Knowledge, Attitude and Practice Survey of Medical Practitioners on Antimicrobial Resistance 2019

– Survey Report –

Infection Control Branch
Centre for Health Protection
Department of Health

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5/F., Island Place Tower, 510 King's Rd., Hong Kong Tel: 852 2891 6687 Fax: 852 2833 6771
Email: general@csg-worldwide.com http://www.csg-worldwide.com/

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EXECUTIVE SUMMARY

Background

The Hong Kong Strategy and Action Plan on Antimicrobial Resistance (2017 – 2022) launched in 2017 recommended, among others, to monitor knowledge, attitude and practice (KAP) towards antimicrobial resistance (AMR) and antimicrobial use among the general public and target population identified by the survey. Results of KAP surveys were useful in providing guidance for key messages to be developed and in providing means for promulgation targeting different populations (e.g. general public, healthcare professionals) in order to raise awareness and enable them to use antimicrobials in an appropriate manner.

In this connection, the Department of Health (DH) commissioned Consumer Search Hong Kong Limited (CSG) to conduct a KAP survey of medical practitioners on AMR ("the Survey") in 2019.

Survey method

The sampling frame of the Survey involved a random sample of medical practitioners with full registration with the Medical Council of Hong Kong under the Medical Registration Ordinance who were on the Resident List of the General Register as at 1 July 2018. While primary care was patients' first point of contact in the continuum of healthcare process, subgroup analysis was also performed for this subgroup. The target sample size was 1 067 registered medical practitioners, among whom at least 350 should be primary care medical practitioners. The Survey was conducted by self-administrated paper-based or web-based questionnaire consisting of 24 questions in English. Paper-based questionnaires with unique QR code and password (for access to web-based questionnaire) were mailed to selected medical practitioners. The fieldwork was conducted during 11 September to 31 December 2019, achieving a sample size of 1 074 (including 364 primary care doctors) and a response rate of 12.3%.

Survey findings

Demographics of Respondents

Findings of the Survey were based on the 1 043 medical practitioners who were practising in Hong Kong as of 30 June 2019. Among them, about two-thirds (66.9%) of respondents enumerated were males and there were relatively more respondents who were aged between 36 and 45 years (25.7%) and between 46 and 55 years (23.4%), followed by those who were 35 years or below (21.0%) and 56 to 65 years (18.1%). Slightly over one in ten (11.8%) respondents were aged over 65 years.

About a quarter of respondents enumerated had been practising in the medical profession for 11 to 20 years (27.4%), over 30 years (26.9%) and 21 to 30 years (25.2%), whereas another 20.5% of the respondents had been in practice for ten years or less. Most of the respondents were either working in the Hospital Authority (47.0%) or the private sector (45.3%). A very small proportion of them were working in the government (4.9%), academic institutions (1.8%) or subvented organisations (1.0%). About two-thirds (66.7%) of them spent most of their working time in specialty practice, either as specialists/fellows/trainees, while around three in ten (31.8%) mainly spent their time on general practice.

Among those practising in specialties and working as specialists/fellows/trainees, slightly more (22.0%) were practising internal medicine, followed by family medicine (15.2%) and surgery (10.3%). Other relatively more common specialties included paediatrics (9.4%), emergency medicine (7.2%), obstetrics & gynaecology (7.1%) and anaesthesiology (5.2%).

Knowledge and Awareness

Majority of respondents considered AMR severe worldwide (70.1%) and in Hong Kong (65.1%), and over 97% of the respondents were aware that AMR could lead to reduced treatment options, increased treatment cost, increased mortality and increased length of hospital stay. Respondents considered that patients' self-medication with antibiotics (83.3%) and inappropriate choice of drug (83.0%) were important drivers of AMR.

The less experienced respondents were more likely to rate AMR in Hong Kong as "very severe"/"slightly severe". The proportion of respondents practised for ten years or less was the highest (79.0%) among all groups who considered AMR in Hong Kong was "very severe"/"slightly severe". About one in ten (9.6%) respondents from the private sector considered AMR not severe ("slightly not severe"/"not severe at all") in Hong Kong, a proportion being at least doubled compared with respondents working in other sectors.

Antibiotic prescription

Over 80% of respondents were confident in interpreting antibiotic susceptibility test results (85.6%) and knowing when to start antibiotic therapy (81.4%). Around seven in ten respondents were confident in choosing the correct drug and dosage (76.8%), educating patient on the proper use of antibiotics (74.5%), determining the right treatment duration (73.1%), differentiating broad-spectrum antibiotics from narrow-spectrum antibiotics and avoiding their unnecessary use (71.5%) and de-escalating antibiotic therapy according to clinical evaluation and diagnostic test results (68.6%). Comparatively fewer doctors (especially females, those in general practice, and those practising non-surgery related specialties) were confident in de-escalating antibiotic therapy and differentiating broad-spectrum antibiotics.

Nearly half (43.9%) of respondents prescribed antibiotics in less than ten percent of all consultations. Slightly more than half (56.8%) of respondents prescribed antibiotics for cold/flu/upper respiratory tract infection (URTI) in a frequency of less than five percent. Being female, practising for 11 to 20 years, working in the government, and practising surgery-related specialties[1] were associated with less frequent prescription of antibiotics for cold/flu/URTI.

More than half (59.4%) of the respondents were “always”/“often”/“sometimes” requested by patients for antibiotics for cold/flu/URTI, and higher frequency of such requests were associated with doctors who were male or in the general practice field. Despite this, a majority (83.0%) of all respondents "rarely"/"never" prescribed antibiotics whenever patients requested. On the other hand, “uncertain clinical diagnosis” was considered by the highest proportion (56.0%) of respondents to be an important (“very important”/“slightly important”) reason for unindicated antibiotic prescription, followed by “expectation/request of antibiotics by patients or carers” (23.8%) and “cannot ensure return of patient for follow up” (17.7%). The frequency of prescribing antibiotics for uncomplicated URTI whenever patients requested was significantly associated with the perceived importance of reasons for unindicated antibiotic prescription including patients/carers’ expectation or request, being unable to ensure the return of patient for follow up, no time to explain why not indicated and fear of patient’s litigation. Among those reported "always"/"often"/"sometimes" prescribed antibiotics for uncomplicated URTI whenever patient requested, 30.9% and 26.9% considered “expectation/request of antibiotics by patients or carers” and “fear of patient’s litigation” respectively as important reasons accounting for unindicated antibiotic prescription and these proportions were significantly lower among those reported “rarely”/“never” (less than 25% and 15% respectively).

One in five respondents (21.1%) “always”/“often” used Point-of-Care test to guide antibiotic prescription when treating patients with uncomplicated URTI, with relatively more respondents in the private sector (24.5%) adopting such practice.

Majority (86.8%) of respondents “always”/“often” reminded their patients to complete course of the antibiotics as prescribed, while slightly more than half (58.1%) of respondents “always”/“often” explained to patients that improper use of antibiotics would increase AMR.

Less than four in ten respondents (38.4%) “always”/“often” re-assessed patients’ antibiotic regimen after 48 to 72 hours of starting treatment. Male doctors, those working in academic institutions, those practising in specialty, especially surgery-related, were more inclined to practice this more frequently.

[1] Including surgery, orthopaedics & traumatology, otorhinolaryngology and plastic surgery.

Majority (71.9%) of respondents considered themselves adequately trained on antibiotic use. Male gender, longer duration of practice and working in academic institutions were found to be factors associated with perceived adequately trained on antibiotic use.

Evaluation of Tools

Amongst the tools covered by the Survey, the Interhospital Multi-disciplinary Programme on Antimicrobial ChemoTherapy (IMPACT) guideline was known to most (78.7%) respondents, followed by the antibiogram for public and private hospitals at 68.2% and the Antibiotic Stewardship Programme (ASP) in Primary Care/Hospital at 64.4%. Subgroup analysis revealed that those with fewer years of practice, working in the Hospital Authority, and practising in a specialty were more aware of IMPACT guideline. Enumerated medical practitioners working in academic institutions or administration/teaching areas were more aware of antibiograms, while those working in academic institutions were more aware of ASP related tool.

Among respondents who were aware of the aforesaid tools, between 70% and 80% expressed that they “always”/“often”/“sometimes” used IMPACT guideline (78.2%), antibiogram for public and private hospitals (72.2%), and ASP in Primary Care/Hospital (71.2%). The frequency of using the tools by relevant respondents was not significantly associated with any of their demographics (gender, year of practice, type of institution, major field of practice, and specialty). Effectiveness of the tools perceived by relevant respondents was also not significantly associated with any of their demographics. Among those who had used the corresponding tools, around three quarters considered the tools useful in improving doctors’ knowledge on proper use of antibiotics respectively for IMPACT guideline (78.5%), antibiograms (78.1%) and ASP related tools (72.0%).

The proportion of respondents reported “always”/“often” use of other references when making decision on antibiotic prescription by descending proportion were presented below:

- laboratory test/Point-of-Care test (77.9%)
- suggestions from peers of the same specialty (46.8%)
- specialist consultation (44.5%)
- guidelines/recommendations of foreign health authorities/agencies (43.8%)

Primary care doctors

Primary care doctors[2] were relatively less likely to consider AMR led to increased length of hospital stay. They were more inclined to regard patients’ non-compliance to antibiotic treatment, self-medication by patients and poor quality of antibiotics important drivers to

[2] Respondents who replied “general practice” as major field of practice or “family medicine” as his/her specialty in the questionnaire were regarded as primary care doctors

AMR, while they were less likely to consider the inappropriate choice of drug as an important factor.

In terms of practice, slightly more than half (56.9%) of primary care doctors prescribed antibiotics in less than ten percent of their consultations and they reported more frequently explained to their patients about indication of antibiotic prescription, side effects of antibiotics, complete course of antibiotics as prescribed, and improper use of antibiotics would increase AMR.

Compare with those not working in the primary care setting, comparatively less primary care doctors reported “always” or “often” requested by patients for antibiotics to treat URTI, while more of them considered expectation/request by patients or carers an important reason for unindicated antibiotic prescription. Despite these, they prescribed antibiotics less frequently, and explained to their patients why they were not indicated more frequently. However, less primary care doctors re-assessed their patients’ antibiotic regimen frequently, and also less primary care doctors made decisions on antibiotic prescription with reference to peers’ suggestions, specialist consultation, and laboratory test/Point-of-Care test.

While more primary care doctors were confident in educating their patients on proper use of antibiotics, less of them were confident in differentiating broad-spectrum antibiotics, and de-escalating antibiotic therapy. Moreover, less primary care doctors were aware of the availability of antibiograms, IMPACT guideline and ASP. Nevertheless, more of them considered continuous medical education (CME) accredited formal lectures, and web/computer-based resources useful to improve doctors’ knowledge on proper use of antibiotics, while less of them considered infectious disease specialist/microbiologist consultation useful.

Recommendations

As relatively less respondents from the private sector considered AMR a severe worldwide and local problem, more AMR awareness-raising activities could be arranged to target medical practitioners working in the private sector.

Since patients’ self-medication with antibiotics was considered by most respondents an important driver of AMR, members of the public should be explained more about the disastrous consequences of AMR instead of merely asking them to stop practicing self-medication.

It was revealed that relatively fewer doctors were confident in de-escalating antibiotic therapy and differentiating broad-spectrum antibiotics. As such, these two areas should be strengthened in continuous professional training, guiding tools and reference materials.

With significantly more respondents who "always"/"often"/"sometimes" prescribed

antibiotics for uncomplicated URTI upon patients' requests considered "expectation/request of antibiotics by patients or carers" and "fear of patient's litigation" as important reasons of unindicated antibiotic prescription, and a significant proportion of respondents were frequently requested by patients for antibiotics for cold/flu/URTI, patient education and expectation management should be enhanced in public promotional campaign.

While more than three quarters of the respondents always/often used either Point-of-Care test or laboratory test, the use of Point-of-Care test to guide antibiotic prescription when treating patients with uncomplicated URTI was found to be relatively infrequent. Consideration might thus be taken for sharing such findings and explore with stakeholders on feasibility of more frequent use of either test to help optimise use of antibiotics in specific settings.

More promotional campaigns could be targeted at primary care doctors to promulgate the antibiograms, IMPACT guideline and ASP. Efforts could be made to explore and remove hindrance to application of the tools, as well as enhancing the feedback mechanism for continuous improvement of these tools. Dissemination of relevant training could be done via CME accredited formal lectures as well as web/computer based resources, which were considered useful by majority of respondents.

CHAPTER 1. INTRODUCTION

1.1. Background

1.1.1 In recognition of the major threat posed by Antimicrobial Resistance (AMR) to public health, the Hong Kong SAR Government announced in the 2016 Policy Address to set up a High Level Steering Committee on Antimicrobial Resistance (HLSC) to formulate strategies in collaboration with relevant sectors to tackle the threat. Under the HLSC, an Expert Committee was established to provide expert opinions on priority areas for actions for the HLSC's consideration.

1.1.2 The Hong Kong Strategy and Action Plan on Antimicrobial Resistance (2017 – 2022) (Action Plan) was launched in July 2017. The Action Plan outlined 6 key areas and 19 objectives to contain the growing threat of antimicrobial resistance (AMR) in Hong Kong. Among others, the Action Plan recommended to monitor knowledge, attitude and practice (KAP) towards AMR and antimicrobial use among general public and target population by survey. Results of KAP surveys were useful in providing guidance for development of key messages and means for promulgation targeting different populations (e.g. general public, healthcare professionals) to raise awareness and enable them to use antimicrobials in an appropriate manner.

1.1.3 In this connection, the Department of Health (DH) commissioned Consumer Search Hong Kong Limited (CSG) to conduct a KAP survey of medical practitioners on AMR ("the Survey") to gauge knowledge, understanding and prescription behaviour of human health practitioners.

1.2. Survey Objectives

1.2.1. The objectives of the Survey are as follows:

(a) To understand medical practitioners' knowledge on antibiotic use;

(b) To understand their knowledge and awareness on AMR;

(c) To understand their prescribing practice; and

(d) To collect their views on strategies to control AMR.

CHAPTER 2. SURVEY METHOD

2.1 Target Respondents

2.1.1. The target respondents were medical practitioners with full registration with the Medical Council of Hong Kong under the Medical Registration Ordinance (Cap. 161), and were on the Resident List of the General Register as at 1 July 2018 ("registered medical practitioners").

2.1.2. The total number of such medical practitioners was 13 990.

2.2 Sampling Design and Target Sample Size

2.2.1. After exclusion of public health doctors working in DH, a random sample of 9 000 doctors was randomly selected from the sampling frame stated in Para. 2.1.1.

2.2.2. While primary care doctors are patients' first point of contact in the continuum of healthcare process, we want to understand more about this group of doctors in this survey. Respondents who replied "general practice" as "major field of practice" or "family medicine" as his/her specialty in the questionnaire were regarded as primary care doctors.

2.2.3. The target sample size was 1 067 registered medical practitioners, among whom at least 350 should be primary care medical practitioners.

2.3 Data Collection Method

2.3.1 The Survey was conducted by self-administrated paper-based or web-based questionnaire consisting of 24 questions in English (**Annex A**).

2.3.2 A survey pack containing the paper-based questionnaire, the invitation letter by CSG, the authorisation letter from DH and a business reply envelope (addressed to CSG) were mailed to the selected medical practitioners.

2.3.3 A QR code and a password (both were unique for each respondent) were printed on the questionnaire and invitation letter for the respondent to access the web-based questionnaire.

2.3.4 For confidentiality reason, the medical practitioner's name and address were not shown on the paper questionnaire. An unique identifier (UID) was assigned to each selected medical practitioner by DH and printed on the questionnaire instead.

2.3.5 The completed paper-based questionnaires were returned to CSG by post.

2.3.6 Two weeks after the first survey pack was sent out, a reminder survey pack containing the reminder letter by CSG, the authorisation letter from DH, the paper-based questionnaire and a business reply envelope were mailed to the medical

practitioners who had not yet completed the web-based questionnaire or returned paper-based questionnaire. The QR code and password for accessing the web-based questionnaire were printed again on the questionnaire and reminder letter.

2.3.7 The dates of sending out different batches of invitation/reminder letters are tabulated as below.

Week of	**Batch number (number of respondents)**				
	1st lot (3 000)	**2nd lot (2 000)**	**3rd lot (3 000)**	**4th lot (500)**	**5th lot (500)**
09/09-15/09	1st invitation				
30/09-05/10	1st reminder	1st invitation			
14/10-20/10		1st reminder			
21/10-27/10			1st invitation		
28/10-03/11	2nd reminder				
11/11-17/11		2nd reminder		1st invitation	
18/11-24/11			1st reminder		
02/12-08/12				1st reminder	1st invitation
09/12-15/12			2nd reminder		
16/12-22/12				2nd reminder	1st reminder

2.3.8 Respondents who completed the Survey were offered an electronic cash coupon from DH as a token of appreciation of their participation in the Survey.

2.4 Questionnaire Design

2.4.1 The questionnaire was divided into three main parts:

- Part 1: Knowledge and awareness on antibiotics and AMR
- Part 2: Prescription of antibiotics
- Part 3: Demographics

2.5 Pilot Study

2.5.1 Prior to the commencement of the main fieldwork of the Survey, a pilot study was conducted between 9 and 20 August 2019.

