance. Data systematically collected and reported on levels of resistance in at least one of those bacterial species, involving a laboratory that follows quality management processes, e.g. proficiency testing. (TrACSS-2019, TrACSS-2020, TrACSS-2021)	37.5	D - Priority pathogenic/ commensal bacterial species have been identified for surveillance. Data systematically collected and reported on levels of resistance in at least one of those bacterial species, involving a laboratory that follows quality management processes e.g. proficiency testing.	37.5
	E - National system of surveillance of AMR established for priority pathogens and for relevant commensal bacteria which follows quality assurance processes in line with intergovernmental standards. Laboratories that report for AMR surveillance follow quality assurance processes. (TrACSS-2018) E - National system of AMR surveillance established for priority animal pathogens, zoonotic and commensal bacterial isolates which follows quality assurance processes in line with intergovernmental standards. Laboratories that report for AMR surveillance follow quality assurance processes. (TrACSS-2019, TrACSS-2020, TrACSS-2021)	50	E - National system of AMR surveillance established for priority animal pathogens, zoonotic and commensal bacterial isolates which follows quality assurance processes in line with intergovernmental standards. Laboratories that report for AMR surveillance follow quality assurance processes.	50
	7.5.1 For each of the following sources of bacteria, please indicate which statement in 7.5 above (A-E) is applicable: [Food]	7.5 (c) National surveillance system for antimicrobial resistance (AMR) in food (animal and plant origin)		5.3 National surveillance system for antimicrobial resistance (AMR) in food (terrestrial and aquatic animal and plant origin)
	A - No national plan for a system of monitoring of AMR is available. (TrACSS-2018) A - No national plan for a system of surveillance of AMR is available. (TrACSS-2019) A - No national plan for an AMR surveillance system. (TrACSS-2020, TrACSS-2021)	0	A - No national plan for an AMR surveillance system.	0

	B - National plan for monitoring AMR but capacity (including laboratory) for surveillance and reporting data on AMR is lacking. (<i>TrACSS-2018</i>) B - National plan for surveillance of AMR but capacity (including laboratory and for reporting data on AMR) is lacking. (<i>TrACSS-2019</i>) B - National plan for AMR surveillance in place but capacity (including laboratory and reporting) is lacking. (<i>TrACSS-2020, TrACSS-2021</i>)	12.5	B - National plan for AMR surveillance in place but capacity (including laboratory and reporting) is lacking.	12.5
	C - Some AMR data is collected locally but may not use a standardised approach and lacks national coordination and/or quality management. (<i>TrACSS-2018, TrACSS-2019</i>) C - Some AMR data is collected - but a standardized approach is not used. National coordination and/or quality management is lacking. (<i>TrACSS-2020, TrACSS-2021</i>)	25	C - Some AMR data is collected - but a standardized approach is not used. National coordination and/or quality management is lacking.	25
	D - Priority pathogenic/ commensal bacterial species have been identified for surveillance. Data systematically collected and reported on levels of resistance in at least 2 of those bacterial species, involving a laboratory that follows quality management processes, e.g. proficiency testing. (<i>TrACSS-2018</i>) D - Priority food borne pathogenic/ indicator bacterial species have been identified for surveillance. Data systematically collected and reported on levels of resistance in at least one of those bacterial species, involving a laboratory that follows quality management processes, e.g. proficiency testing. (<i>TrACSS-2019, TrACSS-2020, TrACSS-2021</i>)	37.5	D - Priority food borne pathogenic/ indicator bacterial species have been identified for surveillance. Data systematically collected and reported on levels of resistance in at least one of those bacterial species, involving a laboratory that follows quality management processes, e.g. proficiency testing.	37.5
	E - National system of surveillance of AMR established for priority pathogens and for relevant commensal bacteria which follows quality assurance processes in line with intergovernmental standards. Laboratories that report for AMR surveillance follow quality assurance processes. (<i>TrACSS-2018</i>) E - National system of AMR surveillance established for priority foodborne pathogens and/or relevant indicator bacteria which follows quality assurance processes in line with intergovernmental standards. Laboratories that report for AMR surveillance follow quality assurance processes. (<i>TrACSS-2019, TrACSS-2020, TrACSS-2021</i>)	50	E - National system of AMR surveillance established for priority foodborne pathogens and/or relevant indicator bacteria which follows quality assurance processes in line with intergovernmental standards. Laboratories that report for AMR surveillance follow quality assurance processes.	50
Scoring Rule	1. In 2021 and 2022, for question 4.7 and 4.8, take the highest score from the two questions; 2. The total score for "2.2.2 Animal and food AMR surveillance system" is the sum of the scores from each sub-question.			

2.2.3 Environment AMR surveillance system

Definition: The AMR surveillance system integrates data to track AMR prevalence in the environment, informing research and policy decisions.

	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
2.2.3 Environment AMR surveillance system	7.5.1 For each of the following sources of bacteria, please indicate which statement in 7.5 above (A-E) is applicable: [Plants] and [Environment]			7.6.1 Has the country established or starting the implementation of an Integrated Multisectoral Surveillance System including Antimicrobial Resistance and Antimicrobial consumption/use? If yes, involving which sector/s	2.13 Has the country established or starting the implementation of an Integrated Surveillance System for Antimicrobial Resistance If yes, involving which sector/s	
	A - No national plan for a system of monitoring of AMR is available.	0	<i>No such questions, the answer from the previous year is used for imputation.</i>	[Plant Health]		50
	B - National plan for monitoring AMR but capacity (including laboratory) for surveillance and reporting data on AMR is lacking.					
	C - Some AMR data is collected locally but may not use a standardised approach and lacks national coordination and/or quality management.					
	D - Priority pathogenic/ commensal bacterial species have been identified for surveillance. Data systematically collected and reported on levels of resistance in at least 2 of those bacterial species, involving a laboratory that follows quality management processes, e.g. proficiency testing.	50		[Environment]		50
	E - National system of surveillance of AMR established for priority pathogens and for relevant commensal bacteria which follows quality assurance processes in line with intergovernmental standards. Laboratories that report for AMR surveillance follow quality assurance processes.					

Scoring Rule	1. In 2017, 7.5.1 is a shared question for [Plants] and [Environment]. For each sub-question, selecting either D or E would grant the corresponding 50 points, for a total of 100 points 2. In 2020, 2021, and 2022, for question 7.6.1 and 2.13 score the corresponding points if the answer is "yes"; 3. The total score for "2.2.3 Environment AMR surveillance system" is the sum of the scores from each sub-question; 4. There are no such questions about plant and environment in 2018 and 2019, the answers of 2017 and 2020 are used as imputation, respectively.
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2.2.4 Laboratory network

Definition: Laboratories conduct antimicrobial susceptibility tests (AST) and incorporate results into the AMR monitoring system, facilitating effective integration of local and national data within the AMR detection system.

Indicator	TrACSS Questions & Responses						
2.2.4 Laboratory network	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)	
	No such questions, the answer from the following year is used for imputation.	7.7 a) Effective integration of laboratories in the AMR surveillance			5.4 a) Effective integration of laboratories in the AMR surveillance in the animal health and food safety sectors		
		A - Information not available					0
		B - Laboratories perform antimicrobial susceptibility testing (AST) for own purposes and are not included in the national AMR surveillance system					6.25
		C - Some laboratories performing AST are integrated in the national AMR surveillance system					12.5
		D - All laboratories performing AST are integrated in the AMR surveillance system but the role should be better formalized and the network better and developed					18.75
		E - All laboratories performing AST are integrated in the national AMR surveillance system, have a clear position, and are linked to a national network coordinated by a National Reference Laboratory					25
	No such questions, the answer from the following year is used for imputation.	7.7 b) Level of the standardization and harmonization of procedures among laboratories included in the AMR surveillance system			5.4 b) Level of the standardization and harmonization of procedures among laboratories included in the AMR surveillance system in the animal health and food safety sectors		
		A - Information not available					0
		B - No standardized national AST guidelines are in place or less than 30% laboratories follow the same AST guidelines					6.25
		C - Between 30% to 79% of laboratories follow the same AST guidelines					12.5
		D - Over 80% of laboratories use the same AST guidelines. (TrACSS-2019)					18.75
		D - Between 80% and < 100% of laboratories use the same AST guidelines. (TrACSS-2020, TrACSS-2021, TrACSS-2022, TrACSS-2023)					
	E - 100% of laboratories use the same AST guidelines					25	
No such questions, the answer from the following year is used for imputation.	7.7 c) Relevance of diagnostic techniques (bacteriology) used by laboratories included in the AMR surveillance system			5.4 c) Relevance of diagnostic (bacteriology) techniques used by laboratories included in the AMR surveillance system in the animal health and food safety sectors			

		A - Information not available		0	
		B - AST, bacterial isolation and identification protocols are not relevant considering the national AMR surveillance objectives		6.25	
		C - Major modifications in the AST, bacterial isolation and identification protocols used are required to improve their adaptation to national AMR surveillance objectives		12.5	
		D - Minor modifications in the AST, bacterial isolation and identification protocols used would improve their adaptation to the national AMR surveillance objectives		18.75	
		E - AST, bacterial isolation and identification protocols are perfectly suited to the national AMR surveillance objectives		25	
	No such questions, the answer from the following year is used for imputation.	7.7 d) Technical level of data management of the laboratory network in the AMR surveillance system	5.4 d) Technical level of data management of the laboratory network in the AMR surveillance system in the animal health and food safety sectors		
		A - Information not available			0
		B - AST data are handled manually, or AST data management is not computerized in all laboratories of the network and/or there are problems in the recording of the samples and their traceability along the analysis chain			6.25
		C - Most laboratories of the network use computers to manage part of their data but important improvements in the system are required			12.5
		D - Some minor improvements may be made in some laboratories of the network for the computerized management of laboratory data (computerized transmission of data, input procedures, sample storage information, etc). (TrACSS-2019)			18.75
		D - Some minor improvements are required in some laboratories of the network to improve the computerized management of AMR laboratory data (sample input procedures, sample storage information, computerized transmission of data, etc). (TrACSS-2020, TrACSS-2021, TrACSS-2022, TrACSS-2023)			
		E - All laboratories use optimal data management (e.g. samples and test results are identified using a complete computerized management system covering each step in the analysis chain, including the storage of epidemiological information, data validation protocol and the computerized transmission of results, conforming perfectly to the requirements of the national AMR surveillance system). (TrACSS-2019)			25
	E - All laboratories use ongoing optimal data management (e.g. samples and test results are identified using a complete computerized management system covering each step in the analysis chain, including the storage of epidemiological information, data validation protocol and the computerized transmission of results, conforming perfectly to the requirements of the national AMR surveillance system). (TrACSS-2020, TrACSS-2021, TrACSS-2022, TrACSS-2023)				
Scoring Rule	1. The total score for "2.2.4 Laboratory network" is the sum of the scores from each sub-question; 2. There are no such questions about laboratory network in 2017, the answers of 2018 are used as imputation.				

2.3.1 Optimization of antimicrobial use in humans

Definition: Develop national antimicrobial governance policies and guidelines for communities and health institutions regarding antimicrobial use.

Indicator	TrACSS Questions & Responses					
	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)

2.3.1 Optimization of antimicrobial use in humans	9.1 Optimizing antimicrobial use in human health		3.6 Optimizing antimicrobial use in human health	
	A - No/weak national policy & regulations for appropriate use. (<i>TrACSS-2018</i>) A - No/weak national policies for appropriate use. (<i>TrACSS-2019, TrACSS-2020, TrACSS-2021</i>)	0	A - No/weak national policies for appropriate antimicrobial use including availability, quality, and disposal of antimicrobials.	0
	B - National policy for antimicrobial governance and regulation developed for the community and health care settings. (<i>TrACSS-2018</i>) B - National policies for antimicrobial governance developed for the community and health care settings. (<i>TrACSS-2019, TrACSS-2020, TrACSS-2021</i>)	25	B - National policies promoting appropriate antimicrobial use/antimicrobial stewardship activities developed for the community and health care settings.	25
	C - Practices to assure appropriate antimicrobial use being implemented in some healthcare facilities and guidelines for appropriate use of antimicrobials available.	50	C - National guidelines for appropriate use of antimicrobials are available and antimicrobial stewardship programs are being implemented in some healthcare facilities.	50
	D - Guidelines and other practices to enable appropriate use are implemented in most health facilities nationwide. Monitoring and surveillance results are used to inform action and to update treatment guidelines and essential medicines lists.	75	D - National guidelines for appropriate use of antimicrobials are available and antimicrobial stewardship programs are being implemented in most health care facilities nationwide. Monitoring and surveillance results are used to inform action and to update treatment guidelines and essential medicines lists.	75
	E - Guidelines on optimizing antibiotic use are implemented for all major syndromes and data on use is systematically fed back to prescribers.	100	E - National guidelines on optimizing antibiotic use are implemented for all major syndromes and data on use is systematically fed back to prescribers.	100

2.3.2 Optimization of antimicrobial use in animals

Definition: Assess whether national policies or legislation exist regarding the quality, safety, and efficacy of antimicrobial products, as well as their distribution, sale, and use in animals.

Indicator	TrACSS Questions & Responses					
2.3.2 Optimization of antimicrobial use in animals	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
	9.2.1. For each of the following sectors, please indicate which statement in 9.2 above (A-E) is applicable: [Animal Health (terrestrial and aquatic)]	9.2 Optimizing antimicrobial use in animal health (terrestrial and aquatic)			4.11 Optimizing antimicrobial use in terrestrial animal health	
					4.12 Optimizing antimicrobial use in aquatic animal health	
	A - No national policy or legislation regarding the quality, safety and efficacy of antimicrobial products, and their distribution, sale or use.					0
	B - National legislation covers some aspects of national manufacture, import, marketing authorization, control of safety, quality and efficacy and distribution of antimicrobial products.					25

	C - National legislation covers all aspects of national manufacture, import, marketing authorization, control of safety, quality and efficacy and distribution of antimicrobial products.	50
	E - Guidelines for responsible and prudent use of antimicrobials based on international standards (e.g. OIE Terrestrial and Aquatic Codes, Codex Alimentarius) are available according to animal species and/or production sector and include restriction of specific antimicrobial classes listed as Critically Important for humans and animals. (TrACSS-2018) D - The national regulatory framework for antimicrobial products incorporates all the elements included in the related international standards on responsible and prudent use of antimicrobials (e.g. OIE Terrestrial and Aquatic Codes, Codex Alimentarius) according to animal species and/or production sector. (TrACSS-2019, TrACSS-2020, TrACSS-2021) D - The national regulatory framework for antimicrobial products incorporates all the elements included in the related international standards on responsible and prudent use of antimicrobials (e.g. OIE/WOAH Terrestrial/Aquatic Animal Health Codes, Codex Alimentarius) according to animal species and/or production sector. (TrACSS-2022)	75
	D - Effective enforcement processes and control are in place to ensure compliance with legislation. (TrACSS-2018) E - Enforcement processes and control are in place to ensure compliance with legislation. (TrACSS-2019, TrACSS-2020, TrACSS-2021, TrACSS-2022, TrACSS-2023)	100
Scoring Rule	In 2021 and 2022, for question 4.11 and 4.12, take the highest score from the two questions.	

2.3.3 Optimization of antimicrobial use in plants and environment

Definition: Rationalize antimicrobial use in agriculture and optimize the use of antibiotics and pesticides. Assess whether national policies or legislation exist regarding the quality, safety, and efficacy of pesticides, including antimicrobial pesticides like bactericides and fungicides, and their distribution, sale, and use.

Indicator	TrACSS Questions & Responses					
	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
2.3.3 Optimization of antimicrobial use in plants and environment	9.2.1 For each of the following sectors, please indicate which statement in 9.2 above (A-E) is applicable: [Plant Health]		<i>No such questions, the answer from the previous year is used for imputation.</i>	9.3 Optimizing antimicrobial pesticide such as bactericides and fungicides use in plant production		5.6 Optimizing antimicrobial pesticide such as bactericides and fungicides use in plant production
	A - No national policy or legislation regarding the quality, safety and efficacy of antimicrobial products, and their distribution, sale or use.	0		A -No national policy or legislation regarding the quality, safety and efficacy of pesticides including antimicrobial pesticides such as bactericides and fungicides and their distribution, sale or use.		0
	B - National legislation covers some aspects of national manufacture, import, marketing authorization, control of safety, quality and efficacy and distribution of antimicrobial products.	12.5		B - National legislation covers some aspects of national manufacture, import, marketing authorization, control of safety, quality and efficacy and distribution of pesticides including antimicrobial pesticides such as bactericides and fungicides.		12.5
	C - National legislation covers all aspects of national manufacture, import, marketing authorization, control of safety, quality and efficacy and distribution of antimicrobial products.	25		C - National legislation covers all aspects of national manufacture, import, marketing authorization, control of safety, quality and efficacy and distribution of pesticides including antimicrobial pesticides such as bactericides and fungicides.		25

	E - Guidelines for responsible and prudent use of antimicrobials based on international standards (e.g. OIE Terrestrial and Aquatic Codes, Codex Alimentarius) are available according to animal species and/or production sector and include restriction of specific antimicrobial classes listed as Critically Important for humans and animals.	37.5		D - The national regulatory framework for antimicrobial pesticides such as bactericides and fungicides incorporates all the elements in the related international standards on responsible and prudent use according to plant type/species.			37.5	
	D - Effective enforcement processes and control are in place to ensure compliance with legislation.	50		E - Enforcement processes and control are in place to ensure compliance with legislation on use of antimicrobial pesticides such as bactericides and fungicides.			50	
	9.3 Legislation and/or regulations to prevent contamination of the environment with antimicrobials		10 Are there legislation and/or regulation and policies to mitigate risks-That specifically addresses AMR		10 Risks for AMR spread in the environment- Are there legislation and/or regulation and policies to mitigate risks?		6.2 Country has legislation and/or regulations to prevent contamination of the environment with antimicrobials- antimicrobial compounds and their metabolites discharged to the environment	
	A - No legislation regarding control of waste discharge (sewage, health facilities, agriculture, manure and industrial effluent) into the environment.	0	1) Human sewage (including wastewater and sludge) quality a) disposal in the environment	7.15	1) Human sewage (including lack of basic toilets and management of wastewater and sludge collected in sewer networks and onsite facilities such as septic tanks) quality	7.15	1) [Human sewage treatment quality (including lack of basic toilets, and management of wastewater and sludge collected in sewer networks and onsite facilities such as septic tanks).]	7.15
			2) Human sewage (including wastewater and sludge) quality b) Re-use					
B - Legislation and/or regulations are in place to control at least the release of human sewage into the environment.	12.5	3) Wastewater discharges from health facilities for disposal in the environment.	7.15	2) Wastewater discharges from health facilities for disposal in the environment. (including lack of basic toilets and management of wastewater and sludge collected in sewer networks and from onsite sanitation such as septic tanks)	7.15	2) [Wastewater discharges from health facilities for disposal in the environment (including lack of basic toilets and management of wastewater and sludge collected in sewer networks and from onsite sanitation such as septic tanks).]	7.15	

	C - Legislation and/or regulations encompass release of sewage, discharge of wastewater from health facilities, manure from intensive animal production, and industrial effluent to the environment.	25	4) Discharges from intensive animal (terrestrial and aquatic production (liquid waste and manure) a) disposal into the environment	7.15	3) Discharges from intensive animal (terrestrial and aquatic) production (liquid waste and manure)	7.15	3) [Discharges from intensive terrestrial animal production (liquid and/or solid waste)]	7.15
							4) [Discharges from intensive aquatic animal production (liquid and solid waste)]	
	E - There is a functioning system for monitoring regulatory compliance of all waste discharge to the environment (sewage, health facilities, agriculture, manure and industrial effluent). Regulations are in place that limit discharge of all antimicrobial residues into the environment, including in municipal and pharmaceutical industry waste and wastewater.	37.5	5) Discharges from intensive animal (terrestrial and aquatic) production (liquid waste and manure) b) Re-use	7.15	4) Treatment of liquid waste and manure from intensive animal (terrestrial and aquatic) production before reusing in agriculture.	7.15	5) [Liquid and solid waste from intensive terrestrial animal production prior to use in agriculture]	7.15
			6) Wastewater discharges from manufacturing sites for antimicrobial agents (either as Active Pharmaceutical Ingredient (API) or finished products)	7.15	5) Wastewater discharges from manufacturing sites for antimicrobial agents (either as Active Pharmaceutical Ingredient (API) or finished products).	7.15	6) [Liquid and solid waste from intensive aquatic animal production prior to use in agriculture]	
							7) [Wastewater discharges from manufacturing sites for antimicrobial agents (either as Active Pharmaceutical Ingredient (API) or finished products).]	7.15
	D - There is a functioning system for monitoring regulatory compliance of discharge to the environment for some types of waste (sewage, health facilities, agriculture, manure and/or industrial effluent).	50	7) Disposal of unused medicines antimicrobial agents.	7.15	6) Disposal of unused medicines antimicrobial agents (unused should include left-over product and also product containers (including pesticides)	7.15	8) [Disposal of medicines, antimicrobial agents (unused, left-over product and also product containers) for human use]	7.15
			8) Disposal of products contaminated with antimicrobial residues.	7.15	7) Disposal of food, plant or animal products contaminated with	7.15	9) [Disposal of medicines, antimicrobial agents (unused, left-over product and/or also product containers) for animal use]	
							10) [Disposal of food, plant or animal products contaminated	7.15

					antimicrobial residues over the MRL (maximum residue limit)		with antimicrobial residues over the MRL (maximum residue limit)]	
Scoring Rule	1. From 2018 to 2022, for question 10 and 6.2, score the corresponding points if the answer is "yes"; 2. In 2018 and 2019, for sub-question 10-1) and 10-2): Score if the answer to either question is "yes"; 3. In 2021 and 2022, for sub-question 6.2-3) and 6.2-4): Score if the answer to either question is "yes", for sub-question 6.2-5) and 6.2-6): Score if the answer to either question is "yes", for sub-question 6.2-8) and 6.2-9): Score if the answer to either question is "yes"; 4. The total score for "2.3.3 Optimization of antimicrobial use in plants and environment" is the sum of the scores from each sub-question; 5. There is no such questions about plant production in 2018, the answers of 2019 are used as imputation.							

2.4.1 Professional education in human health sector

Definition: Providing AMR training and professional education for the human health sector.

Indicator	TrACSS Questions & Responses					
2.4.1 Professional education in human health sector	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
	6.3 Training and professional education on AMR in the human health sector	6.2 Training and professional education on AMR in the human health sector			3.1 Training and professional education on AMR in the human health sector	
	A - No training for human health workers on AMR.					0
	B - Ad hoc AMR training courses in some human health related disciplines.					25
	C - AMR is covered in 1) some pre-service training and in 2) some in-service training or other continuing professional development (CPD) for human health workers.					50
	D - AMR is covered in pre-service training for all relevant cadres. In-service training or other CPD covering AMR is available for all types of human health workers nationwide.					75
	E - AMR is systematically and formally incorporated in pre-service training curricula for all relevant human health cadres. In-service training or other CPD on AMR is taken up by relevant groups for human health nationwide, in public and private sectors.					100

2.4.2 Professional education in veterinary sector

Definition: Providing AMR training for veterinary professionals, including veterinarians and auxiliary veterinary staff.

Indicator	TrACSS Questions & Responses					
	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
2.4.2 Professional education in veterinary sector	6.4 Training and professional education on AMR in the veterinary sector	6.3 Training and professional education on AMR in the veterinary sector			4.1 Training and professional education on AMR in the veterinary sector	
					4.2 Training and professional education on AMR in the aquatic animal health sector	

	A - No training of veterinary related professionals (veterinarians and veterinary paraprofessionals) related to AMR.	0	A - No training of veterinary related professionals (veterinarians and veterinary paraprofessionals) professionals/aquatic animal health professionals related to AMR.	0
	B - Ad hoc AMR training courses available for veterinary related professionals.	25	B - Ad hoc AMR training courses available for veterinary related professionals/aquatic animal health professionals.	25
	C - AMR and appropriate use is covered in core curricula for graduating veterinarians and for veterinary paraprofessionals when relevant. (<i>TrACSS-2018, TrACSS-2019</i>) C - AMR and prudent use of antimicrobial agents are covered in core curricula for graduating veterinarians and for veterinary paraprofessionals in some educational institutions. (<i>TrACSS-2020, TrACSS-2021</i>)	50	C - AMR and prudent use of antimicrobial agents are covered in core curricula for graduating veterinarians and for veterinary paraprofessionals/aquatic animal health professionals in some educational institutions.	50
	D - Continuing professional training on antimicrobial resistance and antimicrobial use is available nationwide for veterinary related professionals.	75	D - Continuing professional training on antimicrobial resistance and antimicrobial use is available nationwide for veterinary related professionals/aquatic animal health professionals.	75
	E - AMR is systematically and formally incorporated in curricula for graduating veterinarians and veterinary paraprofessionals when relevant and continuing professional training is a formal requirement. (<i>TrACSS-2018, TrACSS-2019</i>) E - AMR is systematically and formally incorporated in curricula for graduating veterinarians and veterinary paraprofessionals and continuing professional training is a formal requirement. (<i>TrACSS-2020, TrACSS-2021</i>)	100	E - AMR is systematically and formally incorporated in curricula for graduating veterinarians and veterinary paraprofessionals/aquatic animal health professionals and continuing professional training is a formal requirement.	100
Scoring Rule	In 2021 and 2022, for question 4.1 and 4.2, take the highest score from the two questions.			

2.4.3 Professional education in farming, food, environment sectors

Definition: Offering AMR training courses and professional education to key stakeholders is crucial for controlling antimicrobial use in the farming sector, ensuring food safety, and protecting the environment.

Indicator	TrACSS Questions & Responses					
2.4.3 Professional education in farming, food, environment sectors	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
	6.5 Training and professional education on AMR in farming sector (animal and plant), food production, food safety and the environment	6.4 Training and professional education on AMR in farming sector (animal and plant), food production, food safety and the environment		6.4 Training and professional education on AMR provided to the farming (animal and plant), food production, food safety and the environment sectors	5.1 Training and professional education on AMR provided to the agriculture (animal and plant), food production, food safety and the environment sectors	
	A - No training provision on AMR for key stakeholders, e.g. farmers and farm workers, extension workers, food and feed processors and retailers, environmental specialists. (TrACSS-2018, TrACSS-2019, TrACSS-2020)					0
	A - No training provision on AMR for key stakeholders, e.g. agricultural extension workers, farmers, food safety officers, food and feed processors and retailers, environmental specialists. (TrACSS-2021, TrACSS-2022, TrACSS-2023)					
	B - Tailored ad hoc AMR training courses available for at least two groups of key stakeholders.					25

	C - Tailored ad hoc AMR training courses are available for all or the majority of key stakeholders.	50
	D - Tailored AMR training courses are routinely available nationwide for all key stakeholders and completion of training is a formal requirement for at least two groups of key stakeholders.	75
	E - Tailored AMR training courses are routinely available nationwide and completion of training is a formal requirement for all key stakeholders.	100

2.5.1 Raise awareness in human health field

Definition: Enhance awareness and understanding of AMR risks and response measures in the human health sector.

Indicator	TrACSS Questions & Responses					
	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
2.5.1 Raise awareness in human health field	6.1 Raising awareness and understanding of antibiotic resistance risks and response in human health	6.1 Raising awareness and understanding of AMR risks and response			2.9 Raising awareness and understanding of AMR risks and response	
	A - No significant awareness-raising activities on antibiotic resistance.	0	A - No significant awareness-raising activities on relevant aspects of risks of antimicrobial resistance.	0	A - No awareness-raising activities on risks of antimicrobial resistance.	0
	B - Some activities in parts of the country to raise awareness about risks of antibiotic resistance and actions that can be taken to address it.	25	B - Some activities in parts of the country to raise awareness about risks of antimicrobial resistance and actions that can be taken to address it.	25	B - Some activities to raise awareness about risks of antimicrobial resistance and actions that address it.	25
	C - Limited or small-scale antibiotic resistance awareness campaign targeting some, but not all, relevant stakeholders (e.g. general public, doctors, pharmacists, nurses, medicine sellers).	50	C - Limited or small-scale antimicrobial resistance awareness campaign targeting some but not all relevant stakeholders.	50	C - Some awareness activities at local and/or sub-national level about risks of antimicrobial resistance and actions to address it, targeting some but not all relevant stakeholders, based on stakeholder analysis.	50
	D - Nationwide, government-supported antibiotic awareness campaign targeting all or the majority of stakeholders.	75	D - Nationwide, government-supported antimicrobial resistance awareness campaign targeting all or the majority of relevant stakeholders, based on stakeholder analysis, utilizing targeted messaging accordingly within sectors.	75	D - Nationwide, government-supported antimicrobial resistance awareness raising campaign targeting all or the majority of priority stakeholder groups, utilizing targeted messaging accordingly within sectors.	75
	E - Focused, national scale government-supported activities implemented to change behaviour	100	E - Targeted, nationwide government-supported activities regularly implemented to change behavior of key stakeholders within sectors, with monitoring undertaken over the last 2-5 years.	100	E - Routine targeted, nationwide government-supported campaign implemented to raise	100

	regarding antibiotic resistance in target groups in human health, both public and private sectors, with monitoring undertaken of their awareness and behaviour change over last 5 years.						awareness of priority stakeholders across sectors, with regular monitoring.		
			6.1.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Human Health]	6.1.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Human Health including WASH]	6.1.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Human Health]	2.9.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Human Health :]			
			This sector not involved						0
			Some activities done in this sector						0.5
			This sector is a main focus for activities						1
Scoring Rule	From 2018 to 2022, the score for "2.5.1 Raise awareness in human health field" is calculated by multiplying the coefficients of sub-questions 6.1.1 and 2.9.1 by the scores of questions 6.1 and 2.9, respectively.								

2.5.2 Raise awareness in animal health, food processing fields

Definition: Enhance awareness and understanding of AMR risks and response measures in the animal health and food processing sectors.

Indicator	TrACSS Questions & Responses					
2.5.2 Raise awareness in animal health, food processing fields	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
	6.2 Raising awareness and understanding of AMR risks and response in animal health, plant health, food production, food safety, and environment sectors 6.2.1 For each of the following sectors, please indicate which statement in 6.2 above (A-E) is applicable: [Animal Health (terrestrial and aquatic)] and [Food Production] or [Food Safety]	6.1 Raising awareness and understanding of AMR risks and response			2.9 Raising awareness and understanding of AMR risks and response	
	A - No significant awareness-raising activities on relevant aspects of risks of antimicrobial resistance.	0	A - No significant awareness-raising activities on relevant aspects of risks of antimicrobial resistance.		0	A - No awareness-raising activities on risks of antimicrobial resistance.
	B - Some activities in parts of the country to raise awareness about risks of antimicrobial resistance and actions that can be taken to address it.	12.5	B - Some activities in parts of the country to raise awareness about risks of antimicrobial resistance and actions that can be taken to address it.		25	B - Some activities to raise awareness about risks of antimicrobial resistance and actions that address it.

	C - Limited or small-scale antimicrobial resistance awareness campaign targeting some but not all relevant stakeholders within sector.	25	C - Limited or small-scale antimicrobial resistance awareness campaign targeting some but not all relevant stakeholders.	50	C - Some awareness activities at local and/or sub-national level about risks of antimicrobial resistance and actions to address it, targeting some but not all relevant stakeholders, based on stakeholder analysis.	50		
	D - Nationwide, government-supported antimicrobial resistance awareness campaign targeting all or the majority of relevant stakeholders within sector.	37.5	D - Nationwide, government-supported antimicrobial resistance awareness campaign targeting all or the majority of relevant stakeholders, based on stakeholder analysis, utilizing targeted messaging accordingly within sectors.	75	D - Nationwide, government-supported antimicrobial resistance awareness raising campaign targeting all or the majority of priority stakeholder groups, utilizing targeted messaging accordingly within sectors.	75		
	E - Focused, national scale government supported activities implemented to change behavior of relevant stakeholders within sector, with monitoring undertaken of their awareness and behaviour change over last 2-5 years.	50	E - Targeted, nationwide government-supported activities regularly implemented to change behavior of key stakeholders within sectors, with monitoring undertaken over the last 2-5 years.	100	E - Routine targeted, nationwide government-supported campaign implemented to raise awareness of priority stakeholders across sectors, with regular monitoring.	100		
			6.1.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Animal Health (terrestrial and aquatic)]		2.9.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Terrestrial Animal Health] or [Aquatic Animal Health]			
			This sector not involved					0
			Some activities done in this sector					0.5
			This sector is a main focus for activities					1
			6.1.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Food Production] or [Food Safety]		2.9.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Food Production] or [Food Safety]			
			This sector not involved					0
			Some activities done in this sector					0.5
			This sector is a main focus for activities					1
			Scoring Rule	1. In 2017, 6.2 is a shared question for [Animals Health (terrestrial and aquatic)], [Food Production], [Food Safety]; 2. In 2018, 2019 and 2020, 6.1 is a shared question for [Animals Health (terrestrial and aquatic)], [Food Production], [Food Safety]; 3. In 2021 and 2022, 2.9 is a shared question for [Terrestrial Animal Health], [Aquatic Animal Health], [Food Production], [Food Safety]; 4. From 2018 to 2022, for sub-questions 6.1.1 and 2.9.1, the score is calculated by multiplying the response's corresponding coefficient by the scores of questions 6.1 and 2.9, respectively; 5. From 2017 to 2022, for sub-questions about [Food Production] and [Food Safety], take the highest score from the two questions; 6. The total score for "2.5.2 Raise awareness in animal health, food processing fields" is the sum of the scores from each sub-question (Add the animal health and food scores).				

2.5.3 Raise awareness in plant health and environment fields

Definition: Enhance awareness and understanding of AMR risks and response measures in the plant health and environmental sectors.

