Opportunities and challenges to improving antibiotic prescribing practices through a One Health approach: results of a comparative survey of doctors, dentists, and veterinarians

Supplementary Material

This document provides additional details on participant recruitment and complete data tables corresponding with data in Figures 1, 2, and 3.

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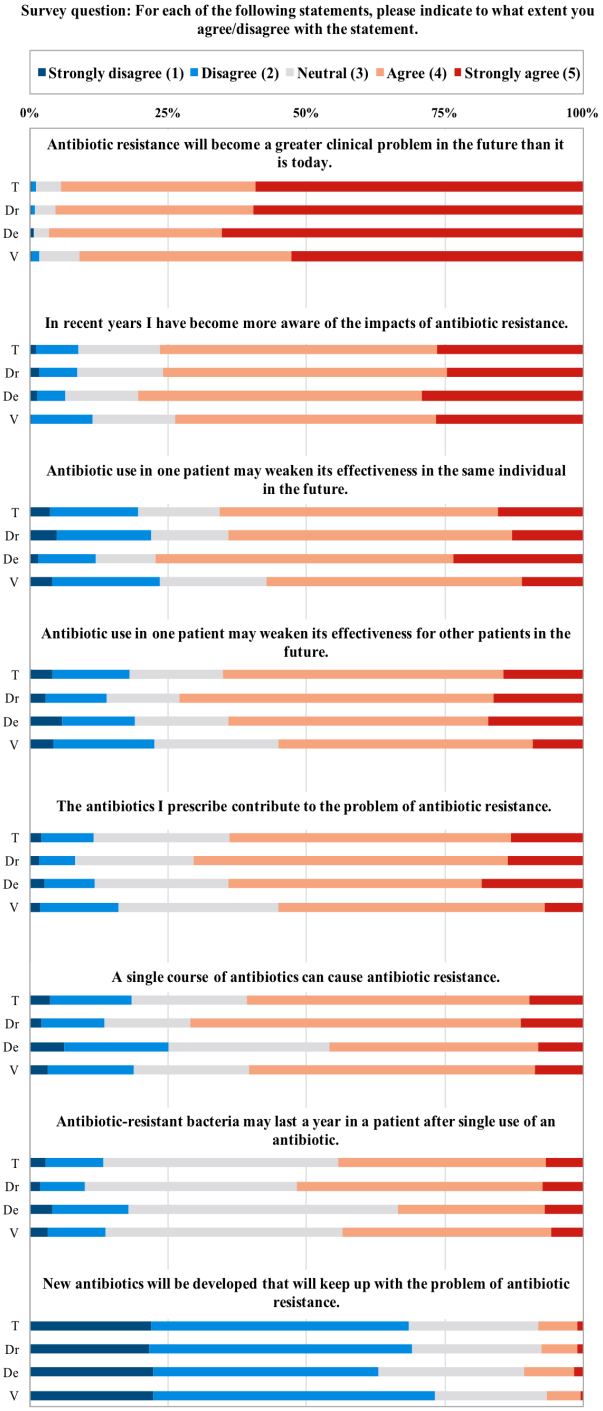
Additional details on recruitment and data collection

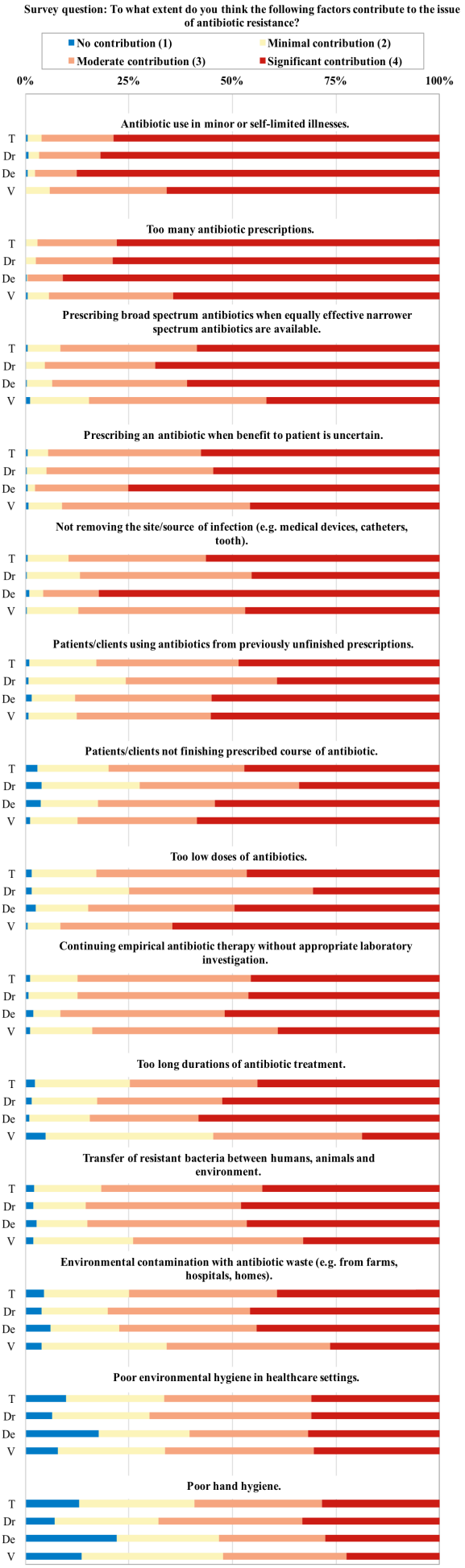
Respondents were reached through various channels including organisations, professional associations, and colleges via their newsletters, bulletins, forum announcements, and websites that targeted their membership and contacts (Supplementary Table 1). Other organisations and individuals who assisted with circulation of the survey (and may have been notified indirectly of the survey through a process of 'passive snowballing') may not be listed below.

Supplementary Table 1. Channels and modes through which potential participants were notified of the online survey.

ORGANISATION/ASSOCIATION/COLLEGE:	Mode of recruitment/ notification:
GENERAL PRACTITIONERS (GPs) ACROSS AUSTRALIA WERE NOTIFIED VIA:	
PHCRIS	Newsletter
NPS MedicineWise	Newsletter
Royal Australian College of General Practitioners (RACGP) – Western Australian and Special Interests branches	Newsletter
Australian Medial Association (AMA) – Federal branch	GP News bulletin
GP Partners Australia (South Australia)	Newsletter
'Australian Doctor' and '6-minute Doctor' publications	Website item
Australian Health Practitioner Regulation Agency (AHPRA) – Medical Board of Australia	Newsletter
Primary Health Networks (PHNs) in all states: At least one PHN assisted in each state and territory. (Not all PHNs that were approached, agreed to assist)	Various: Newsletter items, email broadcast, website items
Australian Association of Practice Management Ltd	Website item
Department of Health, Office of Health Protection contacts (National AMR Strategy)	Email items
Other mailing lists and publications of researchers' contacts	Email items
HOSPITAL-BASED DOCTORS ACROSS AUSTRALIA WERE NOTIFIED VIA:	
Royal Australian College of Physicians	Newsletter
Royal Australasian College of Surgeons	Newsletter/website item
Australian Paediatric Surveillance Unit	Newsletter/website item
Australian Health Practitioner Regulation Agency (AHPRA) – Medical Board of Australia	Newsletter
Department of Health, Office of Health Protection contacts (National AMR Strategy)	Email items
Other mailing lists and publications of researchers' contacts	Email items
DENTISTS ACROSS AUSTRALIA WERE NOTIFIED VIA:	
Australian Dental Association (ADA) branches in: New South Wales, Western Australia, South Australia, Queensland, Northern Territory, Tasmania.	Various: Newsletter items, email broadcast, website items
Royal Australasian College of Dental Surgeons	Online item
The University of Sydney Continuing Education in Dentistry	Newsletter
'Australasian Dentist' publication	Email broadcast service
Other mailing lists and publications of researchers' contacts	Email items
VETERINARIANS ACROSS AUSTRALIA WERE NOTIFIED VIA:	
Australian Veterinary Association (AVA)	Newsletter
The University of Sydney Centre for Veterinary Education	Newsletter
Veterinary Practitioners and Surgeons Boards in the following states: New South Wales, Australian Capital Territory, Western Australia, Tasmania, Northern Territory, Victoria, South Australia.	Various: Newsletter items, email broadcast, website items
Department of Health, Office of Health Protection contacts (National AMR Strategy)	Email items
Other mailing lists and publications of researchers' contacts	Email items

Supplementary Figure 1. Stacked bar charts of responses regarding knowledge and beliefs about antibiotic resistance (corresponds with Figure 1a), and perceptions of drivers contributing to the issue of antibiotic resistance (corresponds with Figure 1b).





T – Total survey sample
Dr – Doctors
De – Dentists
V – Veterinarians

Supplementary Table 2. Relative extent to which respondents agreed/disagreed with statements about antibiotic resistance and Kruskal-Wallis test results (Figure 1a data).