2.5.2 The purpose of the pilot study was to validate the design of the questionnaire and to test the logistics of the fieldwork procedures so that necessary amendments could be made to improve the questionnaire design and survey operation of the main fieldwork.

2.5.3 Each part of the questionnaire, including the length, question flow and wording, was fully tested. The functioning of the web-based questionnaire was also tested.

2.5.4 A total of five participants were recruited by DH. Three doctors filled in the paper-based questionnaire and two doctors completed the web-based questionnaire.

2.5.5 All five successful questionnaires were not counted as part of the main survey.

2.5.6 Feedback from these five doctors was also collected with the use of a Structured Review Questionnaires (**Annex B**). Amendments were made accordingly to improve the questionnaire design and survey operation.

2.6 Fieldwork Period

2.6.1 Fieldwork of the main survey was conducted from 11 September to 31 December 2019.

2.7 Achieved Sample Size and Response Rate

2.7.1 The achieved sample size was 1 074 (including 364 primary care doctors).

2.7.2 A total of 901 medical practitioners out of the 1 074 respondents returned their completed hardcopy questionnaires by mail while 173 respondents replied through the web platform.

2.7.3 The achieved response rate was 12.3%, based on dividing the number of completed cases (whether paper-based or web-based) by the total number of valid selected samples (i.e. total number of completed and non-response cases minus invalid addresses). Detailed enumeration results are shown in Table A:

Table A: Detailed enumeration results

a) Number of doctors invited	9 000
b) Number of completed case (i + ii):	1 074
i) replied by mail	901
- primary care doctor	310
- doctors of other specialty	583

- missing information to determine whether the doctor works in primary setting or not	8
ii) replied through web platform	173
- primary care doctor	54
- doctors of other specialty	119
c) Number of non-response case	7 679
d) Number of invalid case (i.e. invalid address)	247
e) Response rate: ($\frac{b}{a-d}$)	**12.3%**

2.7.4 Among the 1 074 respondents, 1 043 respondents (including 354 primary care doctors) reported practising in Hong Kong. For the remaining 31 respondents (including ten primary care doctors), 28 reported not practising in Hong Kong, while three did not report on their work status. These 31 individuals (including ten primary care doctors) were excluded from further analysis of the survey findings (except for Section 3.1 "Work Status").

2.8 Sampling Error Calculation

2.8.1 The estimator of each parameter $\bar{X}$, was given by $\frac{1}{n}\sum_{i=1}^{n} x_i$, with a variance estimate of $Var(\bar{x}) = (1 - \frac{n}{N})\frac{\bar{x}(1-\bar{x})}{n(n-1)}$, where:

(a) x_i is the response of individual *i*;

(b) *n* is the number of respondents surveyed;

(c) *N* is the size of target population in this Survey; and

2.8.2 The sampling error of this estimator was given by $s.e.(\bar{x}) = \sqrt{Var(\bar{x})}$.

2.8.3 Hence, the maximum sampling error for a sample of 1 074 was estimated to be $\sqrt{\left(1 - \frac{1\,074}{13\,817}\right) \times \frac{0.5\ (1-0.5)}{1\,074\ (1\,074-1)}}$ = 0.045%, with the corresponding 99% confidence interval of 2.576 x 0.028% = ± 0.115%.

2.8.4 This means that we have 99% confidence that the true proportion falls within the sample proportion plus or minus 0.115%.

2.8.5 In the analyses of this Report, it is assumed that respondents and non-respondents had similar knowledge and awareness on AMR, and prescribing practice and opinion on strategies to control AMR.

2.9 Quality Control

2.9.1 Quality control measures were established and implemented at various stages of the Survey to ensure high standard of performance in every task of the Survey.

(a) Assurance of non-duplicate returns

Measures were taken to avoid repeat submission by the same respondent:

(i) As stated in Para 2.3.4, an UID was provided by DH and assigned to each selected medical practitioner to keep track of response;

(ii) The UID was recorded upon receiving a completed questionnaire from the respondent. The list of returned UIDs was submitted to DH on a biweekly basis to avoid sending the reminder letter to respondents who had already submitted their response;

(iii) The UIDs of the completed questionnaires received from paper-based and web-based platforms were de-duplicated by computer programme as well as manual checking to ensure no respondent had returned the questionnaire via more than one means; and

(iv) When repeated submission of completed questionnaire was identified (e.g. the same respondent had submitted the completed questionnaire by more than one method), the first version that was received prevailed.

(b) Data Management

(i) Double data entry of 91 (i.e. ten percent) completed paper-based questionnaires was randomly performed to make sure the data were correctly entered.

(ii) All the data of the web-based questionnaires were entered directly to the electronic platform by the respondents during questionnaire completion. The flow of the questions and quality of the answers were monitored by the built-in logical process of the electronic questionnaire.

(iii) All completed questionnaires were properly edited, coded and validated according to approved coding manual, editing guide and validating rules.

2.10 Statistical Analysis

2.10.1 Categorical variables are analysed using Fisher exact test, Chi-squared test, Mann-Whitney U test or Kruskal-Wallis test.

2.10.2 In questions allowing multiple answers, the sum of percentages from different responses can be greater than 100.0%.

2.10.3 In questions allowing single answer only, the sum of percentages might not add up to or might exceed 100.0% due to rounding.

2.10.4 Owing to rounding again, there may be slight discrepancy between the sum of individual items and the “total” figure shown in the tables.

2.10.5 In the tables and charts of the survey findings, the symbol “-” represents “nil” response.

CHAPTER 3. Survey Findings

Other than Section 3.1 on work status, this chapter presents the detailed findings of the Survey based on the 1 043 medical practitioners who were currently practising in Hong Kong (defined as practising in Hong Kong as at 30 June 2019).

3.1 Work Status

The great majority (97.1%) of all the 1 074 doctors who responded to the Survey were practising in Hong Kong as at 30 June 2019. There were only one (0.1%) and four (0.4%) doctors who were practising in the Mainland/Macao/Taiwan and overseas respectively. (Table 1:a.i.1.Table 1)

Table 1 Work status as at 30 June 2019 (Q19)

Work status	Respondent count	Percentage
Practising in Hong Kong	1 043	97.1%
Practising in Mainland/Macao/Taiwan	1	0.1%
Practising overseas	4	0.4%
Not practising	23	2.1%
(Missing)	(3)	(0.3%)
Total	1 074	100%

Base: All respondents

3.2 Demographics

This section describes the demographic characteristics and other background information of respondents who were practising in Hong Kong, with exclusion of missing data.

3.2.1 Gender and age

(a) About two-thirds (66.9%) of respondents enumerated were males and one-third (33.1%) were females. (Table 2)

(b) There were relatively more respondents of younger age: aged 36 to 45 years (25.7%); aged 46 to 55 years (23.4%); aged 35 years or below (21.0%); and aged 56 to 65 years (18.1%). Slightly over one in ten (11.8%) respondents were aged over 65 years. (Table 3)

Table 2 Distribution of gender (Q17)

	Respondent Count	Percentage
Male	688	66.9%
Female	341	33.1%
Total	**1 029**	**100.0%**

Base: All respondents who were practising in Hong Kong excluding missing

Table 3 Distribution of age (Q16)

	Respondent Count	Percentage
35 or below	214	21.0%
36 – 45	262	25.7%
46 – 55	238	23.4%
56 – 65	184	18.1%
Over 65	120	11.8%
Total	**1 018**	**100.0%**

Base: All respondents who were practising in Hong Kong excluding missing

(c) Analysed by age within sex, the male respondents were more skewed towards the age of 36 to 65 years (67.6%), while most of the female respondents were 55 years old or under (87.5%). (Table 4)

Table 4 Distribution of age within sex (Q16, Q17)

Age	Respondent count (Column percentage)		
	Female	Male	Total
35 or below	99 (29.4%)	115 (16.9%)	214 (21.0%)
36 – 45	125 (37.1%)	137 (20.1%)	262 (25.8%)
46 – 55	71 (21.1%)	167 (24.6%)	238 (23.4%)
56 – 65	28 (8.3%)	156 (22.9%)	184 (18.1%)
Over 65	14 (4.2%)	105 (15.4%)	119 (11.7%)
Total	337 (100.0%)	680 (100.0%)	1 017 (100.0%)

Base: All respondents who were practising in Hong Kong excluding missing

3.2.2 Education attainment or level of professional training

Slightly more than half (53.5%) of the respondents had attended continuous medical education (CME)/continuous professional development (CPD) programme, while more than one-third (36.7%) had attained post-graduate

diplomas. About two in ten (18.9%) respondents held Master's degree and 4.9% held Doctoral degree. (Table 5)

Table 5 Post-graduate qualifications other than fellowship qualification(s) as at 30 June 2019 (Q24)

Post-graduate qualification(s) other than fellowship qualification(s)	Respondent Count	Percentage
CME/CPD programme	538	53.5%
Diploma	369	36.7%
Master's Degree	190	18.9%
Doctoral Degree	49	4.9%
Not applicable	216	21.5%

Base: All respondents who were practising in Hong Kong excluding missing (N=1 005)

Notes: some respondents may returned multiple qualifications

3.3 Medical Practice Background

3.3.1 Years of practising in the medical profession

About a quarter of the respondents had been practising in the medical profession for 11 to 20 years (27.4%), over 30 years (26.9%) and 21 to 30 years (25.2%) respectively, whereas another 20.5% of the respondents had been in practice for ten years or less. (Table 6)

Table 6 Years of practising in the medical profession as at 30 June 2019 (Q18)

Practice duration (Year)	Respondent count	Percentage
10 or less	210	20.5%
11 – 20	281	27.4%
21 - 30	258	25.2%
More than 30	275	26.9%
Total	1 024	100.0%

Base: All respondents who were practising in Hong Kong excluding missing

3.3.2 Type of institution working in

Most of the respondents were either working in the Hospital Authority (47.0%) or the private sector (45.3%). A very small proportion of them were working in the government (4.9%), academic institutions (1.8%) or subvented organisations (1.0%). (Table 7)

Table 7 Type of institution working in as at 30 June 2019 (Q20)

Type of institution	Response count	Percentage
Government	51	4.9%
Hospital Authority	490	47.0%
Academic institution	19	1.8%
Subvented organisation	10	1.0%
Private sector	473	45.3%
Total	1 043	100.0%

Base: All respondents who were practising in Hong Kong excluding missing

3.3.3 Major field of practice

About two-thirds (66.7%) of the respondents spent most of their working time in specialty practice, while around three in ten (31.8%) respondents mainly spent their time on general practice.

There were a very small proportion (1.5%) of the respondents whose major field of practice was administration or teaching. (Table 8)

Table 8 Distribution of major field of practice as at 30 June 2019 (Q21)

Field	Response count	Percentage
Practice in a specialty	693	66.7%
General practice	330	31.8%
Administration/Teaching	16	1.5%
Total	1 039	100.0%

Base: All respondents who were practising in Hong Kong excluding missing

A total of 354 respondents were classified as primary care doctors following the definition in Para 2.2.2.

3.3.4 Level of professional training

About two-thirds (66.7%) of the respondents were specialists/fellows, while 14.1% of the respondents were specialist trainees. Slightly less than one-fifth of the respondents (18.7%) were not under any specialty. (Table 9)

However, a very small percentage (0.6%) of respondents reported that they practised in specialty as their major field of practice (Q21) but their levels of professional training were not under any specialty (Q22).

Table 9 Level of professional training as at 30 June 2019 (Q22)

Level of professional training	Respondent count	Percentage
Specialist/Fellow	693	66.7%
Specialist trainee	146	14.1%
Not under any specialty	194	18.7%
Practice in a specialty while not under any specialty	6	0.6%
Total	1 039	100.0%

Base: All respondents who were practising in Hong Kong excluding missing

3.3.5 Specialties

Among the respondents who were practising in a specialty and working as specialists/fellows/trainees, slightly more of them (22.0%) were practising internal medicine, followed by family medicine (15.2%) and surgery (10.3%). Other relatively more common specialties included paediatrics (9.4%), emergency medicine (7.2%), obstetrics & gynaecology (7.1%) and anaesthesiology (5.2%). (Table 10)

Table 10 Distribution of specialty as at 30 June 2019 (Q23)

Specialty	Respondent count	Percentage
Internal Medicine	185	22.0%
Family Medicine	128	15.2%
Surgery	87	10.3%
Paediatrics	79	9.4%
Emergency Medicine	61	7.2%
Obstetrics and Gynaecology	60	7.1%
Anaesthesiology	44	5.2%
Orthopaedics and Traumatology	33	3.9%
Psychiatry	32	3.8%
Radiology	30	3.6%
Ophthalmology	26	3.1%
Pathology	22	2.6%
Otorhinolaryngology	16	1.9%
Oncology	16	1.9%
Community Medicine	12	1.4%
Others	11	1.3%
Total	842	100.0%

Base: Respondents who were practising in a specialty in Hong Kong and working as specialties/fellows/trainees excluding missing

3.4 Knowledge and Awareness on Antibiotics and AMR

3.4.1 Impact of AMR

Among all respondents, majority of them were aware that AMR could lead to reduced treatment options (98.7%), increased treatment cost (98.5%), increased mortality (97.5%) and increased length of hospital stay (97.3%). (Table 11)

Table 11 Awareness of impact of AMR (Q1a – Q1d)

AMR could lead to…..	Respondent count (Row percentage)			
	Yes	No	Don't know	Total Response
Reduced treatment options	1 027 (98.7%)	11 (1.1%)	3 (0.3%)	1 041 (100.0%)
Increased treatment cost	1024 (98.5%)	9 (0.9%)	7 (0.7%)	1 040 (100.0%)
Increased mortality	1014 (97.5%)	12 (1.2%)	14 (1.3%)	1 040 (100.0%)
Increased length of hospital stay	1012 (97.3%)	13 (1.3%)	15 (1.4%)	1 040 (100.0%)

Base: All respondents who were practising in Hong Kong excluding missing

3.4.2 Severity of AMR

The respondents were asked about their view on the severity of AMR by rating on a 5-point scale, with "5" being "very severe" and "1" being "not severe at all".

In terms of geographical coverage,

(a) About seven in ten (70.1%) respondents held the view that AMR was severe ("very severe"/"slightly severe") worldwide, with about two in ten (18.2%) respondents considering it "very severe". Only 3.2% of the respondents opined that AMR was not severe ("slightly not severe"/"not severe at all") around the world.

(b) The perception on the severity of AMR in Hong Kong was somewhat similar. There were two-thirds (65.1%) of the respondents who regarded AMR severe in Hong Kong in general, with 15.0% of the respondents considering it "very severe". Only 5.9% of the respondents did not think that AMR was severe in Hong Kong.

In terms of settings,

(c) AMR was opined to be severe in the hospital setting by the great majority of respondents (84.3%), with over three in ten (31.1%) respondents rating it "very severe".

(d) The perceived severity of AMR in the community setting was significantly lower when compared to hospital setting. Only 44.6% of the respondents regarded AMR severe in community, with less than one in ten respondents (8.0%) considering it "very severe". (Table 12)

Table 12 Perceived severity of (AMR) in different geographical regions and locations (Q2a – Q2d)

	Respondent count (Row percentage)					
	Not severe at all	**Slightly not severe**	**Neutral**	**Slightly severe**	**Very Severe**	**Total Response**
	1	**2**	**3**	**4**	**5**	
Worldwide	5 (0.5%)	28 (2.7%)	278 (26.7%)	540 (51.9%)	189 (18.2%)	1 040 (100.0%)
Hong Kong in general	6 (0.6%)	55 (5.3%)	302 (29.1%)	520 (50.0%)	156 (15.0%)	1 039 (100.0%)
Hospital setting	3 (0.3%)	24 (2.3%)	136 (13.1%)	551 (53.1%)	323 (31.1%)	1 037 (100.0%)
Community setting	8 (0.8%)	112 (10.8%)	456 (43.9%)	380 (36.6%)	83 (8.0%)	1 039 (100.0%)

Base: All respondents who were practising in Hong Kong excluding missing

3.4.3 Importance of various factors contributing to AMR

Respondents were asked about their view on the importance of different factors contributing to AMR by rating on a 5-point scale, with “5” being “very important” and “1” being “not important at all”.

Self-medication with antibiotics (83.3%) and inappropriate choice of drug (83.0%) were considered by the highest proportions of respondents to be important (“very important”/“slightly important”) drivers of AMR. It is noteworthy that there were over four in ten respondents rated the two factors “very important” (46.0% and 40.2% respectively).

Other important factors contributing to AMR considered by over 60% respondents included inappropriate use of antibiotics in terms of duration (79.0%), patients’ non-compliance to antibiotic treatment (77.1%), and poor infection control (62.3%).