Indicator	TrACSS Questions & Responses					
	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
2.5.3 Raise awareness in plant health and environment fields	6.2 Raising awareness and understanding of AMR risks and response in animal health, plant health, food production, food safety, and environment sectors 6.2.1 For each of the following sectors, please indicate which statement in 6.2 above (A-E) is applicable: [Plant Health] and [Environment]	6.1 Raising awareness and understanding of AMR risks and response			2.9 Raising awareness and understanding of AMR risks and response	
	A - No significant awareness-raising activities on relevant aspects of risks of antimicrobial resistance.	0	A - No significant awareness-raising activities on relevant aspects of risks of antimicrobial resistance.	0	A - No awareness-raising activities on risks of antimicrobial resistance.	0
	B - Some activities in parts of the country to raise awareness about risks of antimicrobial resistance and actions that can be taken to address it.	12.5	B - Some activities in parts of the country to raise awareness about risks of antimicrobial resistance and actions that can be taken to address it.	25	B - Some activities to raise awareness about risks of antimicrobial resistance and actions that address it.	25
	C - Limited or small-scale antimicrobial resistance awareness campaign targeting some but not all relevant stakeholders within sector.	25	C - Limited or small-scale antimicrobial resistance awareness campaign targeting some but not all relevant stakeholders.	50	C - Some awareness activities at local and/or sub-national level about risks of antimicrobial resistance and actions to address it, targeting some but not all relevant stakeholders, based on stakeholder analysis.	50
	D - Nationwide, government-supported antimicrobial resistance awareness campaign targeting all or the majority of relevant stakeholders within sector.	37.5	D - Nationwide, government-supported antimicrobial resistance awareness campaign targeting all or the majority of relevant stakeholders, based on stakeholder analysis, utilizing targeted messaging accordingly within sectors.	75	D - Nationwide, government-supported antimicrobial resistance awareness raising campaign targeting all or the majority of priority stakeholder groups, utilizing targeted messaging accordingly within sectors.	75
	E - Focused, national scale government supported activities implemented to change behavior of relevant stakeholders within sector, with monitoring	50	E - Targeted, nationwide government-supported activities regularly implemented to change behavior of key stakeholders within sectors, with monitoring undertaken over the last 2-5 years.	100	E - Routine targeted, nationwide government-supported campaign implemented to raise awareness of priority stakeholders across sectors, with regular monitoring.	100

	undertaken of their awareness and behaviour change over last 2-5 years.		6.1.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Plant Health]	2.9.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Plant Health]	
			This sector not involved		0
			Some activities done in this sector		0.25
			This sector is a main focus for activities		0.5
			6.1.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Environment]	2.9.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Environment]	
			This sector not involved		0
			Some activities done in this sector		0.25
			This sector is a main focus for activities		0.5
Scoring Rule	1. In 2017, 6.2 is a shared question for [Plant Health] and [Environment]; 2. In 2018, 2019 and 2020, 6.1 is a shared question for [Plant Health] and [Environment]; 3. In 2021 and 2022, 2.9 is a shared question for [Plant Health] and [Environment]; 4. From 2018 to 2022, for sub-questions 6.1.1 and 2.9.1, the score is calculated by multiplying the response's corresponding coefficient by the scores of questions 6.1 and 2.9, respectively; 5. The total score for "2.5.3 Raise awareness in plant health and environment fields" is the sum of the scores from each sub-question (Add the plant health and environment scores).				

2.6.1 Immunization schedule

Definition: National immunization schedules are essential for preventing infections by vaccinating individuals against various diseases. By reducing the incidence of infectious diseases, immunization helps decrease the need for antimicrobials, thereby contributing to the fight against AMR. Governments should develop and implement comprehensive immunization programs to ensure widespread coverage and protection against preventable diseases. Here, we focus on the immunization coverage of four bacterial vaccines: BCG, DTP3, Hib3, and PcV3.

Indicator	Criteria for Group Evaluation	
2.6.1 Immunization schedule	2017-2022	
	0 immunizations with coverage >90% (BCG, DTP3, Hib3, PcV3)	0
	1 immunization with coverage >90% (BCG, DTP3, Hib3, PcV3)	25
	2 immunizations with coverage >90% (BCG, DTP3, Hib3, PcV3)	50
	3 immunizations with coverage >90% (BCG, DTP3, Hib3, PcV3)	75
	4 immunizations with coverage >90% (BCG, DTP3, Hib3, PcV3)	100

2.6.2 Hygiene and prevention in humans

Definition: Hygiene and prevention involve promoting practices like proper handwashing, sanitation, and infection control, along with encouraging healthy lifestyle habits to prevent infections. These efforts aim to reduce pathogen spread and decrease reliance on antimicrobials, thereby combating AMR.

Indicator	TrACSS Questions & Responses					
	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
2.6.2 Hygiene and prevention in humans	8.1 Infection Prevention and Control (IPC) in human health care				3.5 Infection Prevention and Control (IPC) in human health care	
	A - No national IPC programme or operational plan is available.					0
	B - A national IPC programme or operational plan is available. National IPC and water, sanitation and hygiene (WASH) and environmental health standards exist but are not fully implemented.					25
	C - A national IPC programme and operational plan are available and national guidelines for health care IPC are available and disseminated. Selected health facilities are implementing the guidelines, with monitoring and feedback in place.					50
	D - National IPC programme available according to the WHO IPC core components guidelines and IPC plans and guidelines implemented nationwide. All health care facilities have a functional built environment (including water and sanitation), and necessary materials and equipment to perform IPC, per national standards.					75
	E - IPC programmes are in place and functioning at national and health facility levels according to the WHO IPC core components guidelines. Compliance and effectiveness are regularly evaluated and published. Plans and guidance are updated in response to monitoring.					100

2.6.3 Hygiene and prevention in animals and food

Definition: Hygiene and prevention measures aim to maintain high standards of cleanliness and sanitation in animal husbandry, food production, and processing facilities. These practices include regular cleaning and disinfection, proper handling and storage of food products, and strict biosecurity measures to prevent the spread of diseases among animals. Ensuring hygienic conditions throughout the food production chain minimizes the risk of contamination with harmful bacteria, reducing the need for antibiotics in animal agriculture and contributing to the fight against AMR.

Indicator	TrACSS Questions & Responses					
	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
2.6.3 Hygiene and prevention in animals and food	6.6 Progress with strengthening veterinary services	6.5 Progress with strengthening veterinary services			4.3 Progress with strengthening veterinary services	
					4.4 Progress with strengthening aquatic animal health services	
	A - No systematic approach at national level to strengthening Veterinary Services.			0	A - No systematic approach at national level to strengthening Veterinary Services.	0

B - Veterinary services assessed and plans developed to improve capacity, through a structured approach such as OIE Performance of Veterinary Services (PVS) Evaluation and PVS Gap Analysis missions.		6.25	B – Veterinary/Aquatic animal health services assessed and plans developed to improve capacity, through a structured approach such as OIE/WOAH Performance of Veterinary Services (PVS)/ Evaluation of Performance of Aquatic Animal Health Services (PVS Evaluation (Aquatic)) and PVS Gap Analysis (Aquatic) missions. Evaluation and PVS Gap Analysis missions.	6.25
C - Implementation of plan to strengthen capacity gaps in Veterinary Services underway.		12.5	C - Implementation of plan to strengthen capacity gaps in Veterinary Services underway.	12.5
D - Monitoring of Veterinary Services performance carried out regularly, e.g. through PVS Evaluation Follow Up missions.		18.75	D - Monitoring of Veterinary Services performance carried out regularly, e.g. through PVS Evaluation Follow Up missions.	18.75
E - Documented evidence of strong capacity in compliance with OIE standards on the quality of Veterinary Services		25	E - Documented evidence of strong capacity in compliance with OIE standards on the quality of Veterinary Services	25
8.2 Good health, management and hygiene practices to reduce the use of antimicrobials in animal and plant production and AMR transmission in food production 8.2.1 For each of the following sectors, please indicate which statement in 8.2 above (A-E) is applicable: [Animal Health]		8.2 Good health, management and hygiene practices to reduce the use of antimicrobials and minimize development and transmission of AMR in animal production (terrestrial and aquatic)		4.9 Biosecurity and good animal husbandry practices to reduce the use of antimicrobials and minimize development and transmission of AMR in terrestrial animal production 4.10 Biosecurity and good animal husbandry practices to reduce the use of antimicrobials and minimize development and transmission of AMR in aquatic animal production
A - No systematic efforts to improve good production practices to reduce the need to use antimicrobials. (<i>TrACSS-2018</i>) A - No systematic efforts to improve good production practices. (<i>TrACSS-2019, TrACSS-2020, TrACSS-2021</i>)		0	A - No systematic efforts to improve good animal husbandry and biosecurity practices.	0
B - Some activities in place to develop and promote good production practices.		6.25	B - Some activities in place to develop and promote good animal husbandry and biosecurity practices.	6.25
C - National plan agreed to ensure good production practices in line with international standards (e.g. OIE Terrestrial and Aquatic Codes, Codex Alimentarius). Nationally agreed guidance for good production practices developed, adapted for implementation at local farm and food production level.		12.5	C - National plan agreed to ensure good animal husbandry and biosecurity practices in line with international standards (e.g. OIE/WOAH Terrestrial Codes, Codex Alimentarius). Nationally agreed guidance for good practices developed, adapted for implementation at local farm and food production level.	12.5
D - Nationwide implementation of plan to ensure good production practices and national guidance published and disseminated.		18.75	D - Nationwide implementation of plan to ensure good animal husbandry and biosecurity practices and national guidance published and disseminated.	18.75

E - Nationwide implementation of plan to ensure good production practices and monitoring of impact on level of antimicrobial use, on animal health and welfare, and on production, with updating of plans and guidance in response to findings. (<i>TrACSS-2018</i>)		25		E - Implementation of the nation-wide plan is monitored periodically.		25
E - Nationwide implementation of plan to ensure good production practices and monitoring of impact on level of AMR, on animal health and welfare, and on production, with updating of plans and guidance in response to findings. (<i>TrACSS-2019</i>)						
E - Implementation of the nation-wide plan is monitored periodically. (<i>TrACSS-2020, TrACSS-2021</i>)						
8.2.1 For each of the following sectors, please indicate which statement in 8.2 above (A-E) is applicable: [Food Production] and [Food Safety]		8.3 Good management and hygiene practices to reduce the development and transmission of AMR in food processing		5.5 Good management and hygiene practices to reduce the development and transmission of AMR in food processing		
A - No systematic efforts to improve good production practices to reduce the need to use antimicrobials.	0	A - No systematic efforts to improve good management and hygiene practices.	0	A - No systematic efforts to improve good manufacturing (GMP) and hygiene practices (GHP).		0
B - Some activities in place to develop and promote good production practices.	16.7	B - Some activities in place to develop and promote good management and hygiene practices.	16.7	B - Some activities in place to develop and promote good manufacturing (GMP) and hygiene practices (GHP).		16.7
C - National plan agreed to ensure good production practices in line with international standards (e.g. OIE Terrestrial and Aquatic Codes, Codex Alimentarius). Nationally agreed guidance for good production practices developed, adapted for implementation at local farm and food production level.	33.3	C - National plan agreed to ensure good management and hygiene practices in line with international standards (e.g. Codex Alimentarius). Nationally agreed guidance for good practices developed, and adapted for implementation according to local food processing approaches.	33.3	C - National plan agreed to ensure good manufacturing (GMP) and hygiene practices (GHP) in line with international standards (e.g. Codex Alimentarius). Nationally agreed guidance for good practices developed, and adapted for implementation according to local food processing approaches.		33.3
D - Nationwide implementation of plan to ensure good production practices and national guidance published and disseminated.	50	D - Nationwide implementation of plan to ensure good management and hygiene practices and national guidance published and disseminated. (<i>Option E was not included in the TrACSS-2019</i>)	50	D - Nationwide implementation of plan to ensure good manufacturing (GMP) and hygiene practices (GHP) and national guidance published and disseminated.		50
E - Nationwide implementation of plan to ensure good production practices and monitoring of impact on level of antimicrobial use, on animal health and welfare, and on production, with updating of plans and guidance in response to findings.	50	E - Implementation of the nation-wide plan is monitored periodically.	50	E - Implementation of the nation-wide plan is monitored periodically.		50

Scoring Rule	1. In 2017, take the highest score on questions 8.2.1 [Food Production] and [Food Safety]; 2. In 2021 and 2022, take the highest score on questions 4.3 and 4.4 and take the highest score on questions 4.9 and 4.10. 3. The total score for "2.6.3 Hygiene and prevention in animals and food" is the sum of the scores from each sub-question.
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2.6.4 Risk assessment in environment

Definition: Environmental risk assessment involves evaluating potential sources and pathways of AMR, such as contamination of water bodies and soil with antibiotic residues or resistant bacteria. These methodologies help identify areas where interventions are needed to mitigate the environmental spread of AMR.

Indicator	TrACSS Questions & Responses					
	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
2.6.4 Risk assessment in environment	8.2 Good health, management and hygiene practices to reduce the use of antimicrobials in animal and plant production and AMR transmission in food production 8.2.1 For each of the following sectors, please indicate which statement in 8.2 above (A-E) is applicable: [Environment]	10 Risk assessments-Have high locations been risk identified?		10 Risks for AMR spread in the environment-Have risk assessments been conducted?	6.1 Has a national assessment of risks for residues of antimicrobial compounds and antimicrobial resistant pathogens in the environment been conducted?	
	A - No systematic efforts to improve good production practices to reduce the need to use antimicrobials.	0	1) Human sewage (including wastewater sludge) quality a) disposal in the environment 2) Human sewage (including wastewater and sludge) quality b) Re-use	14.3	1) Human sewage (including lack of basic toilets and management of wastewater and sludge collected in sewer networks and onsite facilities such as septic tanks)) quality	14.3
	B - Some activities in place to develop and promote good production practices.	25	3) Wastewater discharges from health facilities for disposal in the environment.	14.3	2) Wastewater discharges from health facilities for disposal in the environment. (including lack of basic toilets and management of wastewater and sludge collected in sewer networks and from onsite sanitation such as septic tanks)	14.3

			4) Discharges from intensive animal (terrestrial and aquatic production (liquid waste and manure) a) disposal into the environment	14.3	3) Discharges from intensive animal (terrestrial and aquatic) production (liquid waste and manure)	14.3	3) [Discharges from intensive terrestrial animal production (liquid and/or solid waste)] 4) [Discharges from intensive aquatic animal production (liquid and solid waste)]	14.3
	C - National plan agreed to ensure good production practices in line with international standards (e.g. OIE Terrestrial and Aquatic Codes, Codex Alimentarius). Nationally agreed guidance for good production practices developed, adapted for implementation at local farm and food production level.	50	5) Discharges from intensive animal (terrestrial and aquatic) production (liquid waste and manure) b) Re-use	14.3	4) Treatment of liquid waste and manure from intensive animal (terrestrial and aquatic) production before reusing in agriculture.	14.3	5) [Liquid and solid waste from intensive terrestrial animal production prior to use in agriculture] 6) [Liquid and solid waste from intensive aquatic animal production prior to use in agriculture]	14.3
	D - Nationwide implementation of plan to ensure good production practices and national guidance published and disseminated.	75	6) Wastewater discharges from manufacturing sites for antimicrobial agents (either as Active Pharmaceutical Ingredient (API) or finished products)	14.3	5) Wastewater discharges from manufacturing sites for antimicrobial agents (either as Active Pharmaceutical Ingredient (API) or finished products).	14.3	7) [Wastewater discharges from manufacturing sites for antimicrobial agents (either as Active Pharmaceutical Ingredient (API) or finished products).]	14.3
	E - Nationwide implementation of plan to ensure good production practices and monitoring of impact on level of antimicrobial use, on animal health and welfare, and on production, with updating of plans and guidance in response to findings.	100	7) Disposal of unused medicines antimicrobial agents.	14.3	6) Disposal of unused medicines antimicrobial agents (unused should include left-over product and also product containers (including pesticides)	14.3	8) [Disposal of medicines, antimicrobial agents (unused, left-over product and also product containers) for human use] 9) [Disposal of medicines, antimicrobial agents (unused, left-over product and/or also product containers) for animal use]	14.3
			8) Disposal of products contaminated with antimicrobial residues.	14.3	7) Disposal of food, plant or animal products contaminated with antimicrobial residues over the MRL (maximum residue limit)	14.3	10) [Disposal of food, plant or animal products contaminated with antimicrobial residues over the MRL (maximum residue limit)]	14.3
Scoring Rule	1. In 2018 and 2019, for sub-question 10 - 1) and 2): Score if the answer to either question is "yes";							

	2. In 2021 and 2022, for sub-question 10 - 3) and 4): Score if the answer to either question is "yes"; for sub-question 10 - 5) and 6): Score if the answer to either question is "yes"; for sub-question 10 - 8) and 9): Score if the answer to either question is "yes". 3. The total score for "2.6.4 Risk assessment in environment " is the sum of the scores from each sub-question;
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2.7.1 Policy support

Definition: Policy support involves governments and institutions developing and implementing policies that facilitate research and innovation in combating AMR.

Indicator	Criteria for Group Evaluation	
2.7.1 Policy support	2017-2022	
	The NAP does not mention any support for research in the AMR field.	0
	The NAP mentions support for research in the AMR field but focuses only on survey-based studies (except innovative research), such as epidemiological surveillance or resistance rate monitoring.	50
	The NAP explicitly supports innovative research in the AMR field, such as the development of new vaccines, drugs, or fundamental research advancements.	100

2.7.2 Scientific research fund

Definition: Scientific research funds allocate resources to support research aimed at understanding AMR mechanisms, developing new antimicrobial agents, improving diagnostics, and exploring alternative treatments.

Indicator	Criteria for Group Evaluation	
2.7.2 Scientific research fund	2017-2022	
	No ongoing AMR R&D projects are currently funded.	0
	At least one ongoing AMR R&D project is currently funded.	100

3.1.1 Transparency

Definition: Countries making their NAPs on AMR publicly available ensures transparency and allows the public to understand national actions against AMR.

Indicator	Criteria for Group Evaluation	
3.1.1 Transparency	2017-2022 (Scoring starts from the first NAP year; No NAP = 0 points)	
	The NAP is not publicly available in the given year.	0
	The NAP is publicly available in the given year.	100

3.1.2 Annual reports

Definition: Countries publishing their annual reports on AMR helps the public understand AMR patterns.

Indicator	Criteria for Group Evaluation	
3.1.2 Annual reports	2017-2022	
	The country's AMR data is not available in the given year	0
	The country's AMR data is available in the given year	100

3.1.3 International collaboration

Definition: International collaboration, such as with the Global Antimicrobial Resistance Surveillance System (GLASS), facilitates sharing of antimicrobial resistance surveillance or antimicrobial use surveillance monitoring data, promoting a coordinated global response to this critical public health issue.

Indicator	Criteria for Group Evaluation	
1.3.1 International collaboration	2017-2022	
	The country is not enrolled in GLASS for either AMR or AMU surveillance.	0
	The country is enrolled in either AMR or AMU surveillance under GLASS.	50
	The country is enrolled in both AMR and AMU surveillance under the GLASS	100

3.2.1 Policy adjustment in human health sector

Definition: In the human health sector, policy adjustments ensure that healthcare policies remain effective and responsive to AMR.

Indicator	TrACSS Questions & Responses						
3.2.1 Policy adjustment in human health sector	2017 (TrACSS-2018)	2018 (TrACSS-2019)		2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
	No such questions, the answer from the following year is used for imputation.	7.6 Multi-sectoral working group or coordination committee in charge of national AMR strategy reviews data on antimicrobial consumption and resistance in human and animal sectors at least annually, considers implications for and amends national strategy accordingly [For human health]		7.6 Is the country using relevant antimicrobial consumption/use and/or antimicrobial resistance data to amend national strategy and/or inform decision making, at least annually? If yes, for which sector/s [Human Health]		2.11 Is the country using relevant antimicrobial consumption/use data to inform operational decision making and amend policies? If yes, for which sector/s [Human Health]	
						2.12 Is the country using relevant antimicrobial resistance surveillance data to inform operational decision making and amend policies? If yes, for which sector/s [Human Health]	
						No	0
	Yes	100	Yes	100	Yes	100	
Scoring Rule	1. In 2021 and 2022, for 2.11 [Human Health] and 2.12 [Human Health]: Score if the answer to either question is "yes"; 2. There is no such question in 2017, and the answers of 2018 are used as imputation.						

3.2.2 Policy adjustment in animal health and food processing sectors

Definition: In the animal health and food processing sectors, policy adjustments ensure that healthcare policies remain effective and responsive to AMR.

Indicator	TrACSS Questions & Responses					
3.2.2 Policy adjustment in animal health and	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
	<i>No such questions, the answer from the</i>	7.6 Multi-sectoral working group or coordination committee in charge of	7.6 Is the country using relevant antimicrobial consumption/use and/or antimicrobial resistance		2.11 Is the country using relevant antimicrobial consumption/use data to inform operational decision	

food processing sectors	following year is used for imputation.	national AMR strategy reviews data on antimicrobial consumption and resistance in human and animal sectors at least annually, considers implications for and amends national strategy accordingly		data to amend national strategy and/or inform decision making, at least annually? If yes, for which sector/s:		making and amend policies? If yes, for which sector/s:		
		[Animal heath]		50	[Animal heath (terrestrial and aquatic)]	50	[Terrestrial animal health] or [Aquatic animal heath]	50
		No such questions about food, the answer from the following year is used for imputation.			[Food Production] or [Food Safety]	50	[Food Production] or [Food Safety]	50
Scoring Rule	1. For each sub-question, score the corresponding points if the answer is "yes"; 2. In 2019 and 2020, For [Food Production] and [Food Safety]: Score if the answer to either question is "yes"; 3. In 2021 and 2022, for 2.11 [Terrestrial animal health], 2.11 [Aquatic animal health], 2.12 [Terrestrial animal health] and 2.12 [Aquatic animal health]: Score if the answer to any question is "yes"; 4. In 2021 and 2022, for 2.11 [Food Production], 2.11 [Food Safety], 2.12 [Food Production] and 2.12 [Food Safety]: Score if the answer to any question is "yes"; 5. The total score for "3.2.2 Policy adjustment in animal health and food processing sectors" is the sum of the scores from each sub-question; 6. There are no such questions in 2017, and the answers of 2018 are used as imputation; no such questions about food in 2018 and the answers of 2019 are used as imputation.							

3.2.3 Policy adjustment in plant and environment health sectors

Definition: In the plant and environmental health sectors, policy adjustments ensure that healthcare policies remain effective and responsive to AMR.

Indicator	TrACSS Questions & Responses					
3.2.3 Policy adjustment in plant and environment health sectors	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
	<i>No such questions, the answer from two years later is used for imputation.</i>		7.6 Is the country using relevant antimicrobial consumption/use and/or antimicrobial resistance data to amend national strategy and/or inform decision making, at least annually? If yes, for which sector/s:		2.11 Is the country using relevant antimicrobial consumption/use data to inform operational decision making and amend policies? If yes, for which sector/s:	
			2.12 Is the country using relevant antimicrobial resistance surveillance data to inform operational decision making and amend policies? If yes, for which sector/s:			
			[Plant Health]	50	[Plant Health]	50
			[Environment]	50	[Environment]	50
Scoring Rule	1. For each sub-question, score the corresponding points if the answer is "yes"; 2. In 2021 and 2022, for 2.11 [Plant Health] and 2.12 [Plant Health]: Score if the answer to either question is "yes"; 3. In 2021 and 2022, for 2.11 [Environment] and 2.12 [Environment]: Score if the answer to either question is "yes";					

	4. The total score for "3.2.3 Policy adjustment in plant and environment health sectors" is the sum of the scores from each sub-question; 5. There are no such questions in 2017 and 2018 and the answers of 2019 are used as imputation.
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3.3.1 AMU surveillance

Definition: The effectiveness of AMU surveillance is evaluated by its ability to accurately monitor antimicrobial use trends and patterns in human health, animal health, and plant production. This surveillance provides critical data to inform policy decisions and interventions aimed at promoting responsible antimicrobial use and mitigating AMR.

Indicator	TrACSS Questions & Responses											
3.3.1 AMU surveillance	2017 (TrACSS-2018)		2018 (TrACSS-2019)		2019 (TrACSS-2020)		2020 (TrACSS-2021)		2021 (TrACSS-2022)		2022 (TrACSS-2023)	
	7.1 National monitoring system for consumption and rational use of antimicrobials in human health								3.2 National monitoring system for consumption and rational use of antimicrobials in human health			
	A - No national plan or system for monitoring use of antimicrobials.											0
	B - System designed for surveillance of antimicrobial use, that includes monitoring national level sales or consumption of antibiotics in health services.											0
	C - Total sales of antimicrobials are monitored at national level and/or some monitoring of antibiotic use at sub-national level.											0
	D - Prescribing practices and quality of antibiotic use are monitored in a national sample of healthcare settings.											40
	E - On a regular basis (every year/two years) data is collected and reported on:											40
	a) Antimicrobial sales or consumption at national level for human use; and b) Antibiotic prescribing and appropriate/rational use, in a representative sample of health facilities, public and private											
	7.2 National monitoring system for antimicrobials intended to be used in animals (sales/use)								4.5 a Do you have a national plan or system in place for monitoring sales/use of antimicrobials in animals?			
	A - No national plan or system for monitoring sales/use of antimicrobials in animals.						0	No	0	No	0	
	B - Plan agreed for monitoring quantities of antimicrobials sold for/used in animals, based on OIE standards.						0					
	C - Data collected and reported on total quantity of antimicrobials sold for/used in animals and their intended type of use (therapeutic or growth promotion).						30	Yes	30	Yes, both aquatic and terrestrial		30
	D - On a regular basis, data is collected and reported to the OIE on the total quantity of antimicrobials sold for/used in animals nationally, by antimicrobial class, by species (aquatic or terrestrial), method of administration, and by type of use (therapeutic or growth promotion).						30			Yes, terrestrial animals only		30
	E - Data on antimicrobials used under veterinary supervision in animals are available at farm level, for individual animal species.						30			Yes, aquatic animals only		30
7.3 National monitoring system for antimicrobial use (antibiotic and antifungal agents) in plant production		7.3 National monitoring system for pesticide use in plant production		7.3 National monitoring system for pesticide use in plant production including antimicrobial pesticides such as bactericides and fungicides				5.2 National monitoring system for antimicrobial-pesticide use in plant production including bactericides and fungicides				

	A - No national plan or system for monitoring use of antimicrobials in plants.	0	A - No national plan or system for monitoring use of pesticides used for the purpose of controlling bacteria or fungal diseases. (<i>TrACSS-2019</i>) A - No national plan or system for monitoring use of pesticides including antimicrobial pesticides such as bactericides and fungicides used for the purpose of controlling bacteria or fungal diseases. (<i>TrACSS-2020</i>) A - No national plan or system for monitoring use of pesticides including antimicrobial pesticides such as bactericides and fungicides used for controlling bacteria or fungal diseases. (<i>TrACSS-2021</i>)	0	A - No national plan or system for monitoring use of pesticides including antimicrobial pesticides such as bactericides and fungicides.	0
	B - Plan agreed for monitoring quantities of antimicrobial sales or use in plant production.	0	B - Plan agreed for monitoring quantities of pesticides used for the purpose of controlling bacteria or fungal diseases. (<i>TrACSS-2019</i>) B - Plan agreed for monitoring quantities of pesticides including antimicrobial pesticides such as bactericides and fungicides used for the purpose of controlling bacteria or fungal diseases. (<i>TrACSS-2020</i>)	0	B - National plan or system under development for monitoring amount of pesticides used including antimicrobial pesticides applied such as bactericides and fungicides.	0
	C - Data collected and reported on quantity of antimicrobial used in some subsectors of plant production.	0	B - Plan agreed for monitoring quantities of pesticides including antimicrobial pesticides such as bactericides and fungicides used for controlling bacteria or fungal diseases. (<i>TrACSS-2021</i>)			
	D - Data collected and reported on total quantity of antimicrobial used nationally in plant production.	30	C - Data collected and reported on total quantity of pesticides sold/ used nationally for the purpose of controlling bacteria or fungal diseases. (<i>TrACSS-2019</i>) C - Data collected and reported on total quantity of pesticides including antimicrobial pesticides such as bactericides and fungicides sold/ used nationally for the purpose of controlling bacteria or fungal diseases. (<i>TrACSS-2020</i>) C - Data collected and reported on total quantity of pesticides including antimicrobial pesticides such as bactericides and fungicides sold/ used nationally for controlling bacteria or fungal diseases. (<i>TrACSS-2021</i>)	30	C - National plan or system in place to collect data and report on the amount of pesticides sold/used nationally, including including antimicrobial pesticides such as bactericides and fungicides.	30
	E - On a regular basis, data is collected and reported on total quantity of antimicrobial use in crop production, by antimicrobial class.	30	D - On a regular basis, data is collected and reported on quantity of pesticides sold/used in plant production for the purpose of controlling bacteria or fungal diseases, disaggregated by class of active ingredient. (<i>TrACSS-2019</i>) D - On a regular basis, data is collected and reported on quantity of pesticides including antimicrobial pesticides such as bactericides and fungicides sold/used in plant production for the purpose of controlling bacteria or fungal diseases, disaggregated by class of active ingredient and plant type/species. (<i>TrACSS-2020</i>)	30		

			D - On a regular basis, data is collected and reported on quantity of pesticides including antimicrobial pesticides such as bactericides and fungicides sold/used in plant production for controlling bacteria or fungal diseases, disaggregated by class of active ingredient and plant type/species. (<i>TrACSS-2021</i>)			
Scoring Rule	The total score for "3.3.1 AMU surveillance" is the sum of the scores from each sub-question.					

3.3.2 AMR surveillance

Definition: The effectiveness of AMR surveillance is measured by its capacity to track the prevalence and trends of antimicrobial resistance in various settings, including healthcare facilities, agriculture, and the environment. Effective surveillance systems enable early detection of emerging resistance patterns and inform targeted interventions to prevent the spread of resistant pathogens.

Indicator	TrACSS Questions & Responses					
	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
3.3.2 AMR surveillance	7.4 National surveillance system for antimicrobial resistance (AMR) in humans				3.3 National surveillance system for antimicrobial resistance (AMR) in humans	
	A - No capacity for generating data and reporting on antibiotic resistance (antibiotic susceptibility testing and accompanying clinical and epidemiological data collection). (<i>TrACSS-2018</i>) A - No capacity for generating data (antibiotic susceptibility testing and accompanying clinical and epidemiological data) and reporting on antibiotic resistance. (<i>TrACSS-2019, TrACSS-2020</i>)				0	0
	B - AMR data is collated locally for common bacteria, but may not use a standardized approach and lacks national coordination and/or quality management. (<i>TrACSS-2018</i>) B - AMR data is collated locally for common bacteria, but data collection may not use a standardized approach and lacks national coordination and/or quality management. (<i>TrACSS-2019, TrACSS-2020</i>)				0	0
	C - National AMR surveillance activities are in place for common bacterial pathogens that link patient information with susceptibility testing, with a national reference laboratory that participates in external quality assurance. (<i>TrACSS-2018</i>) C - National AMR surveillance activities for common bacterial infections follow national standards, and a national reference laboratory that participates in external quality assurance. (<i>TrACSS-2019, TrACSS-2020</i>)				0	0
	D - There is a functioning national AMR surveillance system covering antibiotics in hospitals and outpatient clinics, with external quality assurance, and a national coordinating centre producing reports on resistance levels. (<i>TrACSS-2018</i>) D - There is a functioning national AMR surveillance system covering common bacterial infections in hospitalized and community patients, with external quality assurance, and a national coordinating centre producing reports on AMR. (<i>TrACSS-2019, TrACSS-2020</i>)				40	40

E - The national AMR surveillance system integrates surveillance of AMR across sectors, and generates regular reports. (<i>TrACSS-2018</i>) E - The national AMR surveillance system integrates surveillance of AMR across sectors, and generates regular reports covering at least one common indicator. (<i>TrACSS-2019, TrACSS-2020</i>)		40	E - The national AMR surveillance system links AMR surveillance with antimicrobial consumption and/or use data for human health.	40
7.5.1 For each of the following sources of bacteria, please indicate which statement in 7.5 above (A-E) is applicable: [Animals (terrestrial and aquatic)]	7.5 (a) National surveillance system for antimicrobial resistance (AMR) in animals (terrestrial and aquatic)	4.7 National surveillance system for antimicrobial resistance (AMR) in live terrestrial animals 4.8 National surveillance system for antimicrobial resistance (AMR) in live aquatic animals		
A - No national plan for a system of monitoring of AMR is available. (<i>TrACSS-2018</i>) A - No national plan for a system of surveillance of AMR. (<i>TrACSS-2019, TrACSS-2020</i>) A - No national plan for an AMR surveillance system. (<i>TrACSS-2021</i>)		0	A - There are no local or national strategies/plans for generating AMR surveillance data from (aquatic) animals for an AMR surveillance system.	0
B - National plan for monitoring AMR but capacity (including laboratory) for surveillance and reporting data on AMR is lacking. (<i>TrACSS-2018</i>) B - National plan for surveillance of AMR but capacity (including laboratory and for reporting data on AMR) is lacking. (<i>TrACSS-2019</i>) B - National plan for AMR surveillance in place but capacity (including laboratory and for reporting data on AMR) is lacking. (<i>TrACSS-2020</i>) B - National plan for AMR surveillance in place but capacity (including laboratory and reporting) is lacking. (<i>TrACSS-2021</i>)		0	B - National plan for AMR surveillance in place but laboratory and epidemiology capacities for generating, analysing and reporting data are lacking.	0
C - Some AMR data is collected locally but may not use a standardised approach and lacks national coordination and/or quality management. (<i>TrACSS-2018, TrACSS-2019</i>) C - Some AMR data is collected locally but a standardized approach is not used. National coordination and/or quality management is lacking. (<i>TrACSS-2020</i>) C - Some AMR data is collected but a standardized approach is not used. National coordination and/or quality management is lacking. (<i>TrACSS-2021</i>)		0	C - Some AMR data is collected at local levels but a nationally standardized approach is not used. National coordination and/or quality management is lacking.	0
D - Priority pathogenic/ commensal bacterial species have been identified for surveillance. Data systematically collected and reported on levels of resistance in at least 2 of those bacterial species, involving a laboratory that follows quality management processes, e.g. proficiency testing. (<i>TrACSS-2018</i>) D - Priority pathogenic/ commensal bacterial species have been identified for surveillance. Data systematically collected and reported on levels of resistance in at least one of those bacterial species, involving a laboratory that follows quality management processes, e.g. proficiency testing. (<i>TrACSS-2019, TrACSS-2020, TrACSS-2021</i>)		15	D - Priority pathogenic/ commensal bacterial species have been identified for surveillance. Data systematically collected and reported on levels of resistance in at least one of those bacterial species, involving a laboratory that follows quality management processes e.g. proficiency testing.	15

E - National system of surveillance of AMR established for priority pathogens and for relevant commensal bacteria which follows quality assurance processes in line with intergovernmental standards. Laboratories that report for AMR surveillance follow quality assurance processes. (<i>TrACSS-2018</i>) E - National system of AMR surveillance established for priority animal pathogens, zoonotic and commensal bacterial isolates which follows quality assurance processes in line with intergovernmental standards. Laboratories that report for AMR surveillance follow quality assurance processes. (<i>TrACSS-2019, TrACSS-2020, TrACSS-2021</i>)		15	E - National system of AMR surveillance established for priority animal pathogens, zoonotic and commensal bacterial isolates which follows quality assurance processes in line with intergovernmental standards. Laboratories that report for AMR surveillance follow quality assurance processes.	15
7.5.1 For each of the following sources of bacteria, please indicate which statement in 7.5 above (A-E) is applicable: [Food]	7.5 (c) National surveillance system for antimicrobial resistance (AMR) in food (animal and plant origin)	5.3 National surveillance system for antimicrobial resistance (AMR) in food (terrestrial and aquatic animal and plant origin)		
A - No national plan for a system of monitoring of AMR is available. (<i>TrACSS-2018</i>) A - No national plan for a system of surveillance of AMR is available. (<i>TrACSS-2019</i>) A - No national plan for an AMR surveillance system. (<i>TrACSS-2020, TrACSS-2021</i>)		0	A - No national plan for an AMR surveillance system.	0
B - National plan for monitoring AMR but capacity (including laboratory) for surveillance and reporting data on AMR is lacking. (<i>TrACSS-2018</i>) B - National plan for surveillance of AMR but capacity (including laboratory and for reporting data on AMR) is lacking. (<i>TrACSS-2019</i>) B - National plan for AMR surveillance in place but capacity (including laboratory and reporting) is lacking. (<i>TrACSS-2020, TrACSS-2021</i>)		0	B - National plan for AMR surveillance in place but capacity (including laboratory and reporting) is lacking.	0
C - Some AMR data is collected locally but may not use a standardised approach and lacks national coordination and/or quality management. (<i>TrACSS-2018, TrACSS-2019</i>) C - Some AMR data is collected - but a standardized approach is not used. National coordination and/or quality management is lacking. (<i>TrACSS-2020, TrACSS-2021</i>)		0	C - Some AMR data is collected - but a standardized approach is not used. National coordination and/or quality management is lacking.	0
D - Priority pathogenic/ commensal bacterial species have been identified for surveillance. Data systematically collected and reported on levels of resistance in at least 2 of those bacterial species, involving a laboratory that follows quality management processes, e.g. proficiency testing. (<i>TrACSS-2018</i>) D - Priority food borne pathogenic/ indicator bacterial species have been identified for surveillance. Data systematically collected and reported on levels of resistance in at least one of those bacterial species, involving a laboratory that follows quality management processes, e.g. proficiency testing. (<i>TrACSS-2019, TrACSS-2020, TrACSS-2021</i>)		15	D - Priority food borne pathogenic/ indicator bacterial species have been identified for surveillance. Data systematically collected and reported on levels of resistance in at least one of those bacterial species, involving a laboratory that follows quality management processes, e.g. proficiency testing.	15
E - National system of surveillance of AMR established for priority pathogens and for relevant commensal bacteria which follows quality assurance processes in line with intergovernmental standards. Laboratories that report for AMR surveillance follow quality assurance processes. (<i>TrACSS-2018</i>) E - National system of AMR surveillance established for priority foodborne pathogens and/or relevant indicator bacteria		15	E - National system of AMR surveillance established for priority foodborne pathogens and/or relevant indicator bacteria which follows quality assurance processes in line with	15

which follows quality assurance processes in line with intergovernmental standards. Laboratories that report for AMR surveillance follow quality assurance processes. (TrACSS-2019, TrACSS-2020, TrACSS-2021)			intergovernmental standards. Laboratories that report for AMR surveillance follow quality assurance processes.		
7.5.1 For each of the following sources of bacteria, please indicate which statement in 7.5 above (A-E) is applicable: [Plants] and [Environment]		<i>No such questions, the answer from the previous year is used for imputation.</i>	<i>No such questions, the answer from the following year is used for imputation.</i>	7.6.1 Has the country established or starting the implementation of an Integrated Multisectoral Surveillance System including Antimicrobial Resistance and Antimicrobial consumption/use?	2.13 Has the country established or starting the implementation of an Integrated Surveillance System for Antimicrobial Resistance? If yes, involving which sector/s
A - No national plan for a system of monitoring of AMR is available.	0			[Plant Health]	15
B - National plan for monitoring AMR but capacity (including laboratory) for surveillance and reporting data on AMR is lacking.	0				
C - Some AMR data is collected locally but may not use a standardised approach and lacks national coordination and/or quality management.	0				
D - Priority pathogenic/ commensal bacterial species have been identified for surveillance. Data systematically collected and reported on levels of resistance in at least 2 of those bacterial species, involving a laboratory that follows quality management processes, e.g. proficiency testing.	15			[Environment]	15

	E - National system of surveillance of AMR established for priority pathogens and for relevant commensal bacteria which follows quality assurance processes in line with intergovernmental standards. Laboratories that report for AMR surveillance follow quality assurance processes.	15				
Scoring Rule	1. In 2021 and 2022, for question 4.7 and 4.8, take the highest score from the two questions; 2. In 2017, 7.5.1 is a shared question for [Animals (terrestrial and aquatic)], [Food], [Plants], and [Environment]. For each sub-question, selecting either D or E would grant the corresponding 15 points, for a total of 60 points (Question 7.4 for human 40 points); 3. In 2020, 2021, and 2022, for question 7.6.1 and 2.13 score the corresponding points if the answer is "yes"; 4. The total score for "3.3.2 AMR surveillance" is the sum of the scores from each sub-question; 5. There are no such questions about plant and environment in 2018 and 2019, the answers of 2017 and 2020 are used as imputation, respectively.					