Survey question: For each of the following statements, please indicate to what extent you agree/disagree with the statement.																	
	Responses																
	Strongly disagree (1)		Disagree (2)		Neutral (3)		Agree (4)		Strongly agree (5)		Valid Total	Total	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%	n	%							
Antibiotic resistance will become a greater clinical problem in the future than it is today.																	
Total	4	0.3	8	0.7	57	4.6	432	35.2	726	59.2	1227	1330	103	5 (1)	-	0·001	-
Doctor	1	0.2	3	0.6	20	3.9	183	35.7	306	59.6	513	547	34	5 (1)	619	-	a
Dentist	2	0.6	0	0.0	10	2.9	107	31.1	225	65.4	344	380	36	5 (1)	655	-	a
Veterinarian	1	0.3	5	1.4	27	7.3	142	38.4	195	52.7	370	403	33	5 (1)	568	-	b
In recent years I have become more aware of the impacts of antibiotic resistance.																	
Total	13	1.1	95	7.7	180	14.7	615	50.1	325	26.5	1228	1330	102	4 (1)	-	0·113	-
Doctor	8	1.6	36	7.0	80	15.6	263	51.3	126	24.6	513	547	34	4 (0)	603	-	-
Dentist	4	1.2	18	5.2	45	13.1	177	51.5	100	29.1	344	380	36	4 (1)	646	-	-
Veterinarian	1	0.3	41	11.1	55	14.8	175	47.2	99	26.7	371	403	32	4 (2)	602	-	-
Antibiotic use in one patient may weaken its effectiveness in the same individual in the future.																	
Total	45	3.7	196	15.9	181	14.7	621	50.4	188	15.3	1231	1330	99	4 (1)	-	<0·001	-
Doctor	25	4.9	88	17.1	72	14.0	264	51.3	66	12.8	515	547	32	4 (1)	594	-	a
Dentist	5	1.5	36	10.5	37	10.8	185	53.8	81	23.5	344	380	36	4 (0)	713	-	b
Veterinarian	15	4.0	72	19.4	72	19.4	172	46.2	41	11.0	372	403	31	4 (1)	557	-	a
Antibiotic use in one patient may weaken its effectiveness for other patients in the future.																	
Total	51	4.1	169	13.8	209	17.0	624	50.8	176	14.3	1229	1330	101	4 (1)	-	<0·001	-
Doctor	15	2.9	56	10.9	68	13.2	292	56.8	83	16.1	514	547	33	4 (1)	664	-	a
Dentist	20	5.8	45	13.1	58	16.9	161	46.9	59	17.2	343	380	37	4 (1)	619	-	a
Veterinarian	16	4.3	68	18.3	83	22.3	171	46.0	34	9.1	372	403	31	4 (1)	544	-	b
The antibiotics I prescribe contribute to the problem of antibiotic resistance.																	
Total	24	2.0	117	9.6	300	24.5	625	51.0	159	13.0	1225	1330	105	4 (1)	-	<0·001	-
Doctor	8	1.6	34	6.6	110	21.4	291	56.7	70	13.6	513	547	34	4 (1)	652	-	a
Dentist	9	2.6	31	9.0	83	24.2	157	45.8	63	18.4	343	380	37	4 (1)	634	-	a
Veterinarian	7	1.9	52	14.1	107	29.0	177	48.0	26	7.0	369	403	34	4 (1)	539	-	b
A single course of antibiotics can cause antibiotic resistance.																	
Total	44	3.6	181	14.7	257	20.9	628	51.1	118	9.6	1228	1330	102	4 (1)	-	<0·001	-

Survey question: For each of the following statements, please indicate to what extent you agree/disagree with the statement.																	
	Responses																
	Strongly disagree (1)		Disagree (2)		Neutral (3)		Agree (4)		Strongly agree (5)		Valid Total	Total	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%	n	%							
Doctor	11	2.1	58	11.3	80	15.6	306	59.6	58	11.3	513	547	34	4 (1)	678	-	a
Dentist	21	6.1	65	18.9	100	29.1	130	37.8	28	8.1	344	380	36	3 (1.5)	526	-	b
Veterinarian	12	3.2	58	15.6	77	20.8	192	51.8	32	8.6	371	403	32	4 (1)	608	-	c
Antibiotic-resistant bacteria may last a year in a patient after single use of an antibiotic.																	
Total	35	2.9	128	10.4	521	42.5	459	37.4	83	6.8	1226	1330	104	3 (1)	-	<0·001	-
Doctor	9	1.8	42	8.2	196	38.2	228	44.4	38	7.4	513	547	34	4 (1)	664	-	a
Dentist	14	4.1	47	13.7	167	48.7	91	26.5	24	7.0	343	380	37	3 (1)	546	-	b
Veterinarian	12	3.2	39	10.5	158	42.7	140	37.8	21	5.7	370	403	33	3 (1)	605	-	b
New antibiotics will be developed that will keep up with the problem of antibiotic resistance.																	
Total	269	22.0	571	46.6	285	23.3	87	7.1	13	1.1	1225	1330	105	2 (1)	-	0·106	-
Doctor	111	21.6	243	47.4	120	23.4	34	6.6	5	1.0	513	547	34	2 (1)	611	-	-
Dentist	76	22.2	140	40.8	90	26.2	31	9.0	6	1.7	343	380	37	2 (1)	641	-	-
Veterinarian	82	22.2	188	50.9	75	20.3	22	6.0	2	0.5	369	403	34	2 (1)	589	-	-

[¶] Kruskal-Wallis test P-value

[§] Groups with letters in common are not significantly different (P-value of pairwise comparison >0.05); Groups with different letters are significantly different (P-value of comparison >0.05); Groups with different letters are significantly different (P-value of pairwise comparison <0.05).

Supplementary Table 3. Relative extent to which respondents believed the listed factors as contributing to the issue of antibiotic resistance and Kruskal-Wallis test results (Figure 1b data).

Survey question: To what extent do you think the following factors contribute to the issue of antibiotic resistance?																
	Responses															
	No contribution (1)		Minimal contribution (2)		Moderate contribution (3)		Significant contribution (4)		Valid Total	Total	Unsure	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%								
Antibiotic use in minor or self-limited illnesses.																
Total	6	0.5	40	3.3	209	17.4	943	78.7	1198	1330	14	118	4 (0)	-	<0·001	-
Doctor	4	0.8	13	2.6	74	14.7	412	81.9	503	547	2	42	4 (0)	618	-	a
Dentist	2	0.6	6	1.8	33	9.9	294	87.8	335	380	6	39	4 (0)	653	-	a
Veterinarian	0	0.0	21	5.8	102	28.3	237	65.8	360	403	6	37	4 (1)	523	-	b
Too many antibiotic prescriptions.																
Total	3	0.2	32	2.7	231	19.1	941	78.0	1207	1330	10	113	4 (0)	-	<0·001	-
Doctor	0	0.0	13	2.6	93	18.4	399	79.0	505	547	3	39	4 (0)	611	-	a
Dentist	1	0.3	1	0.3	29	8.5	309	90.9	340	380	1	39	4 (0)	683	-	b
Veterinarian	2	0.6	18	5.0	109	30.1	233	64.4	362	403	6	35	4 (1)	521	-	c
Prescribing broad spectrum antibiotics when equally effective narrower spectrum antibiotics are available.																
Total	6	0.5	93	7.9	391	33.1	690	58.5	1180	1330	35	115	4 (1)	-	<0·001	-
Doctor	1	0.2	22	4.4	133	26.7	343	68.7	499	547	7	41	4 (1)	655	-	a
Dentist	1	0.3	20	6.2	106	32.6	198	60.9	325	380	16	39	4 (1)	609	-	a
Veterinarian	4	1.1	51	14.3	152	42.7	149	41.9	356	403	12	35	3 (1)	483	-	b
Prescribing an antibiotic when benefit to patient is uncertain.																
Total	7	0.6	58	4.9	440	36.9	688	57.7	1193	1330	22	115	4 (1)	-	<0·001	-
Doctor	2	0.4	23	4.6	203	40.4	274	54.6	502	547	5	40	4 (1)	581	-	a
Dentist	2	0.6	6	1.8	75	22.5	251	75.1	334	380	6	40	4 (0)	703	-	b
Veterinarian	3	0.8	29	8.1	162	45.4	163	45.7	357	403	11	35	3 (1)	520	-	c
Not removing the site/source of infection (e.g. medical devices, catheters, tooth).																
Total	6	0.5	114	10.0	379	33.1	645	56.4	1144	1330	70	116	4 (1)	-	<0·001	-
Doctor	2	0.4	60	12.7	197	41.6	215	45.4	474	547	32	41	3 (1)	510	-	a
Dentist	3	0.9	11	3.4	44	13.5	269	82.3	327	380	14	39	4 (0)	720	-	b
Veterinarian	1	0.3	43	12.5	138	40.2	161	46.9	343	403	24	36	3 (1)	519	-	a
Patients/clients using antibiotics from																