Relatively speaking, there were fewer respondents who held the view that influence of pharmaceutical industry (43.9%) was an important contributing factor. Poor quality of antibiotics was considered important by the least respondents, with 24.9% rating it “very important”/“slightly important” and 39.4% rating it “slightly not important”/“not important at all”. (Table 13)

Table 13 Importance of various factors contributing to AMR (Q3a - Q3c)

	Respondent count (Row percentage)					
	Not important at all	**Slightly not important**	**Neutral**	**Slightly important**	**Very important**	**Total Response**
	1	**2**	**3**	**4**	**5**	
Poor infection control	15 (1.5%)	109 (10.6%)	262 (25.6%)	380 (37.1%)	258 (25.2%)	1 024 (100.0%)
Inappropriate use of antibiotics in terms of…						
Duration	5 (0.5%)	40 (3.8%)	174 (16.7%)	454 (43.6%)	368 (35.4%)	1 041 (100.0%)
Choice of drug	1 (0.1%)	30 (2.9%)	146 (14.0%)	446 (42.8%)	419 (40.2%)	1 042 (100.0%)
Influence of pharmaceutical industry	39 (3.7%)	143 (13.7%)	402 (38.6%)	324 (31.1%)	133 (12.8%)	1 041 (100.0%)
Patients' non-compliance to antibiotic treatment	5 (0.5%)	46 (4.4%)	188 (18.0%)	427 (41.0%)	376 (36.1%)	1 042 (100.0%)
Self-medication with antibiotics	5 (0.5%)	39 (3.8%)	130 (12.5%)	387 (37.2%)	478 (46.0%)	1 039 (100.0%)
Poor quality of antibiotics	89 (8.7%)	315 (30.7%)	367 (35.8%)	190 (18.5%)	65 (6.3%)	1 026 (100.0%)

Base: All respondents who were practising in Hong Kong excluding missing

3.5 Prescription of Antibiotics

3.5.1 Level of confidence in antibiotic prescription

Respondents were asked about their level of confidence on various tasks about antibiotic prescription by rating on a 5-point rating scale, with "5" being "very confident" and "1" being "not confident at all".

Majority of respondents expressed confidence in all the areas. The largest proportions of respondents were confident ("very confident"/"slightly confident") in interpreting antibiotic susceptibility test results (85.6%) and knowing when to start antibiotic therapy (81.4%). In particular, close to one-third (32.4%) of the respondents rated themselves "very confident" in the area of interpreting antibiotic susceptibility test results.

Around seven in ten respondents were confident in choosing the correct drug and dosage (76.8%), educating patient on the proper use of antibiotics (74.5%), determining the right treatment duration (73.1%), differentiating broad-spectrum antibiotics from narrow-spectrum antibiotics and avoiding their unnecessary use

(71.5%) and de-escalating antibiotic therapy according to clinical evaluation and diagnostic test results (68.6%). (Table 14)

Table 14 Level of confidence in antibiotic prescription-related tasks (Q6a - Q6g)

	Respondent count (Row percentage)					
	Not confident at all	**Slightly not confident**	**Neutral**	**Slightly confident**	**Very confident**	**Total Response**
	1	**2**	**3**	**4**	**5**	
Knowing when to start antibiotic therapy	2 (0.2%)	20 (1.9%)	170 (16.4%)	635 (61.4%)	208 (20.1%)	1 035 (100.0%)
Choosing the correct drug and dosage	3 (0.3%)	30 (2.9%)	206 (20.0%)	620 (60.1%)	172 (16.7%)	1 031 (100.0%)
Determining the right treatment duration	3 (0.3%)	44 (4.3%)	231 (22.3%)	585 (56.6%)	171 (16.5%)	1 034 (100.0%)
Differentiating broad-spectrum from narrow-spectrum antibiotics, and avoid their unnecessary use	4 (0.4%)	42 (4.1%)	248 (24.0%)	517 (50.0%)	222 (21.5%)	1 033 (100.0%)
Interpreting antibiotic susceptibility test result	1 (0.1%)	21 (2.0%)	127 (12.3%)	550 (53.2%)	335 (32.4%)	1 034 (100.0%)
De-escalating antibiotic therapy according to clinical evaluation and diagnostic test result	8 (0.8%)	66 (6.4%)	251 (24.3%)	505 (48.8%)	204 (19.7%)	1 034 (100.0%)
Educating patient on proper use of antibiotics	2 (0.2%)	40 (3.9%)	222 (21.5%)	542 (52.4%)	228 (22.1%)	1 034 (100.0%)

Base: All respondents who were practising in Hong Kong excluding missing

3.5.2 Practice of antibiotic prescription

Among the respondents, 22.5% reported that less than five percent of their consultations had led to antibiotic prescriptions, 21.4% reported five to less than ten percent of consultations, 17.3% reported ten to less than 15% of consultations and 12.6% reported 15% to less than 20% of consultations.

There were close to two in ten (17.7%) respondents who had prescribed antibiotics in at least one-quarter of their consultations. (Table 15)

Table 15 Percentage of consultations that had led to antibiotic prescription (Q7)

Percentage of consultations	Respondent count	Percentage
0 - <5%	232	22.5%
5 - <10%	221	21.4%
10 - <15%	178	17.3%
15 - <20%	130	12.6%
20 - <25%	87	8.4%
25 - <30%	109	10.6%
≥ 30%	74	7.2%
Total response	1 031	100.0%

Base: All respondents who were practising in Hong Kong excluding missing

3.5.3 Frequency of prescribing antibiotics for cold/flu/upper respiratory tract infection (URTI)

Slightly more than half (56.8%) of the respondents reported that they had prescribed antibiotics for cold/flu/URTI in less than five percent. Another 19.3% of the respondents had done so in five to less than ten percent.

There were 5.1% of respondents prescribed antibiotics in at least one-quarter of their consultations for cold/flu/URTI. (Table 16)

Table 16 Frequency of prescribing antibiotics for cold/flu/URTI (Q8)

Prescription frequency	Respondent count	Percentage
0 - <5%	586	56.8%
5 - <10%	199	19.3%
10 - <15%	95	9.2%
15 - <20%	65	6.3%
20 - <25%	33	3.2%
25 - <30%	36	3.5%
≥ 30%	17	1.6%
Total response	1 031	100.0%

Base: All respondents who were practising in Hong Kong excluding missing

3.5.4 Frequency of patients requesting antibiotics for cold/flu/URTI

Respondents were “sometimes” (50.6%), “often” (8.4%), or “always” (0.3%) being asked by patients for prescribing antibiotics for cold/flu/URTI. Whereas over three in ten respondents (31.9%) had “rarely”, and less than one in ten respondents (8.7%) had “never” come across such request. (Table 17)

Table 17 Frequency of patient requesting antibiotics for cold/flu/URTI (Q9)

Request frequency	Respondent count	Percentage
Never	90	8.7%
Rarely	329	31.9%
Sometimes	522	50.6%
Often	87	8.4%
Always	3	0.3%
Total response	1 031	100.0%

Base: All respondents who were practising in Hong Kong excluding missing

3.5.5 Prescription behaviour for patients with uncomplicated URTI

Respondents were asked about how often they practised the following for patients with uncomplicated URTI (including common cold and flu):

(a) "Do not prescribe antibiotics and explain to patients why they are not indicated"

Majority (78.6%) of respondents "always"/"often" did not prescribe antibiotics and explained to patients why they were not indicated. Only 7.3% of respondents had "rarely"/never" done so.

(b) "Use Point-of-Care test to guide antibiotic prescription"

The usage of Point-of-Care test in guiding their prescription was somewhat low. There were about one in five (21.1%) respondents "always"/"often" used Point-of-Care test to guide their prescription while slightly over half (50.9%) of the respondents had "rarely"/"never" done so. It is noteworthy that over one-quarter (26.3%) of the respondents had actually never used the test for the purpose.

(c) "Prescribing antibiotics whenever patients requested"

Close to four in ten (38.3%) respondents had "never" prescribed antibiotics upon requested by patients, while 44.7% had "rarely" done so. Only 2.1% of respondents "always"/"often" gave such prescription. (Table 18)

Table 18 Prescription behaviour for patients with uncomplicated URTI (Q10a – Q10c)

	Respondent count (Row percentage)					
	Never	**Rarely**	**Sometimes**	**Often**	**Always**	**Total Response**
Not prescribing antibiotics and explaining to patients why they are not indicated	44 (4.3%)	31 (3.0%)	145 (14.1%)	475 (46.2%)	334 (32.5%)	1 029 (100.0%)
Using point-of-care test to guide antibiotic prescription	268 (26.3%)	251 (24.6%)	286 (28.0%)	171 (16.8%)	44 (4.3%)	1 020 (100.0%)
Prescribing antibiotics whenever patients request	394 (38.3%)	460 (44.7%)	153 (14.9%)	21 (2.0%)	1 (0.1%)	1 029 (100.0%)

Base: All respondents who were practising in Hong Kong excluding missing

3.5.6 Reasons for unindicated antibiotic prescription

Respondents were asked about their view on different reasons for unindicated antibiotic prescription by rating on a 5-point rating scale, with “5” being “very important” and “1” being “not important at all”.

“Uncertain clinical diagnosis” was considered by the highest proportion (56.0%) of respondents to be an important (“very important”/“slightly important”) reason for unindicated antibiotic prescription, followed at a distance by “expectation/ request of antibiotics by patients or carers” (23.8%) and “cannot ensure return of patient for follow up” (17.7%).

On the other hand, “no time to explain why not indicated” and “fear of patient’s litigation” were only perceived to be important (“very important”/“slightly important”) reasons by 9.1% and 16.3% of respondents respectively. (Table 19)

Table 19 Importance of the different reason for unindicated antibiotic prescription (Q11a - Q11e)

	Respondent count (Row percentage)					
	Not important at all	**Slightly not important**	**Neutral**	**Slightly important**	**Very important**	**Total Response**
	1	**2**	**3**	**4**	**5**	
Uncertain clinical diagnosis	32 (3.1%)	80 (7.8%)	341 (33.1%)	459 (44.6%)	117 (11.4%)	1 029 (100.0%)
Expectation/request of antibiotics by patients or carers	155 (15.0%)	296 (28.7%)	334 (32.4%)	204 (19.8%)	41 (4.0%)	1 030 (100.0%)
Cannot ensure return of patient for follow up	249 (24.2%)	300 (29.2%)	298 (29.0%)	158 (15.4%)	24 (2.3%)	1 029 (100.0%)
No time to explain why not indicated	367 (35.7%)	322 (31.3%)	245 (23.8%)	74 (7.2%)	20 (1.9%)	1 028 (100.0%)
Fear of patient's litigation	272 (26.4%)	336 (32.6)	254 (24.7%)	134 (13.0%)	34 (3.3%)	1 030 (100.0%)

Base: All respondents who were practising in Hong Kong excluding missing

3.5.7 Frequency of explaining to patients upon antibiotic prescription

Respondents were asked about their frequency of explaining to patients' various issues upon antibiotic prescription.

Majority (86.8%) of respondents "always"/"often" explained to their patients about "complete course of antibiotics as prescribed", followed by 78.6% of respondents on "indication of antibiotic prescription".

Slightly more than half (58.1%) of the respondents "always"/"often" explained to their patients that "improper use of antibiotics would increase antimicrobial resistance" and 54.9% of respondents "always"/"often" explained to them "side effects of antibiotics". (Table 20)

Table 20 Frequency of explaining to patients upon antibiotic prescription (Q12a - Q12d)

	Respondent count (Row percentage)					
	Never	**Rarely**	**Sometimes**	**Often**	**Always**	**Total Response**
Indication of antibiotic prescription	10 (1.0%)	29 (2.8%)	182 (17.6%)	495 (48.0%)	316 (30.6%)	1 032 (100.0%)
Side effects of antibiotics	13 (1.3%)	102 (9.9%)	350 (33.9%)	370 (35.9%)	196 (19.0%)	1 031 (100.0%)
Complete course of antibiotics as prescribed	8 (0.8%)	19 (1.8%)	109 (10.6%)	416 (40.4%)	478 (46.4%)	1 030 (100.0%)
Improper use of antibiotics would increase antimicrobial resistance	20 (1.9%)	131 (12.7%)	280 (27.2%)	350 (34.0%)	248 (24.1%)	1 029 (100.0%)

Base: All respondents who were practising in Hong Kong excluding missing

3.5.8 Frequency of re-assessing patients

Less than four in ten (38.4%) respondents “always”/“often” re-assessed their patients’ antibiotic regimen after 48 to 72 hours of starting treatment, while more than one-third (34.1%) of the respondents “sometimes” did so. There were over one-quarter (27.5%) of respondents “rarely”/“never” made such reassessment. (Table 21)

Table 21 Frequency of re-assessing patients (Q13)

Frequency on reassessment	**Respondent count**	**Percentage**
Never	56	5.4%
Rarely	228	22.1%
Sometimes	352	34.1%
Often	290	28.1%
Always	107	10.4%
Total response	1 033	100.0%

Base: All respondents who were practising in Hong Kong excluding missing

3.5.9 Adequacy of training on antibiotic use

Over seven in ten (71.9%) respondents considered themselves adequately trained on antibiotic use. (Table 22).

Table 22 Whether adequately trained on antibiotic use (Q14)

Response	Respondent count	Percentage
Yes	720	71.9%
No	282	28.1%
Total response	1 002	100.0%

Base: All respondents who were practising in Hong Kong excluding missing

3.6 Evaluation of Tools

3.6.1 Awareness of availability of selected antibiotic prescription guiding tools

All three tools were known by the majority of the respondents. The Interhospital Multi-disciplinary Programme on Antimicrobial ChemoTherapy (IMPACT) guideline was known to most (78.7%) respondents, followed by the antibiogram for public and private hospitals (68.2%) and the Antibiotic Stewardship Programme (ASP) in Primary Care/Hospital at 64.4%. (Table 23)

Table 23 Awareness of availability of antibiotic prescription guiding tools (Q4a – Q4c)

	Respondent count (Row percentage)		
	Yes	No	Total Response
Antibiogram for public and private hospitals	710 (68.2%)	331 (31.8%)	1 041 (100.0%)
IMPACT guideline	819 (78.7%)	222 (21.3%)	1 041 (100.0%)
Antibiotic Stewardship Programme in Primary Care/Hospital	672 (64.4%)	371 (35.6%)	1 043 (100.0%)

Base: All respondents who were practising in Hong Kong excluding missing

3.6.2 Frequency of making reference to different tools when prescribing antibiotics

Among respondents who were aware of the availability of the corresponding antibiotic prescription guiding tools, IMPACT guideline was "always"/"often"/"sometimes" used by more than three quarters (78.2%) of them, followed by antibiogram for public and private hospitals (72.2%), and the Antibiotic Stewardship Programme in Primary Care/Hospital (71.2%). (Table 24)

Table 24 Frequency of making reference to antibiotic prescription guiding tools (Q5a to Q5c)

	Respondent count (Row percentage)						
	Never	**Rarely**	**Sometimes**	**Often**	**Always**	**Total applicable response**	**Not applicable**
Antibiogram for public and private hospitals	33 (4.9%)	155 (22.9%)	255 (37.7%)	162 (24.0%)	71 (10.5%)	676 (100.0%)	26
IMPACT guideline	44 (5.6%)	128 (16.2%)	303 (38.5%)	217 (27.5%)	96 (12.2%)	788 (100.0%)	25
ASP in Primary Care/Hospital	54 (8.5%)	129 (20.3%)	201 (31.6%)	167 (26.3%)	85 (13.4%)	636 (100.0%)	28

Base: Only respondents who were practising in Hong Kong and aware of the corresponding tools excluding missing

Laboratory test/Point-of-Care test was the most widely used among the respondents with more than three quarters (77.9%) of the respondents “always”/“often” used them. There were only 5.7% of respondents who “rarely”/“never” made use of such tests when prescribing antibiotics.