3.3.3 Antimicrobial optimization

Definition: The effectiveness of antimicrobial optimization efforts is assessed by their impact on promoting rational antimicrobial use and reducing the emergence and spread of antimicrobial resistance.

Indicator	TrACSS Questions & Responses					
	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
3.3.3 Antimicrobial optimization	9.1 Optimizing antimicrobial use in human health				3.6 Optimizing antimicrobial use in human health	
	A - No/weak national policy & regulations for appropriate use. (<i>TrACSS-2018</i>) A - No/weak national policies for appropriate use. (<i>TrACSS-2019, TrACSS-2020, TrACSS-2021</i>)			0	A - No/weak national policies for appropriate antimicrobial use including availability, quality, and disposal of antimicrobials.	0
	B - National policy for antimicrobial governance and regulation developed for the community and health care settings. (<i>TrACSS-2018</i>) B - National policies for antimicrobial governance developed for the community and health care settings. (<i>TrACSS-2019, TrACSS-2020, TrACSS-2021</i>)			0	B - National policies promoting appropriate antimicrobial use/antimicrobial stewardship activities developed for the community and health care settings.	0
	C - Practices to assure appropriate antimicrobial use being implemented in some healthcare facilities and guidelines for appropriate use of antimicrobials available.			0	C - National guidelines for appropriate use of antimicrobials are available and antimicrobial stewardship programs are being implemented in some healthcare facilities.	0

	D - Guidelines and other practices to enable appropriate use are implemented in most health facilities nationwide. Monitoring and surveillance results are used to inform action and to update treatment guidelines and essential medicines lists.		40	D - National guidelines for appropriate use of antimicrobials are available and antimicrobial stewardship programs are being implemented in most health care facilities nationwide. Monitoring and surveillance results are used to inform action and to update treatment guidelines and essential medicines lists.	40
	E - Guidelines on optimizing antibiotic use are implemented for all major syndromes and data on use is systematically fed back to prescribers.		40	E - National guidelines on optimizing antibiotic use are implemented for all major syndromes and data on use is systematically fed back to prescribers.	40
	9.2.1 For each of the following sectors, please indicate which statement in 9.2 above (A-E) is applicable: [Animal Health (terrestrial and aquatic)]	9.2 Optimizing antimicrobial use in animal health (terrestrial and aquatic)		4.11 Optimizing antimicrobial use in terrestrial animal health	
				4.12 Optimizing antimicrobial use in aquatic animal health	
	A - No national policy or legislation regarding the quality, safety and efficacy of antimicrobial products, and their distribution, sale or use.		0	A - No national policy or legislation regarding the quality, safety and efficacy of antimicrobial products, and their distribution, sale or use.	0
	B - National legislation covers some aspects of national manufacture, import, marketing authorization, control of safety, quality and efficacy and distribution of antimicrobial products.		0	B - National legislation covers some aspects of national manufacture, import, marketing authorization, control of safety, quality and efficacy and distribution of antimicrobial products.	0
	C - National legislation covers all aspects of national manufacture, import, marketing authorization, control of safety, quality and efficacy and distribution of antimicrobial products.		0	C - National legislation covers all aspects of national manufacture, import, marketing authorization, control of safety, quality and efficacy and distribution of antimicrobial products.	0

E - Guidelines for responsible and prudent use of antimicrobials based on international standards (e.g. OIE Terrestrial and Aquatic Codes, Codex Alimentarius) are available according to animal species and/or production sector and include restriction of specific antimicrobial classes listed as Critically Important for humans and animals. (TrACSS-2018) D - The national regulatory framework for antimicrobial products incorporates all the elements included in the related international standards on responsible and prudent use of antimicrobials (e.g. OIE Terrestrial and Aquatic Codes, Codex Alimentarius) according to animal species and/or production sector. (TrACSS-2019, TrACSS-2020, TrACSS-2021)		30	D - The national regulatory framework for antimicrobial products incorporates all the elements included in the related international standards on responsible and prudent use of antimicrobials (e.g. OIE Terrestrial/Aquatic Animal Health Codes, Codex Alimentarius) according to animal species and/or production sector.		30	
D - Effective enforcement processes and control are in place to ensure compliance with legislation. (TrACSS-2018) E - Enforcement processes and control are in place to ensure compliance with legislation. (TrACSS-2019, TrACSS-2020, TrACSS-2021)		30	E - Enforcement processes and control are in place to ensure compliance with legislation.		30	
9.2.1 For each of the following sectors, please indicate which statement in 9.2 above (A-E) is applicable: [Plant Health]		<i>No such questions, the answer from the previous year is used for imputation.</i>	9.3 Optimizing antimicrobial pesticide such as bactericides and fungicides use in plant production.		5.6 Optimizing antimicrobial pesticide such as bactericides and fungicides use in plant production	
A - No national plan for a system of monitoring of AMR is available.	0		A - No national policy or legislation regarding the quality, safety and efficacy of pesticides including antimicrobial pesticides such as bactericides and fungicides and their distribution, sale or use.	0	A - No national policy or legislation regarding the quality, safety and efficacy of pesticides including antimicrobial pesticides such as bactericides and fungicides and their distribution, sale or use.	0
B - National plan for monitoring AMR but capacity (including laboratory) for surveillance and reporting data on AMR is lacking.	0		B - National legislation covers some aspects of national manufacture, import, marketing authorization, control of safety, quality and efficacy and distribution of pesticides including antimicrobial pesticides such as bactericides and fungicides.	0	B - National legislation covers some aspects of national manufacture, import, marketing authorization, control of safety, quality and efficacy and distribution of pesticides including antimicrobial pesticides such as bactericides and fungicides.	0
C - Some AMR data is collected locally but may not use a standardised approach and lacks national coordination and/or quality management.	0		C - National legislation covers all aspects of national manufacture, import, marketing authorization, control of safety, quality and efficacy and distribution of pesticides including antimicrobial pesticides such as bactericides and fungicides.	0	C - National legislation covers all aspects of national manufacture, import, marketing authorization, control of safety, quality and efficacy and distribution of pesticides including antimicrobial pesticides such as bactericides and fungicides.	0

	D - Priority pathogenic/commensal bacterial species have been identified for surveillance. Data systematically collected and reported on levels of resistance in at least 2 of those bacterial species, involving a laboratory that follows quality management processes, e.g. proficiency testing.	15		D - The national regulatory framework for antimicrobial pesticides such as bactericides and fungicides incorporates all the elements in the related international standards on responsible and prudent use according to plant type/species.		15	D - The national regulatory framework for antimicrobial pesticides such as bactericides and fungicides incorporates all the elements in the related international standards on responsible and prudent use according to plant type/species.		15
	E - National system of surveillance of AMR established for priority pathogens and for relevant commensal bacteria which follows quality assurance processes in line with intergovernmental standards. Laboratories that report for AMR surveillance follow quality assurance processes.	15		E - Enforcement processes and control are in place to ensure compliance with legislation on use of antimicrobial pesticides such as bactericides and fungicides.		15	E - Enforcement processes and control are in place to ensure compliance with legislation on use of antimicrobial pesticides such as bactericides and fungicides.		15
	9.3 Legislation and/or regulations to prevent contamination of the environment with antimicrobials		10 Are there legislation and/or regulation and policies to mitigate risks-That specifically addresses AMR		10 Risks for AMR spread in the environment-Are there legislation and/or regulation and policies to mitigate risks?		6.2 Country has legislation and/or regulations to prevent contamination of the environment with antimicrobials-antimicrobial compounds and their metabolites discharged to the environment		
	A - No legislation regarding control of waste discharge (sewage, health facilities, agriculture, manure and industrial effluent) into the environment.	0	1) Human sewage (including wastewater and sludge) quality a) disposal in the environment	2.145	1) Human sewage (including lack of basic toilets and management of wastewater and sludge collected in sewer networks and onsite facilities such as septic tanks)) quality	2.145	1) [Human sewage treatment quality (including lack of basic toilets, and management of wastewater and sludge collected in sewer networks and onsite facilities such as septic tanks).]		2.145
		2) Human sewage (including wastewater and sludge) quality b) Re-use							

	B - Legislation and/or regulations are in place to control at least the release of human sewage into the environment.	0	3) Wastewater discharges from health facilities for disposal in the environment.	2.145	2) Wastewater discharges from health facilities for disposal in the environment. (including lack of basic toilets and management of wastewater and sludge collected in sewer networks and from onsite sanitation such as septic tanks)	2.145	2) [Wastewater discharges from health facilities for disposal in the environment (including lack of basic toilets and management of wastewater and sludge collected in sewer networks and from onsite sanitation such as septic tanks).]	2.145
	C - Legislation and/or regulations encompass release of sewage, discharge of wastewater from health facilities, manure from intensive animal production, and industrial effluent to the environment.	0	4) Discharges from intensive animal (terrestrial and aquatic production (liquid waste and manure) a) disposal into the environment	2.145	3) Discharges from intensive animal (terrestrial and aquatic) production (liquid waste and manure)	2.145	3) [Discharges from intensive terrestrial animal production (liquid and/or solid waste)]	2.145
							4) [Discharges from intensive aquatic animal production (liquid and solid waste)]	
	D - There is a functioning system for monitoring regulatory compliance of discharge to the environment for some types of waste (sewage, health facilities, agriculture, manure and/or industrial effluent).	15	5) Discharges from intensive animal (terrestrial and aquatic) production (liquid waste and manure) b) Re-use	2.145	4) Treatment of liquid waste and manure from intensive animal (terrestrial and aquatic) production before reusing in agriculture.	2.145	5) [Liquid and solid waste from intensive terrestrial animal production prior to use in agriculture]	2.145
							6) [Liquid and solid waste from intensive aquatic animal production prior to use in agriculture]	
	E - There is a functioning system for monitoring regulatory compliance of all waste discharge to the environment (sewage,	15	6) Wastewater discharges from manufacturing sites for antimicrobial agents (either as Active Pharmaceutical Ingredient (API) or finished products)	2.145	5) Wastewater discharges from manufacturing sites for antimicrobial agents (either as Active Pharmaceutical Ingredient (API) or finished products).	2.145	7) [Wastewater discharges from manufacturing sites for antimicrobial agents (either as Active Pharmaceutical Ingredient (API) or finished products).]	2.145
			7) Disposal of unused medicines antimicrobial agents.	2.145	6) Disposal of unused medicines antimicrobial agents (unused should include left-over product and	2.145	8) [Disposal of medicines, antimicrobial agents (unused, left-over product and also product containers) for human use] 9) [Disposal of medicines, antimicrobial agents (unused, left-over product and/or also product containers) for animal use]	2.145

	health facilities, agriculture, manure and industrial effluent). Regulations are in place that limit discharge of all antimicrobial residues into the environment, including in municipal and pharmaceutical industry waste and wastewater.				also product containers (including pesticides)			
			8) Disposal of products contaminated with antimicrobial residues.	2.145	7) Disposal of food, plant or animal products contaminated with antimicrobial residues over the MRL (maximum residue limit)	2.145	10) [Disposal of food, plant or animal products contaminated with antimicrobial residues over the MRL (maximum residue limit)]	2.145
Scoring Rule	1. In 2021 and 2022, for question 4.11 and 4.12, take the highest score from the two questions; 2. From 2018 to 2022, for question 10 and 6.2, score the corresponding points if the answer is "yes"; 3. In 2018 and 2019, for sub-question 10.1) and 10.2): Score if the answer to either question is "yes"; 4. In 2021 and 2022, for sub-question 6.2-3) and 6.2-4): Score if the answer to either question is "yes", for sub-question 6.2-5) and 6.2-6): Score if the answer to either question is "yes", for sub-question 6.2-8) and 6.2-9): Score if the answer to either question is "yes" 5. The total score for "3.3.3 Antimicrobial optimization" is the sum of the scores from each sub-question; 6. There are no such questions about plant in 2019, the answers of 2018 are used as imputation.							

3.3.4 Professional education

Definition: The effectiveness of professional education programs is evaluated based on their ability to enhance the knowledge, skills, and behaviors of healthcare professionals, veterinarians, farmers, and other stakeholders regarding antimicrobial stewardship and AMR prevention. Effective education initiatives result in improved prescribing practices, reduced unnecessary antimicrobial use, and increased awareness of AMR risks.

Indicator	TrACSS Questions & Responses					
3.3.4 Professional education	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)
	6.3 Training and professional education on AMR in the human health sector	6.2 Training and professional education on AMR in the human health sector			3.1 Training and professional education on AMR in the human health sector	
	A - No training for human health workers on AMR.					0
	B - Ad hoc AMR training courses in some human health related disciplines.					0
	C - AMR is covered in 1) some pre-service training and in 2) some in-service training or other continuing professional development (CPD) for human health workers.					0
	D - AMR is covered in pre-service training for all relevant cadres. In-service training or other CPD covering AMR is available for all types of human health workers nationwide.					40
	E - AMR is systematically and formally incorporated in pre-service training curricula for all relevant human health cadres. In-service training or other CPD on AMR is taken up by relevant groups for human health nationwide, in public and private sectors.					40

	6.4 Training and professional education on AMR in the veterinary sector	6.3 Training and professional education on AMR in the veterinary sector	4.1 Training and professional education on AMR in the veterinary sector	
			4.2 Training and professional education on AMR in the aquatic animal health sector	
	A - No training of veterinary related professionals (veterinarians and veterinary paraprofessionals) related to AMR.	0	A - No training of veterinary related professionals (veterinarians and veterinary paraprofessionals) professionals/aquatic animal health professionals related to AMR.	0
	B - Ad hoc AMR training courses available for veterinary related professionals.	0	B - Ad hoc AMR training courses available for veterinary related professionals/aquatic animal health professionals.	0
	C - AMR and appropriate use is covered in core curricula for graduating veterinarians and for veterinary paraprofessionals when relevant. (<i>TrACSS-2018, TrACSS-2019</i>) C - AMR and prudent use of antimicrobial agents are covered in core curricula for graduating veterinarians and for veterinary paraprofessionals in some educational institutions. (<i>TrACSS-2020, TrACSS-2021</i>)	0	C - AMR and prudent use of antimicrobial agents are covered in core curricula for graduating veterinarians and for veterinary paraprofessionals/aquatic animal health professionals in some educational institutions.	0
	D - Continuing professional training on antimicrobial resistance and antimicrobial use is available nationwide for veterinary related professionals.	30	D - Continuing professional training on antimicrobial resistance and antimicrobial use is available nationwide for veterinary related professionals/aquatic animal health professionals.	30
	E - AMR is systematically and formally incorporated in curricula for graduating veterinarians and veterinary paraprofessionals when relevant and continuing professional training is a formal requirement.	30	E - AMR is systematically and formally incorporated in curricula for graduating veterinarians and veterinary paraprofessionals/aquatic animal health professionals and continuing professional training is a formal requirement.	30
	6.5 Training and professional education on AMR in farming sector (animal and plant), food production, food safety and the environment	6.4 Training and professional education on AMR in farming sector (animal and plant), food production, food safety and the environment	6.4 Training and professional education on AMR provided to the farming (animal and plant), food production, food safety and the environment sectors	5.1 Training and professional education on AMR provided to the agriculture (animal and plant), food production, food safety and the environment sectors
	A - No training provision on AMR for key stakeholders, e.g. farmers and farm workers, extension workers, food and feed processors and retailers, environmental specialists.			0
	B - Tailored ad hoc AMR training courses available for at least two groups of key stakeholders.			0
	C - Tailored ad hoc AMR training courses are available for all or the majority of key stakeholders.			0

	D - Tailored AMR training courses are routinely available nationwide for all key stakeholders and completion of training is a formal requirement for at least two groups of key stakeholders.	30
	E - Tailored AMR training courses are routinely available nationwide and completion of training is a formal requirement for all key stakeholders.	30
Scoring Rule	1. In 2021 and 2022, for question 4.1 and 4.2, take the highest score from the two questions; 2. The total score for "3.3.4 Professional education" is the sum of the scores from each sub-question.	

3.3.5 Public awareness

Definition: The effectiveness of public awareness campaigns is measured by their ability to raise awareness, change behaviors, and mobilize action to combat AMR. Effective campaigns inform the public about the importance of responsible antimicrobial use, hygiene practices, and the risks associated with AMR, ultimately leading to behavior change and reduced antimicrobial use.

Indicator	TrACSS Questions & Responses							
3.3.5 Public awareness	2017 (TrACSS-2018)		2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)	
	6.1 Raising awareness and understanding of antibiotic resistance risks and response in human health		6.1 Raising awareness and understanding of AMR risks and response			2.9 Raising awareness and understanding of AMR risks and response		
	A - No significant awareness-raising activities on antibiotic resistance.	0	A - No significant awareness-raising activities on relevant aspects of risks of antimicrobial resistance.			0	A - No awareness-raising activities on risks of antimicrobial resistance.	0
	B - Some activities in parts of the country to raise awareness about risks of antibiotic resistance and actions that can be taken to address it.	0	B - Some activities in parts of the country to raise awareness about risks of antimicrobial resistance and actions that can be taken to address it.			0	B - Some activities to raise awareness about risks of antimicrobial resistance and actions that address it.	0
	C - Limited or small-scale antibiotic resistance awareness campaign targeting some, but not all, relevant stakeholders (e.g. general public, doctors, pharmacists, nurses, medicine sellers).	0	C - Limited or small-scale antimicrobial resistance awareness campaign targeting some but not all relevant stakeholders.			0	C - Some awareness activities at local and/or sub-national level about risks of antimicrobial resistance and actions to address it, targeting some but not all relevant stakeholders, based on stakeholder analysis.	0
	D - Nationwide, government-supported antibiotic awareness campaign targeting all or the majority of stakeholders.	40	D - Nationwide, government-supported antimicrobial resistance awareness campaign targeting all or the majority of relevant stakeholders, based on stakeholder analysis, utilizing targeted messaging accordingly within sectors.			100	D - Nationwide, government-supported antimicrobial resistance awareness raising campaign targeting all or the majority of priority stakeholder groups, utilizing targeted messaging accordingly within sectors.	100
			E - Targeted, nationwide government-supported activities implemented to change behavior of key stakeholders within sectors, with monitoring undertaken over the last 2-5 years.			100	E - Routine targeted, nationwide government-supported campaign implemented to raise awareness of priority stakeholders across sectors, with regular monitoring.	100

	E - Focused, national scale government-supported activities implemented to change behaviour regarding antibiotic resistance in target groups in human health, both public and private sectors, with monitoring undertaken of their awareness and behaviour change over last 5 years.	40	6.1.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Human Health]	6.1.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Human Health including WASH]	6.1.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Human Health]	2.9.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Human Health]				
			This sector not involved					0		
			Some activities done in this sector					0.2		
			This sector is a main focus for activities					0.4		
	6.2. Raising awareness and understanding of AMR risks and response in animal health, plant health, food production, food safety, and environment sectors 6.2.1 For each of the following sectors, please indicate which statement in 6.2 above (A-E) is applicable: [Animal Health (terrestrial and aquatic)], [Food Production] or [Food Safety], [Plant Health], and [Environment]		6.1.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Animal Health (terrestrial and aquatic)]			2.9.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Terrestrial Animal Health] or [Aquatic Animal Health]				
			A - No significant awareness-raising activities on relevant aspects of risks of antimicrobial resistance.	0	This sector not involved					0
					Some activities done in this sector					0.075
	This sector is a main focus for activities					0.15				
	B - Some activities in parts of the country to raise awareness about risks of antimicrobial resistance and actions that can be taken to address it.	0	6.1.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Food Production] or [Food Safety]			2.9.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Food Production] or [Food Safety]				
			This sector not involved					0		
			Some activities done in this sector					0.075		
			This sector is a main focus for activities					0.15		
	C - Limited or small-scale antimicrobial resistance awareness campaign targeting some but not all relevant stakeholders within sector.	0	6.1.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Plant Health]			2.9.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Plant Health]				
		15	This sector not involved					0		

	D - Nationwide, government-supported antimicrobial resistance awareness campaign targeting all or the majority of relevant stakeholders within sector.		Some activities done in this sector		0.075
			This sector is a main focus for activities		0.15
	E - Focused, national scale government supported activities implemented to change behavior of relevant stakeholders within sector, with monitoring undertaken of their awareness and behaviour change over last 2-5 years.	15	6.1.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Environment]	2.9.1 For the level selected above, please indicate the extent of involvement of the sectors below. [Environment]	
			This sector not involved		0
			Some activities done in this sector		0.075
This sector is a main focus for activities		0.15			
Scoring Rule	1. In 2017, 6.2.1 is a shared question for [Animals Health (terrestrial and aquatic)], [Food Production], [Food Safety], [Plant Health], and [Environment] 2. In 2018, 2019, and 2020, 6.1 is a shared question for [Animals Health (terrestrial and aquatic)], [Food Production], [Food Safety], [Plant Health], and [Environment]; 3. In 2021 and 2022, 2.9 is a shared question for [Terrestrial Animal Health], [Aquatic Animal Health], [Food Production], [Food Safety], [Plant Health], and [Environment]; 4. From 2018 to 2022, for sub-questions 6.1.1 and 2.9.1, the score is calculated by multiplying the response's corresponding coefficient by the scores of questions 6.1 and 2.9, respectively; 5. From 2017 to 2022, for sub-questions about [Food Production] and [Food Safety], take the highest score from the two questions; 6. In 2021 and 2022, for sub-questions about [Terrestrial Animal Health] and [Aquatic Animal Health], take the highest score from the two questions; 7. The total score for "3.3.5 Public awareness" is the sum of the scores from each sub-question.				

3.3.6 Hygiene and prevention

Definition: The effectiveness of hygiene and prevention measures is assessed by their impact on reducing the transmission of infections, preventing the spread of antimicrobial-resistant pathogens, and minimizing the need for antimicrobial treatment. Policies promoting hygiene practices, infection control, and preventive measures contribute to the overall control of AMR by reducing the burden of infectious diseases and preserving antimicrobial efficacy.

Indicator	Criteria for Group Evaluation					
3.3.6 Hygiene and prevention	2017-2022					
	0 immunizations with coverage >90% (BCG, DTP3, Hib3, PcV3)					0
	1 immunization with coverage >90% (BCG, DTP3, Hib3, PcV3)					5
	2 immunizations with coverage >90% (BCG, DTP3, Hib3, PcV3)					10
	3 immunizations with coverage >90% (BCG, DTP3, Hib3, PcV3)					15
	4 immunizations with coverage >90% (BCG, DTP3, Hib3, PcV3)					20
	TrACSS Questions & Responses					
	2017 (TrACSS-2018)	2018 (TrACSS-2019)	2019 (TrACSS-2020)	2020 (TrACSS-2021)	2021 (TrACSS-2022)	2022 (TrACSS-2023)

8.1 Infection Prevention and Control (IPC) in human health care			3.5 Infection Prevention and Control (IPC) in human health care		
A - No national IPC programme or operational plan is available.					0
B - A national IPC programme or operational plan is available. National IPC and water, sanitation and hygiene (WASH) and environmental health standards exist but are not fully implemented.					0
C - A national IPC programme and operational plan are available and national guidelines for health care IPC are available and disseminated. Selected health facilities are implementing the guidelines, with monitoring and feedback in place.					0
D - National IPC programme available according to the WHO IPC core components guidelines and IPC plans and guidelines implemented nationwide. All health care facilities have a functional built environment (including water and sanitation), and necessary materials and equipment to perform IPC, per national standards.					20
E - IPC programmes are in place and functioning at national and health facility levels according to the WHO IPC core components guidelines. Compliance and effectiveness are regularly evaluated and published. Plans and guidance are updated in response to monitoring.					20
6.6. Progress with strengthening veterinary services	6.5 Progress with strengthening veterinary services		4.3 Progress with strengthening veterinary services		
			4.4 Progress with strengthening aquatic animal health services		
A - No systematic approach at national level to strengthening Veterinary Services.		0	A - No systematic approach at national level to strengthening Veterinary Services.		0
B - Veterinary services assessed and plans developed to improve capacity, through a structured approach such as OIE Performance of Veterinary Services (PVS) Evaluation and PVS Gap Analysis missions.		0	B – Veterinary/Aquatic animal health services assessed and plans developed to improve capacity, through a structured approach such as OIE/WOAH Performance of Veterinary Services (PVS)/ Evaluation of Performance of Aquatic Animal Health Services (PVS Evaluation (Aquatic)) and PVS Gap Analysis (Aquatic) missions. Evaluation and PVS Gap Analysis missions.		0
C - Implementation of plan to strengthen capacity gaps in Veterinary Services underway.		0	C - Implementation of plan to strengthen capacity gaps in Veterinary Services underway.		0
D - Monitoring of Veterinary Services performance carried out regularly, e.g. through PVS Evaluation Follow Up missions.		7.5	D - Monitoring of Veterinary Services performance carried out regularly, e.g. through PVS Evaluation Follow Up missions.		7.5
E - Documented evidence of strong capacity in compliance with OIE standards on the quality of Veterinary Services		7.5	E - Documented evidence of strong capacity in compliance with OIE standards on the quality of Veterinary Services		7.5
8.2.1 For each of the following sectors, please indicate which	8.2 Good health, management and hygiene practices to reduce the use of antimicrobials and minimize development and transmission of AMR in animal production (terrestrial and aquatic)		4.9 Biosecurity and good animal husbandry practices to reduce the use of antimicrobials and minimize development and transmission of AMR in terrestrial animal production		

statement in 8.2 above (A-E) is applicable: [Animal Health]				4.10 Biosecurity and good animal husbandry practices to reduce the use of antimicrobials and minimize development and transmission of AMR in aquatic animal production	
A - No systematic efforts to improve good production practices to reduce the need to use antimicrobials. (TrACSS-2018) A - No systematic efforts to improve good production practices. (TrACSS-2019, TrACSS-2020, TrACSS-2021)			0	A - No systematic efforts to improve good animal husbandry and biosecurity practices.	0
B - Some activities in place to develop and promote good production practices.			0	B - Some activities in place to develop and promote good animal husbandry and biosecurity practices.	0
C - National plan agreed to ensure good production practices in line with international standards (e.g. OIE Terrestrial and Aquatic Codes, Codex Alimentarius). Nationally agreed guidance for good production practices developed, adapted for implementation at local farm and food production level.			0	C - National plan agreed to ensure good animal husbandry and biosecurity practices in line with international standards (e.g. OIE/WOAH Terrestrial Codes, Codex Alimentarius). Nationally agreed guidance for good practices developed, adapted for implementation at local farm and food production level.	0
D - Nationwide implementation of plan to ensure good production practices and national guidance published and disseminated.			7.5	D - Nationwide implementation of plan to ensure good animal husbandry and biosecurity practices and national guidance published and disseminated.	7.5
E - Nationwide implementation of plan to ensure good production practices and monitoring of impact on level of antimicrobial use, on animal health and welfare, and on production, with updating of plans and guidance in response to findings. (TrACSS-2018) E - Nationwide implementation of plan to ensure good production practices and monitoring of impact on level of AMR, on animal health and welfare, and on production, with updating of plans and guidance in response to findings. (TrACSS-2019) E - Implementation of the nation-wide plan is monitored periodically. (TrACSS-2020, TrACSS-2021)			7.5	E - Implementation of the nation-wide plan is monitored periodically.	7.5
8.2.1 For each of the following sectors, please indicate which statement in 8.2 above (A-E) is applicable: [Food Production] and [Food Safety]		8.3 Good management and hygiene practices to reduce the development and transmission of AMR in food processing		5.5 Good management and hygiene practices to reduce the development and transmission of AMR in food processing	
A - No systematic efforts to improve good production practices to reduce the need to use antimicrobials.	0	A - No systematic efforts to improve good management and hygiene practices.	0	A - No systematic efforts to improve good manufacturing (GMP) and hygiene practices (GHP).	0

	B - Some activities in place to develop and promote good production practices.	0	B - Some activities in place to develop and promote good management and hygiene practices.	0	B - Some activities in place to develop and promote good manufacturing (GMP) and hygiene practices (GHP).	0
	C - National plan agreed to ensure good production practices in line with international standards (e.g. OIE Terrestrial and Aquatic Codes, Codex Alimentarius). Nationally agreed guidance for good production practices developed, adapted for implementation at local farm and food production level.	0	C - National plan agreed to ensure good management and hygiene practices in line with international standards (e.g. Codex Alimentarius). Nationally agreed guidance for good practices developed, and adapted for implementation according to local food processing approaches.	0	C - National plan agreed to ensure good manufacturing (GMP) and hygiene practices (GHP) in line with international standards (e.g. Codex Alimentarius). Nationally agreed guidance for good practices developed, and adapted for implementation according to local food processing approaches.	0
	D - Nationwide implementation of plan to ensure good production practices and national guidance published and disseminated.	15	D - Nationwide implementation of plan to ensure good management and hygiene practices and national guidance published and disseminated. <i>(Option E was not included in the TrACSS-2019))</i>	15	D - Nationwide implementation of plan to ensure good manufacturing (GMP) and hygiene practices (GHP) and national guidance published and disseminated.	15
	E - Nationwide implementation of plan to ensure good production practices and monitoring of impact on level of antimicrobial use, on animal health and welfare, and on production, with updating of plans and guidance in response to findings.	15	E - Implementation of the nation-wide plan is monitored periodically.	15	E - Implementation of the nation-wide plan is monitored periodically.	15

8.2.1 For each of the following sectors, please indicate which statement in 8.2 above (A-E) is applicable: [Environment] (2017)		10 Risk assessments -Have high locations been risk identified? (2018-2019)		10 Risks for AMR spread in the environment- Have risk assessments been conducted? (2020)		6.1 Has a national assessment of risks for residues of antimicrobial compounds and antimicrobial resistant pathogens in the environment been conducted? (2021-2022)	
A - No systematic efforts to improve good production practices to reduce the need to use antimicrobials.	0	1) Human sewage (including wastewater sludge) quality a) disposal in the environment	4.29	1) Human sewage (including lack of basic toilets and management of wastewater and sludge collected in sewer networks and onsite facilities such as septic tanks)) quality	4.29	1) [Human sewage treatment quality (including lack of basic toilets, and management of wastewater and sludge collected in sewer networks and onsite facilities such as septic tanks).]	4.29
		2) Human sewage (including wastewater and sludge) quality b) Re-use					
B - Some activities in place to develop and promote good production practices.	0	3) Wastewater discharges from health facilities for disposal in the environment.	4.29	2) Wastewater discharges from health facilities for disposal in the environment. (including lack of basic toilets and management of wastewater and sludge collected in sewer networks and from onsite sanitation such as septic tanks)	4.29	2) [Wastewater discharges from health facilities for disposal in the environment (including lack of basic toilets and management of wastewater and sludge collected in sewer networks and from onsite sanitation such as septic tanks).]	4.29
C - National plan agreed to ensure good production practices in line with international standards (e.g. OIE Terrestrial and Aquatic Codes, Codex Alimentarius). Nationally agreed guidance for good production practices developed, adapted for implementation at local farm and food production level.	0	4) Discharges from intensive animal (terrestrial and aquatic production (liquid waste and manure) a) disposal into the environment	4.29	3) Discharges from intensive animal (terrestrial and aquatic) production (liquid waste and manure)	4.29	3) [Discharges from intensive terrestrial animal production (liquid and/or solid waste)]	4.29
						4) [Discharges from intensive aquatic animal production (liquid and solid waste)]	
		5) Discharges from intensive animal (terrestrial and aquatic) production (liquid waste and manure) b) Re-use	4.29	4) Treatment of liquid waste and manure from intensive animal (terrestrial and aquatic) production before reusing in agriculture.	4.29	5) [Liquid and solid waste from intensive terrestrial animal production prior to use in agriculture]	4.29
						6) [Liquid and solid waste from intensive aquatic animal production prior to use in agriculture]	
D - Nationwide implementation of plan to ensure good production practices and national	30	6) Wastewater discharges from manufacturing sites for antimicrobial agents (either as Active Pharmaceutical	4.29	5) Wastewater discharges from manufacturing sites for antimicrobial agents (either as Active Pharmaceutical Ingredient (API) or finished products).	4.29	7) [Wastewater discharges from manufacturing sites for antimicrobial agents (either as Active Pharmaceutical Ingredient (API) or finished products).]	4.29

	guidance published and disseminated.		Ingredient (API) or finished products)					
	E - Nationwide implementation of plan to ensure good production practices and monitoring of impact on level of antimicrobial use, on animal health and welfare, and on production, with updating of plans and guidance in response to findings.	30	7) Disposal of unused medicines antimicrobial agents.	4.29	6) Disposal of unused medicines antimicrobial agents (unused should include left-over product and also product containers (including pesticides)	4.29	8) [Disposal of medicines, antimicrobial agents (unused, left-over product and also product containers) for human use] 9) [Disposal of medicines, antimicrobial agents (unused, left-over product and/or also product containers) for animal use]	4.29
			8) Disposal of products contaminated with antimicrobial residues.	4.29	7) Disposal of food, plant or animal products contaminated with antimicrobial residues over the MRL (maximum residue limit)	4.29	10) [Disposal of food, plant or animal products contaminated with antimicrobial residues over the MRL (maximum residue limit)]	4.29
Scoring Rule	1. In 2021 and 2022, for question 4.3 and 4.4, take the highest score from the two questions; 2. In 2021 and 2022, for question 4.9 and 4.10, take the highest score from the two questions; 3. In 2017, for sub-question 8.2.1 [Food Production] and 8.2.1 [Food Safety], take the highest score from the two questions; 4. From 2018 to 2022, for question 10 and 6.1, score the corresponding points if the answer is "yes"; 5. In 2018 and 2019, for sub-question 10.1) and 10.2): Score if the answer to either question is "yes"; 6. In 2021 and 2022, for sub-question 6.1-3) and 6.1-4): Score if the answer to either question is "yes", for sub-question 6.1-5) and 6.1-6): Score if the answer to either question is "yes", for sub-question 6.1-8) and 6.1-9): Score if the answer to either question is "yes" 7. The score of "3.3.6 Hygiene and prevention" is the sum of the scores from each sub-question.							