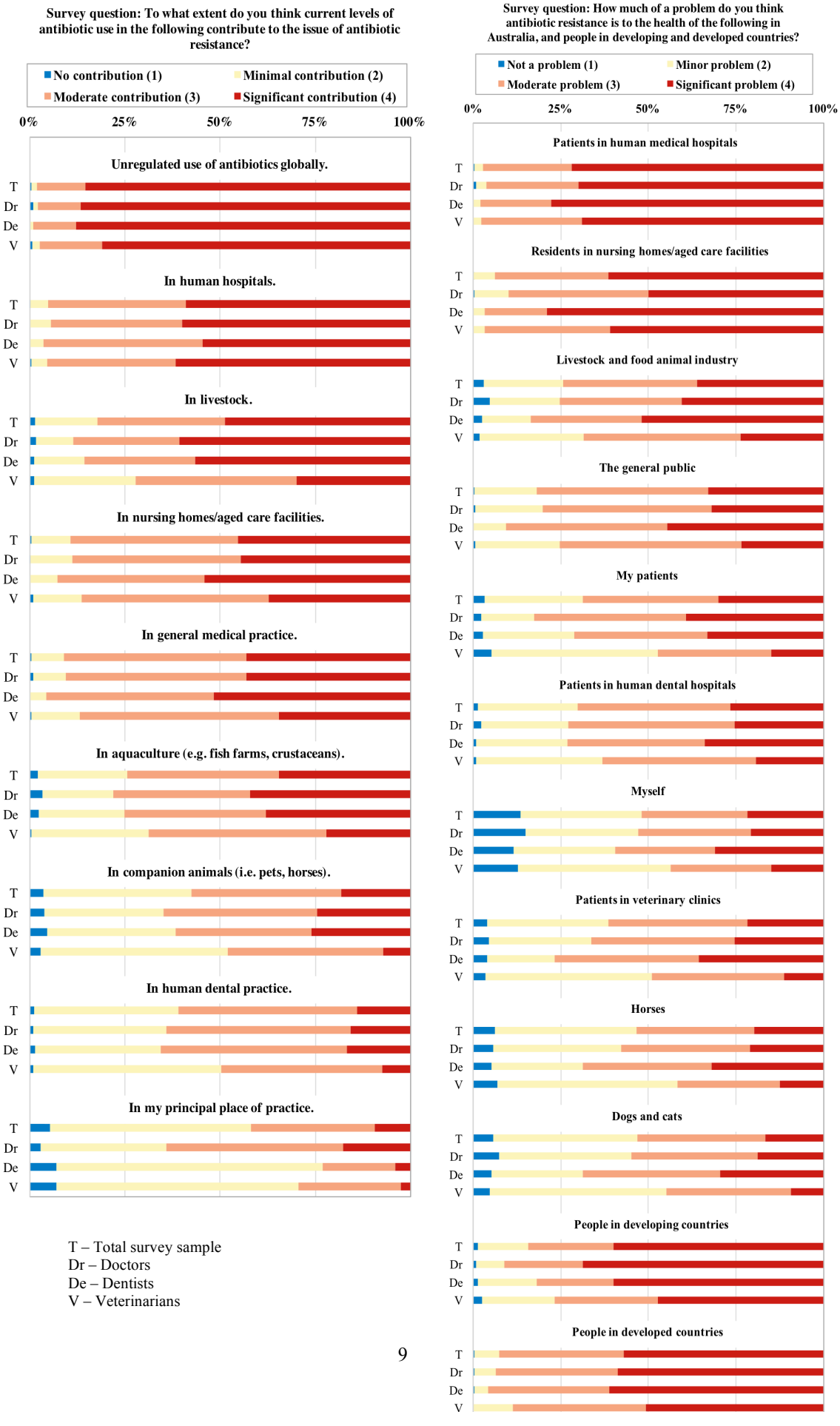
Survey question: To what extent do you think the following factors contribute to the issue of antibiotic resistance?																
	Responses															
	No contribution (1)		Minimal contribution (2)		Moderate contribution (3)		Significant contribution (4)		Valid Total	Total	Unsure	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%								
previously unfinished prescriptions.																
Total	12	1.0	189	16.2	400	34.3	566	48.5	1167	1330	48	115	3 (1)	-	<0·001	-
Doctor	4	0.8	114	23.5	177	36.5	190	39.2	485	547	22	40	3 (1)	518	-	a
Dentist	5	1.5	34	10.5	107	33.0	178	54.9	324	380	17	39	4 (1)	630	-	b
Veterinarian	3	0.8	41	11.5	116	32.4	198	55.3	358	403	9	36	4 (1)	632	-	b
Patients/clients not finishing prescribed course of antibiotic.																
Total	35	3.0	199	17.2	379	32.7	547	47.2	1160	1330	52	118	3 (1)	-	<0·001	-
Doctor	19	3.9	114	23.6	186	38.5	164	34.0	483	547	23	41	3 (2)	497	-	a
Dentist	12	3.8	44	13.8	90	28.1	174	54.4	320	380	20	40	4 (1)	621	-	b
Veterinarian	4	1.1	41	11.5	103	28.9	209	58.5	357	403	9	37	4 (1)	657	-	b
Too low doses of antibiotics.																
Total	17	1.5	176	15.6	411	36.4	524	46.5	1128	1330	84	118	3 (1)	-	<0·001	-
Doctor	7	1.5	110	23.6	207	44.4	142	30.5	466	547	39	42	3 (2)	466	-	a
Dentist	8	2.6	38	12.5	107	35.3	150	49.5	303	380	37	40	3 (1)	583	-	b
Veterinarian	2	0.6	28	7.8	97	27.0	232	64.6	359	403	8	36	4 (1)	676	-	c
Continuing empirical antibiotic therapy without appropriate laboratory investigation.																
Total	14	1.2	132	11.4	486	41.9	528	45.5	1160	1330	54	116	3 (1)	-	0·001	-
Doctor	4	0.8	58	11.8	202	41.1	227	46.2	491	547	15	41	3 (1)	584	-	a,b
Dentist	6	1.9	20	6.5	122	39.6	160	51.9	308	380	32	40	4 (1)	625	-	a
Veterinarian	4	1.1	54	15.0	162	44.9	141	39.1	361	403	7	35	3 (1)	537	-	b
Too long durations of antibiotic treatment.																
Total	27	2.4	258	22.8	349	30.8	499	44.0	1133	1330	82	115	3 (2)	-	<0·001	-
Doctor	8	1.6	77	15.8	146	30.0	255	52.5	486	547	22	39	4 (1)	627	-	a
Dentist	3	1.0	45	14.5	82	26.4	181	58.2	311	380	29	40	4 (1)	659	-	a
Veterinarian	16	4.8	136	40.5	121	36.0	63	18.8	336	403	31	36	3 (1)	395	-	b
Transfer of resistant bacteria between humans, animals and environment.																
Total	24	2.2	177	16.1	427	38.9	470	42.8	1098	1330	112	120	3 (1)	-	<0·001	-
Doctor	9	2.0	58	12.6	172	37.4	221	48.0	460	547	46	41	3 (1)	585	-	a
Dentist	8	2.8	35	12.2	111	38.5	134	46.5	288	380	49	43	3 (1)	576	-	a

Survey question: To what extent do you think the following factors contribute to the issue of antibiotic resistance?																
	Responses															
	No contribution (1)		Minimal contribution (2)		Moderate contribution (3)		Significant contribution (4)		Valid Total	Total	Unsure	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%								
Veterinarian	7	2.0	84	24.0	144	41.1	115	32.9	350	403	17	36	3 (2)	482	-	b
Environmental contamination with antibiotic waste (e.g. from farms, hospitals, homes).																
Total	47	4.5	217	20.6	375	35.6	414	39.3	1053	1330	159	118	3 (2)	-	<0·001	-
Doctor	17	3.8	72	16.1	153	34.3	204	45.7	446	547	60	41	3 (1)	568	-	a
Dentist	17	6.0	47	16.7	93	33.1	124	44.1	281	380	58	41	3 (1)	551	-	a
Veterinarian	13	4.0	98	30.1	129	39.6	86	26.4	326	403	41	36	3 (2)	450	-	b
Poor environmental hygiene in healthcare settings.																
Total	107	9.8	261	23.8	388	35.4	339	31.0	1095	1330	116	119	3 (2)	-	0·097	-
Doctor	30	6.4	110	23.5	184	39.2	145	30.9	469	547	37	41	3 (2)	566	-	-
Dentist	50	17.7	62	21.9	81	28.6	90	31.8	283	380	56	41	3 (2)	517	-	-
Veterinarian	27	7.9	89	25.9	123	35.9	104	30.3	343	403	23	37	3 (2)	548	-	-
Poor hand hygiene.																
Total	141	13.0	302	27.8	335	30.8	310	28.5	1088	1330	121	121	3 (2)	-	<0·001	-
Doctor	33	7.0	118	25.1	163	34.7	156	33.2	470	547	35	42	3 (2)	600	-	a
Dentist	63	22.1	70	24.6	73	25.6	79	27.7	285	380	53	42	3 (2)	503	-	b
Veterinarian	45	13.5	114	34.2	99	29.7	75	22.5	333	403	33	37	3 (1)	502	-	b

[¶] Kruskal-Wallis test P-value

[§] Groups with letters in common are not significantly different (P-value of pairwise comparison >0.05); Groups with different letters are significantly different (P-value of comparison >0.05); Groups with different letters are significantly different (P-value of pairwise comparison <0.05).

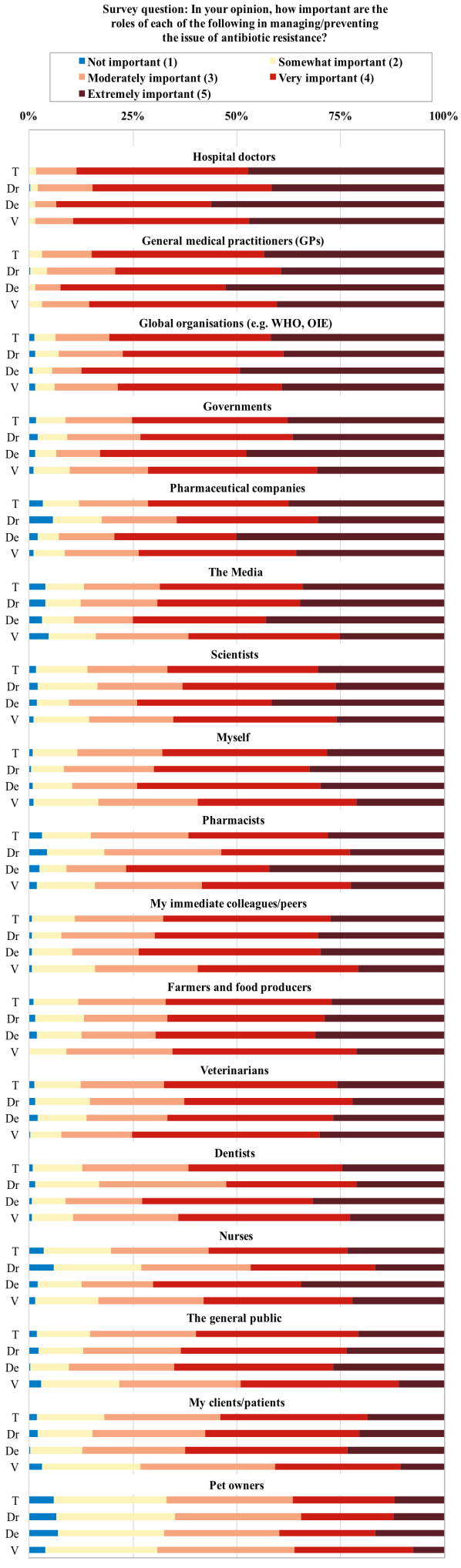
Supplementary Figure 2. Stacked bar charts of responses regarding beliefs about current levels of antibiotic use as drivers of antibiotic resistance (corresponds with Figure 2a), and the extent of the problem of antibiotic resistance (corresponds with Figure 2b).



T – Total survey sample
Dr – Doctors
De – Dentists
V – Veterinarians

Supplementary Figure 3. Stacked bar charts of responses regarding perceived importance of stakeholders in managing/preventing the issue of antibiotic resistance (corresponds with Figure 2c).

T – Total survey sample
Dr – Doctors
De – Dentists
V – Veterinarians



Supplementary Table 4. Relative extent to which respondents believed that current levels of antibiotic use as contributing to antibiotic resistance and Kruskal-Wallis test results (Figure 2a data).