Suggestions from peers of the same specialty, specialist consultation and guidelines/recommendations of foreign health authorities/agencies had similar same level of usage, being “always”/“often” used by 46.8%, 44.5% and 43.8% of respondents respectively. (Table 25)

Table 25 Frequency of making reference to different tools when prescribing antibiotics (Q5d to Q5g)

	Respondent count (Row percentage)						
	Never	**Rarely**	**Sometimes**	**Often**	**Always**	**Total applicable response**	**Not applicable**
Foreign guidelines/ recommendations for health authorities/agencies	70 (7.0%)	160 (16.1%)	329 (33.1%)	335 (33.7%)	101 (10.2%)	995 (100.0%)	35
Peers’ suggestion of the same specialty	52 (5.2%)	112 (11.2%)	367 (36.7%)	388 (38.8%)	80 (8.0%)	999 (100.0%)	32
Specialist consultation	71 (7.2%)	189 (19.1%)	288 (29.1%)	273 (27.6%)	167 (16.9%)	988 (100.0%)	44
Laboratory test/Point-of-care test	19 (1.9%)	38 (3.8%)	163 (16.4%)	373 (37.5%)	401 (40.3%)	994 (100.0%)	36

Base: All respondents who were practising in Hong Kong excluding missing

3.6.3 Perceived effectiveness of various tools/reference on improving doctors' knowledge on proper use of antibiotics

Among respondents who were aware of and had ever used the tools, IMPACT guideline was considered useful ("very useful"/"slightly useful") by over third quarters (78.5%) of them, followed by antibiogram for public and private hospitals (78.1%) and ASP in Primary Care/Hospital (72.0%). (Table 26)

Table 26 Effectiveness of various tools on improving respondents' knowledge on proper use of antibiotics (Q15b – Q15d)

	Respondent count (Row percentage)						
	Not useful at all	Slightly not useful	Neutral	Slightly useful	Very useful	Total Response	Not applicable
	1	2	3	4	5		
Antibiogram for public and private hospitals	5 (0.8%)	31 (4.9%)	104 (16.3%)	258 (40.4%)	241 (37.7%)	639 (100.0%)	4
IMPACT guideline	4 (0.5%)	22 (3.0%)	133 (18.0%)	298 (40.3%)	282 (38.2%)	739 (100.0%)	5
ASP in Primary Care/Hospital	3 (0.5%)	37 (6.4%)	122 (21.1%)	204 (35.3%)	212 (36.7%)	578 (100.0%)	4

Base: Only respondents who were practising in Hong Kong, were aware of and also had ever used the corresponding tools, excluding missing

CME accredited formal lecture, web/computer-based resources and infectious disease specialist/microbiologist consultation were considered useful by 76.2%, 76.1% and 75.2% respondents respectively. (Table 27)

Table 27 Effectiveness of various sources of information on improving respondents' knowledge on proper use of antibiotics (Q15a, e, f)

	Respondent count (Row percentage)						
	Not useful at all	Slightly not useful	Neutral	Slightly useful	Very useful	Total Response	Not applicable
	1	2	3	4	5		
Formal lecture (CME accredited)	13 (1.3%)	48 (4.7%)	181 (17.8%)	370 (36.4%)	404 (39.8%)	1 016 (100.0%)	18
Web/computer-based resources	14 (1.4%)	45 (4.4%)	183 (18.0%)	357 (35.2%)	415 (40.9%)	1 014 (100.0%)	17
Infectious disease specialist/microbiologist consultation	14 (1.4%)	70 (7.0%)	163 (16.4%)	291 (29.2%)	458 (46.0%)	996 (100.0%)	36

Base: All respondents who were practising in Hong Kong excluding missing

CHAPTER 4. Sub-group Analysis by Demographic Information and Related Questions

In this chapter, sub-group analyses were performed based on the breakdown of respondents' demographic and background information (including gender, years of practice, type of institution, level of professional training and specialty) to identify if there are any significant associations between these factors and the areas being investigated in the Survey. Practising as Primary Care doctors, as defined in Para 2.2.2, was also studied for significant associations.

While year of practice of doctors in Hong Kong is closely associated with their age, to avoid presenting similar findings, the former which represented work experience, was used in the sub-group analysis instead of age.

Missing responses were excluded from all the sub-group analyses.

Only results that are statistically significant at less than five percent level are discussed and shown below.

4.1 Re-grouping of Variables

4.1.1 Some of the similar responses were collapsed in order that the sample bases for the sub-group analyses were larger and hence more robust. (Table 28)

Table 28 Collapsing of similar responses

Variable	Original level	Respondent count	Re-grouped level	Respondent count
Type of institution (Q20)	Government	51	Government	51
	Hospital Authority	490	Hospital Authority	490
	Academic institution	19	Academic institution	19
	Subvented organisation	10	Subvented organisation	10
	Private – Clinic-based	403#	Private sector	473
	Private – Hospital-based	80#		
	Private – others	7#		
Major field of practice (Q21)	General Practice	330	General Practice	330
	Practice in a specialty	693	Practice in a specialty	693
	Administration/ Management	13^	Administration/ Teaching	16
	Teaching/Education	4^		
Specialty (Q23)	Surgery	87	Surgery-related specialty	140
	Orthopaedics and Traumatology	33		
	Otorhinolaryngology	16		
	Others*	4		
	Internal Medicine	185	Non-surgery-related specialty	702
	Family Medicine	128		

	Paediatrics	79		
	Emergency Medicine	61		
	Obstetrics and Gynaecology	60		
	Anaesthesiology	44		
	Psychiatry	32		
	Radiology	30		
	Ophthalmology	26		
	Pathology	22		
	Oncology	16		
	Community Medicine	12		
	Others*	7		
How often do you make decision on antibiotic prescription with reference to Antibiogram for public and private hospitals (Q5a)	Not applicable	357	Never used	390
	Never	33		
	Rarely	155	Have ever used before	643
	Sometimes	255		
	Often	162		
	Always	71		
How often do you make decision on antibiotic prescription with reference to IMPACT guideline (Q5b)	Not applicable	247	Never used	291
	Never	44		
	Rarely	128	Have ever used before	745
	Sometimes	304		
	Often	217		
	Always	96		
How often do you make decision on antibiotic prescription with reference to Antibiotic Stewardship Programme in Primary Care/ Hospital (Q5c)	Not applicable	399	Never used	453
	Never	54		
	Rarely	129	Have ever used before	582
	Sometimes	201		
	Often	167		
	Always	85		
How often do you prescribe antibiotics for patients with uncomplicated URTI whenever patient request (Q10a)	Never	394	Never/Rarely	854
	Rarely	460		
	Sometimes	153	Always/Often/ Sometimes	175
	Often	21		
	Always	1		

Note: #: Respondents might choose more than one type of institution

Note: ^: there was one response for both “administration/management” and “teaching and education”

Note: *: Among the 11 responses in “others”, four responses (e.g. plastic) were re-grouped as “surgery-related specialty”, while the other 7 responses (e.g. dermatology, nephrology) were re-grouped as “non-surgery-related specialty”.

4.2 Knowledge and awareness on antibiotics and AMR

4.2.1 Impact of AMR

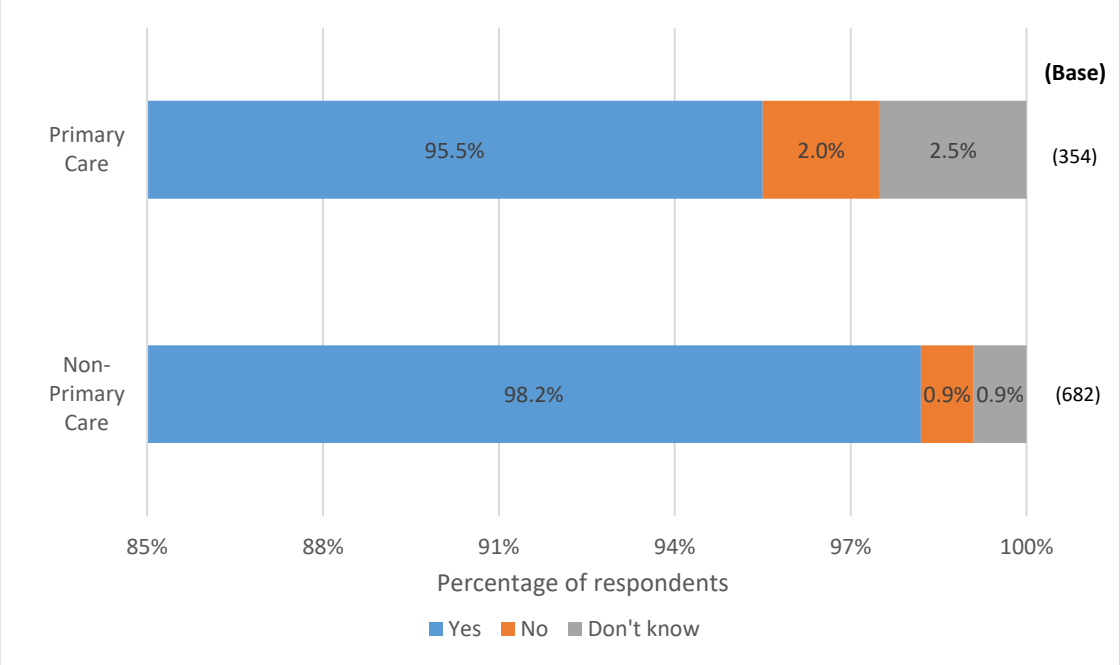
Respondents' knowledge on AMR causing increased length of hospital stay is significantly associated with their type of practice. (Table 29)

Table 29 Awareness of AMR leading to increased length of hospital stay (Q1b)

		Respondent count (Row percentage)				
Variable	**Level**	**Base**	**Yes**	**No**	**Don't know**	**p-value** **Fisher exact test**
Type of practice	Primary Care	354 (100%)	338 (95.5%)	7 (2.0%)	9 (2.5%)	0.04
	Non-Primary Care	682 (100%)	670 (98.2%)	6 (0.9%)	6 (0.9%)	

Primary care doctors (95.5%) were less likely to recognise that AMR could lead to an increased length of hospital stay when compared to non-primary care doctors (98.2%). (Chart 1)

Chart 1. Awareness of AMR leading to increased length of hospital stay by type of practice(Q1b)



Respondents' knowledge on AMR causing increased mortality was significantly associated with their years of practice and major field of practice. (Table 30)

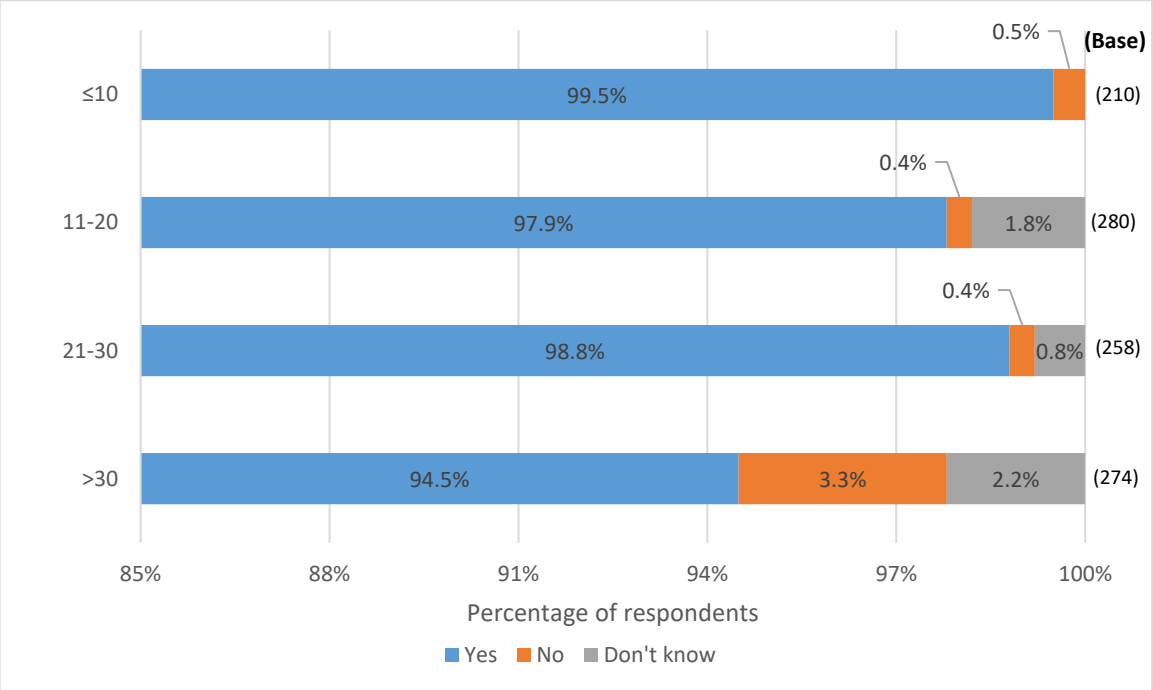
Table 30 Awareness of AMR leading to increased mortality (Q1d)

		Respondent count (Row percentage)				
Variable	**Level**	**Base**	**Yes**	**No**	**Don't know**	**p-value** Fisher exact test
Year of practice	≤10	210 (100.0%)	209 (99.5%)	1 (0.5%)	(-)	<0.005
	11-20	280 (100.0%)	274 (97.9%)	1 (0.4%)	5 (1.8%)	
	21-30	258 (100.0%)	255 (98.8%)	1 (0.4%)	2 (0.8%)	
	>30	274 (100.0%)	259 (94.5%)	9 (3.3%)	6 (2.2%)	
Major field of practice	General practice	329 (100.0%)	315 (95.7%)	7 (2.1%)	7 (2.1%)	0.01
	Practice in a specialty	691 (100.0%)	681 (98.6%)	4 (0.6%)	6 (0.9%)	
	Administration/ Teaching	16## (100.0%)	14 (87.5%)	1 (6.3%)	1 (6.3%)	

##: Very small sample size (<30)

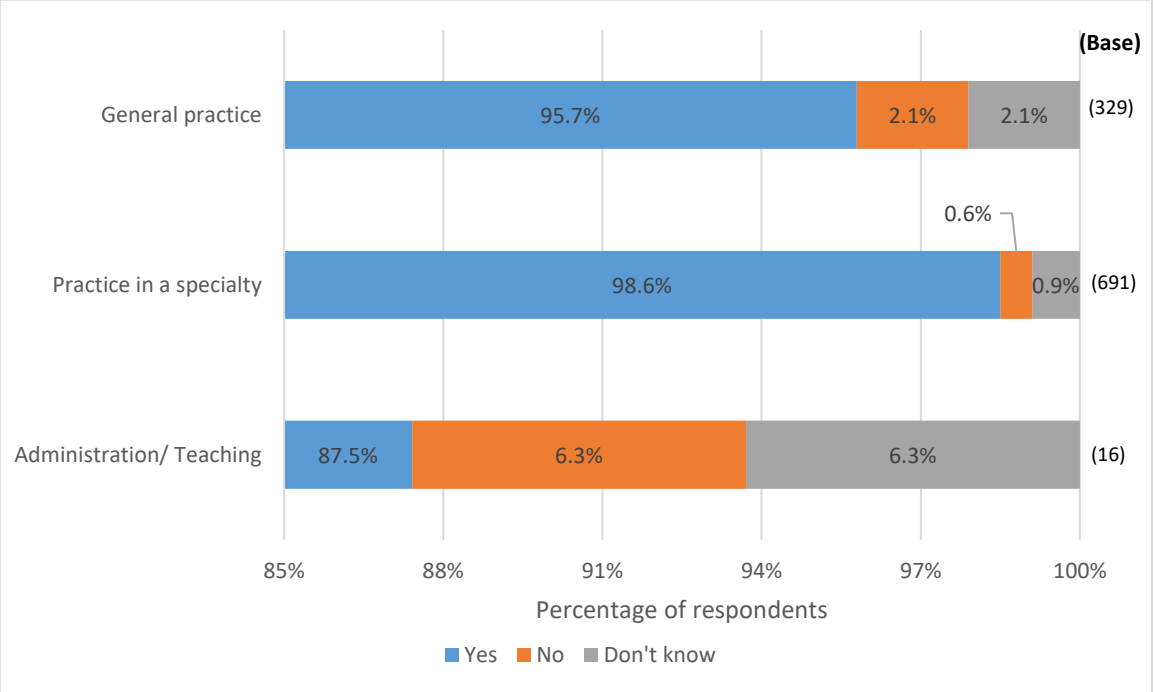
Respondents' who had practised for 30 years or less were more prone to be aware of such threat (ranging from 97.9% to 99.5%) than those who had practiced for over 30 years (94.5%). (Chart 2)

Chart 2. Awareness of AMR leading to increased mortality by years of practice (Q1d)



Respondents who were practising in a specialty also had higher level of awareness of AMR leading to increased mortality (98.6%), as compared to respondents who were in general practice (95.7%) or administration/teaching areas (87.5%). (Chart 3)

Chart 3. Awareness of AMR leading to increased mortality by major field of practice (Q1d)



4.2.2 Perceived severity of AMR

Respondents' perception on the severity of AMR worldwide was significantly associated with the respondents' years of practice and type of institution. (Table 31)

Table 31 Perceived severity of AMR worldwide (Q2a)

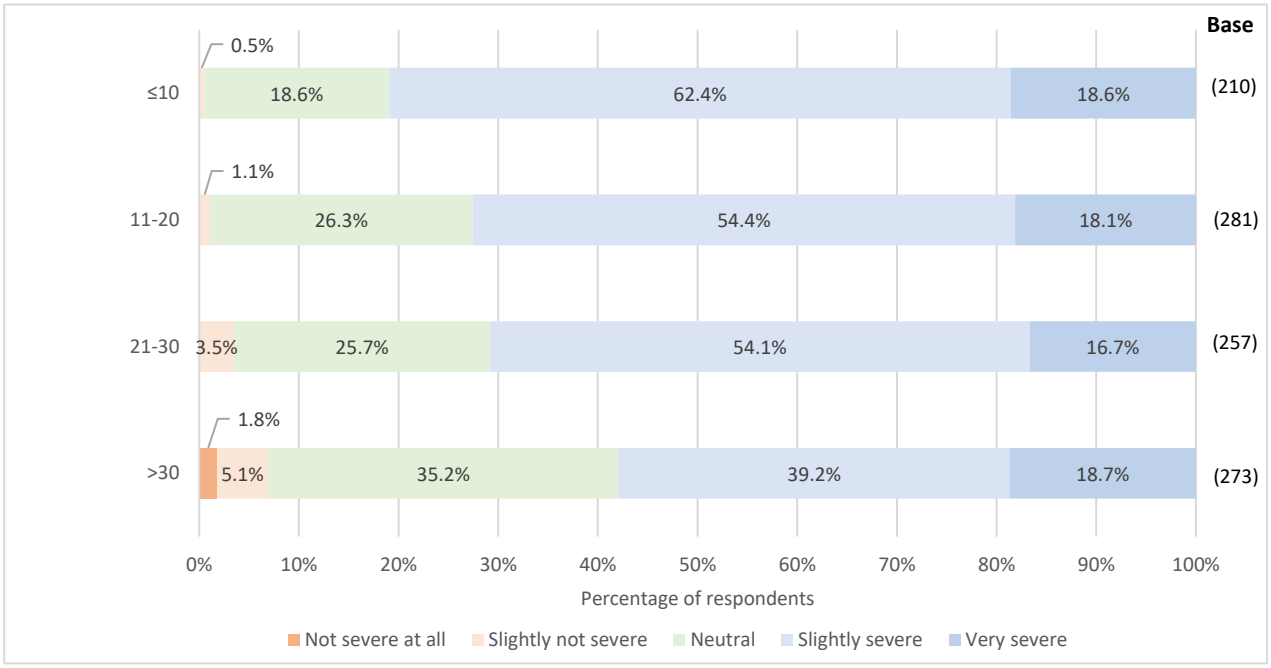
		Respondent count (Row percentage)						
Variable	**Level**	**Base**	**Not severe at all**	**Slightly not severe**	**Neutral**	**Slightly severe**	**Very severe**	**p-value** Kruskal-Wallis test
Years of practice	≤10	210 (100.0%)	(-)	1 (0.5%)	39 (18.6%)	131 (62.4%)	39 (18.6%)	<0.005
	11-20	281 (100.0%)	(-)	3 (1.1%)	74 (26.3%)	153 (54.4%)	51 (18.1%)	
	21-30	257 (100.0%)	(-)	9 (3.5%)	66 (25.7%)	139 (54.1%)	43 (16.7%)	
	>30	273	5	14	96	107	51	