Table S16. Overview of outcome Indicator data inputs

Indicator	Description	Source	Years	Countries Covered	Missing Data
Human AMU	Antimicrobial consumption in humans (DDD per 1,000 population per day)	Browne et al.	2000–2018	193	13.6%
Animal AMU	Antimicrobial consumption in food-producing animals (mg/PCU)	Mulchandani et al.	2020	182	95.7%
Agricultural crop production AMU	Crop-production–related antimicrobial chemical inputs (t/1000 ha)	FAOSTAT	2000–2021	180	7.3%
AMR prevalence	Resistance rates among pathogens listed in the WHO Bacterial Priority Pathogens List (2024).	GBD, WHO Global TB Reports	1990–2021	193	0%
AMR associated deaths	Deaths caused directly by AMR infections.	GBD	1990–2021	193	0%
AMR attributable deaths	Deaths in which AMR contributed, but was not the direct cause.	GBD	1990–2021	193	0%

Abbreviations: AMU=antimicrobial use. AMR=antimicrobial resistance. DDD=defined daily doses. GBD=Global Burden of Disease. PCU=population correction unit. TB=tuberculosis. WHO=World Health Organization.

Note: To avoid mis-estimation of national AMU scores, we excluded countries or territories in which either (1) animal AMU data or (2) **agricultural crop production AMU** was entirely unavailable across all study years. Because the composite AMU score requires both components, retaining countries with systematically absent data in either dimension would introduce structurally biased. The following countries/territories were therefore excluded from AMU score calculation:

- 1) **Lacking animal AMU (n = 8):** Andorra, Bermuda, Cook Islands, Maldives, Nauru, Palau, Seychelles, Tuvalu;
- 2) **Lacking agricultural crop production AMU (n = 10):** Afghanistan, Dominica, Guyana, Mali, North Korea, Pakistan, Singapore, South Sudan, United Arab Emirates, Uzbekistan
- 3) **Lacking bouth (n = 3):** Marshall Islands, Monaco, San Marino

A total of 172 countries were retained for AMU data imputation and composite AMU score calculation.

Table S17. Weights of the AMR governance index

Domain	Weight	Subdomain	Weight	Indicators	AHP weight	Entropy weight	Final weight
1 Policy Design	31.77%	1.1 Strategic vision	8.5%	NPP	2.9%	1.4%	2.6%
				EVS	2.9%	2.3%	2.9%
				OBC	3.0%	2.4%	3.0%
		1.2 Multi-sector engagement	8.2%	PLM	2.9%	2.4%	2.9%
				ACP	2.9%	2.2%	2.6%
				MSC	2.9%	1.2%	2.6%
		1.3 Sustainability	7.0%	PAW	2.1%	0.1%	0.1%
				BGP	2.2%	3.2%	2.6%
				TCR	2.2%	2.2%	2.2%
		1.4 Accountability	8.1%	PEI	2.1%	2.3%	2.1%
				EXP	4.0%	2.4%	4.0%
				SUP	4.1%	2.4%	4.1%
2 Implementation	32.98%	2.1 AMU surveillance system	5.9%	HUS	1.6%	1.9%	1.6%
				AUS	1.6%	1.8%	1.6%
				PUS	1.5%	3.0%	2.6%
		2.2 AMR surveillance system	5.7%	HRS	1.3%	0.6%	0.6%
				ARS	1.2%	1.6%	1.2%
				ERS	1.2%	6.1%	2.6%
		2.3 Optimization of antimicrobial use	3.8%	LBN	1.2%	1.5%	1.2%
				HOP	1.6%	1.1%	1.1%
				AOP	1.6%	1.3%	1.3%
		2.4 Professional education	3.4%	EOP	1.5%	1.4%	1.4%
				PEH	1.5%	0.6%	0.6%
				PEA	1.5%	1.3%	1.3%
		2.5 Public awareness	3.1%	PEF	1.5%	2.2%	1.5%
				HRA	1.6%	0.6%	0.6%
				ARA	1.6%	1.0%	1.0%
		2.6 Hygiene and prevention	5.4%	ERA	1.5%	1.9%	1.5%
				IMZ	1.2%	1.6%	1.2%
				HHP	1.3%	0.9%	0.9%
		2.7 Research innovation	5.7%	AHP	1.2%	0.7%	0.7%
				PRE	1.2%	4.1%	2.6%
				RPS	2.4%	2.5%	2.4%
3 Monitoring	35.18%	3.1 Reporting	8.9%	RSF	2.4%	3.3%	3.3%
				TRN	3.6%	2.0%	2.6%
				ANR	3.6%	2.1%	2.6%
		3.2 Policy adjustment	13.3%	INC	3.6%	2.9%	3.6%
				HAD	3.5%	2.3%	3.5%
				AAD	3.6%	3.1%	3.6%
		3.3 Effectiveness	13.0%	EAD	3.5%	6.2%	6.2%
				USE	1.8%	2.4%	1.8%
				RSE	1.9%	2.2%	1.9%
				OPE	1.8%	2.9%	2.6%
				PEE	1.8%	4.0%	2.6%
				PAE	1.8%	3.5%	2.6%
HPE	1.9%			1.4%	1.4%		

Abbreviations: AAD=Policy adjustment in animal health and food processing sectors. ACP=Action participation. AHP=Hygiene and prevention in animals and food. AMR=Antimicrobial resistance. AMU=Antimicrobial use. ANR=Annual reports.

AOP=Optimization of antimicrobial use in animals. ARA=Raise awareness in animal health and food processing fields.

ARS=Animals and food AMR surveillance system. AUS=Animal antimicrobial use surveillance system. BGP=Budget planning.

EAD=Policy adjustment in plant and environment health sectors. EOP=Optimization of antimicrobial use in plants and environment.

ERA=Raise awareness in plant health and environment fields. ERS=Environment AMR surveillance system. EXP=Explanation.

EVS=Evidence sufficiency. HAD=Policy adjustment in human health sector. HHP=Hygiene and prevention in humans.

HOP=Optimization of antimicrobial use in humans. HPE=Hygiene and prevention. HRA=Raise awareness in human health field.

HRS=Humans AMR surveillance system. HUS=Human antimicrobial use surveillance system. IMZ=Immunization schedule. INC=International collaboration. LBN=Laboratory network. MSC=Multi-sector coordination. NPP=National action plan progress. OBC=Objective clarity. OPE=Optimization of antimicrobial use. PAE=Public awareness. PAW=Participation will. PEA=Professional education in veterinary sector. PEE=Professional education. PEF=Professional education in farming, food, and environment sectors. PEH=Professional education in human health sector. PLM=Policy maker. PRE=Risk assessment in environment. PPS=Policy support. PUS=Plant production antimicrobial use surveillance system. RSE=AMR surveillance system. RSF=Scientific research fund. SUP=Supervision. TCR=Technical reference. TRN=Transparency. USE=antimicrobial use surveillance system.

Table S18. Weights of the AMU and AMR prevalence

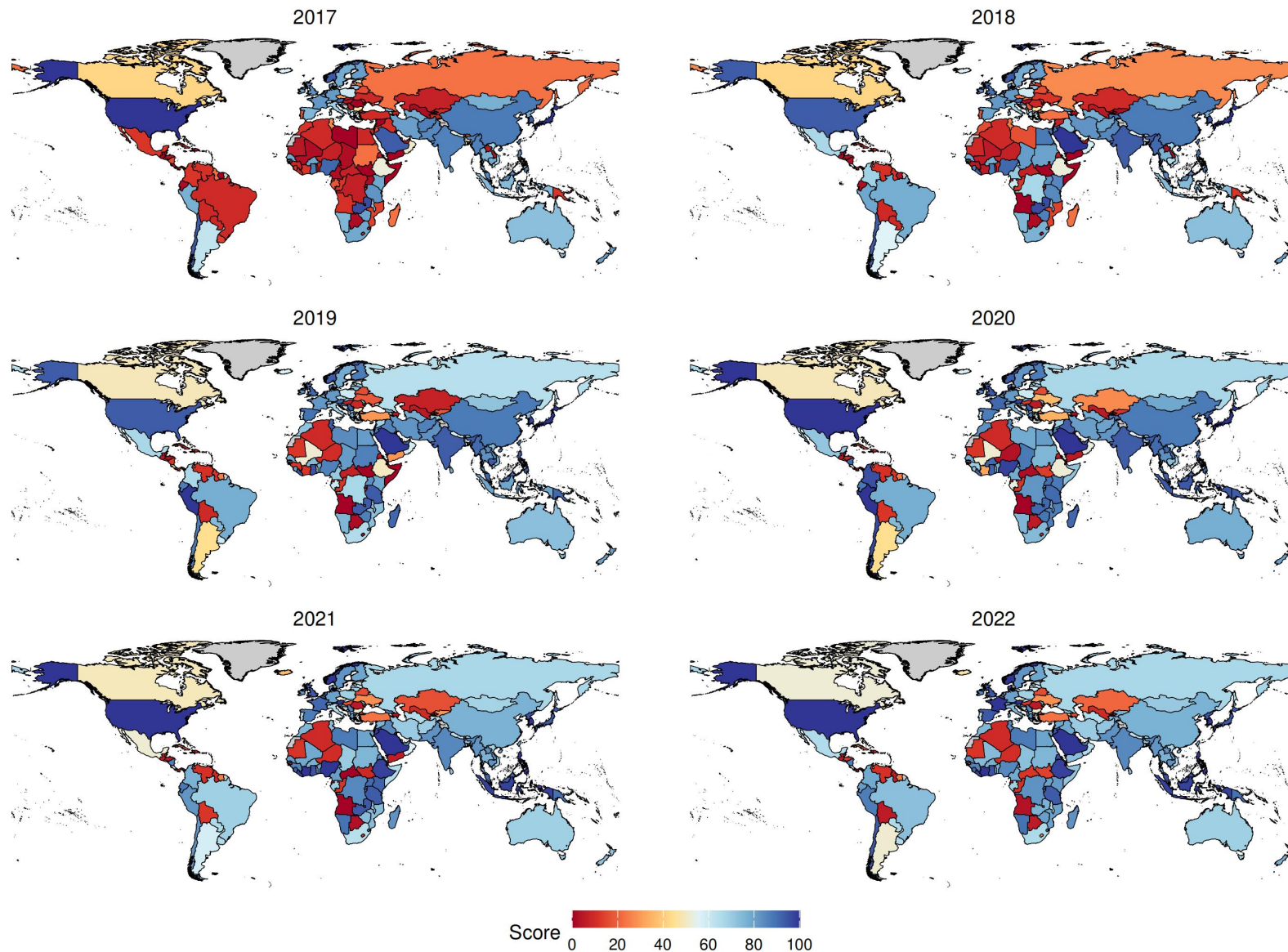
AMR Outcome	Subdomain	Weight	Indicators	AHP weight	Entropy weight	Final weight
AMU	1 Human AMU	35.5%	-	34.0%	55.6%	35.5%
	2 Animal AMU	35.1%	-	33.5%	37.0%	35.1%
	3 Agricultural production AMU	29.4%	-	32.5%	7.4%	29.4%
AMR Prevalence	1 Critical Priority Group	54.2%	CRKP	6.3%	2.5%	4.4%
			CREC	6.1%	1.1%	1.8%
			3GCRKP	5.9%	10.0%	5.7%
			3GCREC	5.7%	7.3%	5.5%
			CRAB	5.9%	18.9%	33.1%
	2 High Priority Group	30.0%	RRTB	5.9%	2.0%	3.5%
			MRSA	4.4%	4.6%	4.2%
			FQRST	4.4%	10.5%	4.2%
			FQRNTS	4.2%	2.3%	4.0%
			FQRSG	4.0%	5.4%	3.9%
			VREFM	4.2%	3.3%	4.0%
			CRPA	4.4%	5.1%	4.2%
			3GCRNG	4.2%	0.8%	1.5%
			FQRNG	4.0%	12.3%	2.8%
	3 Medium Priority Group	15.9%	MacRGAS	7.5%	1.6%	1.8%
			PenRGSB	7.9%	1.1%	7.2%
			MacRSPN	7.5%	8.9%	4.1%
			AmpRSI	7.3%	2.3%	2.8%

Abbreviations: AMR=Antimicrobial resistance. AmpRSI=Ampicillin-resistant *Haemophilus influenzae*. AMU=Antimicrobial use. CRAB=Carbapenem-resistant *Acinetobacter baumannii*. CRKP=Carbapenem-resistant *Klebsiella pneumoniae*. CRPA=Carbapenem-resistant *Pseudomonas aeruginosa*. CREC=Carbapenem-resistant *Escherichia coli*. FQRNG=Fluoroquinolone-resistant *Neisseria gonorrhoeae*. FQRNTS=Fluoroquinolone-resistant non-typhoidal *Salmonella*. FQRST=Fluoroquinolone-resistant *Salmonella Typhi*. FQRSG=Fluoroquinolone-resistant *Shigella* spp. MacRGAS=Macrolide-resistant Group A *Streptococci*. MacRSPN=Macrolide-resistant *Streptococcus pneumoniae*. MRSA=Methicillin-resistant *Staphylococcus aureus*. PenRGSB=Penicillin-resistant Group B *Streptococci*. RRTB=Rifampicin-resistant *Mycobacterium tuberculosis*. VREFM=Vancomycin-resistant *Enterococcus faecium*. 3GCREC=3rd-generation cephalosporin-resistant *E. coli*. 3GCRKP=3rd-generation cephalosporin-resistant *K. pneumoniae*. 3GCRNG=3rd-generation cephalosporin-resistant *Neisseria gonorrhoeae*.

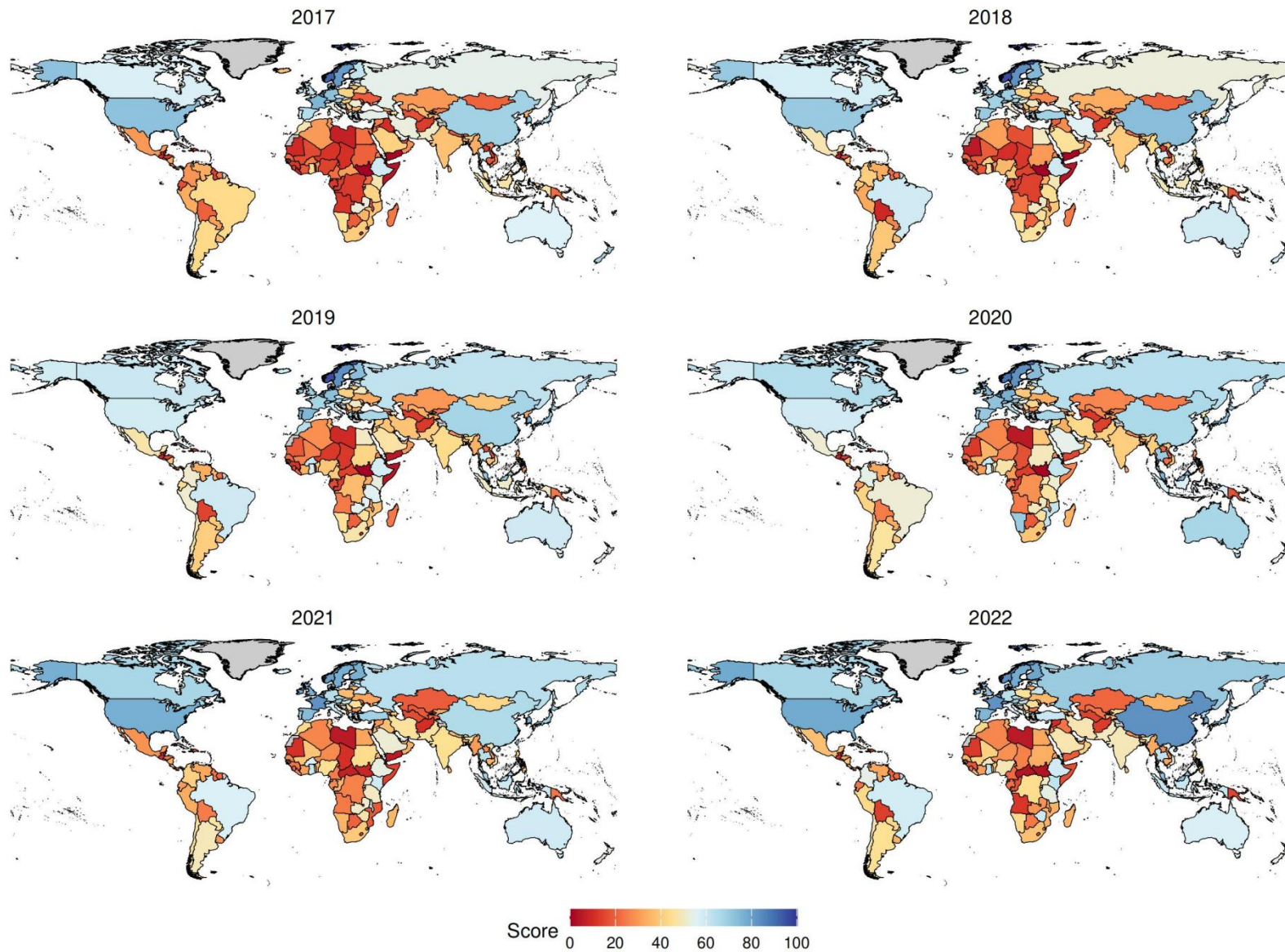
Figure S1. Global maps of governance subdomain scores, 2017-2022

World maps showing country-level AMR governance subdomains scores from 2017 to 2022. **Abbreviations:** AMR=antimicrobial resistance.