Survey question: To what extent do you think CURRENT LEVELS OF ANTIBIOTIC USE in the following contribute to the issue of antibiotic resistance?																
	Responses															
	No contribution (1)		Minimal contribution (2)		Moderate contribution (3)		Significant contribution (4)		Valid Total	Total	Unsure	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%								
Unregulated use of antibiotics globally.																
Total	6	0.5	16	1.4	144	12.8	963	85.3	1129	1330	72	129	4 (0)	-	0·021	-
Doctor	4	0.8	6	1.3	53	11.2	410	86.7	473	547	29	45	4 (0)	572	-	a,b
Dentist	0	0.0	3	1.0	35	11.1	277	87.9	315	380	22	43	4 (0)	580	-	a
Veterinarian	2	0.6	7	2.1	56	16.4	276	80.9	341	403	21	41	4 (0)	540	-	b
In human hospitals.																
Total	1	0.1	51	4.6	404	36.4	655	59.0	1111	1330	91	128	4 (1)	-	0·245	-
Doctor	0	0.0	27	5.6	166	34.3	291	60.1	484	547	19	44	4 (1)	560	-	-
Dentist	0	0.0	11	3.5	132	42.0	171	54.5	314	380	23	43	4 (1)	535	-	-
Veterinarian	1	0.3	13	4.2	106	33.9	193	61.7	313	403	49	41	4 (1)	571	-	-
In livestock.																
Total	13	1.4	159	16.5	320	33.3	470	48.9	962	1330	242	126	3 (1)	-	<0·001	-
Doctor	6	1.6	37	9.8	105	27.8	230	60.8	378	547	124	45	4 (1)	544	-	a
Dentist	3	1.2	32	13.1	71	29.1	138	56.6	244	380	93	43	4 (1)	520	-	a
Veterinarian	4	1.2	90	26.5	144	42.4	102	30.0	340	403	25	38	3 (2)	384	-	b
In nursing homes/aged care facilities.																
Total	3	0.3	102	10.4	431	44.0	444	45.3	980	1330	220	130	3 (1)	-	<0·001	-
Doctor	1	0.2	49	11.0	198	44.3	199	44.5	447	547	54	46	3 (1)	486	-	a
Dentist	0	0.0	20	7.2	108	38.8	150	54.0	278	380	58	44	4 (1)	538	-	b
Veterinarian	2	0.8	33	12.9	125	49.0	95	37.3	255	403	108	40	3 (1)	447	-	a
In general medical practice.																
Total	5	0.4	98	8.6	546	47.9	490	43.0	1139	1330	65	126	3 (1)	-	<0·001	-
Doctor	4	0.8	42	8.6	231	47.4	210	43.1	487	547	17	43	3 (1)	569	-	a
Dentist	0	0.0	14	4.4	141	44.1	165	51.6	320	380	16	44	4 (1)	630	-	b
Veterinarian	1	0.3	42	12.7	174	52.4	115	34.6	332	403	32	39	3 (1)	514	-	c
In aquaculture (e.g. fish farms, crustaceans)																
Total	16	2.1	178	23.6	300	39.7	261	34.6	755	1330	447	128	3 (2)	-	<0·001	-
Doctor	10	3.3	57	18.6	110	35.9	129	42.2	306	547	196	45	3 (1)	407	-	a
Dentist	5	2.4	46	22.4	76	37.1	78	38.0	205	380	132	43	3 (1)	389	-	a
Veterinarian	1	0.4	75	30.7	114	46.7	54	22.1	244	403	119	40	3 (1)	332	-	b

Survey question: To what extent do you think CURRENT LEVELS OF ANTIBIOTIC USE in the following contribute to the issue of antibiotic resistance?																
	Responses															
	No contribution (1)		Minimal contribution (2)		Moderate contribution (3)		Significant contribution (4)		Valid Total	Total	Unsure	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%								
In companion animals (i.e. pets, horses).																
Total	33	3.7	349	38.7	355	39.4	164	18.2	901	1330	301	128	3 (1)	-	<0·001	-
Doctor	13	3.9	105	31.3	135	40.3	82	24.5	335	547	168	44	3 (1)	492	-	a
Dentist	10	4.6	74	33.8	78	35.6	57	26.0	219	380	117	44	3 (2)	484	-	a
Veterinarian	10	2.9	170	49.0	142	40.9	25	7.2	347	403	16	40	2 (1)	391	-	b
In human dental practice.																
Total	10	1.1	347	38.0	428	46.9	127	13.9	912	1330	290	128	3 (1)	-	<0·001	-
Doctor	3	0.9	121	35.1	167	48.4	54	15.7	345	547	158	44	3 (1)	474	-	a
Dentist	5	1.5	108	32.9	160	48.8	55	16.8	328	380	9	43	3 (1)	482	-	a
Veterinarian	2	0.8	118	49.4	101	42.3	18	7.5	239	403	123	41	2 (1)	396	-	b
In my principal place of practice.																
Total	62	5.3	613	52.7	381	32.7	108	9.3	1164	1330	39	127	2 (1)	-	<0·001	-
Doctor	14	2.9	160	33.1	224	46.3	86	17.8	484	547	19	44	3 (1)	721	-	a
Dentist	23	7.1	227	69.8	62	19.1	13	4.0	325	380	11	44	2 (0)	470	-	b
Veterinarian	25	7.0	226	63.7	95	26.8	9	2.5	355	403	9	39	2 (1)	497	-	b

[¶] Kruskal-Wallis test P-value

[§] Groups with letters in common are not significantly different (P-value of pairwise comparison >0.05); Groups with different letters are significantly different (P-value of comparison >0.05); Groups with different letters are significantly different (P-value of pairwise comparison <0.05).

Supplementary Table 5. Relative extent to which respondents believed that antibiotic resistance is a problem to the health of the listed groups and individuals and Kruskal-Wallis test results (Figure 2b data).

Survey question: How much of a problem do you think antibiotic resistance is to the HEALTH of the following in Australia, and people in developing and developed countries?																
	Responses															
	Not a problem (1)		Minor problem (2)		Moderate problem (3)		Significant problem (4)		Valid Total	Total	Unsure	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%								
Patients in human medical hospitals																
Total	4	0.3	30	2.6	294	25.3	835	71.8	1163	1330	41	126	4 (1)	-	0·022	-
Doctor	4	0.8	15	3.0	131	26.3	349	69.9	499	547	5	43	4 (1)	570	-	a
Dentist	0	0.0	7	2.1	66	20.2	253	77.6	326	380	12	42	4 (0)	616	-	b
Veterinarian	0	0.0	8	2.4	97	28.7	233	68.9	338	403	24	41	4 (1)	567	-	a
Residents in nursing homes/aged care facilities																
Total	2	0.2	66	6.0	355	32.4	672	61.4	1095	1330	109	126	4 (1)	-	<0·001	-
Doctor	2	0.4	46	9.7	188	39.8	236	50.0	472	547	31	44	3.5 (1)	481	-	a
Dentist	0	0.0	10	3.2	56	17.8	248	79.0	314	380	24	42	4 (0)	645	-	b
Veterinarian	0	0.0	10	3.2	111	35.9	188	60.8	309	403	54	40	4 (1)	552	-	c
Livestock and food animal industry																
Total	23	3.0	174	22.6	295	38.3	279	36.2	771	1330	428	131	3 (2)	-	<0·001	-
Doctor	12	4.8	50	20.0	87	34.8	101	40.4	250	547	252	45	3 (1)	398	-	a
Dentist	5	2.6	27	13.8	62	31.8	101	51.8	195	380	139	46	4 (1)	453	-	b
Veterinarian	6	1.8	97	29.8	146	44.8	77	23.6	326	403	37	40	3 (1)	337	-	c
The general public																
Total	5	0.4	207	17.8	566	48.7	384	33.0	1162	1330	40	128	3 (1)	-	<0·001	-
Doctor	3	0.6	94	19.2	236	48.2	157	32.0	490	547	12	45	3 (1)	571	-	a
Dentist	0	0.0	31	9.4	152	46.1	147	44.5	330	380	8	42	3 (1)	671	-	b
Veterinarian	2	0.6	82	24.0	178	52.0	80	23.4	342	403	20	41	3 (0)	511	-	c
My patients																
Total	40	3.4	331	27.9	459	38.6	358	30.1	1188	1330	16	126	3 (2)	-	<0·001	-
Doctor	12	2.4	74	14.9	217	43.6	195	39.2	498	547	5	44	3 (1)	688	-	a
Dentist	9	2.7	86	26.1	125	38.0	109	33.1	329	380	8	43	3 (2)	617	-	b
Veterinarian	19	5.3	171	47.4	117	32.4	54	15.0	361	403	3	39	2 (1)	444	-	c
Patients in human dental hospitals																
Total	13	1.4	261	28.4	400	43.5	246	26.7	920	1330	286	124	3 (2)	-	0·001	-
Doctor	8	2.4	84	24.7	162	47.6	86	25.3	340	547	164	43	3 (2)	464	-	a
Dentist	3	0.9	85	26.1	127	39.0	111	34.0	326	380	12	42	3 (2)	494	-	a
Veterinarian	2	0.8	92	36.2	111	43.7	49	19.3	254	403	110	39	3 (1)	413	-	b
Myself																