		(100.0%)	(1.8%)	(5.1%)	(35.2%)	(39.2%)	(18.7%)	
Type of Institution	Government	50 (100.0%)	(-)	1 (2.0%)	9 (18.0%)	29 (58.0%)	11 (22.0%)	<0.005
	Hospital Authority	490 (100.0%)	(-)	5 (1.0%)	101 (20.6%)	289 (59.0%)	95 (19.4%)	
	Academic Institution	19## (100.0%)	(-)	(-)	2 (10.5%)	12 (63.2%)	5 (26.3%)	
	Subvented Organisation	10## (100.0%)	(-)	(-)	2 (20.0%)	7 (70.0%)	1 (10.0%)	
	Private Sector	471 (100.0%)	5 (1.1%)	22 (4.7%)	164 (34.8%)	203 (43.1%)	77 (16.3%)	

##: Very small sample size (<30)

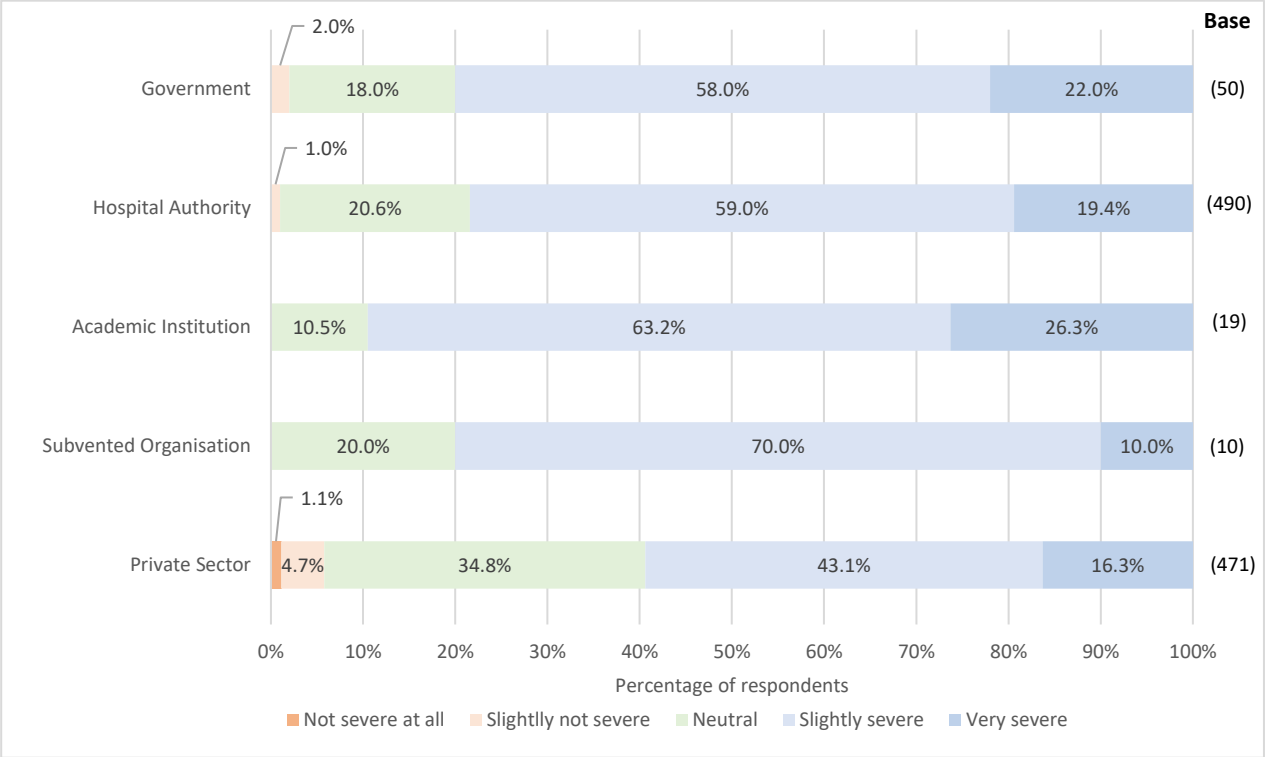
The fewer the years of practice, the more respondents considered AMR severe worldwide. The proportion of respondents who had practiced for ten years or less considered AMR worldwide “very severe”/“slightly severe” (81.0%) was the highest among all groups. (Chart 4)

Chart 4. Perceived severity of AMR worldwide by years of practice (Q2a)



Respondents from the private sector were significantly less likely to opine that AMR was “very severe”/“slightly severe” worldwide (59.4%). (Chart 5)

Chart 5. Perceived severity of AMR worldwide by type of institution (Q2a)



Respondents' perception on the severity of AMR in Hong Kong was significantly associated with the respondents' years of practice and type of institution. (Table 32)

Table 32 Perceived severity of AMR in Hong Kong (Q2b)

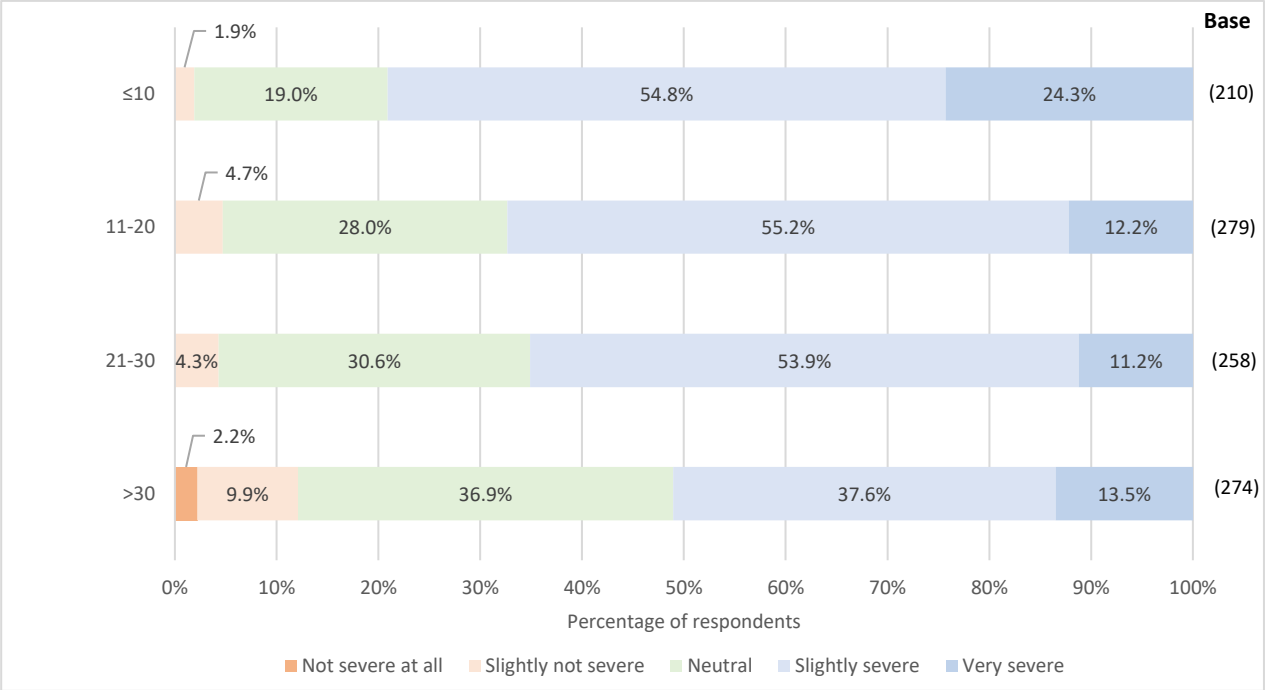
		Respondent count (Row percentage)						
Variable	**Level**	**Base**	**Not severe at all**	**Slightly not severe**	**Neutral**	**Slightly severe**	**Very severe**	**p-value** Kruskal-Wallis test
Years of practice	≤10	210 (100.0%)	(-)	4 (1.9%)	40 (19.0%)	115 (54.8%)	51 (24.3%)	<0.005
	11-20	279 (100.0%)	(-)	13 (4.7%)	78 (28.0%)	154 (55.2%)	34 (12.2%)	
	21-30	258 (100.0%)	(-)	11 (4.3%)	79 (30.6%)	139 (53.9%)	29 (11.2%)	
	>30	274 (100.0%)	6 (2.2%)	27 (9.9%)	101 (36.9%)	103 (37.6%)	37 (13.5%)	
Type of Institution	Government	51 (100.0%)	(-)	2 (3.9%)	9 (17.6%)	32 (62.7%)	8 (15.7%)	<0.005
	Hospital Authority	488 (100.0%)	(-)	14 (2.9%)	117 (24.0%)	268 (54.9%)	89 (18.2%)	
	Academic Institution	19## (100.0%)	(-)	(-)	4 (21.1%)	12 (63.2%)	3 (15.8%)	
	Subvented Organisation	10## (100.0%)	(-)	(-)	3 (30.0%)	7 (70.0%)	(-)	

	Private Sector	471 (100.0%)	6 (1.3%)	39 (8.3%)	169 (35.9%)	201 (42.7%)	56 (11.9%)	

##: Very small sample size (<30)

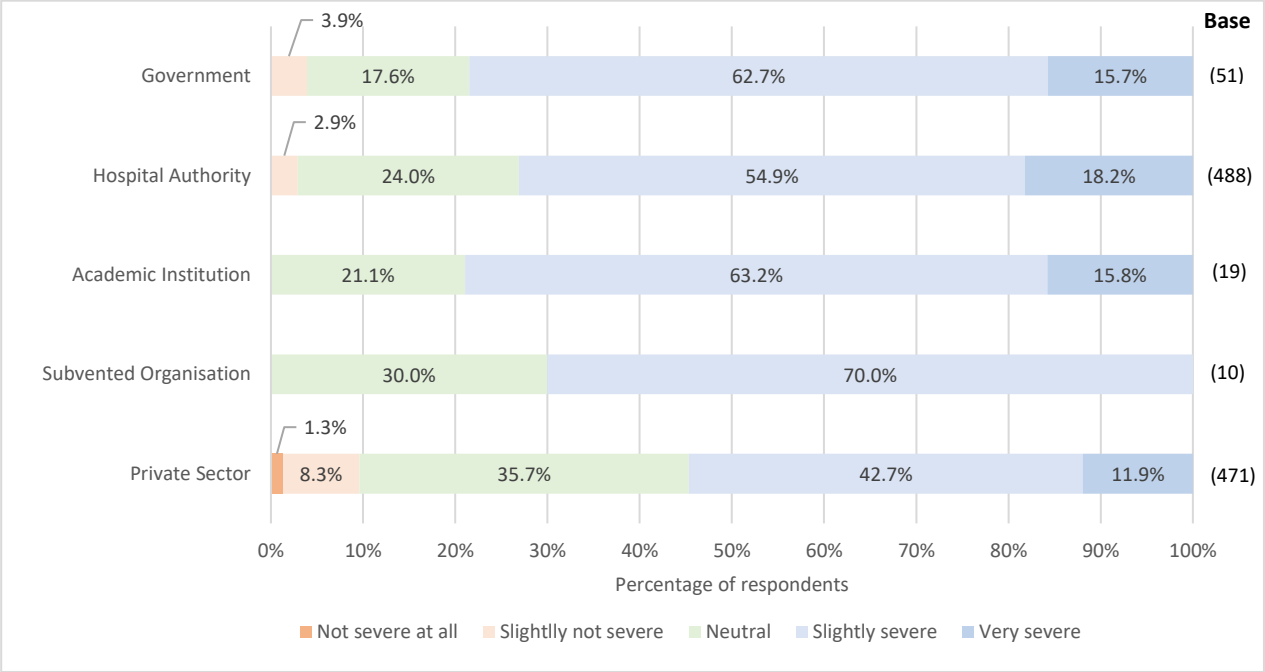
The less experienced respondents were more prone to regard AMR in Hong Kong as “very severe”/“slightly severe”. The proportion of respondents practiced for ten years or less was the highest (79.0%) among all groups who considered AMR in Hong Kong “very severe”/“slightly severe”. (Chart 6)

Chart 6. Perceived severity of AMR in Hong Kong by years of practice (Q2b)



Respondents from the private sector were significantly less likely (54.6%) to opine that AMR was “very severe”/“slightly severe” in Hong Kong. (Chart 7)

Chart 7. Perceived severity of AMR in Hong Kong by type of institution (Q2b)



Respondents' perception on the severity of AMR in hospital setting was significantly associated with the respondents' years of practice and type of institution. (Table 33)

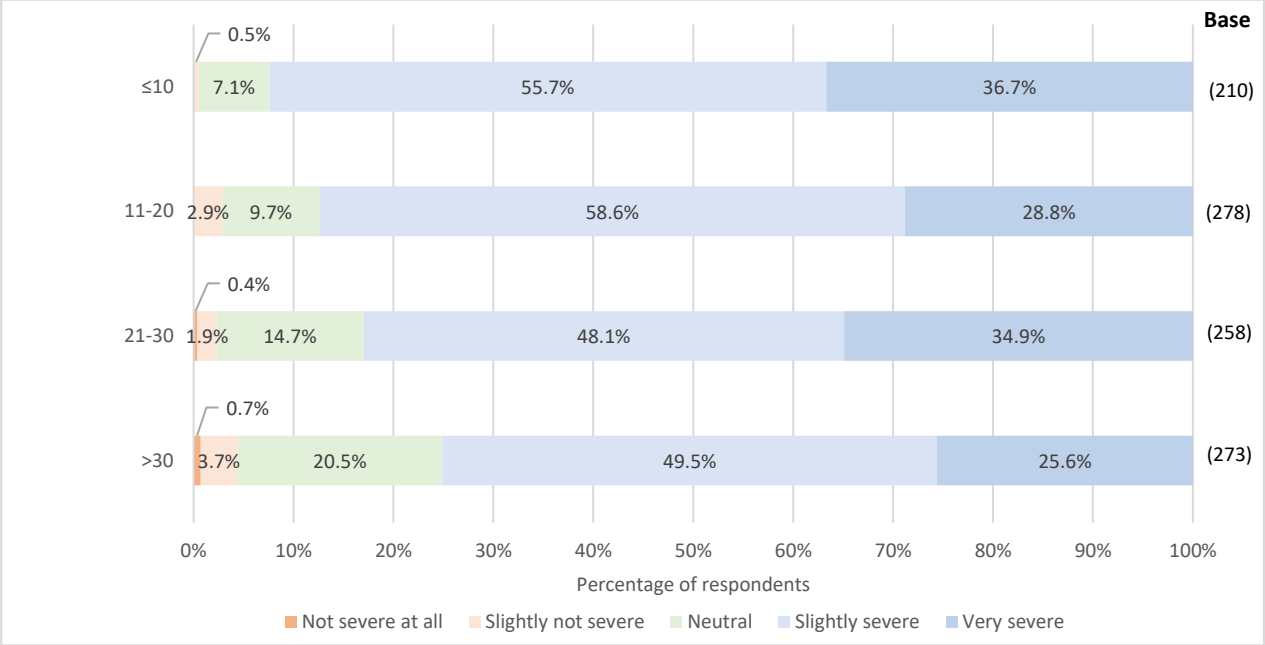
Table 33 Perceived severity of AMR in hospital setting (Q2c)