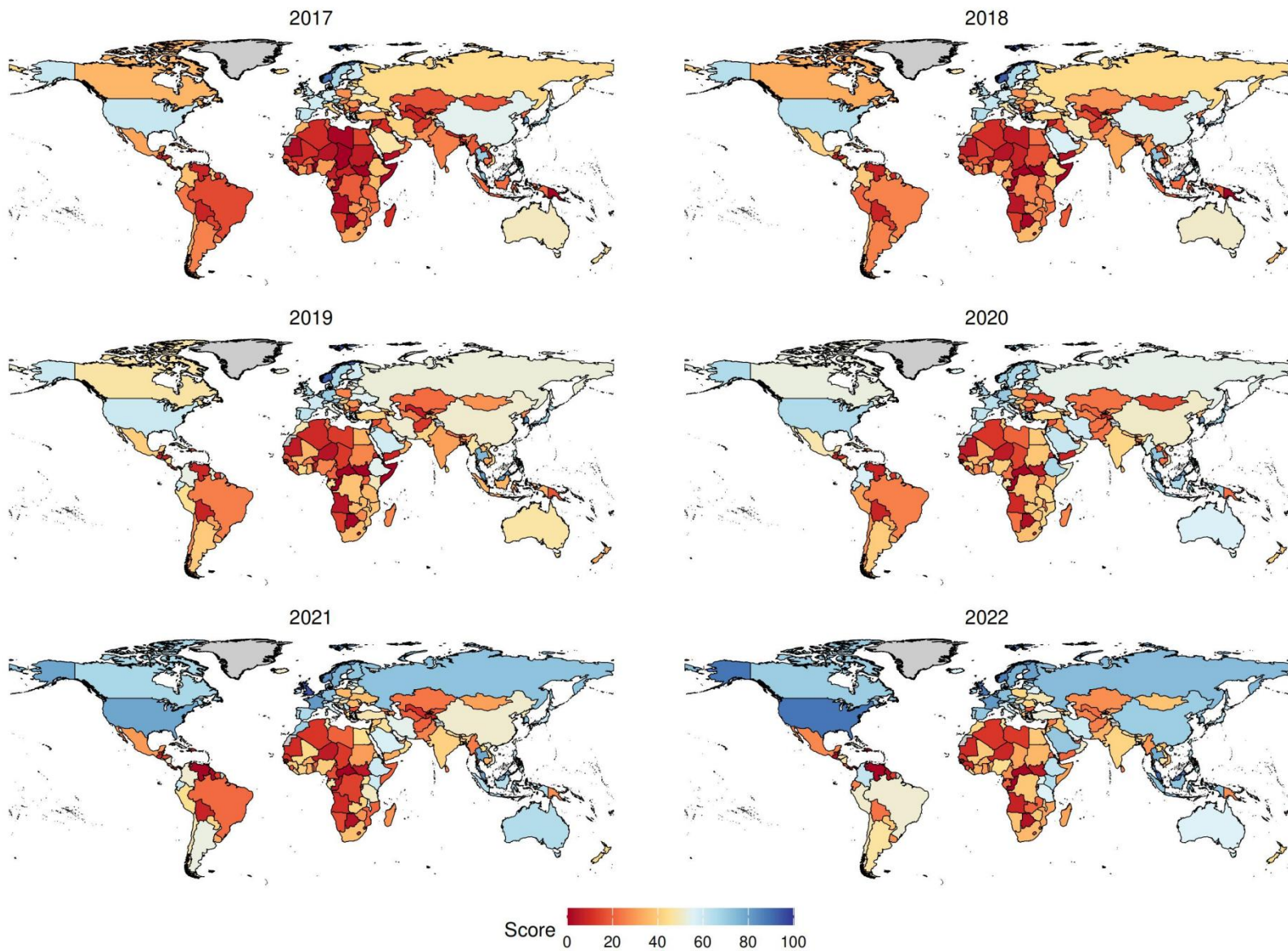
1 Policy design



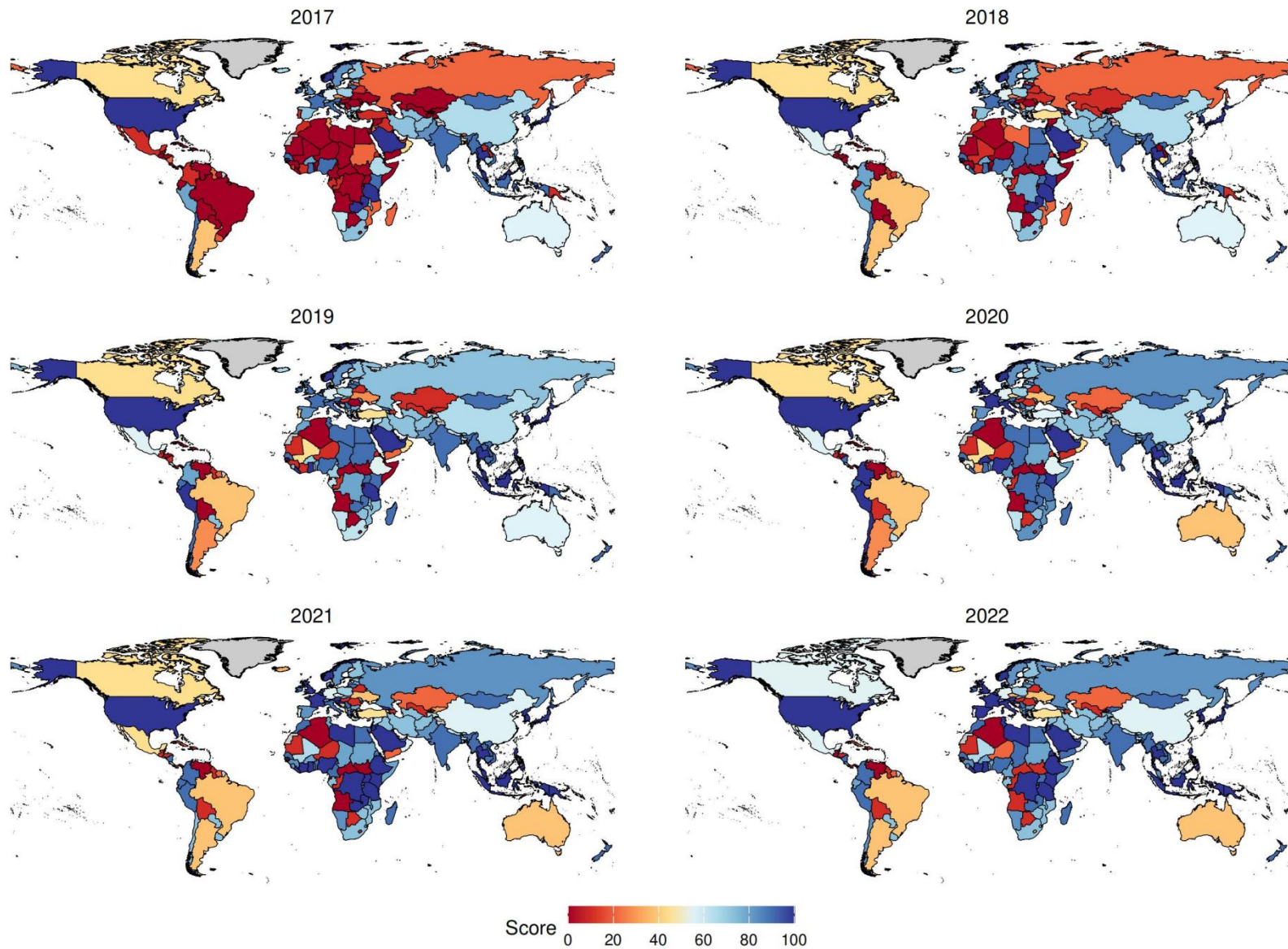
2 Implementation



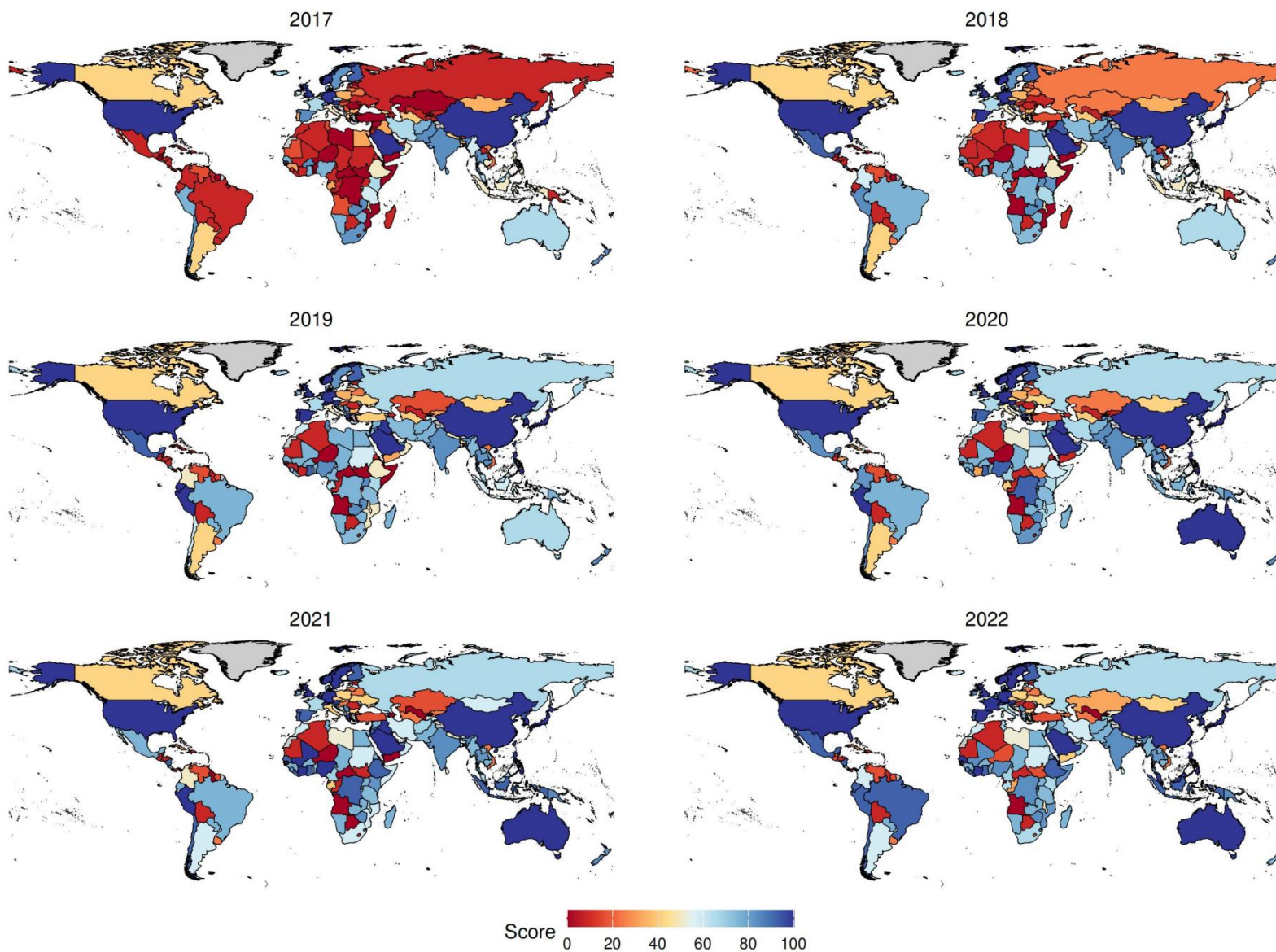
3 Monitoring



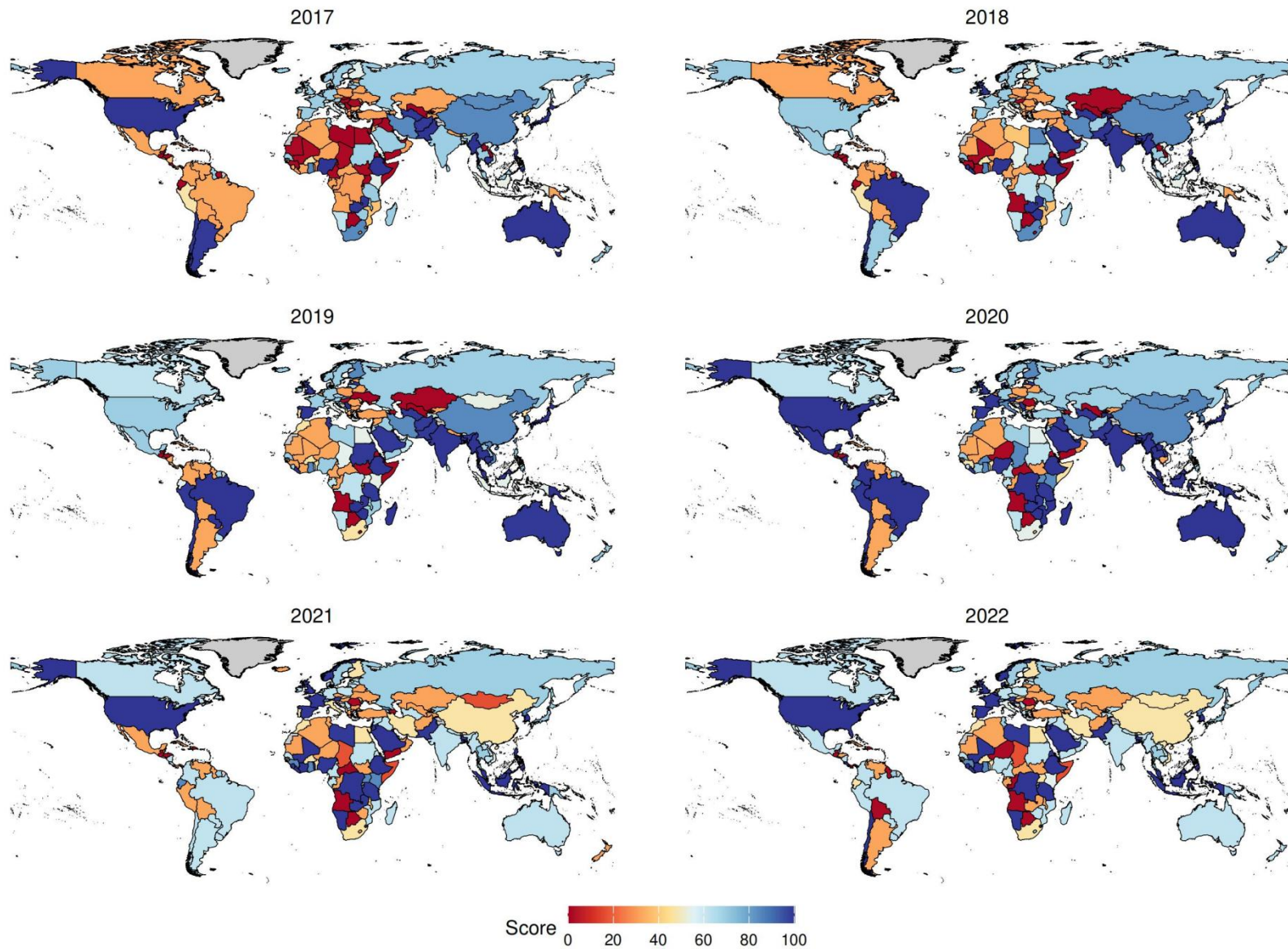
1.1 Strategic vision



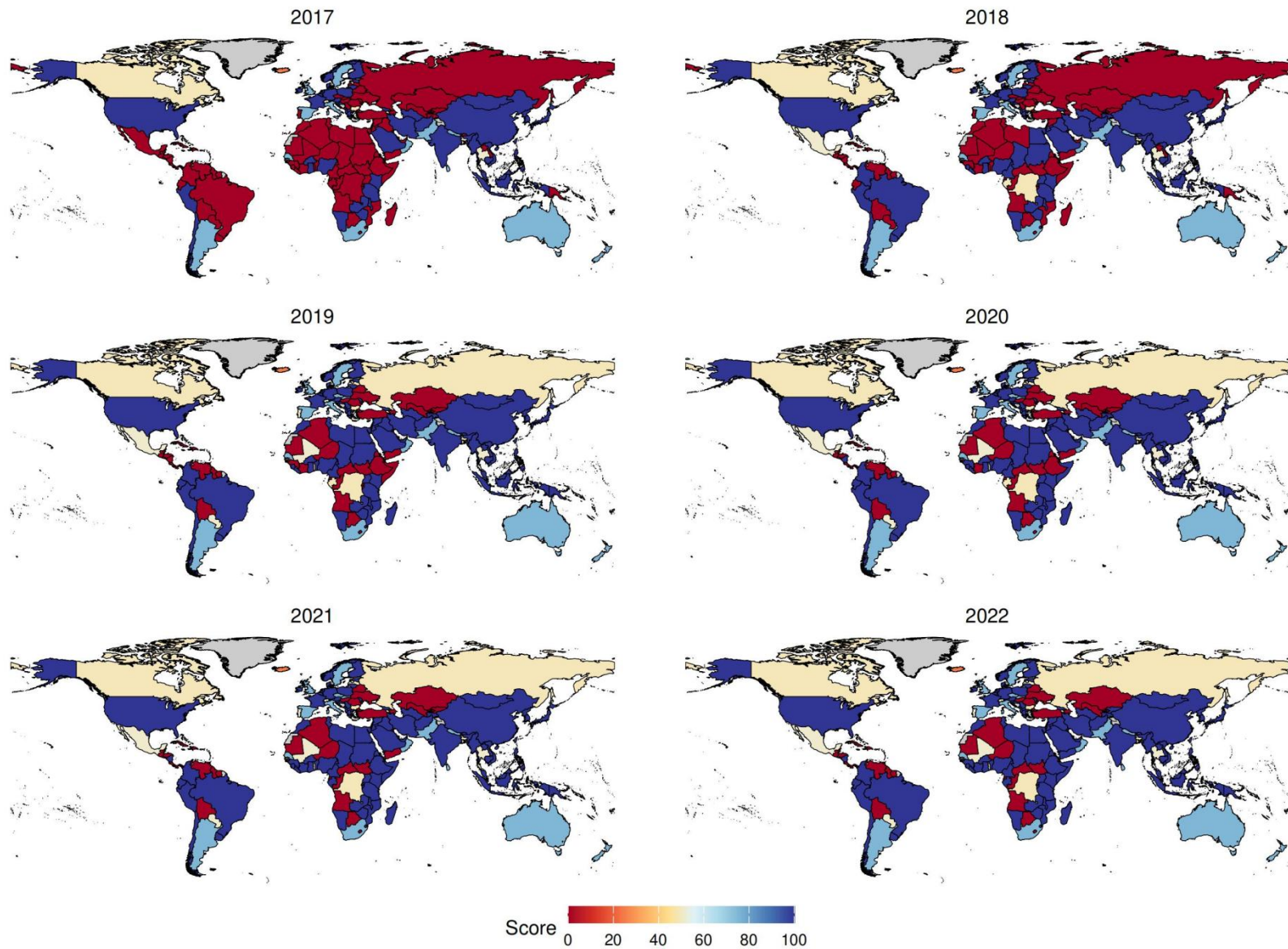
1.2 Multi-sector engagement



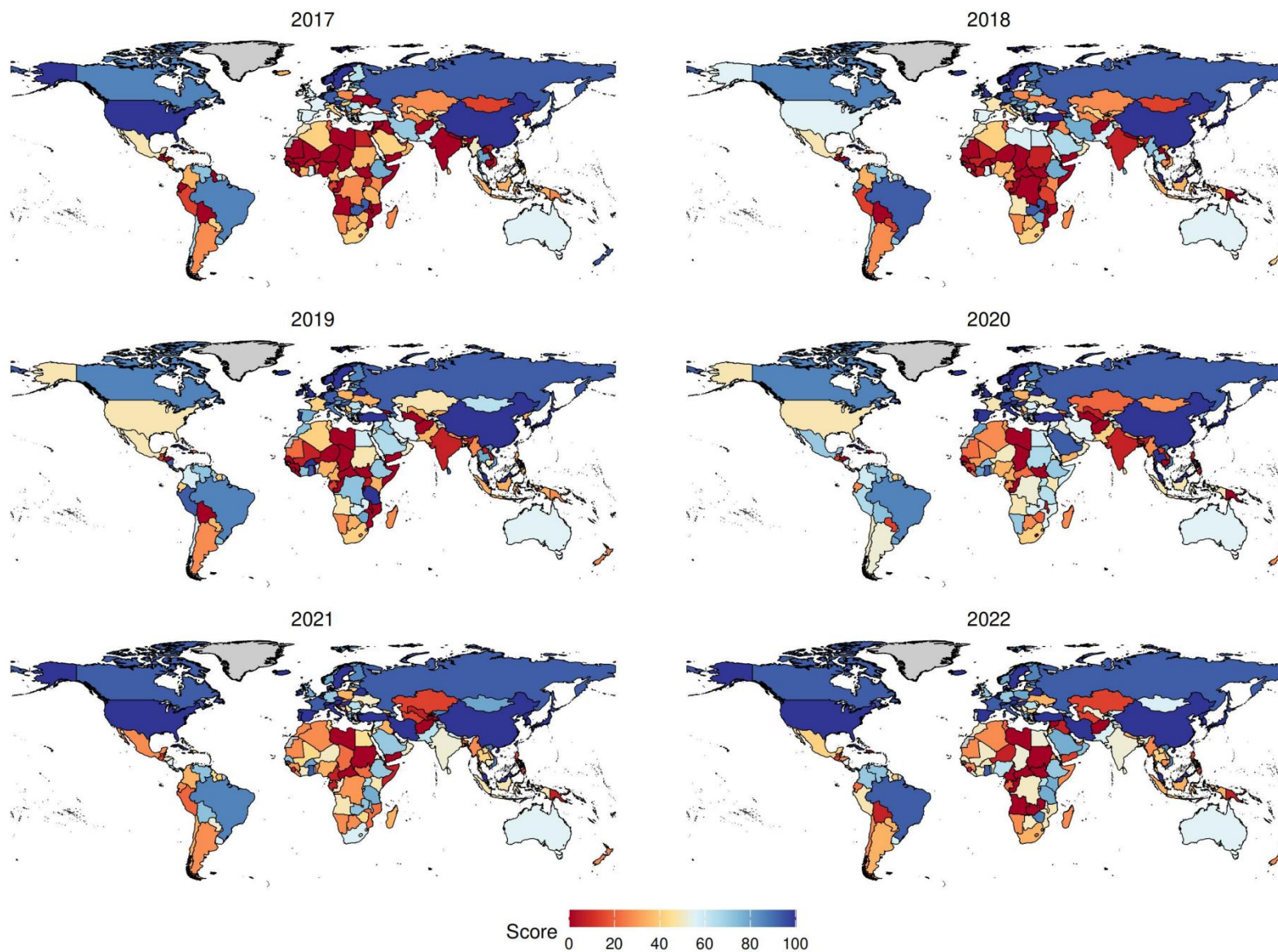
1.3 Sustainability



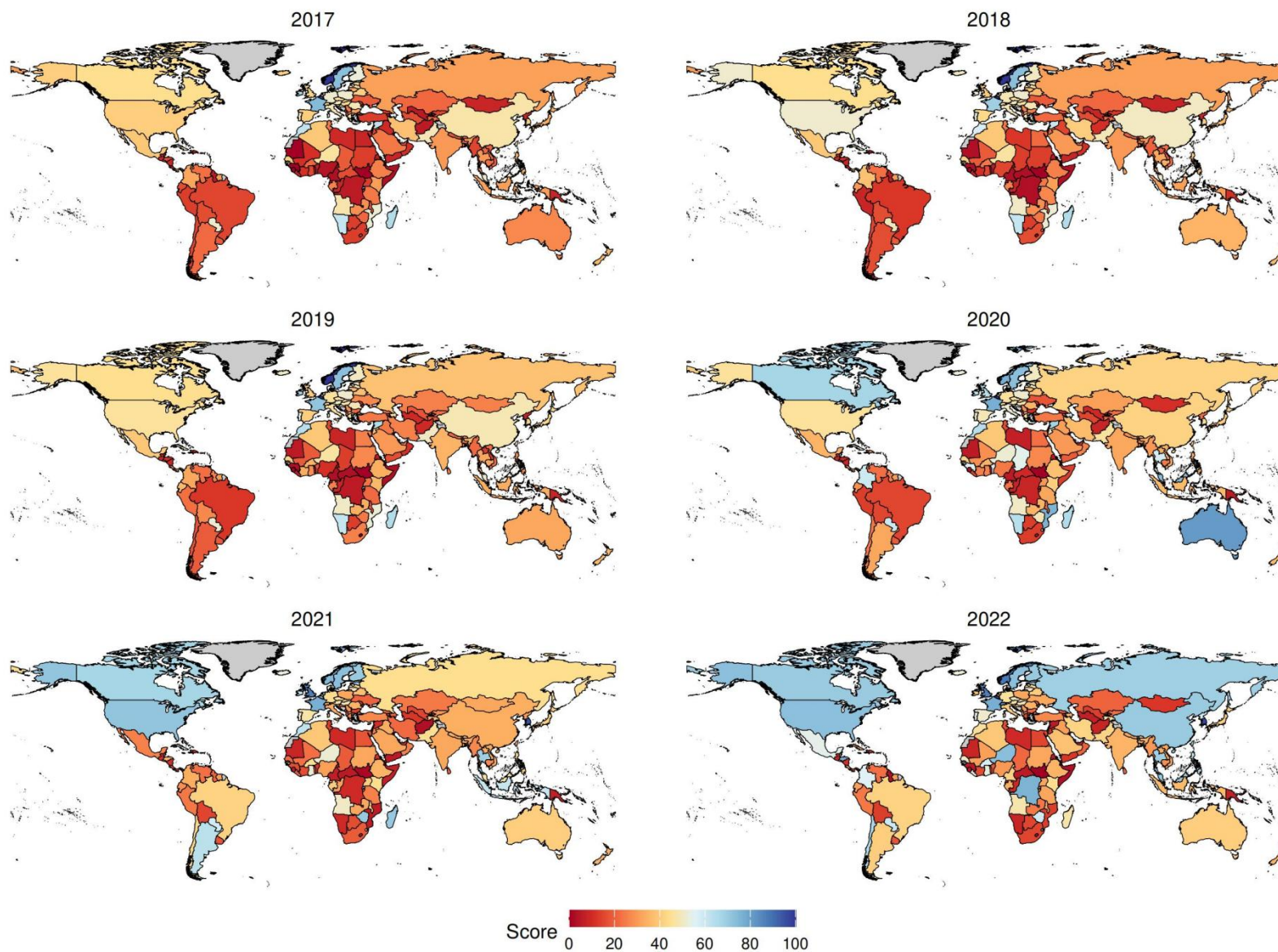
1.4 Accountability



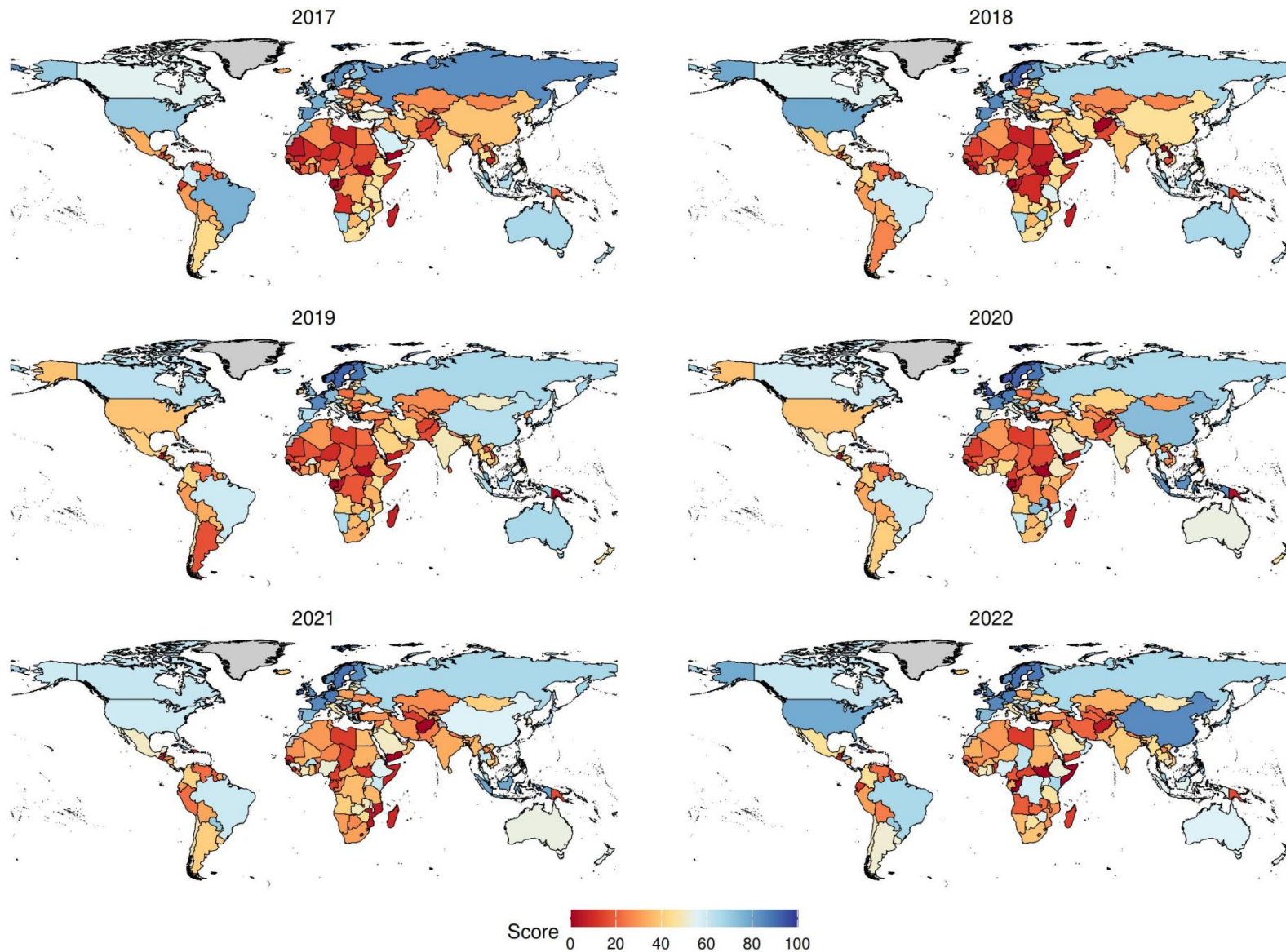
2.1 AMU surveillance system



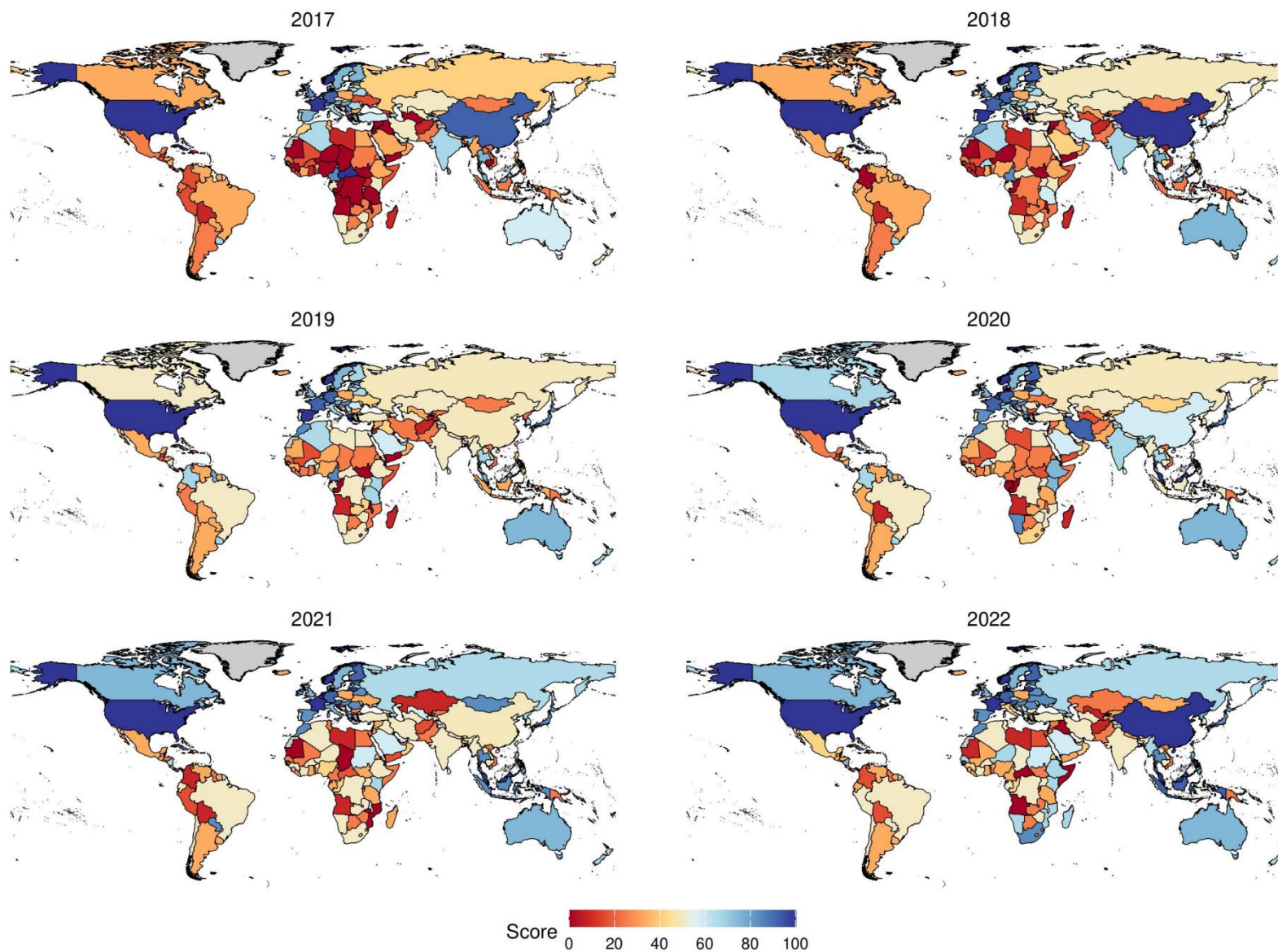
2.2 AMR surveillance system



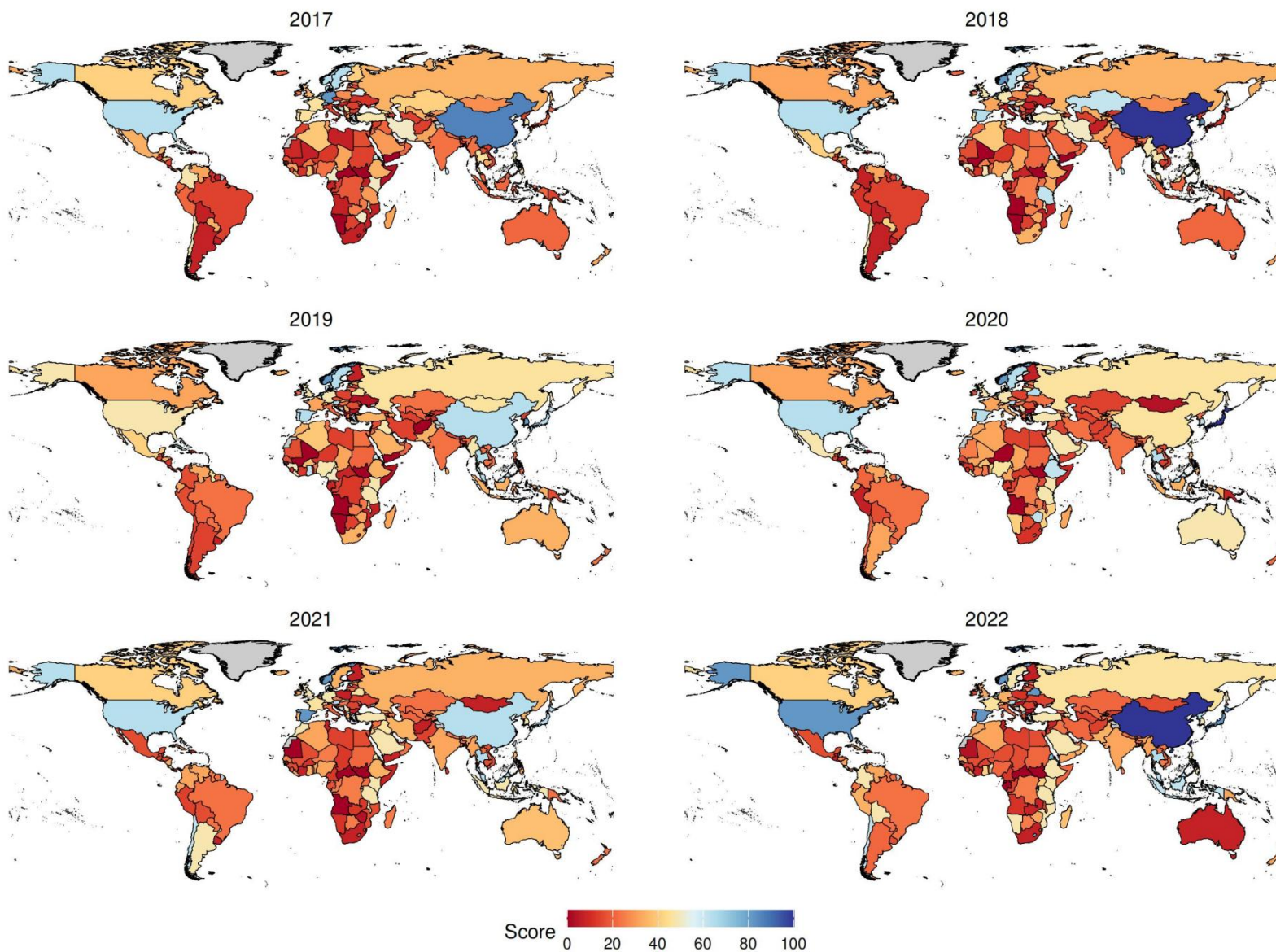
2.3 Optimization of antimicrobial use



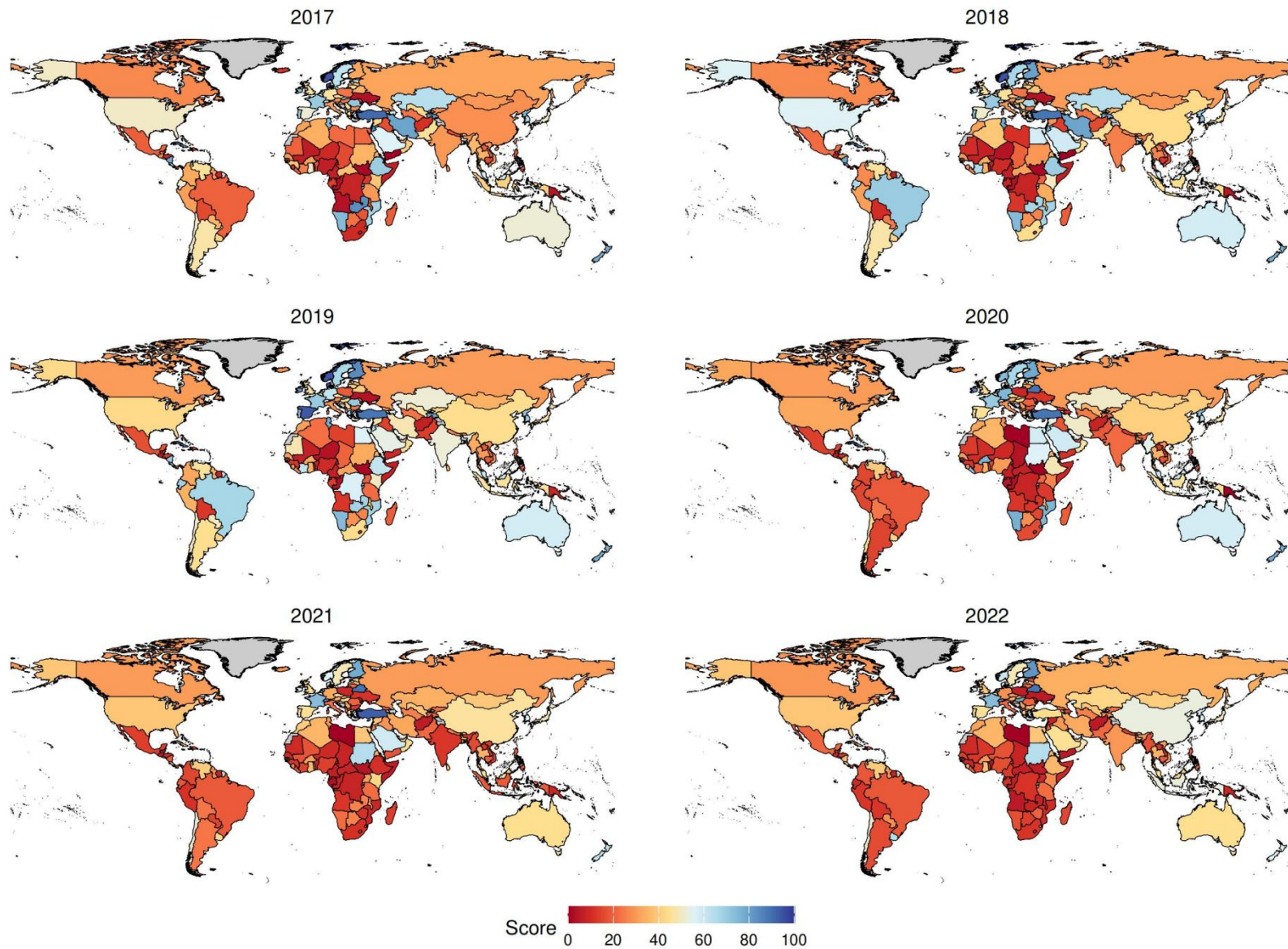
2.4 Professional education



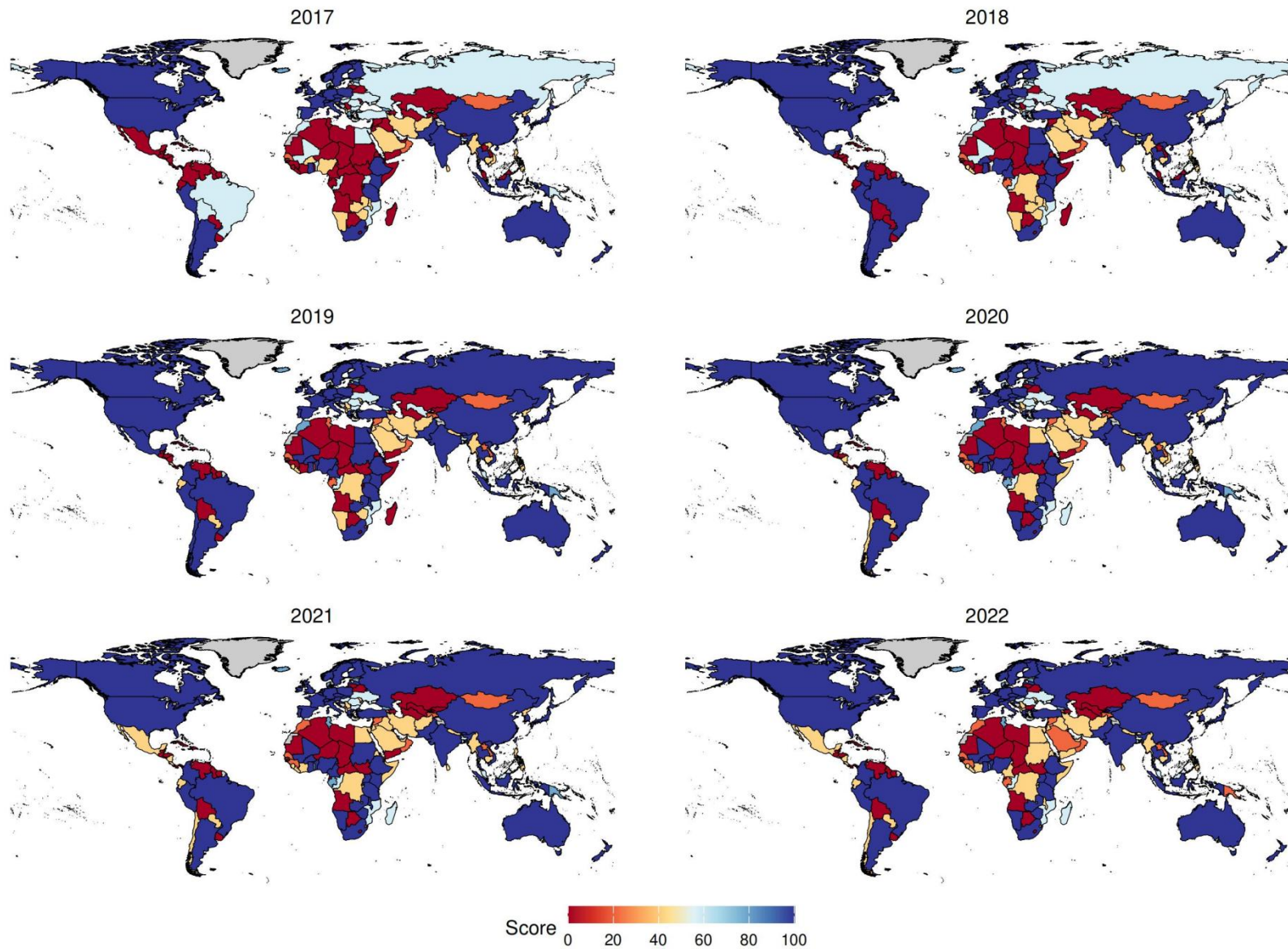
2.5 Public awareness



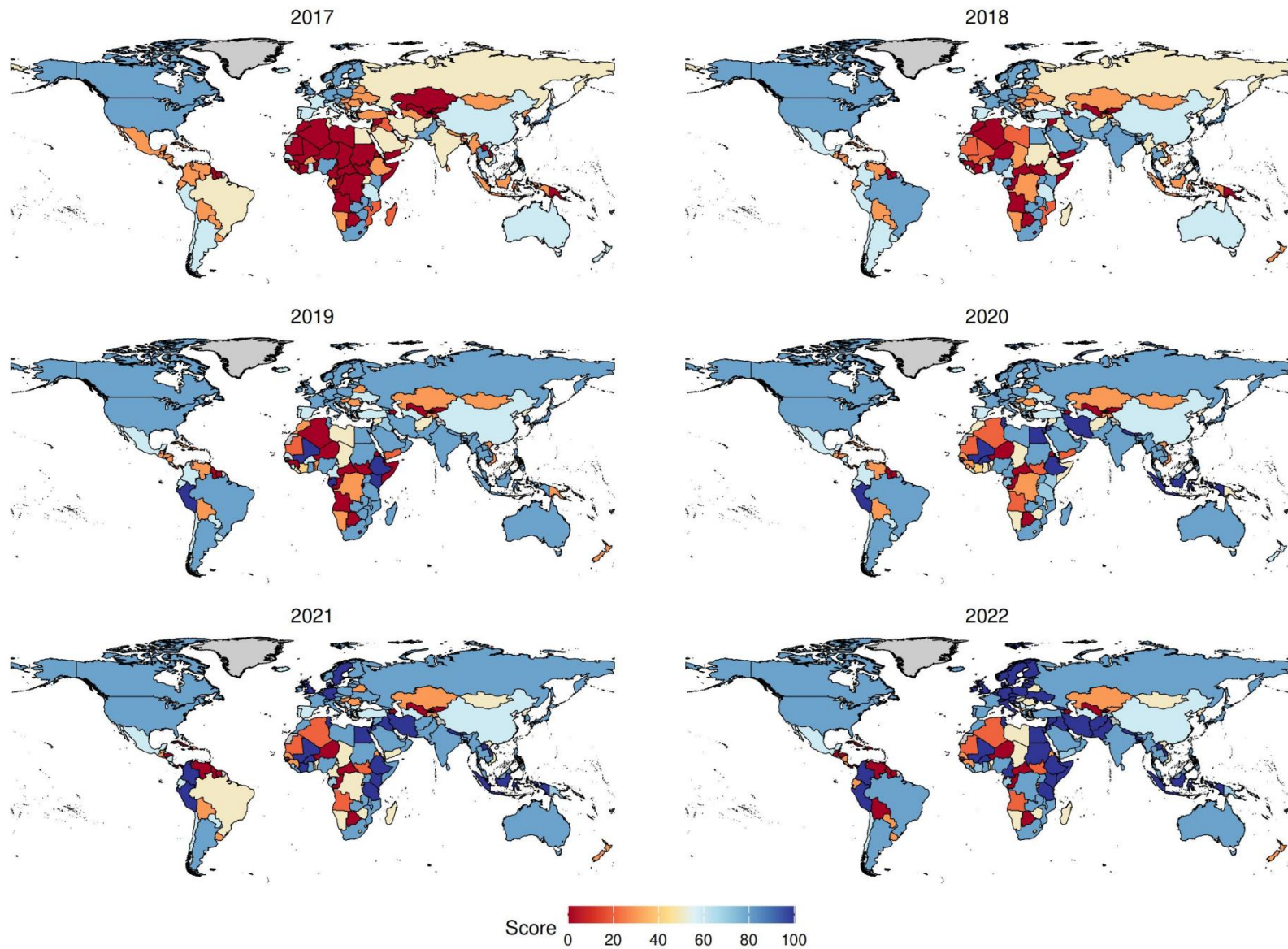
2.6 Hygiene and prevention