Survey question: How much of a problem do you think antibiotic resistance is to the HEALTH of the following in Australia, and people in developing and developed countries?																
	Responses															
	Not a problem (1)		Minor problem (2)		Moderate problem (3)		Significant problem (4)		Valid Total	Total	Unsure	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%								
Total	158	13.4	410	34.7	355	30.1	257	21.8	1180	1330	24	126	3 (1)	-	<0·001	-
Doctor	74	15.0	158	32.1	158	32.1	102	20.7	492	547	11	44	3 (1)	586	-	a
Dentist	38	11.5	96	29.1	94	28.5	102	30.9	330	380	7	43	3 (2)	653	-	b
Veterinarian	46	12.8	156	43.6	103	28.8	53	14.8	358	403	6	39	2 (1)	539	-	a
Patients in veterinary clinics																
Total	32	3.9	282	34.7	322	39.6	177	21.8	813	1330	389	128	3 (1)	-	<0·001	-
Doctor	11	4.4	73	29.3	102	41.0	63	25.3	249	547	253	45	3 (2)	430	-	a
Dentist	8	3.9	40	19.3	85	41.1	74	35.7	207	380	130	43	3 (1)	489	-	b
Veterinarian	13	3.6	169	47.3	135	37.8	40	11.2	357	403	6	40	2 (1)	344	-	c
Horses																
Total	42	6.2	274	40.5	226	33.4	135	19.9	677	1330	525	128	3 (1)	-	<0·001	-
Doctor	12	5.7	77	36.7	77	36.7	44	21.0	210	547	293	44	3 (1)	352	-	a
Dentist	9	5.3	44	26.0	62	36.7	54	32.0	169	380	167	44	3 (2)	400	-	b
Veterinarian	21	7.0	153	51.3	87	29.2	37	12.4	298	403	65	40	2 (1)	295	-	c
Dogs and cats																
Total	42	5.7	302	41.1	268	36.5	123	16.7	735	1330	467	128	3 (1)	-	<0·001	-
Doctor	16	7.5	80	37.6	77	36.2	40	18.8	213	547	289	45	3 (1)	374	-	a
Dentist	9	5.3	44	26.0	66	39.1	50	29.6	169	380	168	43	3 (2)	438	-	b
Veterinarian	17	4.8	178	50.4	125	35.4	33	9.3	353	403	10	40	2 (1)	331	-	c
People in developing countries																
Total	16	1.4	158	14.2	271	24.4	666	59.9	1111	1330	91	128	4 (1)	-	<0·001	-
Doctor	4	0.8	38	8.0	107	22.6	325	68.6	474	547	29	44	4 (1)	611	-	a
Dentist	4	1.3	53	16.8	69	21.9	189	60.0	315	380	21	44	4 (1)	551	-	b
Veterinarian	8	2.5	67	20.8	95	29.5	152	47.2	322	403	41	40	3 (1)	479	-	c
People in developed countries																
Total	3	0.3	82	7.0	417	35.7	666	57.0	1168	1330	35	127	4 (1)	-	0·002	-
Doctor	2	0.4	30	6.0	173	34.9	291	58.7	496	547	8	43	4 (1)	595	-	a
Dentist	1	0.3	13	4.0	113	34.5	201	61.3	328	380	8	44	4 (1)	615	-	a
Veterinarian	0	0.0	39	11.3	131	38.1	174	50.6	344	403	19	40	4 (1)	540	-	b

[¶] Kruskal-Wallis test P-value

[§] Groups with letters in common are not significantly different (P-value of pairwise comparison >0.05); Groups with different letters are significantly different (P-value of comparison >0.05); Groups with different letters are significantly different (P-value of pairwise comparison <0.05).

Supplementary Table 6. Perceived relative importance of the roles of stakeholders in managing/preventing the issue of antibiotic resistance and Kruskal-Wallis test results (Figure 2c data).

Survey question: In your opinion, how important are the roles of each of the following in managing/preventing the issue of antibiotic resistance?																	
	Responses																
	Not important (1)		Somewhat important (2)		Moderately important (3)		Very important (4)		Extremely important (5)		Valid Total	Total	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%	n	%							
Hospital doctors																	
Total	1	0.1	19	1.6	116	9.7	493	41.3	565	47.3	1194	1330	136	4 (1)	-	<0·001	-
Doctor	1	0.2	9	1.8	66	13.2	216	43.3	207	41.5	499	547	48	4 (1)	555	-	a
Dentist	0	0.0	5	1.5	17	5.1	125	37.2	189	56.3	336	380	44	5 (1)	660	-	b
Veterinarian	0	0.0	5	1.4	33	9.2	152	42.3	169	47.1	359	403	44	4 (1)	599	-	a
General medical practitioners (GPs)																	
Total	1	0.1	36	3.0	143	12.0	494	41.4	518	43.5	1192	1330	138	4 (1)	-	<0·001	-
Doctor	1	0.2	20	4.0	82	16.5	199	40.0	196	39.4	498	547	49	4 (1)	557	-	a
Dentist	0	0.0	5	1.5	20	6.0	133	39.7	177	52.8	335	380	45	5 (1)	670	-	b
Veterinarian	0	0.0	11	3.1	41	11.4	162	45.1	145	40.4	359	403	44	4 (1)	583	-	a
Global organisations (e.g. WHO, OIE)																	
Total	15	1.3	60	5.0	155	13.0	462	38.8	498	41.8	1190	1330	140	4 (1)	-	<0·001	-
Doctor	7	1.4	28	5.7	76	15.4	192	38.8	192	38.8	495	547	52	4 (1)	570	-	a
Dentist	3	0.9	15	4.5	24	7.2	128	38.2	165	49.3	335	380	45	4 (1)	653	-	b
Veterinarian	5	1.4	17	4.7	55	15.3	142	39.4	141	39.2	360	403	43	4 (1)	576	-	a
Governments																	
Total	19	1.6	84	7.1	190	16.0	446	37.5	450	37.8	1189	1330	141	4 (1)	-	<0·001	-
Doctor	10	2.0	36	7.2	87	17.5	183	36.8	181	36.4	497	547	50	4 (2)	581	-	a
Dentist	5	1.5	17	5.1	35	10.5	117	35.1	159	47.7	333	380	47	4 (1)	666	-	b
Veterinarian	4	1.1	31	8.6	68	18.9	146	40.7	110	30.6	359	403	44	4 (2)	549	-	a
Pharmaceutical companies																	
Total	39	3.3	103	8.7	197	16.6	403	33.9	446	37.5	1188	1330	142	4 (2)	-	<0·001	-
Doctor	28	5.6	59	11.9	89	17.9	169	34.1	151	30.4	496	547	51	4 (2)	533	-	a
Dentist	7	2.1	17	5.1	44	13.2	98	29.4	167	50.2	333	380	47	5 (1)	680	-	b
Veterinarian	4	1.1	27	7.5	64	17.8	136	37.9	128	35.7	359	403	44	4 (2)	599	-	c
The Media																	
Total	46	3.9	110	9.2	219	18.4	409	34.4	406	34.1	1190	1330	140	4 (2)	-	<0·001	-
Doctor	19	3.8	43	8.6	92	18.5	171	34.3	173	34.7	498	547	49	4 (2)	601	-	a
Dentist	10	3.0	26	7.8	47	14.1	107	32.1	143	42.9	333	380	47	4 (1)	657	-	a
Veterinarian	17	4.7	41	11.4	80	22.3	131	36.5	90	25.1	359	403	44	4 (2)	531	-	b
Scientists																	

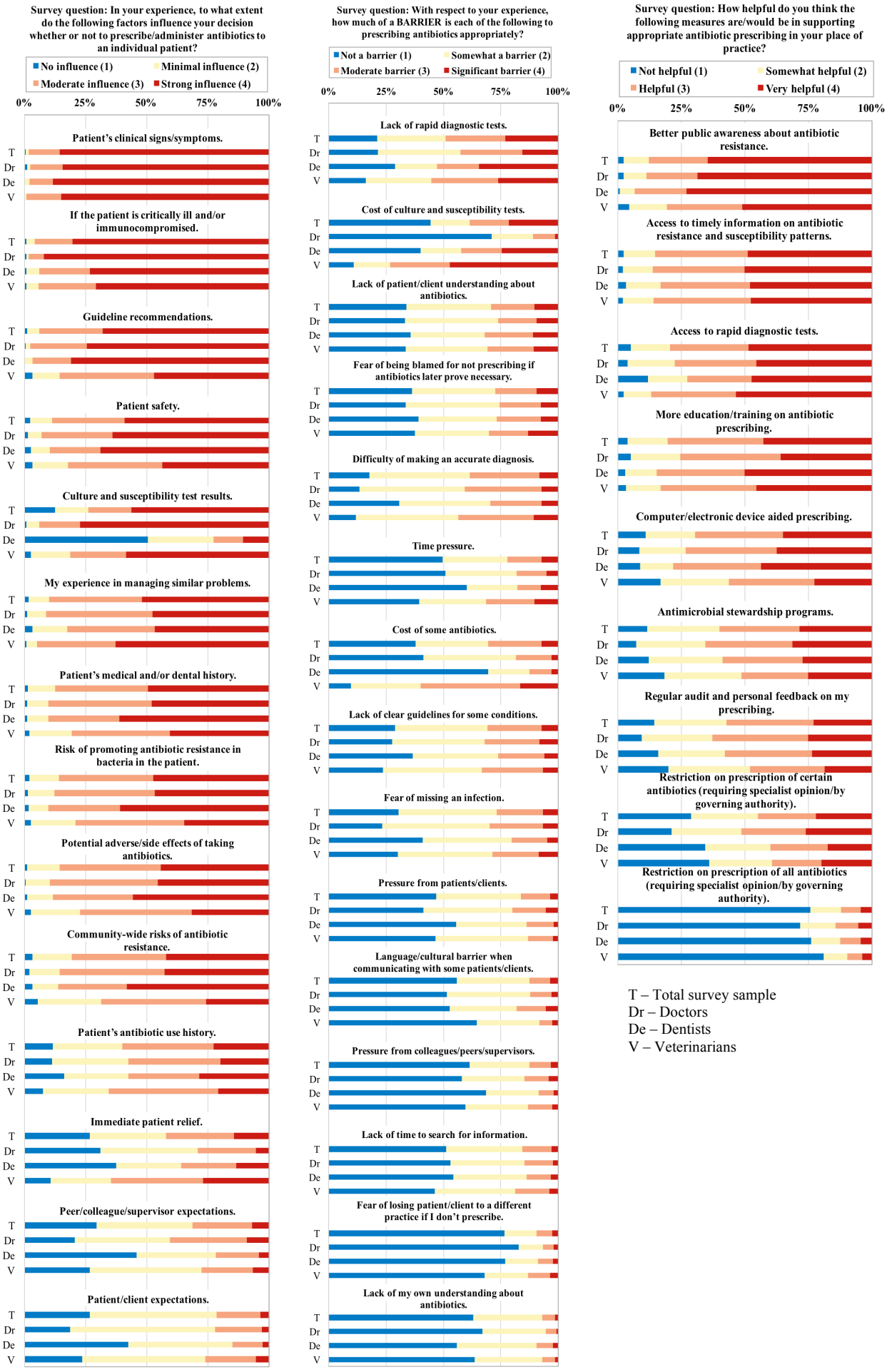
Survey question: In your opinion, how important are the roles of each of the following in managing/preventing the issue of antibiotic resistance?																	
	Responses																
	Not important (1)		Somewhat important (2)		Moderately important (3)		Very important (4)		Extremely important (5)		Valid Total	Total	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%	n	%							
Total	20	1.7	146	12.3	228	19.2	433	36.4	362	30.4	1189	1330	141	4 (2)	-	<0·001	-
Doctor	10	2.0	72	14.5	101	20.4	183	36.9	130	26.2	496	547	51	4 (2)	561	-	a
Dentist	6	1.8	26	7.8	55	16.4	109	32.5	139	41.5	335	380	45	4 (2)	671	-	b
Veterinarian	4	1.1	48	13.4	72	20.1	141	39.4	93	26.0	358	403	45	4 (2)	572	-	a
Myself																	
Total	9	0.8	128	10.7	246	20.6	474	39.7	338	28.3	1195	1330	135	4 (2)	-	<0·001	-
Doctor	2	0.4	40	8.0	108	21.6	187	37.5	162	32.5	499	547	48	4 (2)	628	-	a
Dentist	3	0.9	32	9.5	52	15.5	149	44.3	100	29.8	336	380	44	4 (2)	628	-	a
Veterinarian	4	1.1	56	15.6	86	23.9	138	38.3	76	21.1	360	403	43	4 (1)	528	-	b
Pharmacists																	
Total	36	3.0	141	11.8	281	23.6	400	33.5	335	28.1	1193	1330	137	4 (2)	-	<0·001	-
Doctor	21	4.2	69	13.9	140	28.1	155	31.1	113	22.7	498	547	49	4 (1)	543	-	a
Dentist	8	2.4	22	6.6	48	14.3	116	34.6	141	42.1	335	380	45	4 (1)	713	-	b
Veterinarian	7	1.9	50	13.9	93	25.8	129	35.8	81	22.5	360	403	43	4 (1)	564	-	a
My immediate colleagues/peers																	
Total	7	0.6	124	10.4	255	21.3	483	40.4	327	27.3	1196	1330	134	4 (2)	-	<0·001	-
Doctor	3	0.6	36	7.2	112	22.4	197	39.4	152	30.4	500	547	47	4 (2)	625	-	a
Dentist	2	0.6	33	9.8	54	16.1	147	43.8	100	29.8	336	380	44	4 (2)	631	-	a
Veterinarian	2	0.6	55	15.3	89	24.7	139	38.6	75	20.8	360	403	43	4 (1)	532	-	b
Farmers and food producers																	
Total	13	1.1	126	10.6	251	21.2	474	40.0	322	27.2	1186	1330	144	4 (2)	-	0·177	-
Doctor	7	1.4	58	11.7	100	20.2	187	37.8	143	28.9	495	547	52	4 (2)	596	-	-
Dentist	6	1.8	36	10.8	59	17.8	128	38.6	103	31.0	332	380	48	4 (2)	616	-	-
Veterinarian	0	0.0	32	8.9	92	25.6	159	44.3	76	21.2	359	403	44	4 (1)	570	-	-
Veterinarians																	
Total	15	1.3	131	11.0	238	20.1	497	41.9	306	25.8	1187	1330	143	4 (2)	-	<0·001	-
Doctor	7	1.4	65	13.2	112	22.7	201	40.7	109	22.1	494	547	53	4 (1)	557	-	a
Dentist	7	2.1	39	11.7	65	19.5	133	39.9	89	26.7	333	380	47	4 (2)	591	-	a,b
Veterinarian	1	0.3	27	7.5	61	16.9	163	45.3	108	30.0	360	403	43	4 (1)	648	-	b
Dentists																	
Total	11	0.9	140	11.8	305	25.6	441	37.1	293	24.6	1190	1330	140	4 (1)	-	<0·001	-
Doctor	7	1.4	77	15.5	152	30.6	155	31.3	105	21.2	496	547	51	4 (1)	538	-	a
Dentist	2	0.6	27	8.1	62	18.5	138	41.2	106	31.6	335	380	45	4 (2)	672	-	b
Veterinarian	2	0.6	36	10.0	91	25.3	148	41.2	82	22.8	359	403	44	4 (1)	603	-	c