		Respondent count (Row percentage)						
Variable	**Level**	**Base**	**Not severe at all**	**Slightly not severe**	**Neutral**	**Slightly severe**	**Very severe**	**p-value** Kruskal-Wallis test
Years of practice	≤10	210 (100.0%)	(-)	1 (0.5%)	15 (7.1%)	117 (55.7%)	77 (36.7%)	<0.005
	11-20	278 (100.0%)	(-)	8 (2.9%)	27 (9.7%)	163 (58.6%)	80 (28.8%)	
	21-30	258 (100.0%)	1 (0.4%)	5 (1.9%)	38 (14.7%)	124 (48.1%)	90 (34.9%)	
	>30	273 (100.0%)	2 (0.7%)	10 (3.7%)	56 (20.5%)	135 (49.5%)	70 (25.6%)	
Type of Institution	Government	51 (100.0%)	(-)	1 (2.0%)	8 (15.7%)	19 (37.3%)	23 (45.1%)	<0.005
	Hospital Authority	488 (100.0%)	(-)	8 (1.6%)	42 (8.6%)	271 (55.5%)	167 (34.2%)	
	Academic Institution	19## (100.0%)	(-)	1 (5.3%)	1 (5.3%)	10 (52.6%)	7 (36.8%)	
	Subvented Organisation	10## (100.0%)	(-)	(-)	1 (10.0%)	5 (50.0%)	4 (40.0%)	
	Private Sector	469 (100.0%)	3 (0.6%)	14 (3.0%)	84 (17.9%)	246 (52.5%)	122 (26.0%)	

##: Very small sample size (<30)

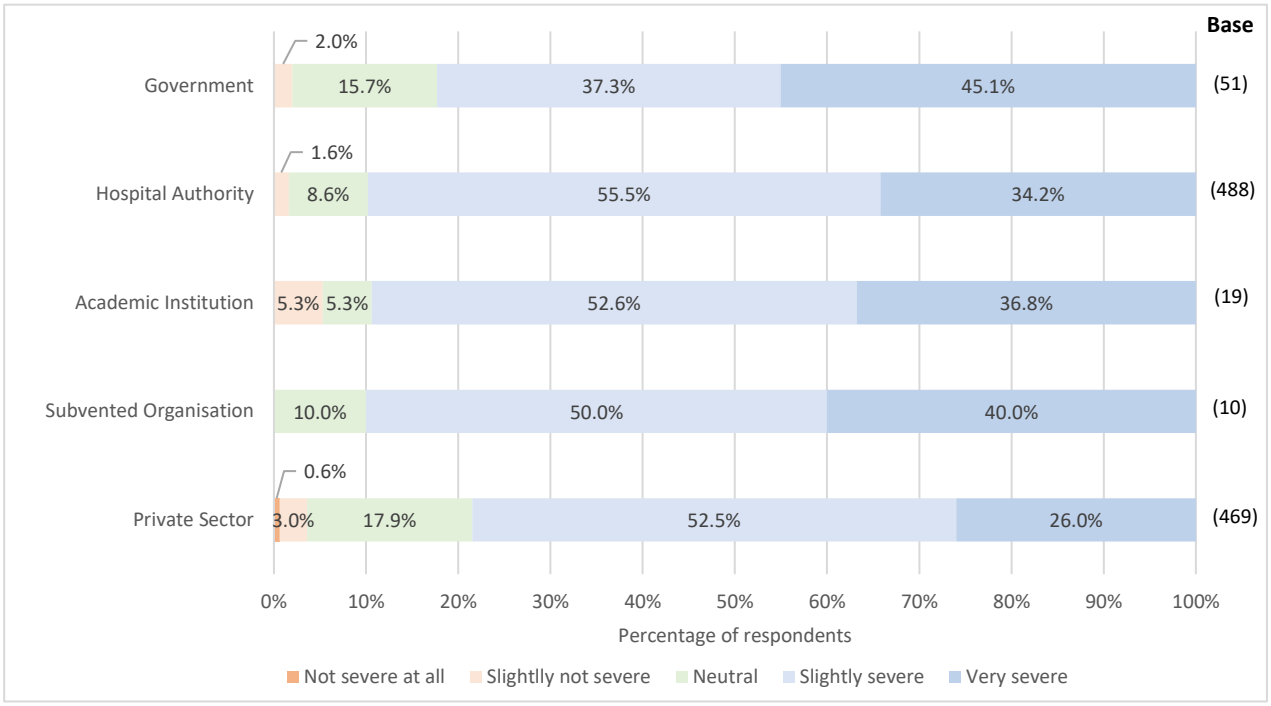
Respondents with fewer experiences tended to regard AMR in the hospital setting as “very severe”/“slightly severe”. The proportion of respondents practiced for ten years or less was the highest (92.4%) among all groups who considered AMR in hospital setting “very severe”/“slightly severe”. (Chart 8)

Chart 8. Perceived severity of AMR in hospital setting by years of practice (Q2c)



Respondents from the private sector were significantly less likely (78.5%) to opine that AMR was “very severe”/“slightly severe” in hospital setting. (Chart 9)

Chart 9. Perceived severity of AMR in hospital setting by type of institution (Q2c)



Respondents' perception on the severity of AMR in the community setting was significantly associated with the type of institution. (Table 34)

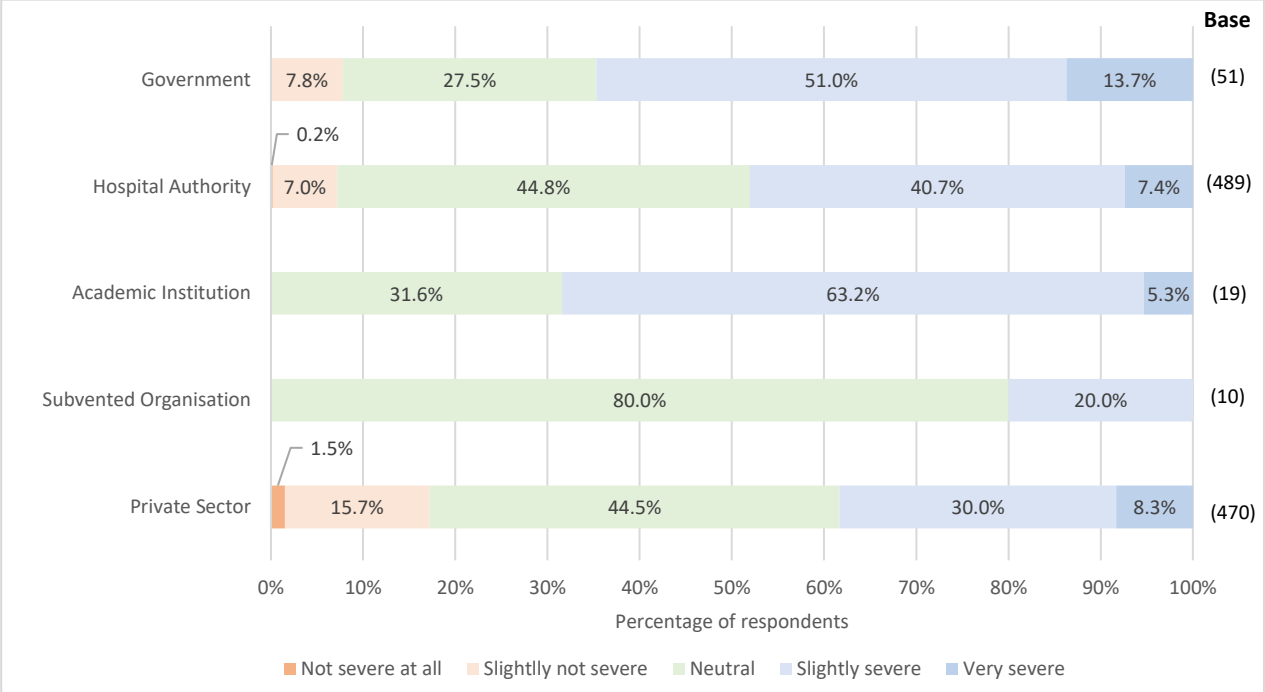
Table 34 Perceived severity of AMR in the community setting(Q2d)

		Respondent count (Row percentage)						
Variable	**Level**	**Base**	**Not severe at all**	**Slightly not severe**	**Neutral**	**Slightly severe**	**Very severe**	**p-value** Kruskal-Wallis test
Type of Institution	Government	51 (100.0%)	(-)	4 (7.8%)	14 (27.5%)	26 (51.0%)	7 (13.7%)	<0.005
	Hospital Authority	489 (100.0%)	1 (0.2%)	34 (7.0%)	219 (44.8%)	199 (40.7%)	36 (7.4%)	
	Academic Institution	19## (100.0%)	(-)	(-)	6 (31.6%)	12 (63.2%)	1 (5.3%)	
	Subvented Organisation	10## (100.0%)	(-)	(-)	8 (80.0%)	2 (20.0%)	(-)	
	Private Sector	470 (100.0%)	7 (1.5%)	74 (15.7%)	209 (44.5%)	141 (30.0%)	39 (8.3%)	

##: Very small sample size (<30)

Respondents from the private sector (38.3%) and subvented organisations (20.0%) were significantly less likely to opine that AMR was "very severe"/"slightly severe" in the community setting. (Chart 10)

Chart 10. Perceived severity of AMR in the community setting by type of institution (Q2d)



4.2.3 Importance of various factors contributing to AMR

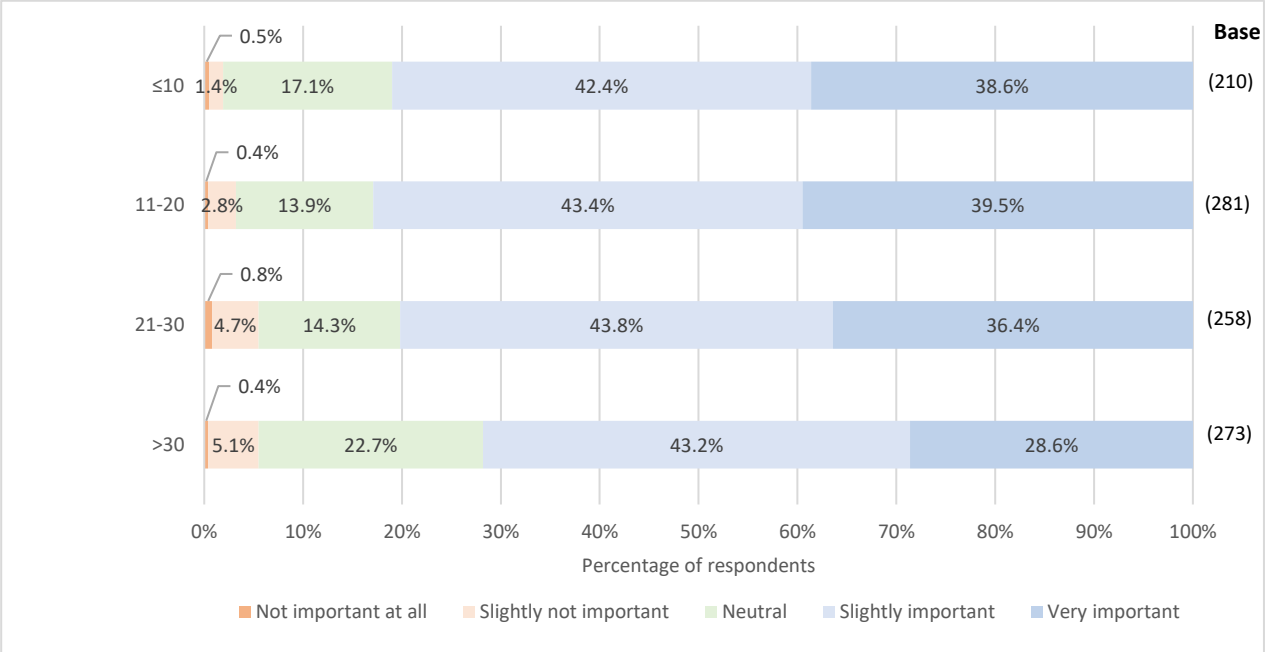
Respondents' perception on the importance of inappropriate use of antibiotics in terms of duration was significantly associated with the respondents' years of practice. (Table 35)

Table 35 Importance of inappropriate use of antibiotics in terms of duration (Q3b i)

		Respondent count (Row percentage)						
Variable	**Level**	**Base**	**Not Important at all**	**Slightly not important**	**Neutral**	**Slightly important**	**Very Important**	**p-value** Kruskal-Wallis test
Years of practice	≤10	210 (100.0%)	1 (0.5%)	3 (1.4%)	36 (17.1%)	89 (42.4%)	81 (38.6%)	0.01
	11 - 20	281 (100.0%)	1 (0.4%)	8 (2.8%)	39 (13.9%)	122 (43.4%)	111 (39.5%)	
	21 - 30	258 (100.0%)	2 (0.8%)	12 (4.7%)	37 (14.3%)	113 (43.8%)	94 (36.4%)	
	>30	273 (100.0%)	1 (0.4%)	14 (5.1%)	62 (22.7%)	118 (43.2%)	78 (28.6%)	

Respondents practiced for more than 30 years had the lowest percentage (71.8%) in considering inappropriate use of antibiotics in terms of duration a "very important"/"slightly important" factor contributing to AMR. (Chart 11)

Chart 11. Importance of inappropriate use of antibiotics in terms of duration by years of practice (Q3b i)



Respondents' perception on the importance of inappropriate use of antibiotics in terms of choice of drug was significantly associated with the respondents' type of practice, years of practice, type of institution and major field of practice. (Table 36)

Table 36 Importance of inappropriate use of antibiotics in terms of choice of drug (Q3b ii)

		Respondent count (Row percentage)						
Variable	**Level**	**Base**	**Not Important at all**	**Slightly not important**	**Neutral**	**Slightly important**	**Very Important**	**p-value**
Type of practice	Primary Care	353 (100.0%)	1 (0.3%)	16 (4.5%)	61 (17.3%)	144 (40.8%)	131 (37.1%)	0.01[a]
	Non-Primary Care	685 (100.0%)	(-)	14 (2.0%)	85 (12.4%)	301 (43.9%)	285 (41.6%)	
Years of practice	≤10	210 (100.0%)	(-)	2 (1.0%)	17 (8.1%)	86 (41.0%)	105 (50.0%)	<0.005[b]
	11 - 20	281 (100.0%)	1 (0.4%)	6 (2.1%)	33 (11.7%)	123 (43.8%)	118 (42.0%)	
	21 - 30	258 (100.0%)	(-)	4 (1.6%)	36 (14.0%)	122 (47.3%)	96 (37.2%)	
	>30	274 (100.0%)	(-)	16 (5.8%)	57 (20.8%)	108 (39.4%)	93 (33.9%)	

Institution type	Government	51 (100.0%)	(-)	1 (2.0%)	4 (7.8%)	19 (37.3%)	27 (52.9%)	<0.005[b]
	Hospital Authority	490 (100.0%)	(-)	6 (1.2%)	46 (9.4%)	209 (42.7%)	229 (46.7%)	
	Academic Institution	19[##] (100.0%)	(-)	(-)	(-)	9 (47.4%)	10 (52.6%)	
	Subvented Organisation	10[##] (100.0%)	(-)	(-)	2 (20.0%)	6 (60.0%)	2 (20.0%)	
	Private	472 (100.0%)	1 (0.2%)	23 (4.9%)	94 (19.9%)	203 (43.0%)	151 (32.0%)	
Major field of practice	General Practice	329 (100.0%)	1 (0.3%)	16 (4.9%)	59 (17.9%)	132 (40.1%)	121 (36.8%)	0.04[b]
	Practice in a specialty	693 (100.0%)	(-)	14 (2.0%)	87 (12.6%)	307 (44.3%)	285 (41.1%)	
	Administration/ Teaching	16[##] (100.0%)	(-)	(-)	(-)	6 (37.5%)	10 (62.5%)	

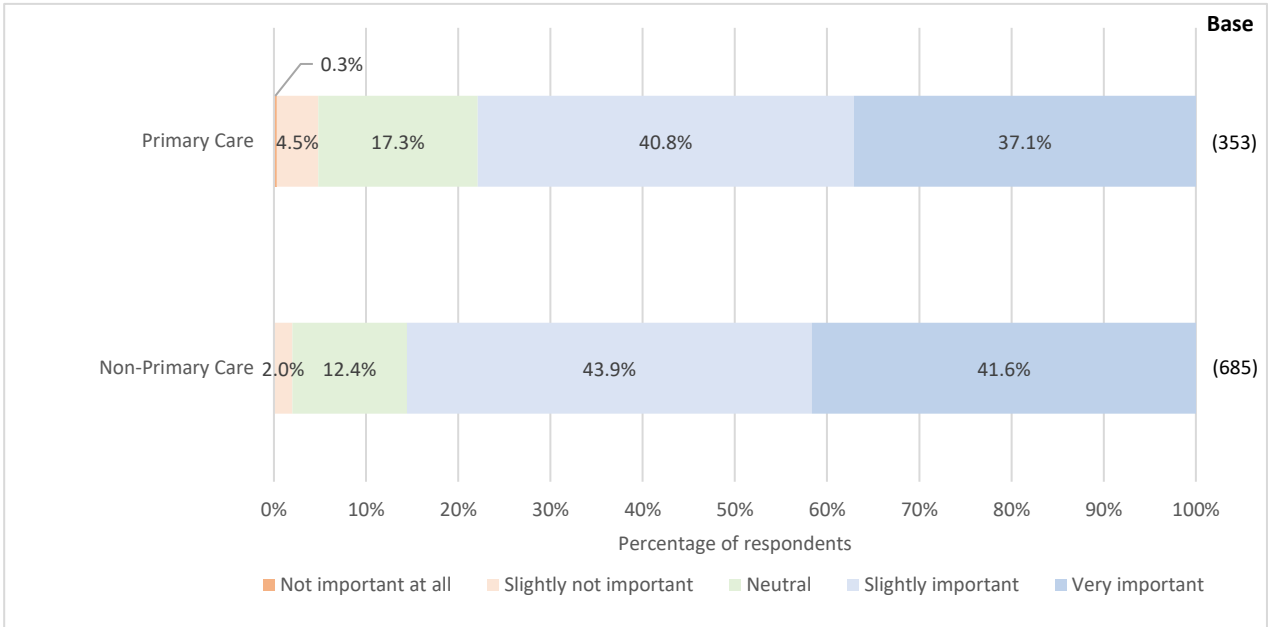
##: Very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