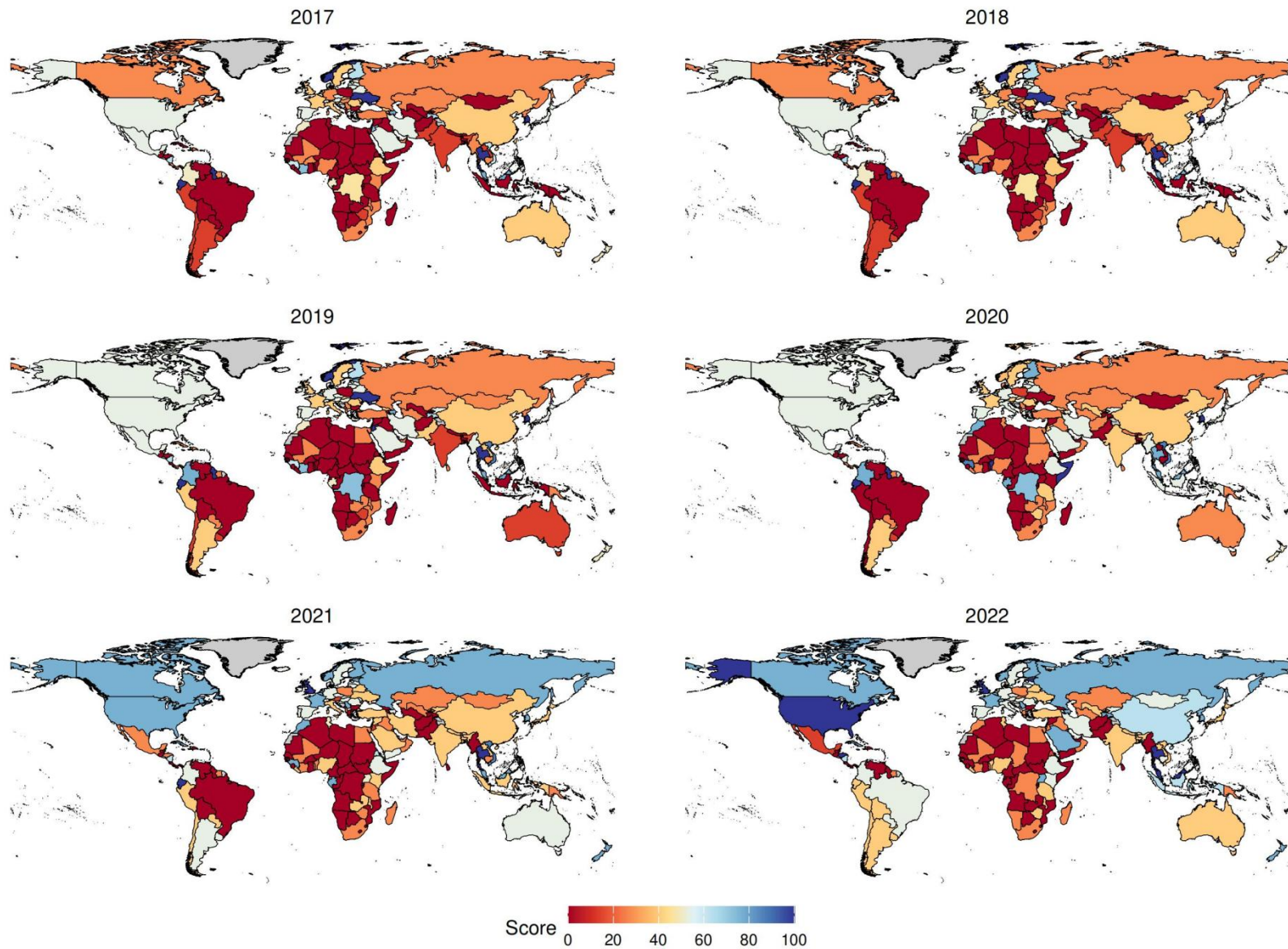
2.7 Research innovation



3.1 Reporting



3.2 Policy adjustment



3.3 Effectiveness

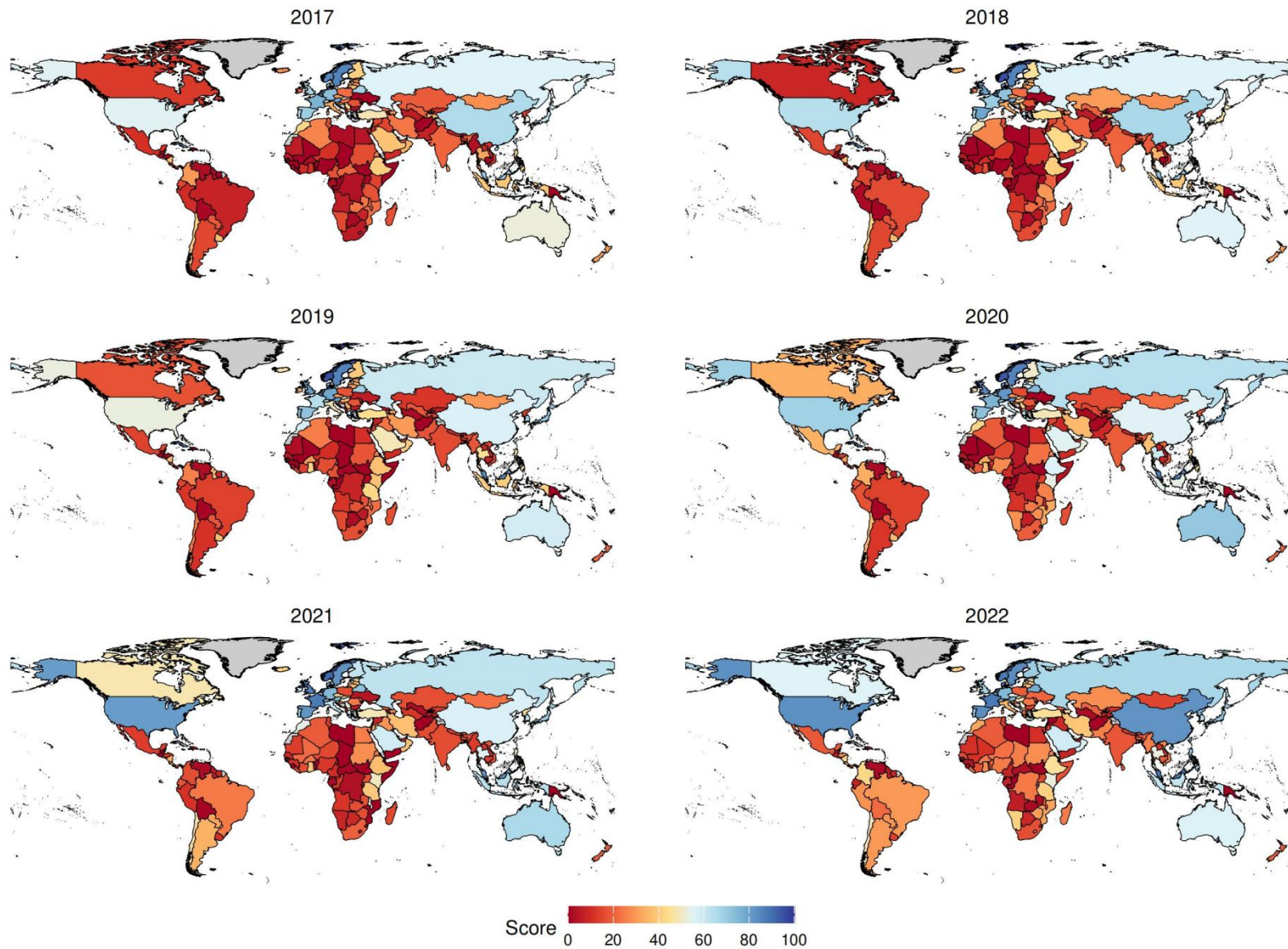
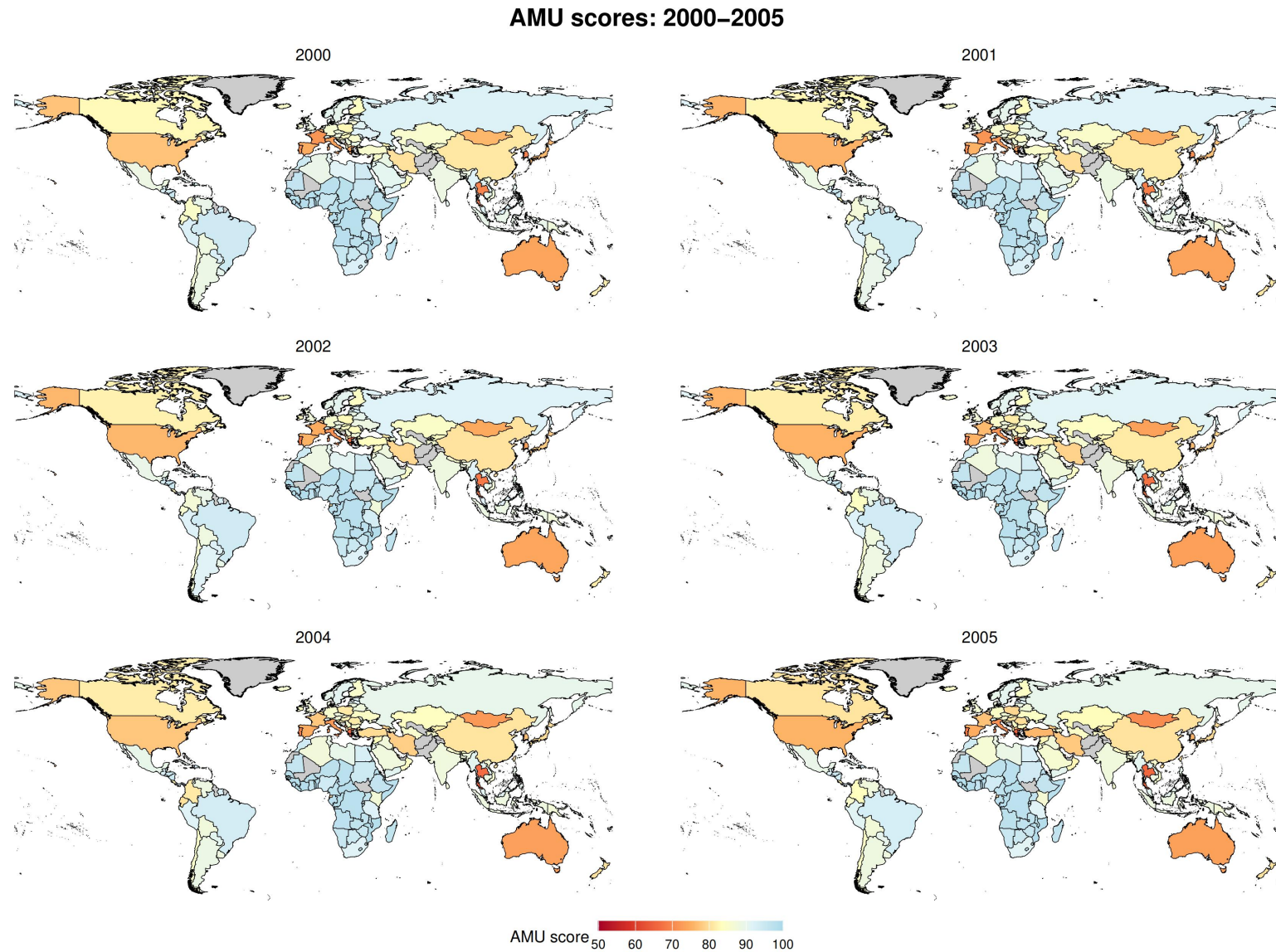
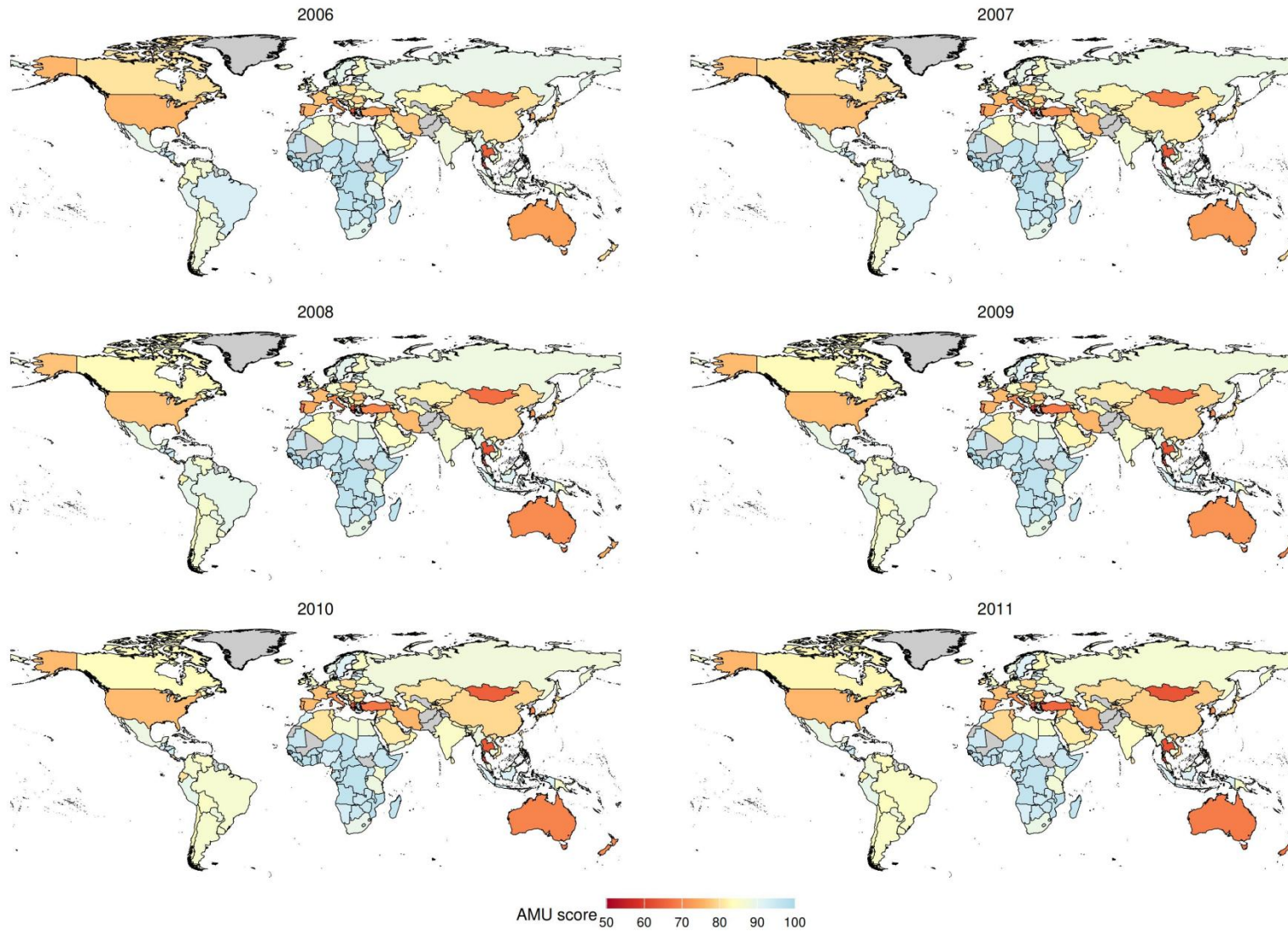


Figure S2. Global maps of AMU scores, 2000-2021

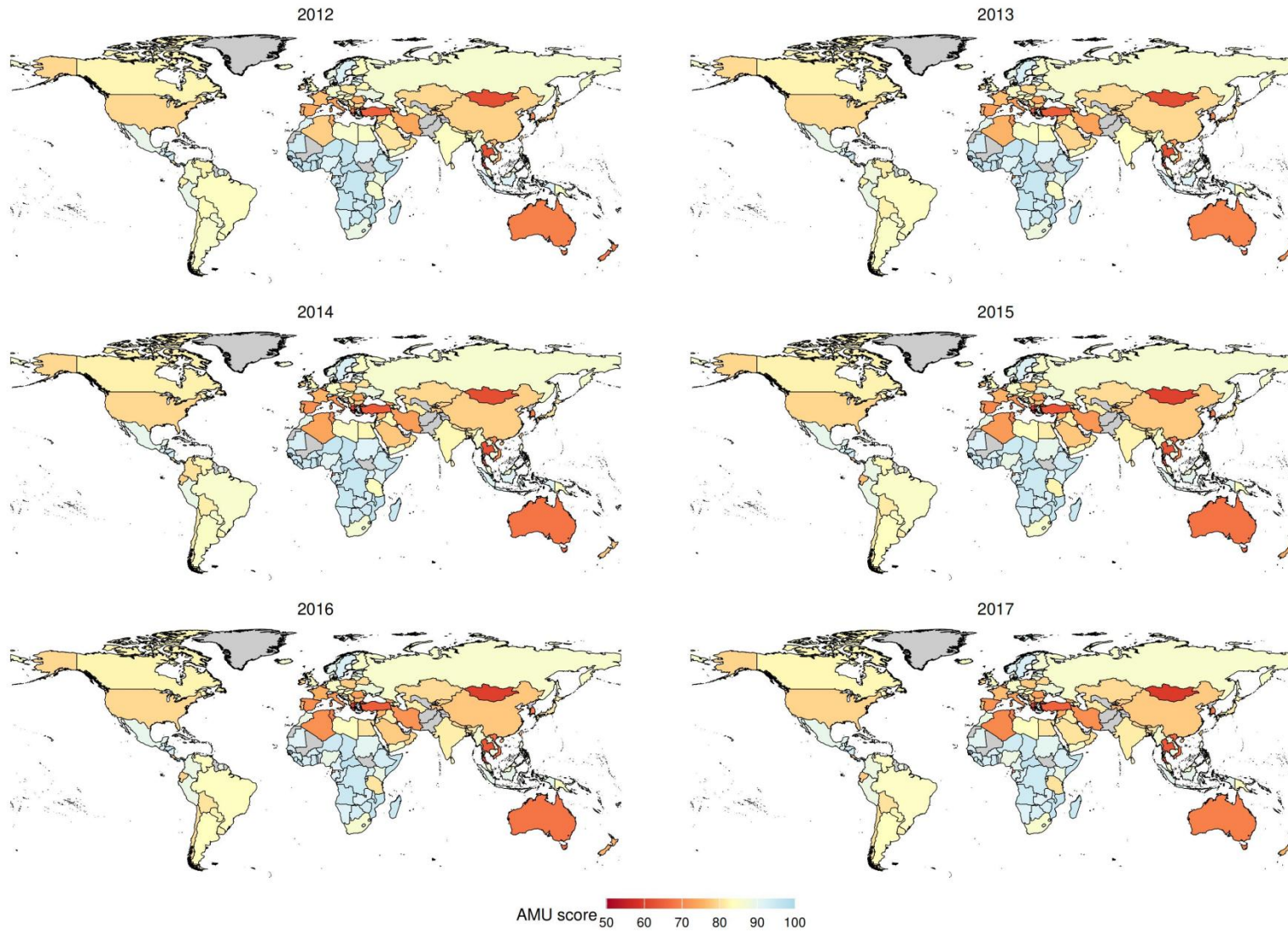
World maps showing country-level AMU scores from 2000 to 2021. **Abbreviations:** AMU=antimicrobial use.



AMU scores: 2006–2011



AMU scores: 2012–2017



AMU scores: 2018–2021

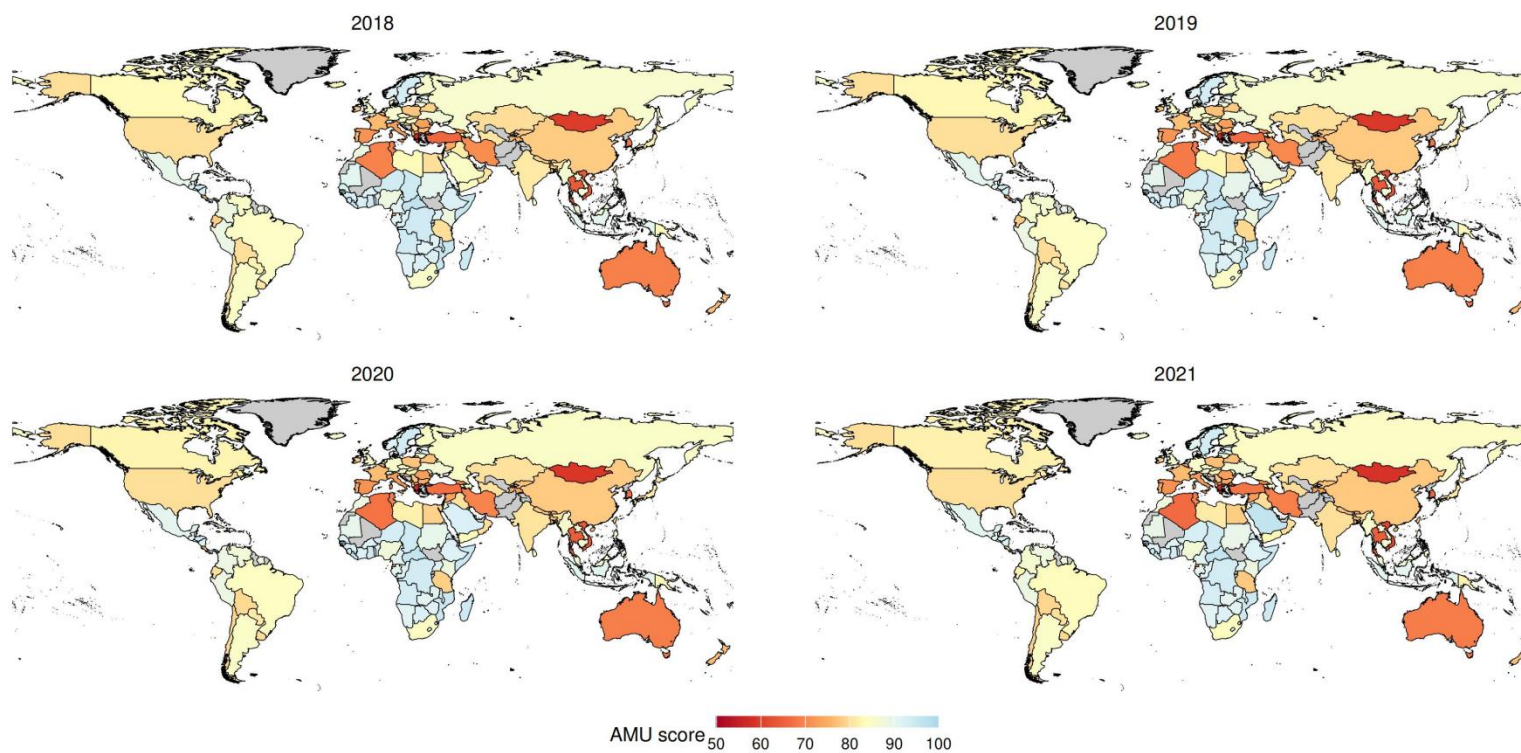
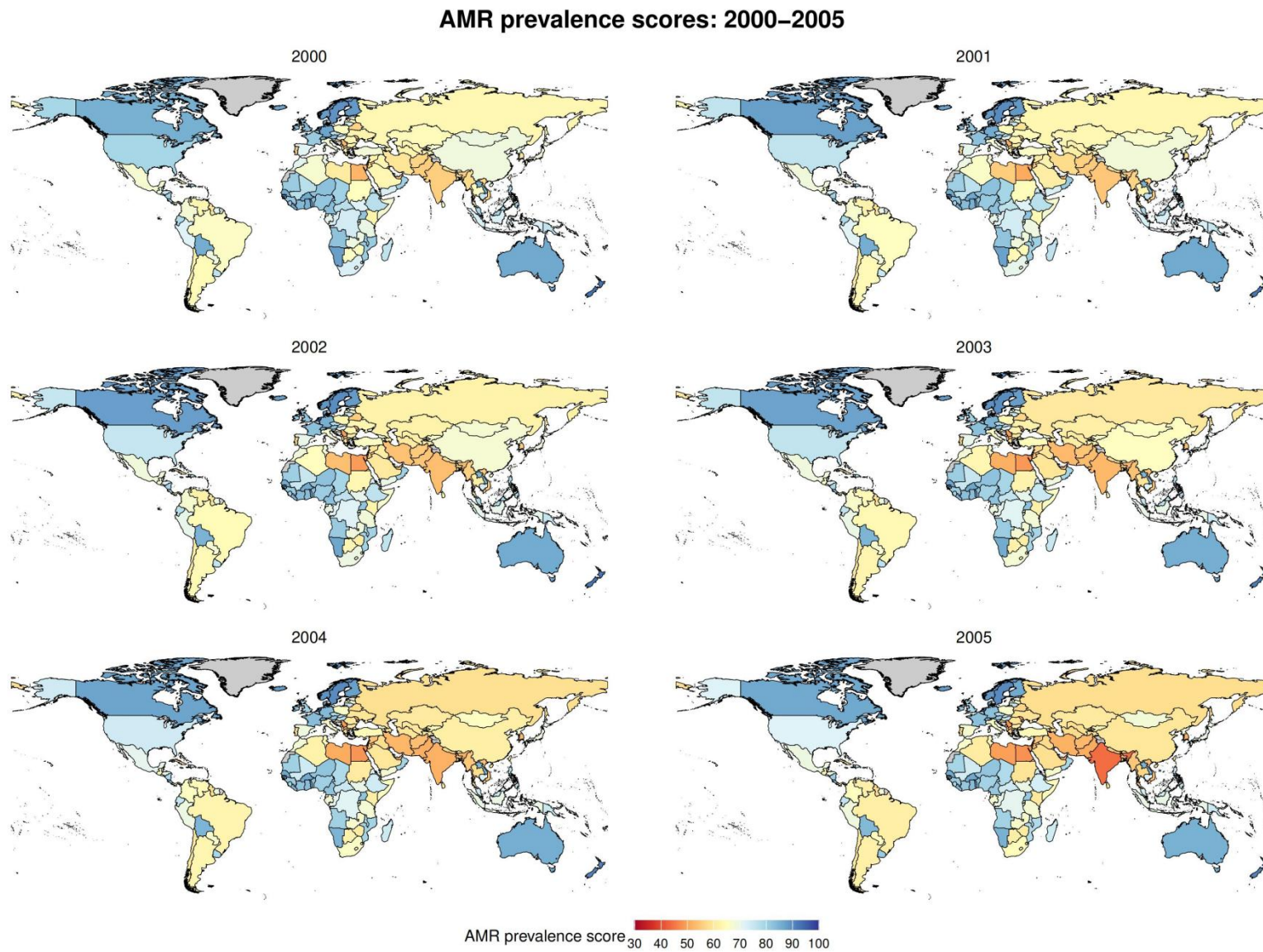
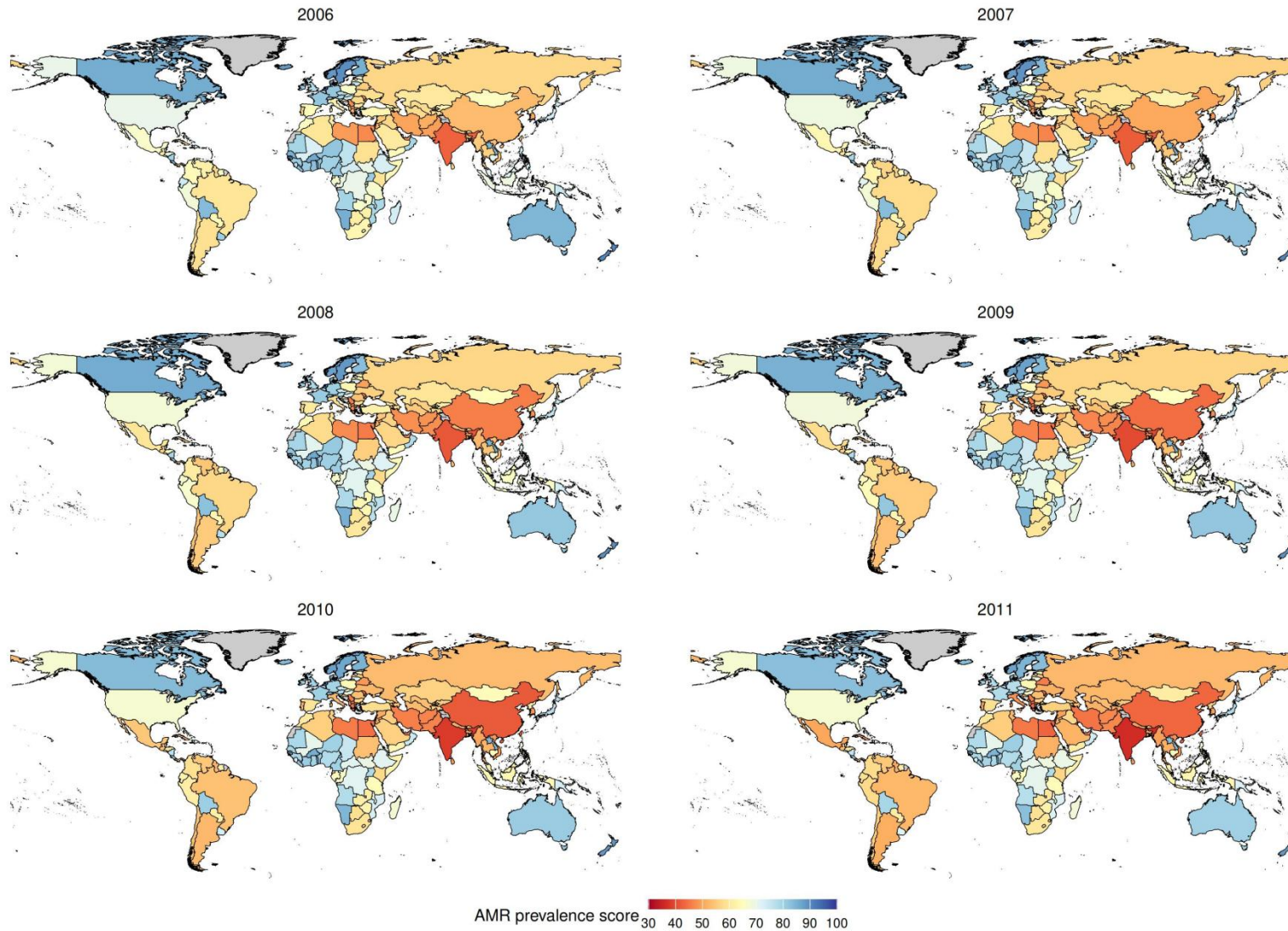


Figure S3. Global maps of AMR prevalence scores, 2000-2021

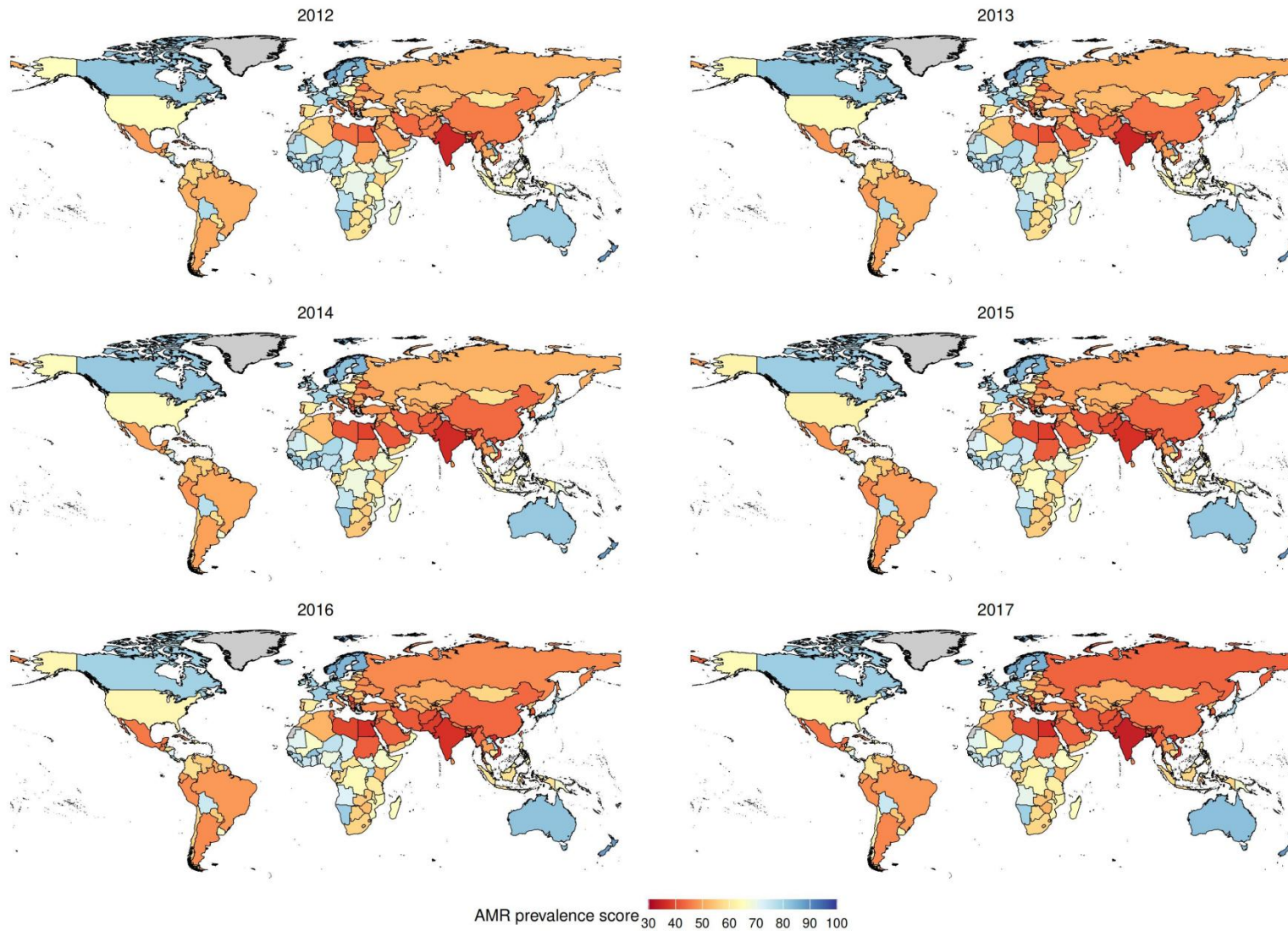
World maps showing country-level AMR prevalence scores from 2000 to 2021. **Abbreviations:** AMR=antimicrobial resistance.