Survey question: In your opinion, how important are the roles of each of the following in managing/preventing the issue of antibiotic resistance?																	
	Responses																
	Not important (1)		Somewhat important (2)		Moderately important (3)		Very important (4)		Extremely important (5)		Valid Total	Total	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%	n	%							
Nurses																	
Total	41	3.4	195	16.3	280	23.5	398	33.4	279	23.4	1193	1330	137	4 (1)	-	<0·001	-
Doctor	29	5.8	105	21.1	131	26.4	149	30.0	83	16.7	497	547	50	3 (2)	520	-	a
Dentist	7	2.1	35	10.4	58	17.3	120	35.7	116	34.5	336	380	44	4 (2)	699	-	b
Veterinarian	5	1.4	55	15.3	91	25.3	129	35.8	80	22.2	360	403	43	4 (1)	607	-	c
The general public																	
Total	22	1.8	153	12.8	306	25.6	465	39.0	247	20.7	1193	1330	137	4 (1)	-	<0·001	-
Doctor	11	2.2	54	10.8	117	23.4	199	39.9	118	23.6	499	547	48	4 (1)	626	-	a
Dentist	1	0.3	31	9.2	85	25.3	129	38.4	90	26.8	336	380	44	4 (2)	653	-	a
Veterinarian	10	2.8	68	19.0	104	29.1	137	38.3	39	10.9	358	403	45	3 (1)	504	-	b
My clients/patients																	
Total	22	1.8	193	16.2	334	28.0	424	35.6	219	18.4	1192	1330	138	4 (1)	-	<0·001	-
Doctor	10	2.0	66	13.2	135	27.1	185	37.1	103	20.6	499	547	48	4 (1)	625	-	a
Dentist	1	0.3	42	12.5	83	24.8	131	39.1	78	23.3	335	380	45	4 (1)	660	-	a
Veterinarian	11	3.1	85	23.7	116	32.4	108	30.2	38	10.6	358	403	45	3 (2)	497	-	b
Pet owners																	
Total	69	5.8	323	27.3	359	30.3	290	24.5	142	12.0	1183	1330	147	3 (2)	-	0·339	-
Doctor	32	6.5	141	28.7	149	30.3	110	22.4	60	12.2	492	547	55	3 (2)	578	-	-
Dentist	23	6.9	85	25.6	92	27.7	77	23.2	55	16.6	332	380	48	3 (2)	612	-	-
Veterinarian	14	3.9	97	27.0	118	32.9	103	28.7	27	7.5	359	403	44	3 (2)	593	-	-

[¶] Kruskal-Wallis test P-value

[§] Groups with letters in common are not significantly different (P-value of pairwise comparison >0.05); Groups with different letters are significantly different (P-value of comparison >0.05); Groups with different letters are significantly different (P-value of pairwise comparison <0.05).

Supplementary Figure 4. Stacked bar charts of responses about factors influencing prescribing decisions, barriers to appropriate prescribing, and helpfulness of measures (corresponds with Figure 3).



Supplementary Table 7. Relative extent to which the listed factors influence decisions whether or not to prescribe antibiotics and Kruskal-Wallis test results (Figure 3a data).

Survey question: In your experience, to what extent do the following factors influence your decision WHETHER or NOT TO prescribe/administer antibiotics to an individual patient?																
	Responses															
	No influence (1)		Minimal influence (2)		Moderate influence (3)		Strong influence (4)		Valid Total	Total	N/A	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%								
Patient's clinical signs/symptoms.																
Total	7	0.5	17	1.3	164	12.6	1118	85.6	1306	1330	2	22	4 (0)	-	0·221	-
Doctor	6	1.1	7	1.3	72	13.4	453	84.2	538	547	0	9	4 (0)	644	-	-
Dentist	1	0.3	7	1.9	36	9.6	331	88.3	375	380	1	4	4 (0)	670	-	-
Veterinarian	0	0.0	3	0.8	56	14.2	334	85.0	393	403	1	9	4 (0)	651	-	-
If the patient is critically ill and/or immunocompromised.																
Total	11	0.9	43	3.4	198	15.5	1023	80.2	1275	1330	28	27	4 (0)	-	<0·001	-
Doctor	4	0.8	6	1.1	33	6.2	489	91.9	532	547	6	9	4 (0)	712	-	a
Dentist	3	0.8	19	5.3	75	20.8	264	73.1	361	380	11	8	4 (1)	592	-	b
Veterinarian	4	1.0	18	4.7	90	23.6	270	70.7	382	403	11	10	4 (1)	578	-	b
Guideline recommendations.																
Total	17	1.3	64	5.0	331	25.7	878	68.1	1290	1330	12	28	4 (1)	-	<0·001	-
Doctor	3	0.6	10	1.9	124	23.2	398	74.4	535	547	3	9	4 (1)	692	-	a
Dentist	1	0.3	11	3.0	59	15.9	300	80.9	371	380	1	8	4 (0)	729	-	a
Veterinarian	13	3.4	43	11.2	148	38.5	180	46.9	384	403	8	11	3 (1)	500	-	b
Patient safety.																
Total	31	2.5	113	9.0	374	29.6	744	59.0	1262	1330	27	41	4 (1)	-	<0·001	-
Doctor	8	1.5	30	5.7	153	29.0	336	63.8	527	547	7	13	4 (1)	669	-	a
Dentist	10	2.8	27	7.7	73	20.8	241	68.7	351	380	11	18	4 (1)	688	-	a
Veterinarian	13	3.4	56	14.6	148	38.5	167	43.5	384	403	9	10	3 (1)	528	-	b
Culture and susceptibility test results.																
Total	148	12.5	162	13.7	207	17.5	665	56.3	1182	1330	113	35	4 (2)	-	<0·001	-
Doctor	5	0.9	28	5.3	88	16.5	412	77.3	533	547	3	11	4 (0)	738	-	a
Dentist	133	50.6	71	27.0	31	11.8	28	10.6	263	380	102	15	1 (1)	239	-	b
Veterinarian	10	2.6	63	16.3	88	22.8	225	58.3	386	403	8	9	4 (1)	629	-	c
My experience in managing similar problems.																
Total	22	1.7	109	8.5	490	38.0	668	51.8	1289	1330	9	32	4 (1)	-	<0·001	-
Doctor	7	1.3	40	7.5	234	43.7	255	47.6	536	547	1	10	3 (1)	625	-	a
Dentist	12	3.3	52	14.3	130	35.8	169	46.6	363	380	5	12	3 (1)	591	-	a
Veterinarian	3	0.8	17	4.4	126	32.3	244	62.6	390	403	3	10	4 (1)	723	-	b
Patient's medical and/or dental history.																