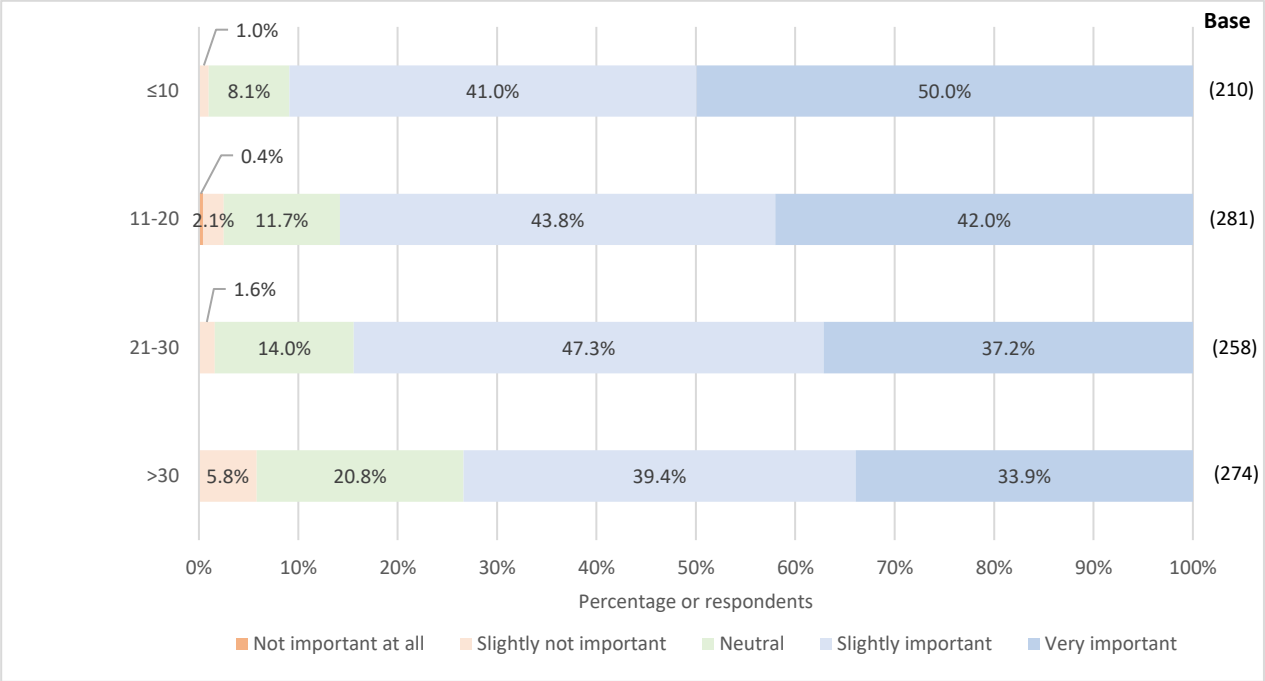
Respondents who were primary care doctors were less likely to consider inappropriate choice of drug an important ("very important"/"slightly important") factor contributing to AMR (77.9%) when compared to non-primary care doctors (85.5%). (Chart 12)

Chart 12. Importance of inappropriate use of antibiotics in terms of choice of drug by type of practice (Q3b ii)



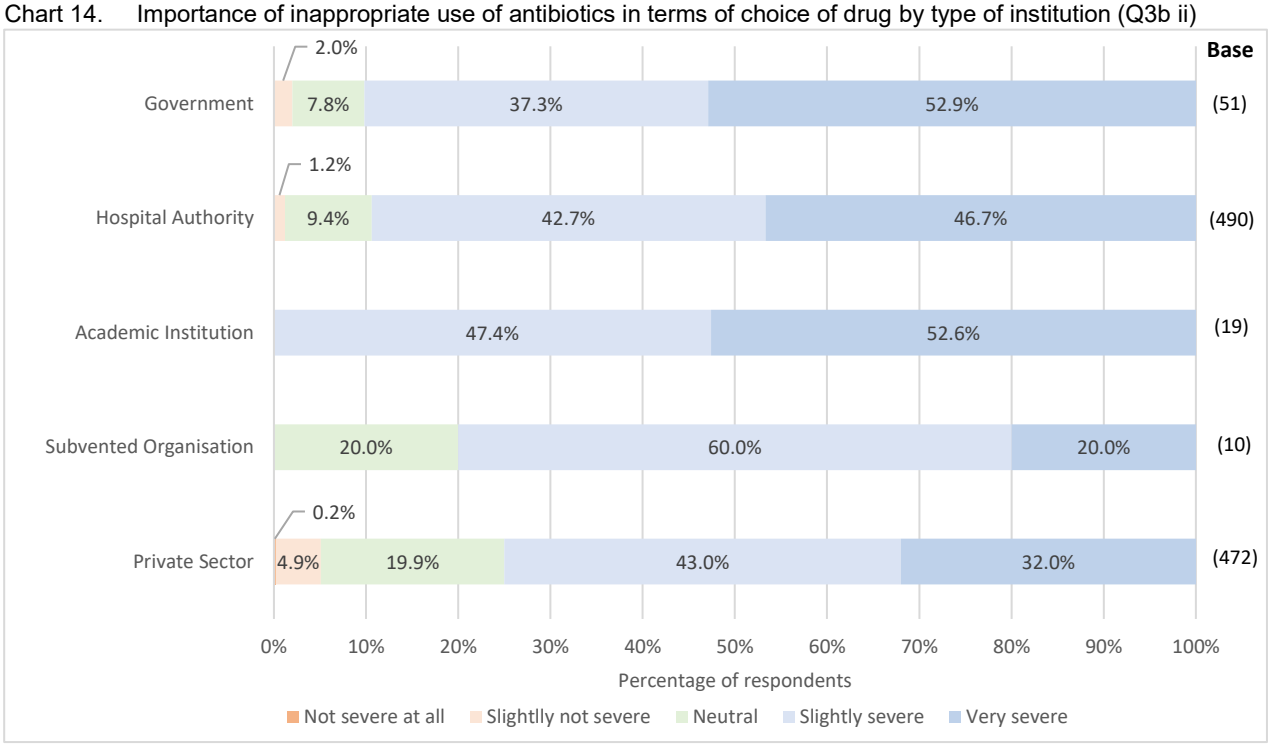
Respondents who were less experienced were more likely to consider inappropriate use of antibiotics in terms of choice of drug an important factor in contributing to AMR when compared to respondents who had been practising for a longer period of time (≤ten years, 91.0%; >30 years, 73.4%). (Chart 13)

Chart 13. Importance of inappropriate use of antibiotics in terms of choice of drug by years of practice (Q3b ii)



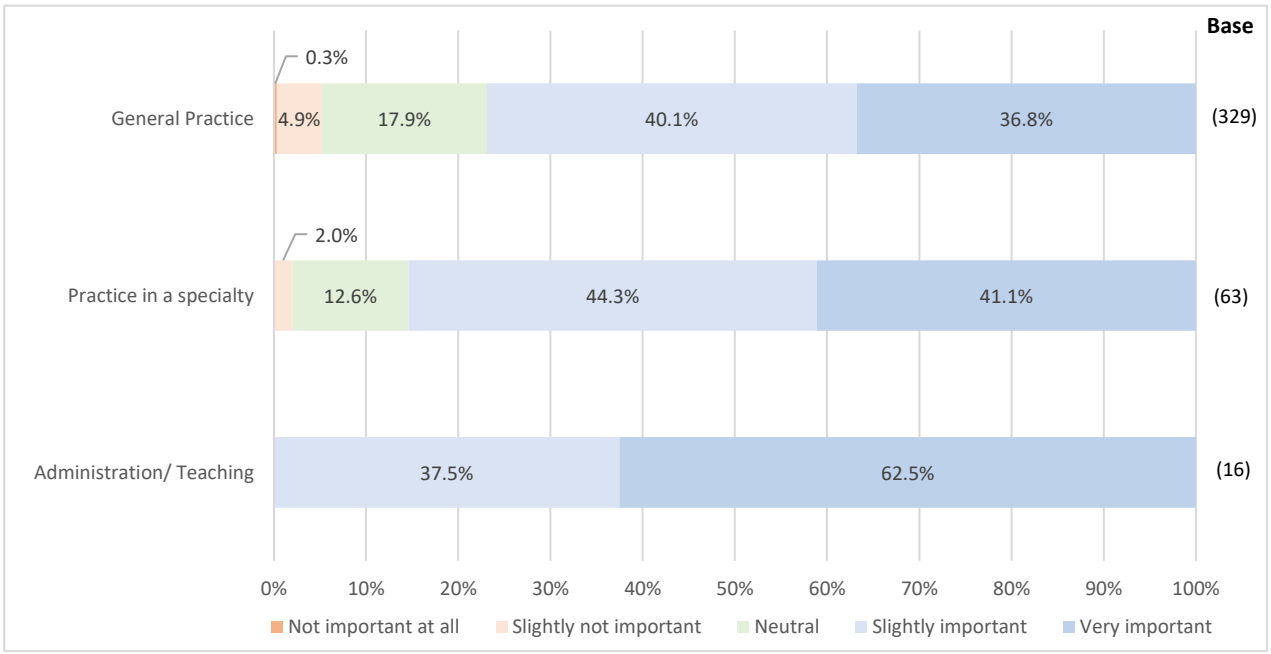
Relatively less respondents (75.0%) from the private sector considered inappropriate choice of drug an important driver of AMR. (Chart 14)

Chart 14. Importance of inappropriate use of antibiotics in terms of choice of drug by type of institution (Q3b ii)



Relatively higher proportion of respondents who practised in a specialty (85.4%) opined the inappropriate use of antibiotics in terms of choice of drug to be an important factor for AMR, compared to respondents who were in general practice (76.9%). (Chart 15)

Chart 15. Importance of inappropriate use of antibiotics in terms of choice of drug by major field of practice (Q3b ii)



Respondents' perception on the importance of patients' non-compliance to antibiotic treatment contributing to AMR was significantly associated with the respondents' gender, type of practice, major field of practice and specialty. (Table 37)

Table 37 Importance of patients' non-compliance to antibiotic treatment (Q3b iv)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Not Important at all**	**Slightly not important**	**Neutral**	**Slightly important**	**Very Important**	**p-value**
Gender	Male	687 (100.0%)	4 (0.6%)	43 (6.3%)	127 (18.5%)	282 (41.0%)	231 (33.6%)	<0.005[a]
	Female	341 (100.0%)	1 (0.3%)	3 (0.9%)	56 (16.4%)	141 (41.3%)	140 (41.1%)	
Type of practice	Primary Care	353 (100.0%)	(-)	10 (2.8%)	47 (13.3%)	131 (37.1%)	165 (46.7%)	<0.005[a]
	Non-Primary Care	685 (100.0%)	5 (0.7%)	35 (5.1%)	141 (20.6%)	296 (43.2%)	208 (30.4%)	
Major field of practice	General Practice	329 (100.0%)	(-)	6 (1.8%)	45 (13.7%)	125 (38.0%)	153 (46.5%)	<0.005[b]
	Practice in a specialty	693 (100.0%)	5 (0.7%)	37 (5.3%)	141 (20.3%)	296 (42.7%)	214 (30.9%)	
	Administration/ Teaching	16[##] (100.0%)	(-)	2 (12.5%)	2 (12.5%)	6 (37.5%)	6 (37.5%)	
Specialty	Surgery-related	140 (100.0%)	1 (0.7%)	12 (8.6%)	32 (22.9%)	61 (43.6%)	34 (24.3%)	<0.005[a]
	Non-surgery-related	701 (100.0%)	4 (0.6%)	27 (3.9%)	128 (18.3%)	298 (42.5%)	244 (34.8%)	

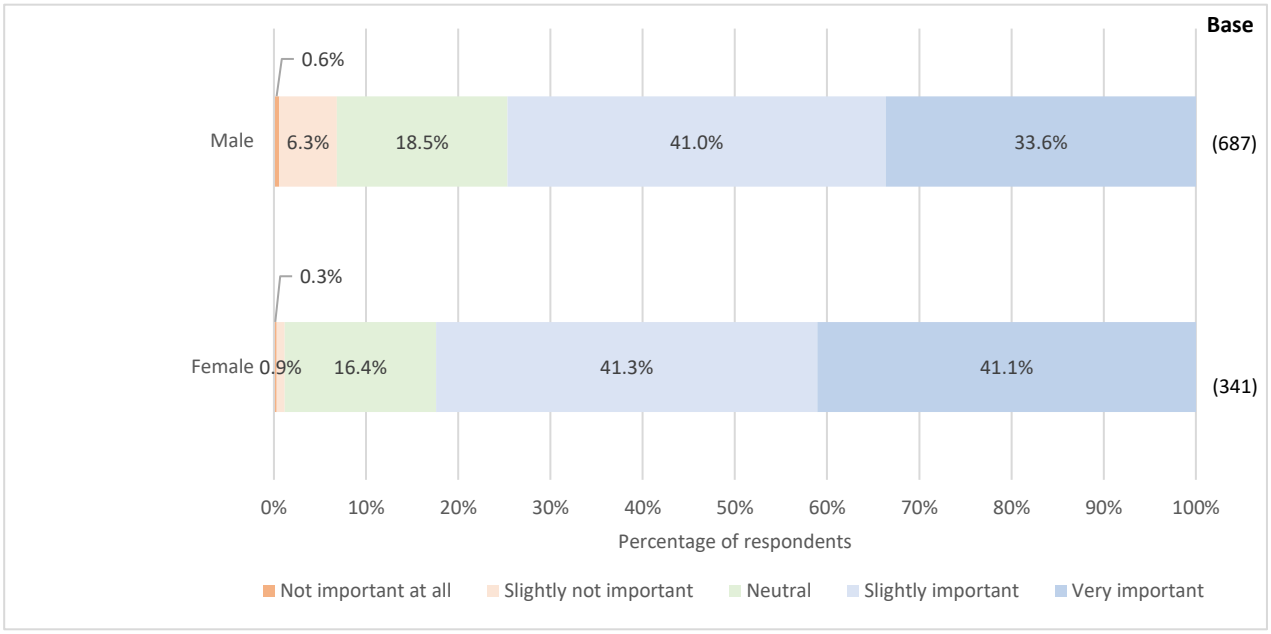
##: Very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

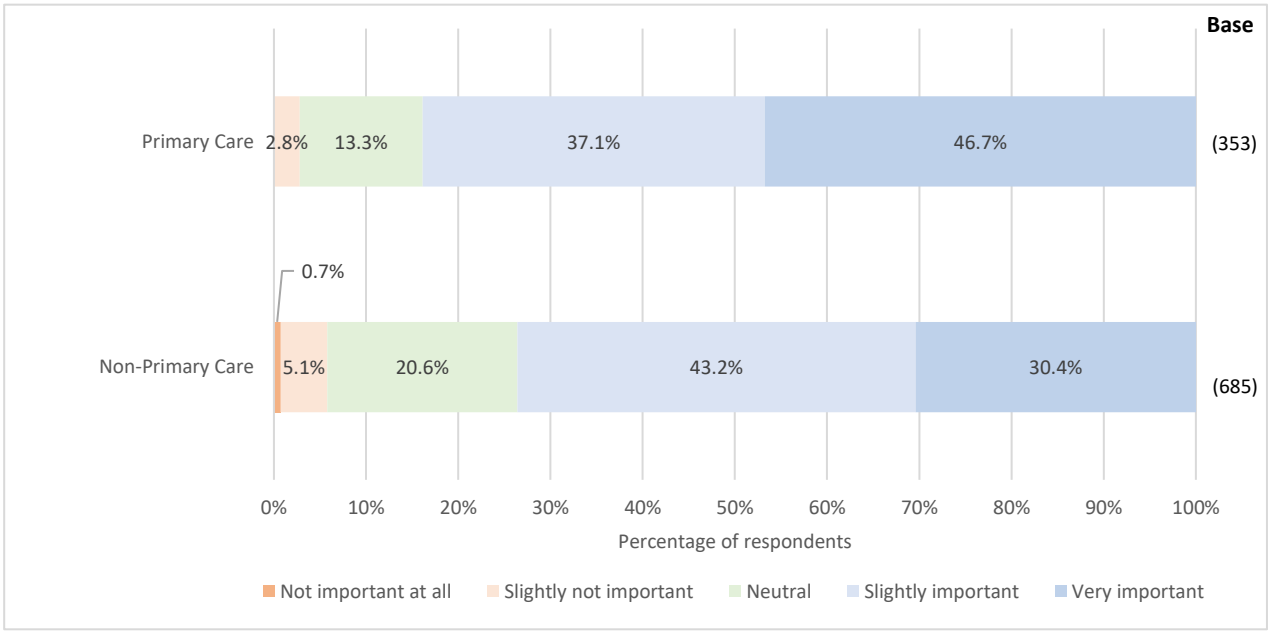
Respondents who were female (82.4%) were more inclined to opine patients' non-compliance to antibiotic treatment as important ("very important"/"slightly important") factors leading to AMR. (Chart 16)