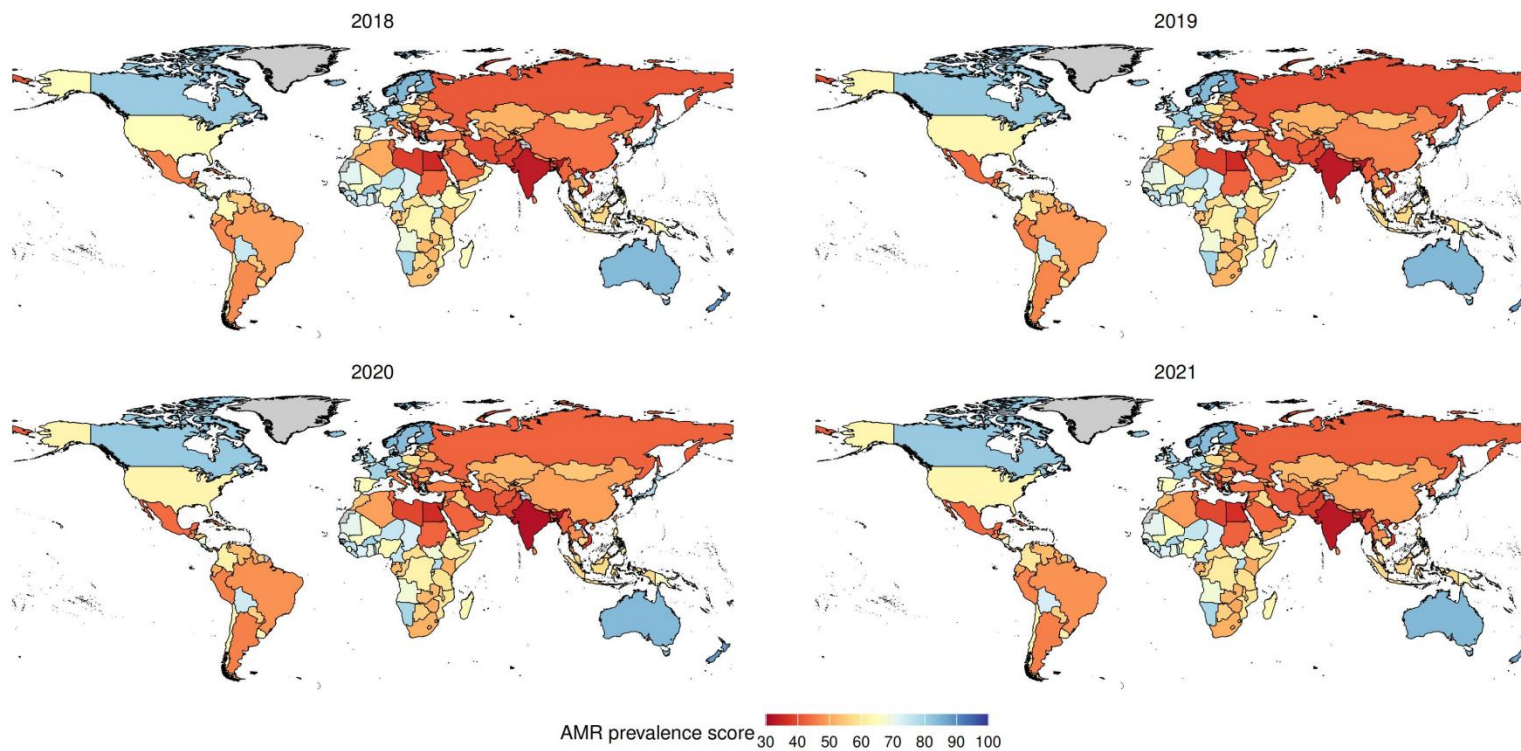
AMR prevalence scores: 2006–2011



AMR prevalence scores: 2012–2017



AMR prevalence scores: 2018–2021



Difference-in-differences identification and robustness strategy

To strengthen the credibility of our DID findings, we implemented four families of robustness checks:

- (1) three DID estimators that account for cross-country heterogeneity in staggered adoption;
- (2) extensive control for baseline country characteristics;
- (3) three approaches to control for pandemic-era confounding in 2020–2021; and
- (4) sensitivity to the temporal window by restricting estimation to a ± 5 -year band around NAP adoption.

Across all specifications, the results are consistent: a delayed improvement in AMR prevalence scores emerges after NAP adoption, indicating that the policy effects emerge gradually rather than immediately, while no discernible effects are observed for AMU scores, AMR-attributable deaths, or AMR-associated deaths.

1. Three DID estimators for robustness assessment

1.1 Baseline TWFE OLS DID and Goodman–Bacon decomposition

We first estimate a two-way fixed effects (TWFE) ordinary least squares (OLS) DID model with country and year fixed effects. Although widely used, TWFE can be biased in staggered-adoption settings because the estimator implicitly pools treatment effects from countries adopting the policy at different times. When treatment effects evolve dynamically, this averaging can distort the estimated overall effect. To assess this issue for the outcome showing a statistically significant effect (AMR prevalence score), we performed a Goodman–Bacon decomposition, which separates the TWFE estimate into weighted comparisons across three contrast types: Treated vs. Never Treated, Earlier Treated vs. Later Treated, and Later Treated vs. Earlier Treated (Table S19).

Table S19: Goodman–Bacon decomposition of TWFE OLS DID estimator

Comparison type	Treatment effect	Weight
Treated vs. Never Treated	-0.049	0.590
Treated Earlier vs. Later	1.140	0.273
Treated Later vs. Earlier	-1.097	0.137

Abbreviations: DID=difference-in-differences. OLS=ordinary least squares. TWFE=two-way fixed-effects

The decomposition shows that the primary positive contribution to the overall estimated policy effect comes from comparisons where countries adopting NAPs earlier experienced greater improvements in AMR prevalence than those adopting later. The weight of the “treated-later vs. treated-earlier” component is 0.137, which is not excessively large but also not negligible. This indicates that part of the TWFE estimate is influenced by comparisons in which units receiving treatment later serve as controls for those treated earlier—a structure known to potentially bias effect magnitudes when treatment effects evolve over time. These results reinforce the need to employ heterogeneity-robust DID estimators that appropriately account for staggered treatment timing. Therefore, we next estimate the two-stage DID and stacked event-study models.

1.2 Other heterogeneity-robust DID estimators.

To address the potential bias in traditional TWFE models arising from staggered treatment timing and heterogeneous treatment effects, we employ two modern heterogeneity-robust estimation DID approaches. First, we implement the two-stage DID estimator (DID-2S) proposed by Gardner in 2021. This doubly-residualized method recovers the Average Treatment Effect on the Treated (ATT) by using never-treated and not-yet-treated units to construct counterfactuals, thereby avoiding the negative-weighting problem. Second, we use a Stacked Event-Study design (Stacked) following Cengiz et al. in 2019. This approach stacks datasets for each treatment cohort alongside a common control group of never-treated units. By estimating the model with cohort-specific relative-time indicators, we obtain clean dynamic treatment effects and can visually inspect the parallel trends assumption.

Both heterogeneity-robust estimators from these two methodologies replicate delayed, positive effect on AMR prevalence scores in the TWFE model. At the same time, neither method indicates meaningful changes in AMU scores, AMR-attributable deaths, or AMR-associated deaths (Manuscript Figure 4A-D). This consistency mitigates concern that results are driven by TWFE artifacts.

2. Controlling for country characteristics

To reduce confounding from differences in structural capacity and development, we augmented all DID specification with 10 covariates: health expenditure, out-of-pocket expenditure, PM_{2.5}, population density, international tourism, temperature change on land, urban population, drinking water services, income group, and primary school enrollment (Table S20).

Table S20: Description of covariables

Variables	Unit of measurement	Definition	Data source
Health expenditure	% of GDP	Annual national spending on health services per capita, reflecting overall health system capacity.	World Bank
Out-of-pocket expenditure	% of total health expenditure	The share of health costs paid directly by individuals, indicating financial protection in healthcare access.	World Bank
Income group	consistent with 2021	World Bank national income classification category, summarizing economic development level.	World Bank
Drinking water services	% of total population	Percentage of the population with access to safely managed drinking water, representing hygiene infrastructure.	World Bank
Urban population	% of total population	Proportion of the population living in urban areas, reflecting urbanization and infrastructure levels.	World Bank
Population density	logarithmic transformation	Number of people per square kilometer, reflecting population concentration and transmission potential.	World Bank
International tourism	logarithmic transformation	Annual inbound international tourist arrivals, representing cross-border mobility and pathogen flow.	World Bank
Primary school enrollment	% school-age population	Gross enrollment rate in primary education, reflecting basic education access and literacy environment.	World Bank
Temperature change on land	°C	Year-to-year change in mean land surface temperature, indicating climate variability.	FAOSTAT
PM _{2.5}	µg/m ³	Annual mean fine particulate matter concentration, capturing environmental pollution exposure.	Atmospheric Composition Analysis Group

Abbreviations: GDP=gross domestic product; PM_{2.5}=fine particulate matter ≤2.5 µm in aerodynamic diameter.

Before including these covariates in the DID models, we first assessed potential multicollinearity among the 10 baseline variables. We ran a OLS regression of the AMR prevalence score on the 10 covariates and calculated variance inflation factors (VIFs) for each variable. Variables with VIF > 10 were defined as exhibiting problematic multicollinearity and would have been excluded from subsequent analyses.

Table S21. OLS results and VIFs for covariates

Variables	Coefficient	Standard error	VIF
Health expenditure	0.496	0.081	1.22
Out-of-pocket expenditure	-0.131	0.014	1.43
Income group	-2.444	0.340	2.56
Drinking water services	-0.031	0.009	1.33
Urban population	0.049	0.013	1.98
Population density	-0.909	0.156	1.06
International tourism	0.379	0.124	1.33
Primary school enrollment	-0.053	0.020	1.11
Temperature change on land	-1.709	0.431	1.11
PM _{2.5}	-0.068	0.019	1.39

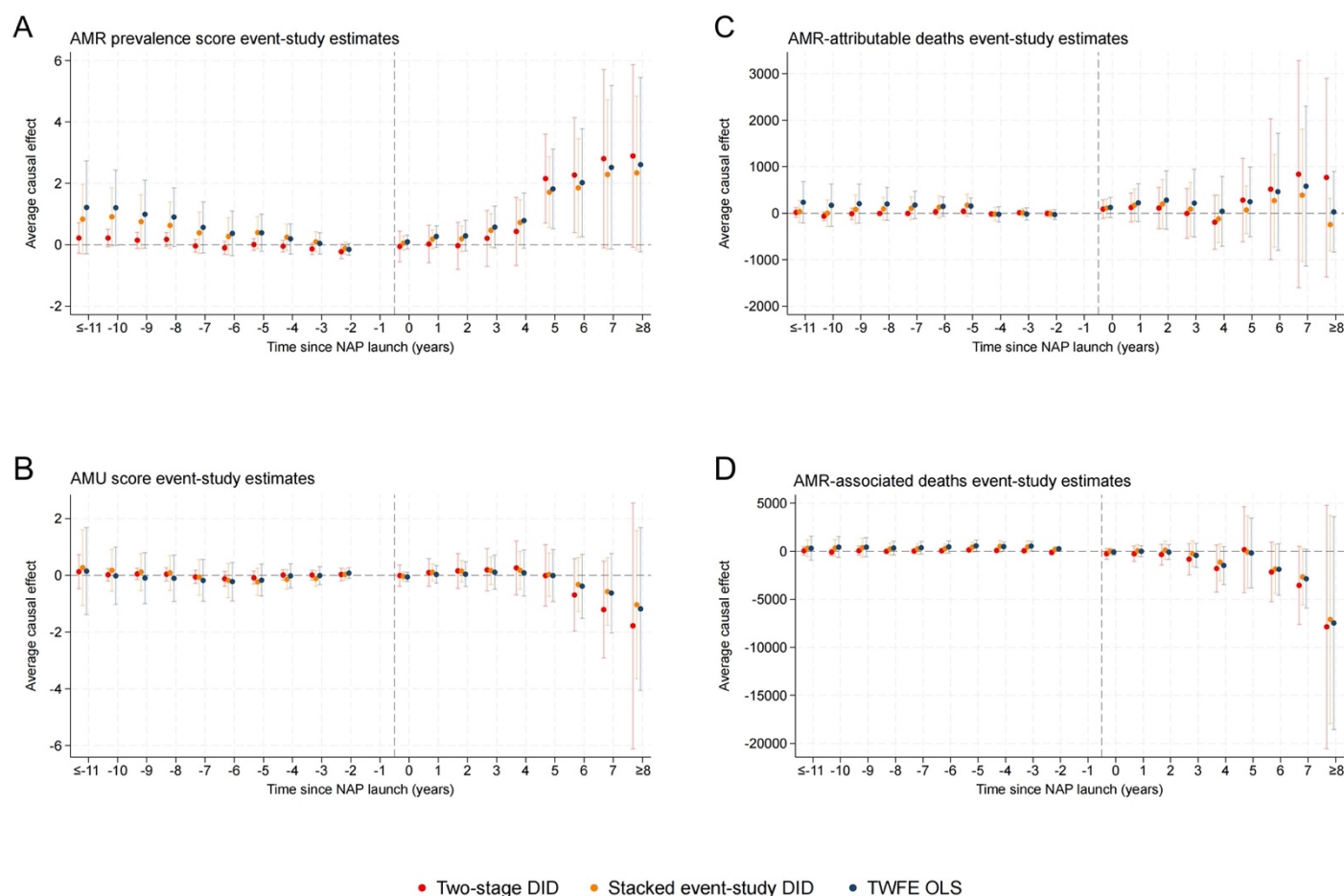
Abbreviations: OLS=ordinary least squares; PM_{2.5}=fine particulate matter ≤ 2.5 μm in aerodynamic diameter; VIF=variance inflation factor

The results show that all 10 covariates have VIF values < 5, indicating no substantive multicollinearity among the selected variables (Table S21). Therefore, all 10 variables were retained and incorporated into the adjusted DID specifications.

All three DID estimators (TWFE, DID-2S, stacked) preserve the same qualitative pattern (Figure S4): AMR prevalence score: statistically significant improvement emerging at year 5 post-adoption (persisting into year 6); AMU scores, AMR-attributable deaths, AMR-associated deaths: no significant changes.

The attenuation of significance around years 7–8 likely reflects (i) smaller effective sample sizes among long-run post-adoption cohorts under staggered timing, and/or (ii) genuine reversion risks, consistent with the notion that improvements in AMR prevalence require sustained reinforcement to avoid relapse.

Figure S4. Effects of AMR NAPs on AMR-related outcomes (controlling for baseline characteristics)



(A) Heterogeneous DID estimates of NAP's effect on AMR prevalence score (n=193).

(B) Heterogeneous DID estimates of NAP's effect on AMU score (n=172).

(C) Heterogeneous DID estimates of NAP's effect on AMR-attributable deaths (n=193).

(D) Heterogeneous DID estimates of NAP's effect on AMR-associated deaths (n=193).

For each country, the year of NAP adoption is defined as event time zero ($t=0$). Points represent estimated treatment effects for each year relative to the reference year ($t=-1$), with error bars indicating 95% confidence intervals. Three models are shown: the two-stage DID, the stacked event-study DID, and TWFE OLS.

Estimates additionally control for countries' structural covariates.

Abbreviations: AMU=antimicrobial use. AMR=antimicrobial resistance. DID=difference-in-differences. NAP=national action plan. OLS=ordinary least squares. TWFE=two-way fixed-effects.

3. Controlling for pandemic-era confounding (2020–2021)

The COVID-19 pandemic represents a major potential confounder when assessing the effects of NAP adoption on AMR outcomes. However, the direction, timing, and magnitude of pandemic-related impacts on AMR remain uncertain, given competing influences of reduced community transmission, increased empiric antibiotic use, changes in infection control capacity, and disruptions to routine health services. To assess whether our estimates are sensitive to pandemic-era disruptions, we implemented three complementary strategies.

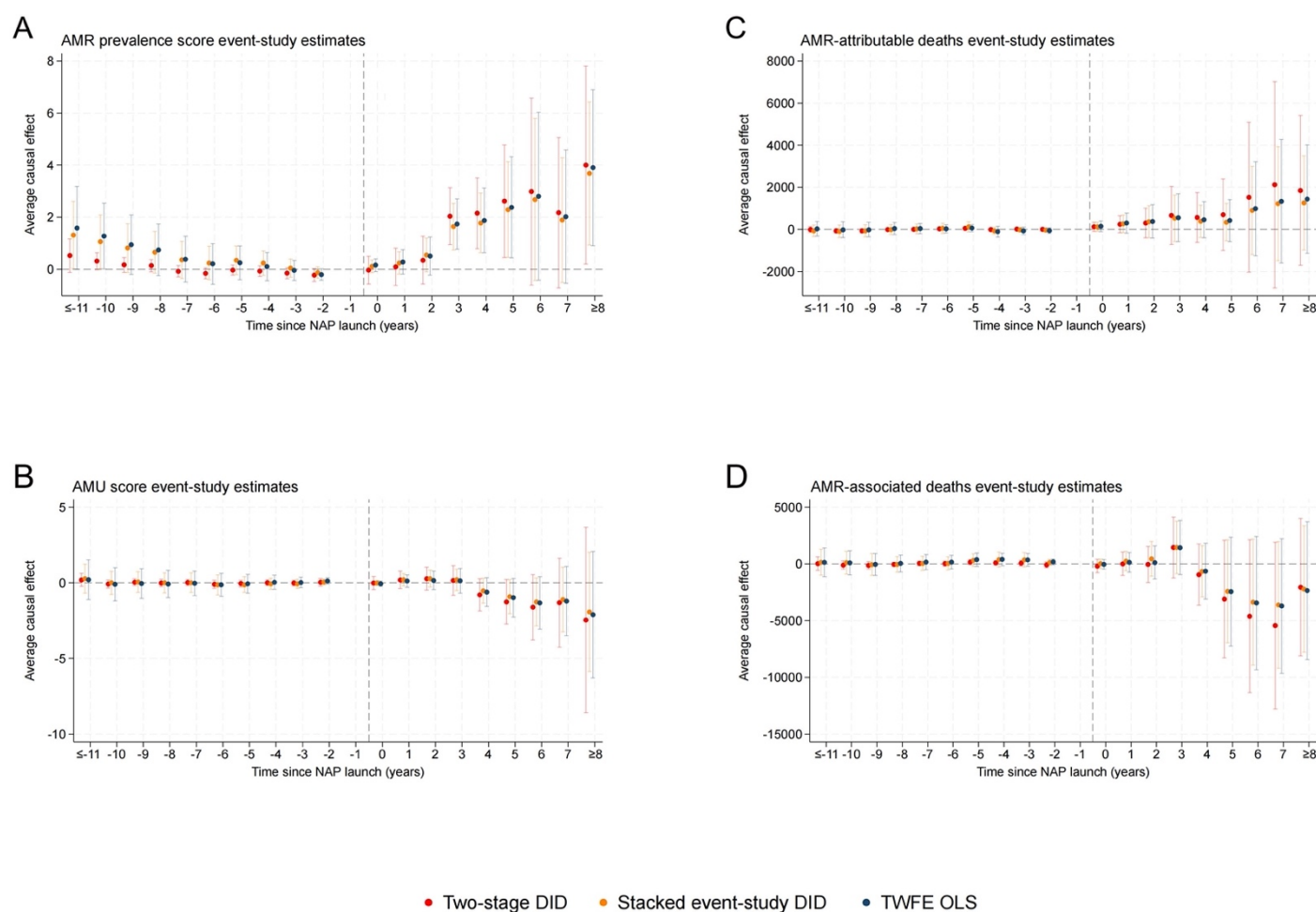
3.1 Excluding the pandemic years (2020–2021)

We first re-estimated all three DID specifications (TWFE, DID-2S, and stacked event-study) after removing the pandemic period (2020–2021) from the dataset. The resulting estimates consistently show that the AMR prevalence score displays a delayed improvement following NAP adoption, becoming statistically detectable in

the third year, remaining significant through the fifth year, loses significant in the sixth and seventh years, and reappearing in the eighth year (Figure S5). As in the main analysis, no statistically significant associations are observed for AMU scores, AMR-attributable deaths, or AMR-associated deaths.

The slight temporal displacement of the AMR prevalence coefficient trajectory likely reflects the shortened estimation horizon and the corresponding reduction in post-adoption observation periods for later adopters. Removing 2020–2021 also increases the proportion of countries classified as never-adopters during the estimation period, altering comparison weights in staggered DID design. This compression places greater weight on early post-adoption years, when treatment effects are still emerging, and reduces the stability and precision of estimates at longer lags. Hence, the temporal shift should be interpreted cautiously, as it may partly arise from the truncated observation window and pandemic-period data removal, and does not necessarily imply a substantive alteration of the underlying effect.

Figure S5. Effects of AMR NAPs on AMR-related outcomes (excluding pandemic years)



(A) Heterogeneous DID estimates of NAP's effect on AMR prevalence score (n=193).

(B) Heterogeneous DID estimates of NAP's effect on AMU score (n=172).

(C) Heterogeneous DID estimates of NAP's effect on AMR-attributable deaths (n=193).

(D) Heterogeneous DID estimates of NAP's effect on AMR-associated deaths (n=193).

For each country, the year of NAP adoption is defined as event time zero ($t=0$). Points represent estimated treatment effects for each year relative to the reference year ($t=-1$), with error bars indicating 95% confidence intervals. Three models are shown: the two-stage DID, the stacked event-study DID, and TWFE OLS.

The analysis excludes data from 2020–2021.

Abbreviations: AMU=antimicrobial use. AMR=antimicrobial resistance. DID=difference-in-differences. NAP=national action plan. OLS=ordinary least squares. TWFE=two-way fixed-effects.

3.2 Controlling for pandemic intensity

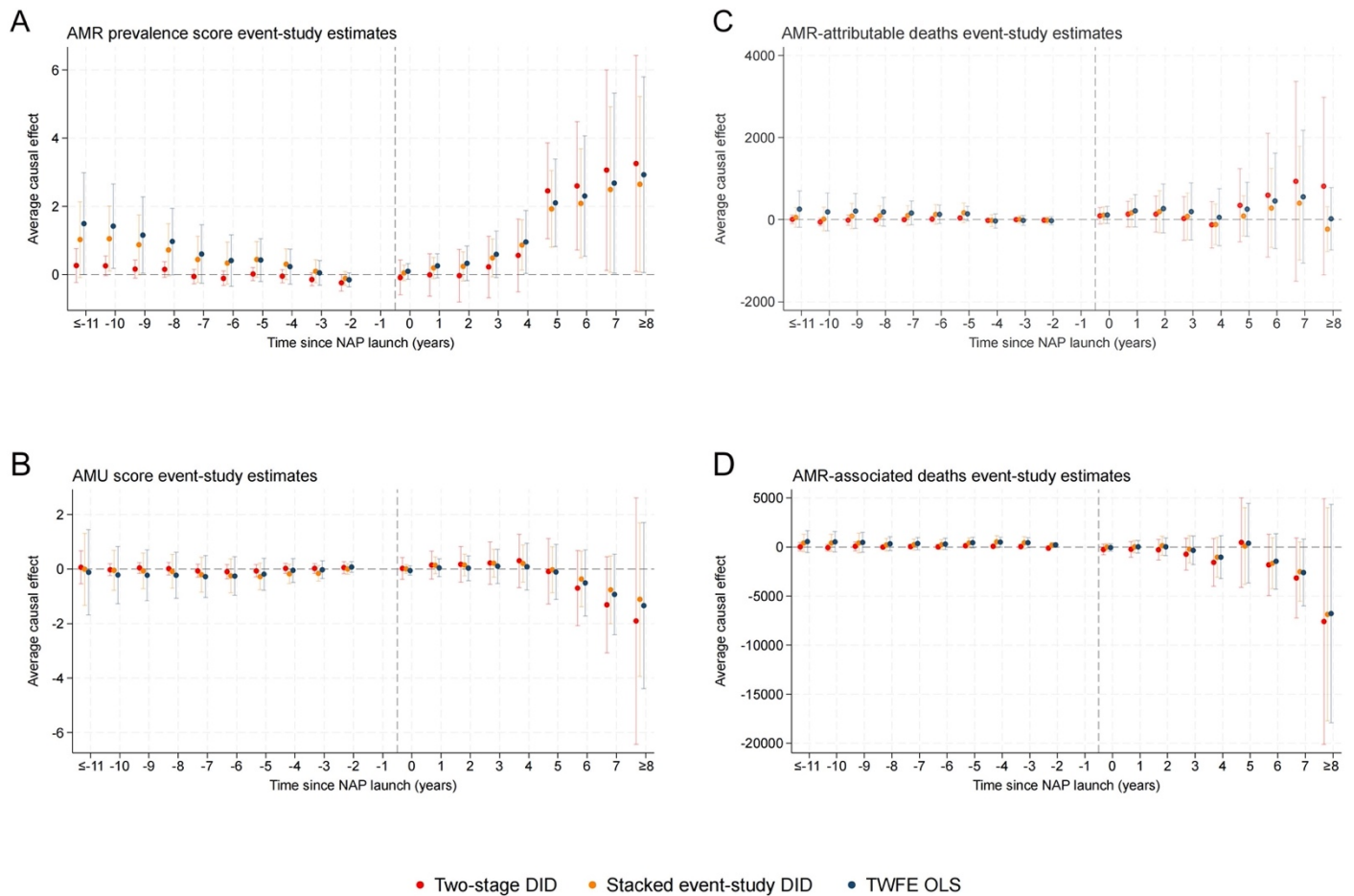
We next attempted to directly control for pandemic intensity by incorporating age-standardized COVID-19 death rates (from GBD, <https://vizhub.healthdata.org/gbd-results/>). However, because values are structurally zero prior to 2019, the variable was omitted by all three models, yielding results identical to the main results.

To retain a pandemic-intensity signal across the full study period, we constructed a respiratory infection age-standardized death rate by combining death from COVID-19, upper respiratory infections, and lower respiratory infections (from GBD, <https://vizhub.healthdata.org/gbd-results/>). In GBD, COVID-19 death is estimated separately from other respiratory infections, allowing these causes to be aggregated without double-counting. Using this composite indicator, estimates again show a 5-year lagged and sustained improvement in AMR prevalence scores following NAP adoption, with no corresponding changes in AMU scores, AMR-attributable deaths, or AMR-associated deaths (Figure S6).

3.3 Including a pandemic-period variable

Finally, we included a binary pandemic-period variable, coded as 1 for 2020 – 2021 and 0 otherwise. As with age-standardized COVID-19 death rates, the dummy is omitted by all three estimators and produces estimates identical to the main analysis. Thus, the inclusion of an explicit pandemic-period adjustment does not alter the estimated treatment effect trajectory.

Figure S6. Effects of AMR NAPs on AMR-related outcomes (controlling for respiratory infection burden)



(A) Heterogeneous DID estimates of NAP's effect on AMR prevalence score (n=193).

(B) Heterogeneous DID estimates of NAP's effect on AMU score (n=172).

(C) Heterogeneous DID estimates of NAP's effect on AMR-attributable deaths (n=193).

(D) Heterogeneous DID estimates of NAP's effect on AMR-associated deaths (n=193).

For each country, the year of NAP adoption is defined as event time zero ($t=0$). Points represent estimated treatment effects for each year relative to the reference year ($t=-1$), with error bars indicating 95% confidence intervals. Three models are shown: the two-stage DID, the stacked event-study DID, and TWFE OLS. Estimates further control for national respiratory infection burden.

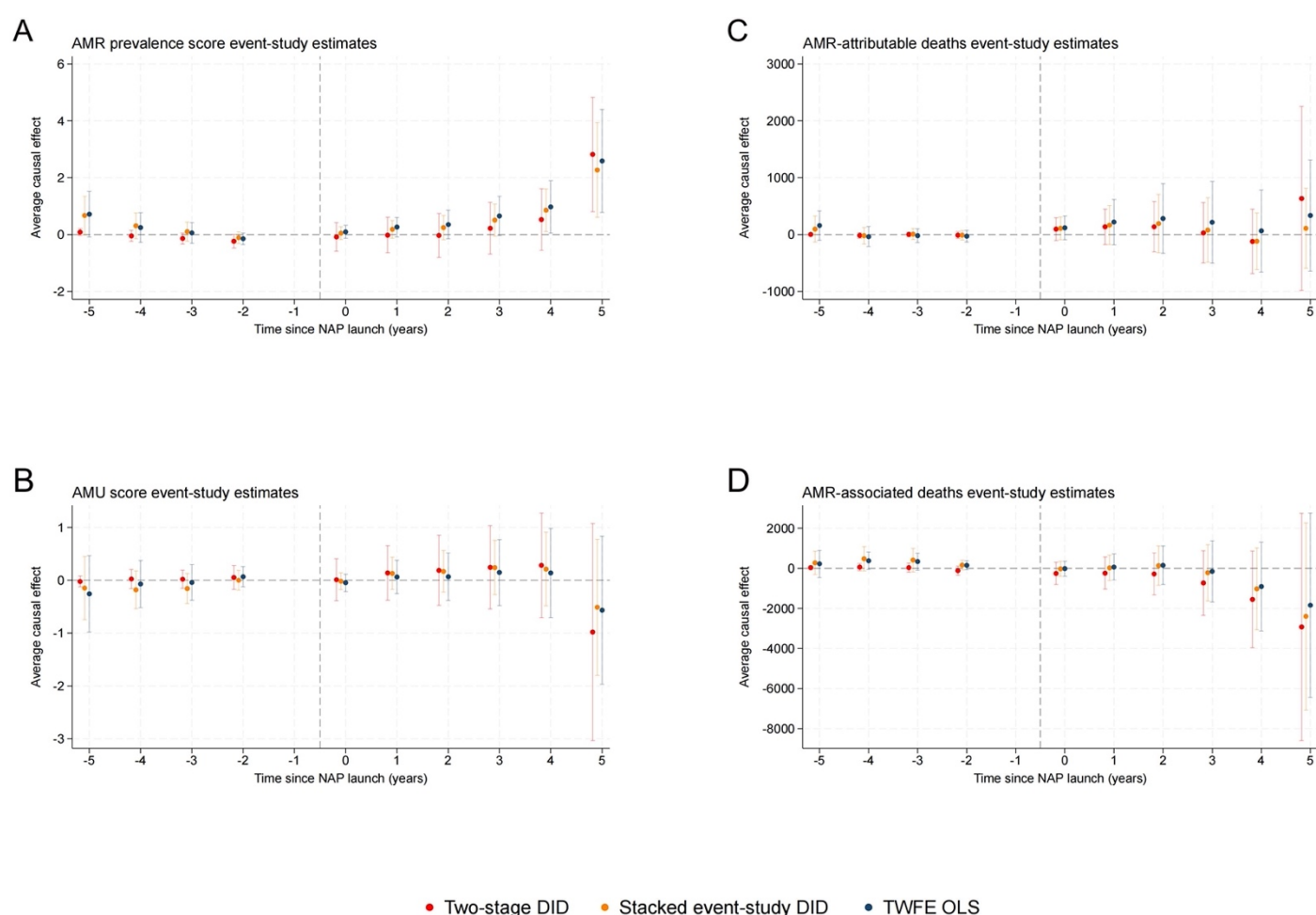
Abbreviations: AMU=antimicrobial use. AMR=antimicrobial resistance. DID=difference-in-differences. NAP=national action plan. OLS=ordinary least squares. TWFE=two-way fixed-effects.

4. Temporal window sensitivity (± 5 -year band around adoption)

To test whether long pre/post tails or composition changes drive the results, we re-estimated all three DID models on a restricted window of ± 5 years around each country's adoption year. This restriction reduces influence from distant periods and ensures more comparable treated–control contrasts.

The findings remain qualitatively consistent across three models (Figure S7): the AMR prevalence score shows a gradual and delayed improvement following NAP adoption in year 5, whereas no meaningful changes are observed in AMU scores, AMR-attributable deaths, or AMR-associated deaths.

Figure S7. Effects of AMR NAPs on AMR-related outcomes (event window: ± 5 years)



(A) Heterogeneous DID estimates of NAP's effect on AMR prevalence score ($n=193$).

(B) Heterogeneous DID estimates of NAP's effect on AMU score ($n=172$).

(C) Heterogeneous DID estimates of NAP's effect on AMR-attributable deaths ($n=193$).

(D) Heterogeneous DID estimates of NAP's effect on AMR-associated deaths ($n=193$).

For each country, the year of NAP adoption is defined as event time zero ($t=0$). Points represent estimated treatment effects for each year relative to the reference year ($t=-1$), with error bars indicating 95% confidence

intervals. Three models are shown: the two-stage DID, the stacked event-study DID, and TWFE OLS. The estimation window is restricted to five years before and after NAP adoption.

Abbreviations: AMU=antimicrobial use. AMR=antimicrobial resistance. DID=difference-in-differences. NAP=national action plan. OLS=ordinary least squares. TWFE=two-way fixed-effects.

Across four families of robustness checks—(1) three DID estimators that handle cross-country heterogeneity in staggered adoption; (2) extensive control for baseline country characteristics; (3) three approaches to control for pandemic-era confounding in 2020–2021; and (4) sensitivity to the temporal window by restricting estimation to a ± 5 -year band around NAP adoption, we observe a non-immediate, positive association between NAP adoption and improvements in AMR prevalence scores, while no statistically meaningful changes are detected for AMU scores, AMR-attributable deaths, or AMR-associated deaths. Heterogeneity-robust estimators address concerns about TWFE aggregation under staggered timing; covariate adjustment and window restrictions reduce confounding from structural differences and distant periods; and pandemic controls do not alter inference.

Taken together, these results support a causal interpretation of the NAP effect on AMR prevalence within a quasi-experimental DID framework, while highlighting that benefits materialize with delay and are not mirrored across AMU or AMR-related mortality outcomes.

Grouping countries by AMR improvement trajectories to identify governance subdomains

Step 1: Analytical objective

Our aim was to identify countries in which AMR prevalence showed meaningful improvement following the launch of the GAP. To do so, we examined temporal deviations in AMR prevalence from each country's pre-GAP baseline. Specifically, a deviation-based outcome (Δ AMR) was defined and calculated as the difference between the observed AMR prevalence score during 2015–2021 and the expected value projected from a linear trend fitted to each country's 2000–2014 trajectory. This metric captures improvement relative to a country's historical trajectory rather than absolute AMR levels. Our goal was to identify which groups of countries demonstrated strongest improvement and then evaluate which governance subdomains were most closely associated with those improvements.

Step 2: Identification of AMR improvement trajectories

To classify countries by distinct AMR improvement trajectories, we applied latent class growth modelling (LCGM). This approach aligns with our analytical objective as the key question was not whether AMR improved on average, but which countries improved, which did not, and whether these patterns were systematic rather than random pathways.

LCGM was implemented using the `hlme()` function in the `lcmm` package, fitting models with 1 to 7 latent classes. Model selection was based on AIC, BIC, posterior classification probabilities, class-size distribution (%class), and interpretability of trajectory shapes (Table S22).

Table S22. Model fit indices and class size distributions for 1–7 class LCGM solutions

Model	AIC	BIC	Class 1 (%)	Class 2 (%)	Class 3 (%)	Class 4 (%)	Class 5 (%)	Class 6 (%)	Class 7 (%)
1-class	7559.37	7569.16	100.00	—	—	—	—	—	—
2-class	6745.22	6764.80	46.11	53.89	—	—	—	—	—
3-class	6172.65	6202.02	33.68	15.03	51.30	—	—	—	—
4-class	5807.30	5846.45	27.46	41.97	24.87	5.70	—	—	—
5-class	5563.55	5612.49	13.47	20.73	24.87	35.23	5.70	—	—
6-class	5482.97	5541.70	8.81	19.69	17.10	30.57	18.13	5.70	—
7-class	5304.66	5373.18	9.84	27.98	19.69	18.13	5.70	17.10	1.55

Abbreviation: AIC=Akaike information criterion; BIC=Bayesian information criterion.

Step 3: Selection of the final model

Although models with four or more classes produced lower BIC values, they also generated very small latent classes (e.g., a class comprising only ~5.70% of countries in the 4-class solution), reducing statistical stability and policy generalizability, and likely represent statistical over-partitioning rather than meaningful epidemiological patterns. To preserve interpretability, internal validity, and policy relevance, we required each class to contain $\geq 10\%$ of countries. The 3-class model achieved a balance of statistical fit, class stability, and interpretability, meeting this criterion while maintaining clear differentiation in trajectory shape and preserving model parsimony without introducing small or unstable classes (Extended Data Figure. 8). The three latent trajectories were interpreted as a High-growth group, reflecting pronounced improvement in AMR prevalence; a Moderate-growth group, showing modest but sustained improvement; and a Negative-growth group, in which no improvement or continued deterioration was observed over the study period.

Step 4: Subgroup association analysis

Because the Negative-growth group showed no improvement during the study period, we restricted further analysis to the High-growth and Moderate-growth groups. For each group, we estimated country fixed-effects panel models to assess the associations between governance subdomain scores and Δ AMR. We report raw p-values and False Discovery Rate (FDR) adjusted q-values, using clustered robust standard errors to account for subdomains correlation and multiple comparisons (Table S23-24). Subgroup association analyses were conducted in R (version 4.3.2) using “plm” package for fixed-effects panel regression. Clustered robust standard errors were computed using “sandwich” package and inference was performed with “lmtest” package.