Survey question: In your experience, to what extent do the following factors influence your decision WHETHER or NOT TO prescribe/administer antibiotics to an individual patient?																
	Responses															
	No influence (1)		Minimal influence (2)		Moderate influence (3)		Strong influence (4)		Valid Total	Total	N/A	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%								
Total	19	1.5	145	11.2	490	37.9	640	49.5	1294	1330	9	27	3 (1)	-	<0·001	-
Doctor	7	1.3	46	8.6	227	42.2	258	48.0	538	547	0	9	3 (1)	648	-	a
Dentist	4	1.1	32	8.6	108	29.2	226	61.1	370	380	1	9	4 (1)	723	-	b
Veterinarian	8	2.1	67	17.4	155	40.2	156	40.4	386	403	8	9	3 (1)	574	-	c
Risk of promoting antibiotic resistance in bacteria in the patient.																
Total	26	2.0	158	12.2	500	38.7	608	47.1	1292	1330	6	32	3 (1)	-	<0·001	-
Doctor	8	1.5	58	10.8	219	40.9	250	46.7	535	547	1	11	3 (1)	651	-	a
Dentist	7	1.9	29	7.9	107	29.2	223	60.9	366	380	1	13	4 (1)	738	-	b
Veterinarian	11	2.8	71	18.2	174	44.5	135	34.5	391	403	4	8	3 (1)	554	-	c
Potential adverse/side effects of taking antibiotics.																
Total	17	1.3	171	13.2	535	41.4	570	44.1	1293	1330	6	31	3 (1)	-	<0·001	-
Doctor	3	0.6	53	9.9	237	44.2	243	45.3	536	547	1	10	3 (1)	669	-	a
Dentist	4	1.1	39	10.6	120	32.7	204	55.6	367	380	1	12	4 (1)	721	-	a
Veterinarian	10	2.6	79	20.3	178	45.6	123	31.5	390	403	4	9	3 (1)	547	-	b
Community-wide risks of antibiotic resistance.																
Total	44	3.4	207	16.0	498	38.6	541	41.9	1290	1330	7	33	3 (1)	-	<0·001	-
Doctor	11	2.1	67	12.5	229	42.7	229	42.7	536	547	1	10	3 (1)	669	-	a
Dentist	12	3.3	39	10.6	103	28.1	213	58.0	367	380	1	12	4 (1)	749	-	b
Veterinarian	21	5.4	101	26.1	166	42.9	99	25.6	387	403	5	11	3 (2)	515	-	c
Patient's antibiotic use history.																
Total	150	11.7	364	28.4	479	37.4	289	22.5	1282	1330	17	31	3 (1)	-	0·124	-
Doctor	61	11.4	166	31.1	201	37.7	105	19.7	533	547	4	10	3 (1)	621	-	-
Dentist	59	16.2	96	26.3	106	29.0	104	28.5	365	380	3	12	3 (2)	643	-	-
Veterinarian	30	7.8	102	26.6	172	44.8	80	20.8	384	403	10	9	3 (1)	669	-	-
Immediate patient relief.																
Total	337	26.7	395	31.3	348	27.6	180	14.3	1260	1330	30	40	2 (2)	-	<0·001	-
Doctor	161	31.2	205	39.7	122	23.6	28	5.4	516	547	18	13	2 (2)	543	-	a
Dentist	134	37.5	95	26.6	80	22.4	48	13.4	357	380	5	18	2 (2)	566	-	a
Veterinarian	42	10.9	95	24.5	146	37.7	104	26.9	387	403	7	9	3 (2)	806	-	b
Peer/colleague/supervisor expectations.																
Total	372	29.6	493	39.2	306	24.3	87	6.9	1258	1330	35	37	2 (2)	-	<0·001	-
Doctor	109	20.7	205	38.9	165	31.3	48	9.1	527	547	10	10	2 (1)	709	-	a

Survey question: In your experience, to what extent do the following factors influence your decision WHETHER or NOT TO prescribe/administer antibiotics to an individual patient?																
	Responses															
	No influence (1)		Minimal influence (2)		Moderate influence (3)		Strong influence (4)		Valid Total	Total	N/A	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%								
Dentist	159	46.1	112	32.5	60	17.4	14	4.1	345	380	18	17	2 (1)	513	-	b
Veterinarian	104	26.9	176	45.6	81	21.0	25	6.5	386	403	7	10	2 (2)	625	-	c
Patient/client expectations.																
Total	342	26.9	662	52.0	225	17.7	44	3.5	1273	1330	20	37	2 (1)	-	<0·001	-
Doctor	100	18.7	317	59.4	102	19.1	15	2.8	534	547	2	11	2 (0)	680	-	a
Dentist	151	42.5	151	42.5	44	12.4	9	2.5	355	380	8	17	2 (1)	530	-	b
Veterinarian	91	23.7	194	50.5	79	20.6	20	5.2	384	403	10	9	2 (1)	676	-	a
[¶] Kruskal-Wallis test P-value																
[§]Groups with letters in common are not significantly different (P-value of pairwise comparison >0.05); Groups with different letters are significantly different (P-value of comparison >0.05); Groups with different letters are significantly different (P-value of pairwise comparison <0.05).																

Supplementary Table 8. Relative extent to which respondents perceived the listed factors as barriers to prescribing antibiotics appropriately and Kruskal-Wallis test results (Figure 3b data).

Survey question: With respect to YOUR experience, how much of a BARRIER is each of the following to prescribing antibiotics appropriately?																
	Responses															
	Not a barrier (1)		Somewhat a barrier (2)		Moderate barrier (3)		Significant barrier (4)		Valid Total	Total	N/A	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%								
Lack of rapid diagnostic tests.																
Total	240	21.2	337	29.8	292	25.8	261	23.1	1130	1330	135	65	2 (1)	-	<0·001	-
Doctor	111	21.4	187	36.0	140	27.0	81	15.6	519	547	8	20	2 (1)	524	-	a
Dentist	69	29.0	43	18.1	44	18.5	82	34.5	238	380	116	26	3 (3)	587	-	b
Veterinarian	60	16.1	107	28.7	108	29.0	98	26.3	373	403	11	19	3 (2)	609	-	b
Cost of culture and susceptibility tests.																
Total	468	44.3	181	17.1	179	17.0	228	21.6	1056	1330	210	64	2 (2)	-	<0·001	-
Doctor	357	71.0	90	17.9	49	9.7	7	1.4	503	547	25	19	1 (1)	352	-	a
Dentist	70	40.0	31	17.7	31	17.7	43	24.6	175	380	178	27	2 (2)	555	-	b
Veterinarian	41	10.8	60	15.9	99	26.2	178	47.1	378	403	7	18	3 (2)	752	-	c
Lack of patient/client understanding about antibiotics.																
Total	418	33.9	455	36.9	233	18.9	126	10.2	1232	1330	32	66	2 (2)	-	0·730	-
Doctor	172	33.2	211	40.7	86	16.6	49	9.5	518	547	10	19	2 (2)	608	-	-
Dentist	122	35.6	111	32.4	72	21.0	38	11.1	343	380	11	26	2 (2)	621	-	-
Veterinarian	124	33.4	133	35.8	75	20.2	39	10.5	371	403	11	21	2 (2)	625	-	-

Survey question: With respect to YOUR experience, how much of a BARRIER is each of the following to prescribing antibiotics appropriately?																
	Responses															
	Not a barrier (1)		Somewhat a barrier (2)		Moderate barrier (3)		Significant barrier (4)		Valid Total	Total	N/A	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%								
Fear of being blamed for not prescribing if antibiotics later prove necessary.																
Total	449	36.3	451	36.4	222	17.9	116	9.4	1238	1330	26	66	2 (2)	-	0·543	-
Doctor	175	33.6	213	40.9	93	17.9	40	7.7	521	547	6	20	2 (2)	623	-	-
Dentist	132	39.1	115	34.0	65	19.2	26	7.7	338	380	16	26	2 (2)	603	-	-
Veterinarian	142	37.5	123	32.5	64	16.9	50	13.2	379	403	4	20	2 (2)	630	-	-
Difficulty of making an accurate diagnosis.																
Total	215	17.6	536	43.8	371	30.3	102	8.3	1224	1330	40	66	2 (1)	-	<0·001	-
Doctor	70	13.5	238	45.8	174	33.5	38	7.3	520	547	7	20	2 (1)	635	-	a
Dentist	100	30.6	130	39.8	73	22.3	24	7.3	327	380	27	26	2 (2)	521	-	b
Veterinarian	45	11.9	168	44.6	124	32.9	40	10.6	377	403	6	20	2 (1)	661	-	a
Time pressure.																
Total	591	49.7	334	28.1	177	14.9	87	7.3	1189	1330	76	65	2 (1)	-	<0·001	-
Doctor	260	50.9	159	31.1	66	12.9	26	5.1	511	547	17	19	1 (1)	576	-	a
Dentist	183	60.2	67	22.0	31	10.2	23	7.6	304	380	48	28	1 (1)	535	-	a
Veterinarian	148	39.6	108	28.9	80	21.4	38	10.2	374	403	11	18	2 (2)	670	-	b
Cost of some antibiotics.																
Total	445	38.0	371	31.7	270	23.1	85	7.3	1171	1330	93	66	2 (2)	-	<0·001	-
Doctor	207	41.2	204	40.6	77	15.3	15	3.0	503	547	23	21	2 (1)	527	-	a
Dentist	201	69.6	52	18.0	28	9.7	8	2.8	289	380	64	27	1 (1)	392	-	b
Veterinarian	37	9.8	115	30.3	165	43.5	62	16.4	379	403	6	18	3 (1)	812	-	c
Lack of clear guidelines for some conditions.																
Total	347	28.8	486	40.3	287	23.8	85	7.1	1205	1330	61	64	2 (2)	-	0·003	-
Doctor	144	27.7	209	40.3	124	23.9	42	8.1	519	547	9	19	2 (2)	614	-	a
Dentist	116	36.6	118	37.2	64	20.2	19	6.0	317	380	36	27	2 (2)	550	-	b
Veterinarian	87	23.6	159	43.1	99	26.8	24	6.5	369	403	16	18	2 (1)	633	-	a
Fear of missing an infection.																
Total	373	30.3	528	42.9	248	20.1	83	6.7	1232	1330	31	67	2 (2)	-	<0·001	-
Doctor	121	23.3	243	46.8	120	23.1	35	6.7	519	547	7	21	2 (1)	660	-	a
Dentist	138	41.1	130	38.7	52	15.5	16	4.8	336	380	17	27	2 (1)	539	-	b
Veterinarian	114	30.2	155	41.1	76	20.2	32	8.5	377	403	7	19	2 (2)	626	-	a
Pressure from patients/clients.																
Total	575	46.8	455	37.0	155	12.6	44	3.6	1229	1330	36	65	2 (1)	-	<0·001	-
Doctor	214	41.2	201	38.7	76	14.6	28	5.4	519	547	7	21	2 (1)	657	-	a