Table S23. Associations between governance subdomains and AMR improvement in the High-growth group

Subdomains	β estimates (95% CI)	p (raw)	q (BH-FDR)
1.1 Strategic vision	-0.021 (-0.095, 0.053)	0.580	0.888
1.2 Multi-sector engagement	0.054 (0.016, 0.093)	0.007	0.065
1.3 Sustainability	-0.005 (-0.040, 0.029)	0.756	0.924
1.4 Accountability	0.020 (-0.027, 0.067)	0.396	0.729
2.1 AMU surveillance system	0.041 (0.015, 0.066)	0.002	0.082
2.2 AMR surveillance system	0.006 (-0.051, 0.062)	0.838	0.924
2.3 Optimization of antimicrobial use	0.041 (-0.017, 0.098)	0.166	0.680
2.4 Professional education	-0.018 (-0.060, 0.024)	0.402	0.801
2.5 Public awareness	-0.041 (-0.087, 0.005)	0.084	0.297
2.6 Hygiene and prevention	-0.028 (-0.061, 0.006)	0.112	0.680
2.7 Research innovation	-0.002 (-0.038, 0.035)	0.925	0.938
3.1 Reporting	0.038 (-0.004, 0.080)	0.078	0.532
3.2 Policy adjustment	-0.002 (-0.033, 0.028)	0.881	0.938
3.3 Effectiveness	0.045 (-0.041, 0.132)	0.310	0.680

Note: β estimates reflect the association between each governance subdomain score and deviation-based AMR improvement (Δ AMR). *p* (raw) denotes unadjusted p-values; *q* (BH-FDR) denotes false discovery rate-adjusted p-values using the Benjamini–Hochberg procedure to account for multiple comparisons across subdomains.

Abbreviation: AMR=antimicrobial resistance. AMU=antimicrobial use. BH-FDR=Benjamini–Hochberg false discovery rate. CI=confidence interval.

Table S24. Associations between governance subdomains and AMR improvement in the Moderate-growth group

Subdomains	β estimates (95% CI)	p (raw)	q (BH-FDR)
1.1 Strategic vision	0.002 (-0.016, 0.021)	0.826	0.952
1.2 Multi-sector engagement	-0.002 (-0.018, 0.014)	0.806	0.952
1.3 Sustainability	0.000 (-0.008, 0.009)	0.939	0.952

1.4 Accountability	−0.001 (−0.011, 0.009)	0.853	0.952
2.1 AMU surveillance system	0.004 (−0.002, 0.010)	0.202	0.805
2.2 AMR surveillance system	−0.004 (−0.018, 0.009)	0.520	0.874
2.3 Optimization of antimicrobial use	−0.005 (−0.017, 0.007)	0.400	0.805
2.4 Professional education	−0.000 (−0.009, 0.008)	0.940	0.952
2.5 Public awareness	−0.011 (−0.021, −0.000)	0.049	0.539
2.6 Hygiene and prevention	−0.016 (−0.025, −0.007)	0.001	0.107
2.7 Research innovation	−0.003 (−0.010, 0.004)	0.382	0.805
3.1 Reporting	0.003 (−0.005, 0.012)	0.422	0.914
3.2 Policy adjustment	0.006 (−0.002, 0.014)	0.126	0.805
3.3 Effectiveness	0.022 (0.001, 0.043)	0.037	0.506

Note: β estimates reflect the association between each governance subdomain score and deviation-based AMR improvement (Δ AMR). p (raw) denotes unadjusted p-values; q (BH-FDR) denotes false discovery rate—adjusted p-values using the Benjamini–Hochberg procedure to account for multiple comparisons across subdomains.

Abbreviation: AMR=antimicrobial resistance. AMU=antimicrobial use. BH-FDR=Benjamini–Hochberg false discovery rate. CI=confidence interval.

Step 5: Results interpretation

In the High-growth group, the fixed-effects model indicated that I 2.1 One Health engagement and I 2.1 AMU surveillance system were statistically significant at $p < 0.05$. After FDR correction, these two governance dimensions remained the strongest signals, although their q -values were slightly above the conventional 0.05 threshold, but remained statistically significant under a more liberal $q < 0.10$ criterion. All other subdomains showed no evidence of association under multiplicity control.

In the Moderate-growth group, I 2.5 Public awareness, I 2.6 Hygiene and prevention, and I 3.3 Effectiveness were significant at $p < 0.05$, but none remained significant after FDR correction—even under a relaxed $q < 0.10$ threshold.

Step 6: Conclusion

The analysis aimed to identify the countries contributing most to global AMR improvement and then determine which governance subdomains were associated with that progress. The High-growth group exhibited consistent and most statistically strong governance signals, particularly in multi-sector engagement and AMU surveillance capacity, suggesting that these domains may be key enabling mechanisms in accelerating AMR reduction. In contrast, associations in the Moderate-growth group were weaker and non-reproducible after multiplicity adjustment, indicating that improvement in these countries may be more diffuse, less governance-driven, or earlier in development.

Accordingly, subsequent country-level interpretation and case analysis on the 29 countries in the High-growth group, as they provide the clearest and statistically most defensible evidence linking governance mechanisms to measurable AMR improvement.

Panel model selection and pandemic-period robustness analysis

In our main DID analysis, we identified a delayed yet significant positive effect of national AMR governance on AMR prevalence improvement. To provide policy-relevant guidance for future AMR governance actions, we further examined which governance subdomains were most strongly associated with AMR prevalence performance. We approached this question from two complementary perspectives:

- (1) Process-oriented leadership — countries that adopted their NAPs earlier than the GAP release (≤ 2014), reflecting proactive engagement in AMR governance (n=17; Table S25);
- (2) Outcome-oriented improvement — countries that demonstrated the greatest improvements in AMR prevalence, identified using AMR improvement trajectory grouping (n=29; Table S26; see “Grouping countries by AMR improvement trajectories to identify governance subdomains” section for details)

Table S25. Countries with NAP launched before the GAP

No.	ISO3	Country	NAP launch year
1	AUT	Austria	2014
2	BEL	Belgium	2014
3	CAN	Canada	2014
4	CYP	Cyprus	2012
5	CZE	Czech Republic	2009
6	DNK	Denmark	2010
7	ESP	Spain	2014
8	ETH	Ethiopia	2012
9	FRA	France	2011
10	GBR	United Kingdom	2013
11	GRC	Greece	2008
12	IND	India	2011
13	MKD	North Macedonia	2012
14	PHL	Philippines	2014
15	PRT	Portugal	2013
16	VNM	Viet Nam	2013
17	ZAF	South Africa	2014

Abbreviation: GAP=global action plan; NAP=national action plan.

Table S26. Countries with the greatest improvements in AMR prevalence scores

No.	ISO3	Country	Δ AMR in 2015	Δ AMR in 2021
1	ALB	Albania	3.4	9.9
2	AND	Andorra	-0.2	7.8
3	ARM	Armenia	4.0	13.0
4	AUS	Australia	2.6	7.8
5	BLR	Belarus	0.5	18.4
6	CHL	Chile	3.6	13.3
7	CHN	China	7.3	26.3
8	COL	Colombia	3.0	12.4
9	CZE	Czech Republic	3.9	7.0
10	DEU	Germany	2.0	8.1
11	ECU	Ecuador	-1.7	11.0
12	ESP	Spain	5.1	15.1
13	GRC	Greece	3.5	12.2
14	IND	India	6.2	11.9
15	ISR	Israel	1.5	8.4
16	ITA	Italy	3.4	12.8
17	KGZ	Kyrgyzstan	1.5	8.9
18	KNA	Saint Kitts and Nevis	2.6	10.3
19	LKA	Sri Lanka	3.5	9.8
20	MLT	Malta	3.9	6.3
21	MYS	Malaysia	5.4	9.7
22	PAN	Panama	8.8	5.1
23	PRT	Portugal	3.2	18.9
24	QAT	Qatar	3.9	6.1
25	SGP	Singapore	1.6	7.3
26	SMR	San Marino	3.7	11.6
27	SWZ	Eswatini	1.2	8.6
28	THA	Thailand	2.4	7.3
29	UZB	Uzbekistan	0.8	7.7

Note: Δ AMR is defined as the difference between the observed AMR prevalence score during 2015–2021 and the expected value projected from a linear trend fitted to each country’s 2000–2014 trajectory

For both groups, we linked subdomains to AMR prevalence scores while restricting the analysis to 2017–2021 due to data availability. Although this window captures only the early stage of governance implementation, it provides valuable insight into the mechanisms through which governance translates into AMR improvement. We first identified the appropriate panel model structure and then conducted three complementary approaches to assess the robustness of results to pandemic-era confounding:

- (1) Excluding the pandemic years (2020–2021);
- (2) Controlling for pandemic intensity;
- (3) Including a pandemic-period dummy variable.

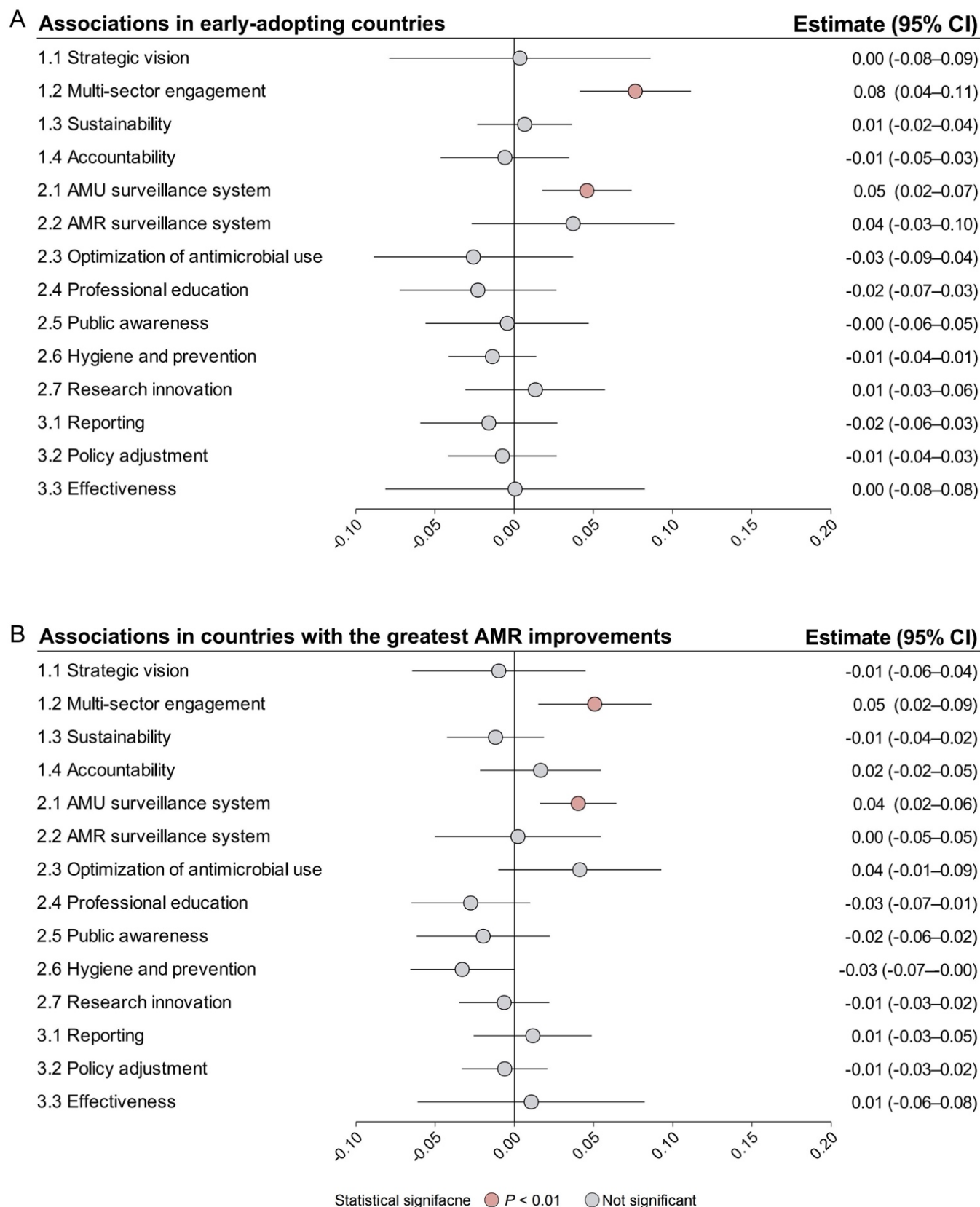
All analyses were conducted in R (version 4.3.2) using the “plm” package.

1. Selection of panel model

Both fixed effects and random effects models were initially estimated. The Hausman test returned $p < 0.001$, indicating that the fixed effects model is the preferred specification. Consistent results across both models, however, indicate a high degree of robustness in the estimated associations.

In both model types, subdomain *1.2 Multi-sector engagement* and subdomain *2.1 AMU surveillance system* show significant positive associations with AMR prevalence scores in both country groups (Figure 5 in the manuscript; Figure S8). Under the fixed effects specification, subdomain *1.1 Strategic vision* and subdomain *2.2 AMR surveillance system* are also significant, though these associations do not persist under random effects, indicating potential sensitivity to unobserved heterogeneity. Nevertheless, the random effects model serves as a robustness check, supporting the stability of the core findings.

Figure S8. Associations between governance subdomains and AMR prevalence improvements based on random effects model



(A) Associations in 17 early-adopting countries with NAPs launched before the GAP.

(B) Associations in 29 countries with the greatest AMR prevalence improvements.

Results are shown for random effects models. Each point represents the estimated association (regression coefficient) between a governance subdomain score and the change in AMR prevalence score; error bars indicate 95%

confidence intervals. P values were obtained from two-sided tests of the null hypothesis that the coefficient equals zero.

Abbreviations: AMR=Antimicrobial resistance. AMU=Antimicrobial use. CI=Confidence intervals. GAP=Global action plan. NAP=National action plan.

2. Controlling for pandemic-era confounding (2020–2021)

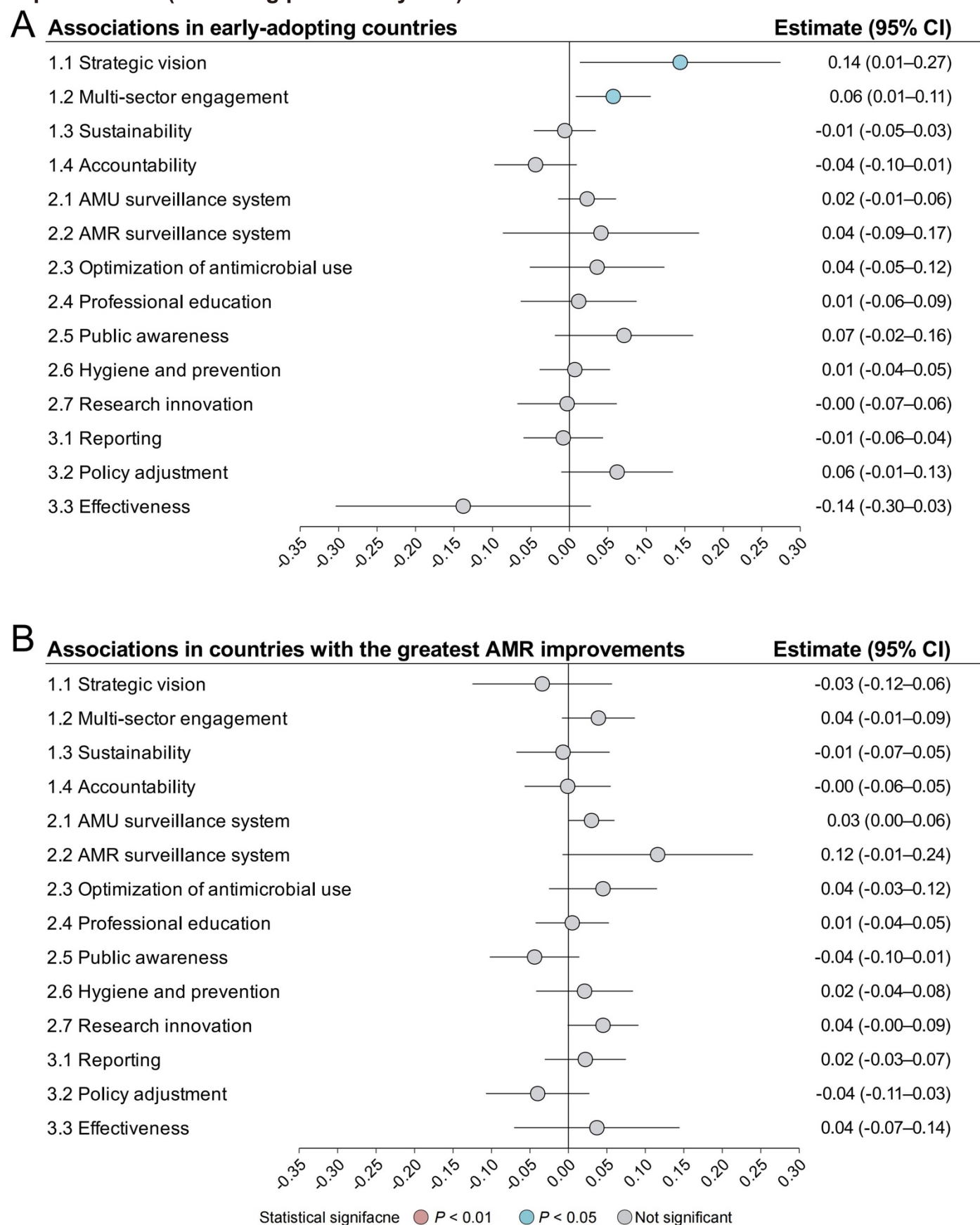
Given that 2020–2021 encompass the COVID-19 pandemic, which may have influenced AMR surveillance, antimicrobial use, healthcare system strain, and reporting, we employed three complementary strategies to assess robustness.

2.1 Removing the pandemic years (2020–2021)

After restricting the study window to 2017–2019, fixed effects models were re-estimated for both country groups. In the 17 early-adopting countries, subdomain *1.1 Strategic vision* ($\beta = 0.14$, 95% CI: 0.01-0.27, $p < 0.05$) and subdomain *1.2 Multi-sector engagement* ($\beta = 0.06$, 95% CI: 0.01-0.11, $p < 0.05$) remained significant, while other subdomains became non-significant (Figure S9). For the 29 high-improvement countries, most associations became statistically non-significant.

This attenuation likely reflects the substantial reduction in temporal variation when truncating the dataset to 2017-2019 only (a 40% reduction in the analytic timeframe). Given our DID findings that governance effects generally require multiple years to materialize, removing two of the five available years may have limited the ability to detect subdomains whose impacts emerge more gradually. In other words, the loss of post-adoption observation time may have suppressed measurable effects in subdomains that exert influence over longer implementation horizons, rather than indicating that these subdomains lack relevance. The persistence of *1.2 Multi-sector engagement* across reduced time windows reinforces its foundational role in enabling coordinated One Health governance systems.

Figure S9. Associations between governance subdomains and AMR prevalence improvements (excluding pandemic years)



(A) Associations in 17 early-adopting countries with NAPs launched before the GAP.

(B) Associations in 29 countries with the greatest AMR prevalence improvements.

Results are shown for excluding pandemic years. Each point represents the estimated association (regression coefficient) between a governance subdomain score and the change in AMR prevalence score; error bars indicate 95% confidence intervals. P values were obtained from two-sided tests of the null hypothesis that the coefficient equals zero.

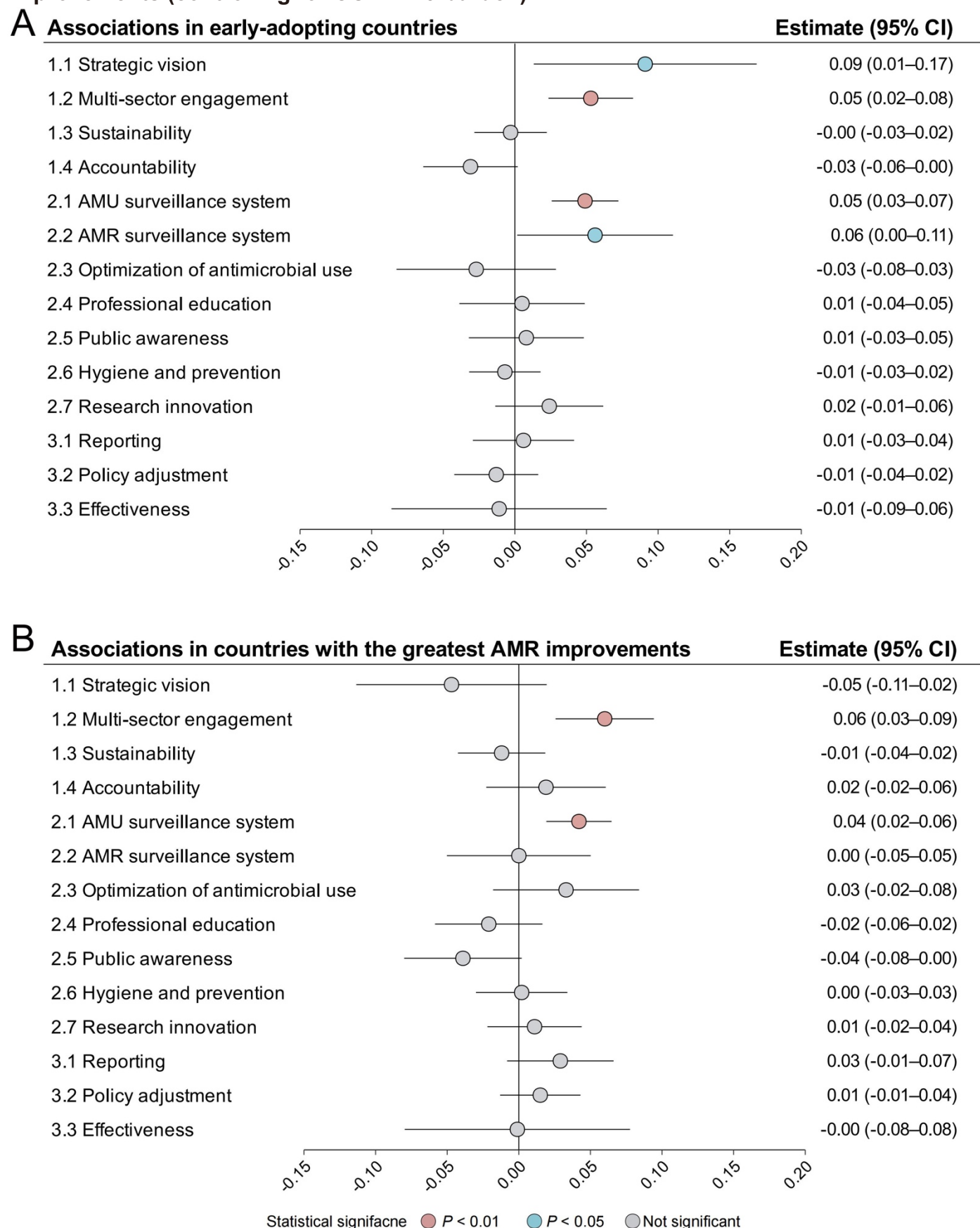
Abbreviations: AMR=Antimicrobial resistance. AMU=Antimicrobial use. CI=Confidence intervals. GAP=Global action plan. NAP=National action plan.

2.2 Controlling for pandemic intensity

To account for pandemic impacts while retaining the full 2017–2021 window, we first adjusted for age-standardized COVID-19 death rates (from GBD). Results remained highly consistent with the main fixed effects estimates: in early-adopting countries, subdomains *1.1 Strategic vision* ($\beta = 0.09$, 95% CI: 0.01-0.17, $p < 0.05$), *1.2 Multi-sector engagement* ($\beta = 0.05$, 95% CI: 0.02-0.08, $p < 0.01$), *2.1 AMU surveillance* ($\beta = 0.05$, 95% CI: 0.03-0.07, $p < 0.01$), and *2.2 AMR surveillance system* ($\beta = 0.06$, 95% CI: 0.00-0.11, $p < 0.05$) were all significantly associated with AMR improvement (Figure S10).

We further constructed a respiratory infection–related death rates variable by combining age-standardized death rates from COVID-19, upper respiratory infections, and lower respiratory infections (from GBD), recognizing that these causes are independently estimated in GBD. In this specification, only *1.1 Strategic vision* lost significance in the early-adopting group, while *1.2 Multi-sector engagement* ($\beta = 0.05$, 95% CI: 0.02-0.08, $p < 0.01$) and *2.1 AMU surveillance system* ($\beta = 0.05$, 95% CI: 0.03-0.07, $p < 0.01$) remained consistently significant (Figure S11). This further supports the robustness of these two subdomains.

Figure S10. Associations between governance subdomains and AMR prevalence improvements (controlling for COVID-19 burden)



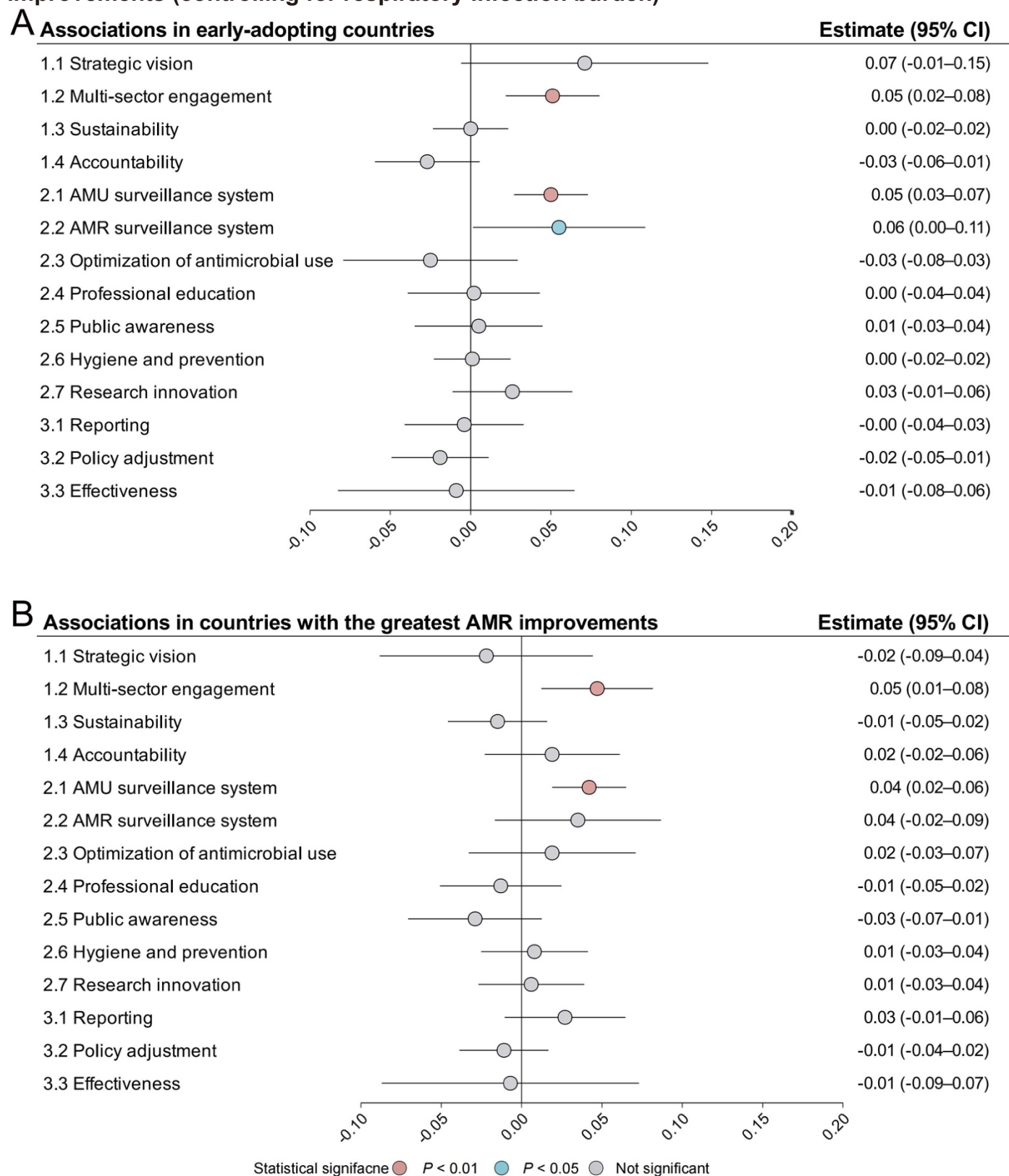
(A) Associations in 17 early-adopting countries with NAPs launched before the GAP.

(B) Associations in 29 countries with the greatest AMR prevalence improvements.

Results are shown for controlling for COVID-19 burden. Each point represents the estimated association (regression coefficient) between a governance subdomain score and the change in AMR prevalence score; error bars indicate 95% confidence intervals. P values were obtained from two-sided tests of the null hypothesis that the coefficient equals zero.

Abbreviations: AMR=Antimicrobial resistance. AMU=Antimicrobial use. CI=Confidence intervals. GAP=Global action plan. NAP=National action plan.

Figure S11. Associations between governance subdomains and AMR prevalence improvements (controlling for respiratory infection burden)



(A) Associations in 17 early-adopting countries with NAPs launched before the GAP.

(B) Associations in 29 countries with the greatest AMR prevalence improvements.

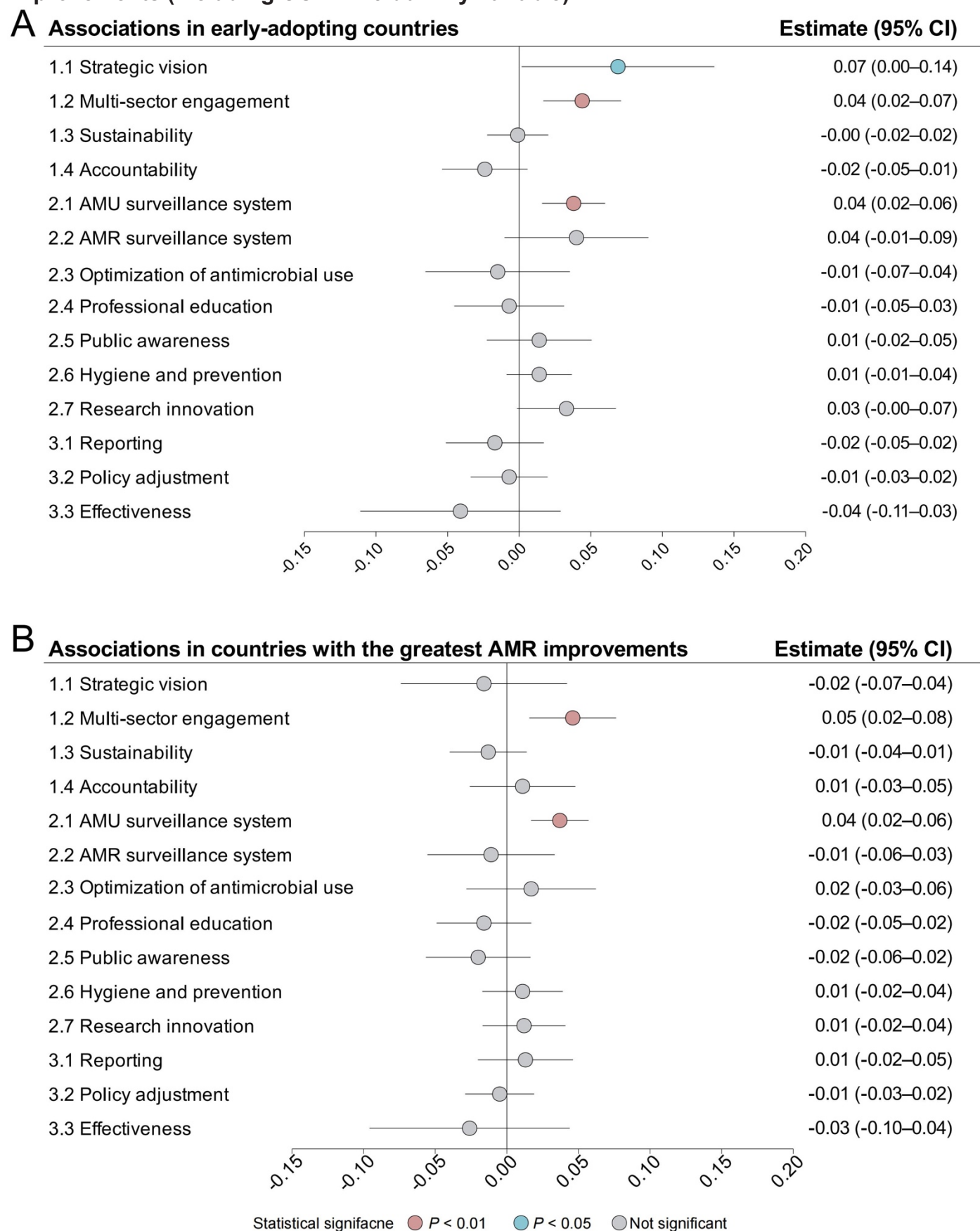
Results are shown for controlling for respiratory infection burden. Each point represents the estimated association (regression coefficient) between a governance subdomain score and the change in AMR prevalence score; error bars indicate 95% confidence intervals. P values were obtained from two-sided tests of the null hypothesis that the coefficient equals zero.

Abbreviations: AMR=Antimicrobial resistance. AMU=Antimicrobial use. CI=Confidence intervals. GAP=Global action plan. NAP=National action plan.

2.3 Including a pandemic-period dummy variable

Finally, we introduced a COVID-period dummy variable (0 for 2017–2019, 1 for 2020–2021) into the fixed effects models. Relative to the primary results, only *2.2 AMR surveillance system* lost significance in the early-adopting group, while *1.2 Multi-sector engagement* ($\beta = 0.04$, 95% CI: 0.02-0.07, $p < 0.01$) and *2.1 AMU surveillance system* ($\beta = 0.04$, 95% CI: 0.02-0.06, $p < 0.01$) remained significant (Figure S12).

Figure S12. Associations between governance subdomains and AMR prevalence improvements (including COVID-19 dummy variable)



(A) Associations in 17 early-adopting countries with NAPs launched before the GAP.

(B) Associations in 29 countries with the greatest AMR prevalence improvements.

Results are shown for including COVID-19 dummy variable. Each point represents the estimated association (regression coefficient) between a governance subdomain score and the change in AMR prevalence score; error bars indicate 95% confidence intervals. P values were obtained from two-sided tests of the null hypothesis that the coefficient equals zero.

Abbreviations: AMR=Antimicrobial resistance. AMU=Antimicrobial use. CI=Confidence intervals. GAP=Global action plan. NAP=National action plan.

Across all model specifications and pandemic-period adjustments, two subdomains repeatedly demonstrate robust positive associations with AMR prevalence improvement:

1.2 Multi-sector engagement — highlighting the necessity of coordinated One Health–aligned governance structures;

2.1 AMU surveillance system — emphasizing the foundational role of systematic antimicrobial use monitoring in guiding stewardship and policy implementation.

Although removing pandemic years reduced temporal variation and weakened significance for several subdomains, this may appear attributable to the shortened observation window, consistent with the lagged nature of governance effects observed in the DID models.

Taken together, these results reinforce that effective AMR governance requires both cross-sector coordination and actionable surveillance capacity, particularly in the formative years of national AMR strategy implementation.