Survey question: With respect to YOUR experience, how much of a BARRIER is each of the following to prescribing antibiotics appropriately?																
	Responses															
	Not a barrier (1)		Somewhat a barrier (2)		Moderate barrier (3)		Significant barrier (4)		Valid Total	Total	N/A	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%								
Dentist	188	55.6	104	30.8	39	11.5	7	2.1	338	380	17	25	1 (1)	560	-	b
Veterinarian	173	46.5	150	40.3	40	10.8	9	2.4	372	403	12	19	2 (1)	606	-	a,b
Language/cultural barrier when communicating with some patients/clients.																
Total	667	55.8	379	31.7	109	9.1	41	3.4	1196	1330	69	65	1 (1)	-	<0·001	-
Doctor	261	51.6	184	36.4	47	9.3	14	2.8	506	547	22	19	1 (1)	619	-	a
Dentist	174	52.7	96	29.1	42	12.7	18	5.5	330	380	24	26	1 (1)	630	-	a
Veterinarian	232	64.4	99	27.5	20	5.6	9	2.5	360	403	23	20	1 (1)	541	-	b
Pressure from colleagues/peers/supervisors.																
Total	745	61.4	317	26.1	114	9.4	38	3.1	1214	1330	50	66	1 (1)	-	0·003	-
Doctor	297	57.9	140	27.3	55	10.7	21	4.1	513	547	15	19	1 (1)	632	-	a
Dentist	227	68.6	76	23.0	21	6.3	7	2.1	331	380	22	27	1 (1)	560	-	b
Veterinarian	221	59.7	101	27.3	38	10.3	10	2.7	370	403	13	20	1 (1)	617	-	a
Lack of time to search for information.																
Total	620	51.2	403	33.3	153	12.6	36	3.0	1212	1330	50	68	1 (1)	-	0·034	-
Doctor	269	53.0	165	32.5	63	12.4	11	2.2	508	547	18	21	1 (1)	594	-	a
Dentist	175	54.2	104	32.2	34	10.5	10	3.1	323	380	29	28	1 (1)	586	-	a
Veterinarian	176	46.2	134	35.2	56	14.7	15	3.9	381	403	3	19	2 (1)	641	-	a
Fear of losing patient/client to a different practice if I don't prescribe.																
Total	895	76.6	165	14.1	79	6.8	29	2.5	1168	1330	96	66	1 (0)	-	<0·001	-
Doctor	400	83.0	50	10.4	23	4.8	9	1.9	482	547	46	19	1 (0)	547	-	a
Dentist	247	76.9	46	14.3	21	6.5	7	2.2	321	380	31	28	1 (0)	582	-	a
Veterinarian	248	67.9	69	18.9	35	9.6	13	3.6	365	403	19	19	1 (1)	636	-	b
Lack of my own understanding about antibiotics.																
Total	760	62.9	363	30.0	69	5.7	16	1.3	1208	1330	55	67	1 (1)	-	0·003	-
Doctor	340	67.1	139	27.4	25	4.9	3	0.6	507	547	20	20	1 (1)	578	-	a
Dentist	183	55.8	114	34.8	23	7.0	8	2.4	328	380	26	26	1 (1)	650	-	b
Veterinarian	237	63.5	110	29.5	21	5.6	5	1.3	373	403	9	21	1 (1)	601	-	a,b

[¶] Kruskal-Wallis test P-value

[§] Groups with letters in common are not significantly different (P-value of pairwise comparison >0.05); Groups with different letters are significantly different (P-value of comparison >0.05); Groups with different letters are significantly different (P-value of pairwise comparison <0.05).

Supplementary Table 9. Relative extent to which the listed measures were perceived as helpful to supporting appropriate prescribing and Kruskal-Wallis test results (Figure 3c data).

Survey question: How helpful do you think the following measures are/would be in supporting appropriate antibiotic prescribing in YOUR place of practice?																
	Responses															
	Not helpful (1)		Somewhat helpful (2)		Helpful (3)		Very helpful (4)		Valid Total	Total	Unsure	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%								
Better public awareness about antibiotic resistance.																
Total	30	2.4	122	9.9	282	23.0	794	64.7	1228	1330	6	96	4 (1)	-	<0·001	-
Doctor	12	2.3	45	8.8	103	20.2	351	68.7	511	547	5	31	4 (1)	639	-	a
Dentist	2	0.6	21	6.1	70	20.2	253	73.1	346	380	0	34	4 (1)	673	-	a
Veterinarian	16	4.3	56	15.1	109	29.4	190	51.2	371	403	1	31	4 (1)	527	-	b
Access to timely information on antibiotic resistance and susceptibility patterns.																
Total	28	2.3	150	12.3	446	36.6	594	48.8	1218	1330	11	101	3 (1)	-	0·599	-
Doctor	10	1.9	60	11.7	187	36.3	258	50.1	515	547	0	32	4 (1)	620	-	-
Dentist	11	3.3	45	13.5	118	35.3	160	47.9	334	380	10	36	3 (1)	598	-	-
Veterinarian	7	1.9	45	12.2	141	38.2	176	47.7	369	403	1	33	3 (1)	606	-	-
Access to rapid diagnostic tests.																
Total	60	5.2	178	15.4	356	30.9	559	48.5	1153	1330	76	101	3 (1)	-	0·002	-
Doctor	19	3.7	95	18.6	164	32.2	232	45.5	510	547	5	32	3 (1)	561	-	a
Dentist	33	11.8	43	15.4	71	25.4	132	47.3	279	380	63	38	3 (2)	546	-	a
Veterinarian	8	2.2	40	11.0	121	33.2	195	53.6	364	403	8	31	4 (1)	624	-	b
More education/training on antibiotic prescribing.																
Total	47	3.8	193	15.8	458	37.5	524	42.9	1222	1330	8	100	3 (1)	-	<0·001	-
Doctor	25	4.9	101	19.6	203	39.5	185	36.0	514	547	2	31	3 (1)	561	-	a
Dentist	10	2.9	42	12.4	117	34.4	171	50.3	340	380	4	36	4 (1)	663	-	b
Veterinarian	12	3.3	50	13.6	138	37.5	168	45.7	368	403	2	33	3 (1)	635	-	b
Computer/electronic device aided prescribing.																
Total	129	11.0	226	19.3	407	34.8	408	34.9	1170	1330	60	100	3 (2)	-	<0·001	-
Doctor	43	8.5	92	18.2	180	35.6	190	37.6	505	547	10	32	3 (2)	613	-	a
Dentist	28	8.8	42	13.1	110	34.4	140	43.8	320	380	24	36	3 (1)	653	-	a
Veterinarian	58	16.8	92	26.7	117	33.9	78	22.6	345	403	26	32	3 (1)	484	-	b
Antimicrobial stewardship programs.																
Total	102	11.6	251	28.5	276	31.4	251	28.5	880	1330	345	105	3 (2)	-	0·001	-
Doctor	30	7.3	112	27.1	142	34.4	129	31.2	413	547	101	33	3 (2)	470	-	a
Dentist	27	12.1	65	29.1	70	31.4	61	27.4	223	380	119	38	3 (2)	434	-	a,b
Veterinarian	45	18.4	74	30.3	64	26.2	61	25.0	244	403	125	34	3 (1.5)	396	-	b
Regular audit and personal feedback on my																

Survey question: How helpful do you think the following measures are/would be in supporting appropriate antibiotic prescribing in YOUR place of practice?																
	Responses															
	Not helpful (1)		Somewhat helpful (2)		Helpful (3)		Very helpful (4)		Valid Total	Total	Unsure	Missing	Median (IQR)	Mean rank	P[¶]	Group[§]
	n	%	n	%	n	%	n	%								
prescribing.																
Total	166	14.3	333	28.6	399	34.3	266	22.9	1164	1330	65	101	3 (1)	-	<0·001	-
Doctor	48	9.5	140	27.7	191	37.7	127	25.1	506	547	9	32	3 (2)	623	-	a
Dentist	50	15.8	83	26.3	108	34.2	75	23.7	316	380	27	37	3 (1)	584	-	a
Veterinarian	68	19.9	110	32.2	100	29.2	64	18.7	342	403	29	32	2 (1)	521	-	b
Restriction on prescription of certain antibiotics (requiring specialist opinion/by governing authority).																
Total	319	28.9	287	26.0	254	23.0	242	22.0	1102	1330	126	102	2 (2)	-	<0·001	-
Doctor	104	21.1	135	27.4	126	25.6	128	26.0	493	547	23	31	3 (2)	603	-	a
Dentist	96	34.5	71	25.5	63	22.7	48	17.3	278	380	64	38	2 (2)	509	-	b
Veterinarian	119	36.0	81	24.5	65	19.6	66	19.9	331	403	39	33	2 (2)	511	-	b
Restriction on prescription of all antibiotics (requiring specialist opinion/by governing authority).																
Total	881	75.8	137	11.8	90	7.7	54	4.6	1162	1330	65	103	1 (0)	-	0·008	-
Doctor	359	71.8	69	13.8	45	9.0	27	5.4	500	547	16	31	1 (1)	605	-	a
Dentist	233	76.1	35	11.4	24	7.8	14	4.6	306	380	34	40	1 (0)	580	-	a,b
Veterinarian	289	81.2	33	9.3	21	5.9	13	3.7	356	403	15	32	1 (0)	550	-	b

[¶] Kruskal-Wallis test P-value

[§] Groups with letters in common are not significantly different (P-value of pairwise comparison >0.05); Groups with different letters are significantly different (P-value of comparison >0.05); Groups with different letters are significantly different (P-value of pairwise comparison <0.05).