Chart 16. Importance of patients' non-compliance to antibiotic treatment by gender (Q3b iv)



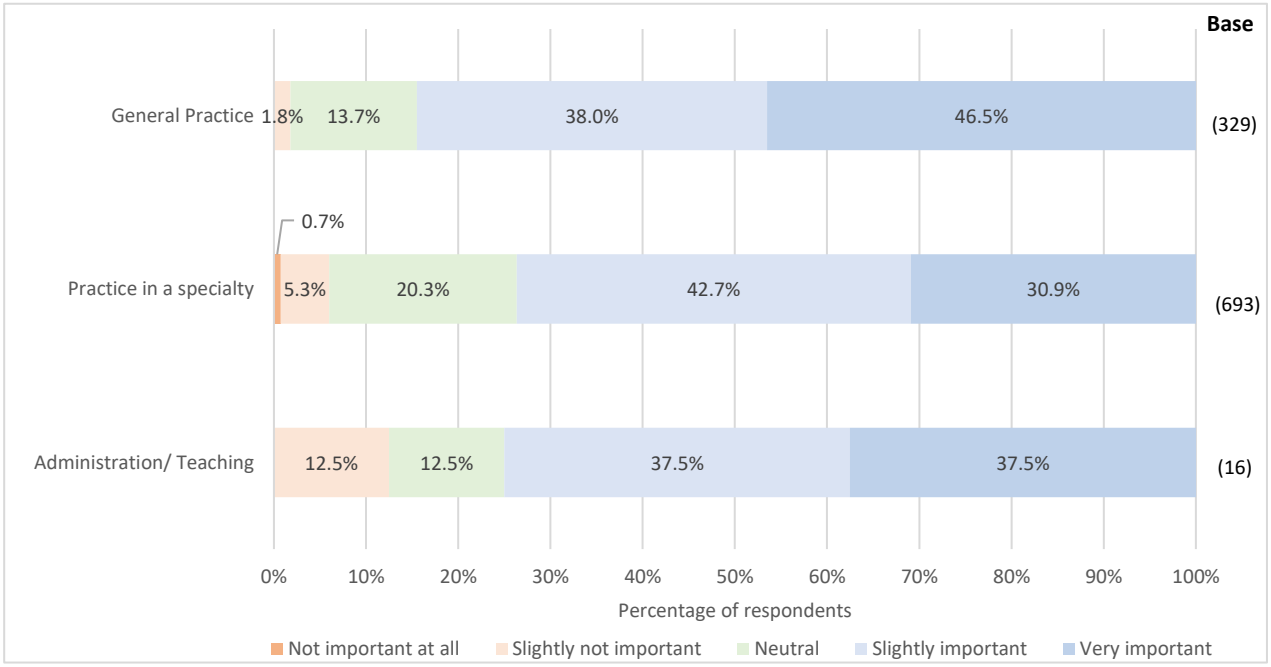
Respondents who were primary care doctors (83.9%) were more inclined to opine patients' non-compliance to antibiotic treatment as important factors leading to AMR. (Chart 17)

Chart 17. Importance of patients' non-compliance to antibiotic treatment by type of practice (Q3b iv)



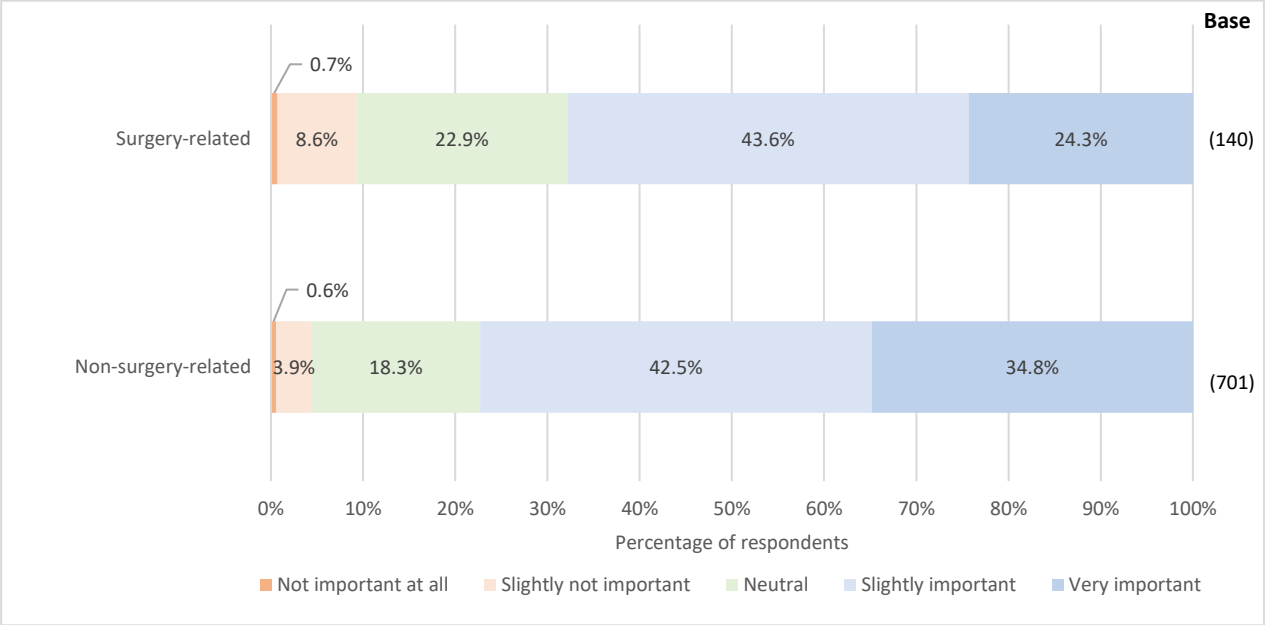
Respondents who were practising in a specialty (73.6%) were less likely than the general practitioners (84.5%) to hold the view that patients' non-compliance was an important factor contributing to AMR. (Chart 18)

Chart 18. Importance of patients' non-compliance to antibiotic treatment by major field of practice (Q3b iv)



A higher proportion of respondents practising in non-surgery-related specialties (77.3%) considered patients' non-compliance to antibiotic treatment an important factor contributing to AMR, as compared to respondents who were in a surgery related specialty (67.9%). (Chart 19)

Chart 19. Importance of patients' non-compliance to antibiotic treatment by specialty (Q3b iv)



Respondents' perception on the importance of patients' self-medication with antibiotics contributing to AMR was significantly associated with the respondents' gender, type of practice and major field of practice. (Table 38)

Table 38 Importance of patients' self-medication with antibiotics (Q3b v)

		Respondent count (Row percentage)						
Variable	**Level**	**Base**	**Not Important at all**	**Slightly not important**	**Neutral**	**Slightly important**	**Very Important**	**p-value**
Gender	Male	684 (100.0%)	5 (0.7%)	33 (4.8%)	96 (14.0%)	254 (37.1%)	296 (43.3%)	<0.005[a]
	Female	341 (100.0%)	(-)	5 (1.5%)	32 (9.4%)	130 (38.1%)	174 (51.0%)	
Type of practice	Primary Care	352 (100.0%)	3 (0.9%)	9 (2.6%)	28 (8.0%)	99 (28.1%)	213 (60.5%)	<0.005[a]
	Non-Primary Care	683 (100.0%)	2 (0.3%)	30 (4.4%)	102 (14.9%)	287 (42.0%)	262 (38.4%)	
Major field of practice	General Practice	328 (100.0%)	3 (0.9%)	7 (2.1%)	27 (8.2%)	94 (28.7%)	197 (60.1%)	<0.005[b]
	Practice in a specialty	691 (100.0%)	2 (0.3%)	31 (4.5%)	101 (14.6%)	284 (41.1%)	273 (39.5%)	
	Administration/ Teaching	16[##] (100.0%)	(-)	1 (6.3%)	2 (12.5%)	8 (50.0%)	5 (31.3%)	

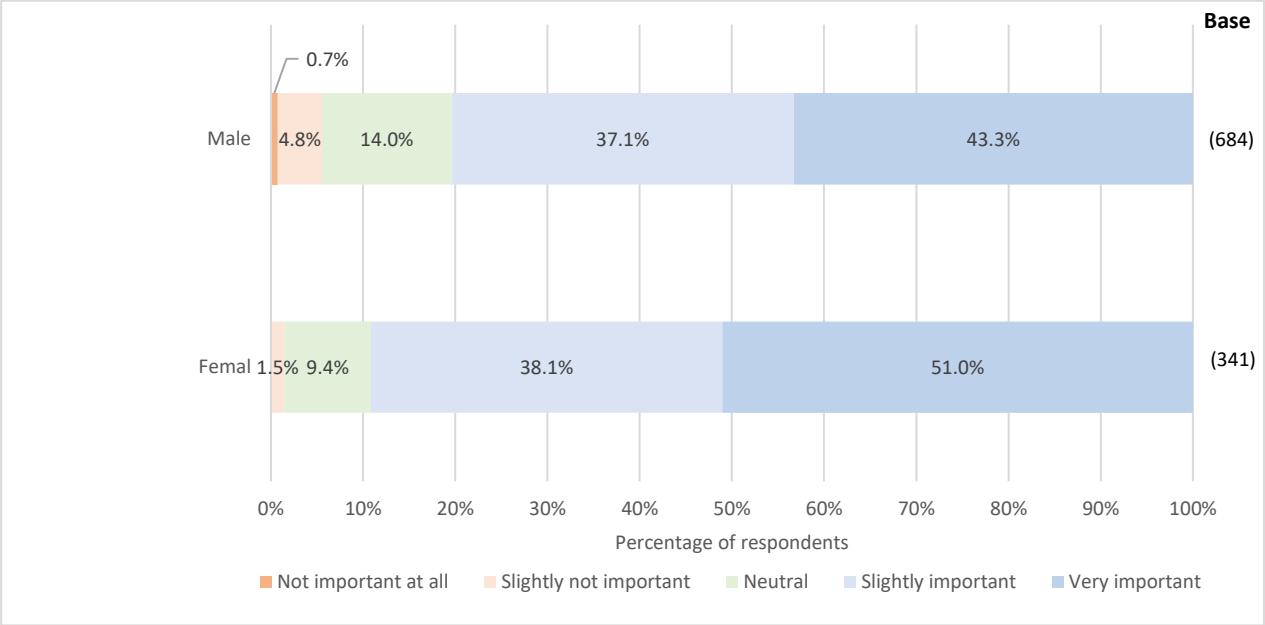
##: Very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

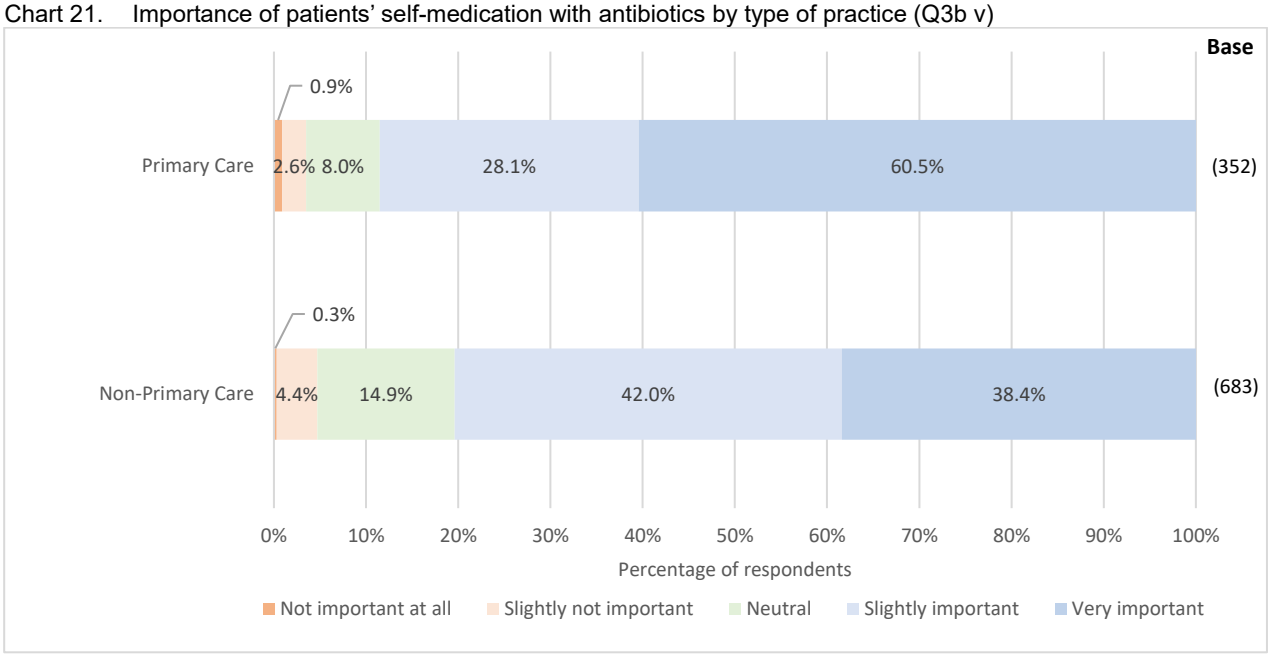
Respondents who were male (80.4%) were less likely to consider patients' self-medication with antibiotics an important ("very important"/"slightly important") factor contributing to AMR when compared to female doctors (89.1%). (Chart 20)

Chart 20. Importance of patients' self-medication with antibiotics by gender (Q3b v)



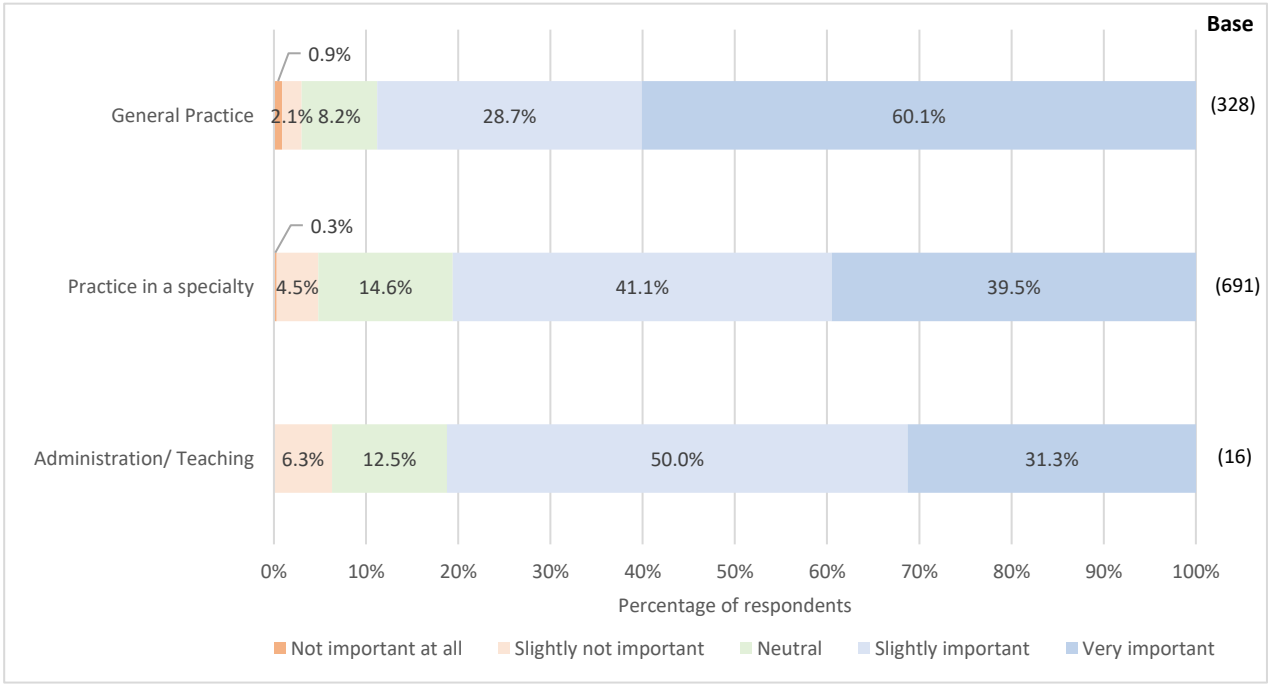
Respondents who were primary care doctors (88.6%) were more inclined to opine patients' self-medication with antibiotics as an important factor leading to AMR. (Chart 21)

Chart 21. Importance of patients' self-medication with antibiotics by type of practice (Q3b v)



Respondents practising in a specialty (80.6%) were less likely than the general practitioners (88.7%) to consider patients' self-medication with antibiotics an important factor leading to AMR. (Chart 22)

Chart 22. Importance of patients' self-medication with antibiotics by major field of practice (Q3b v)



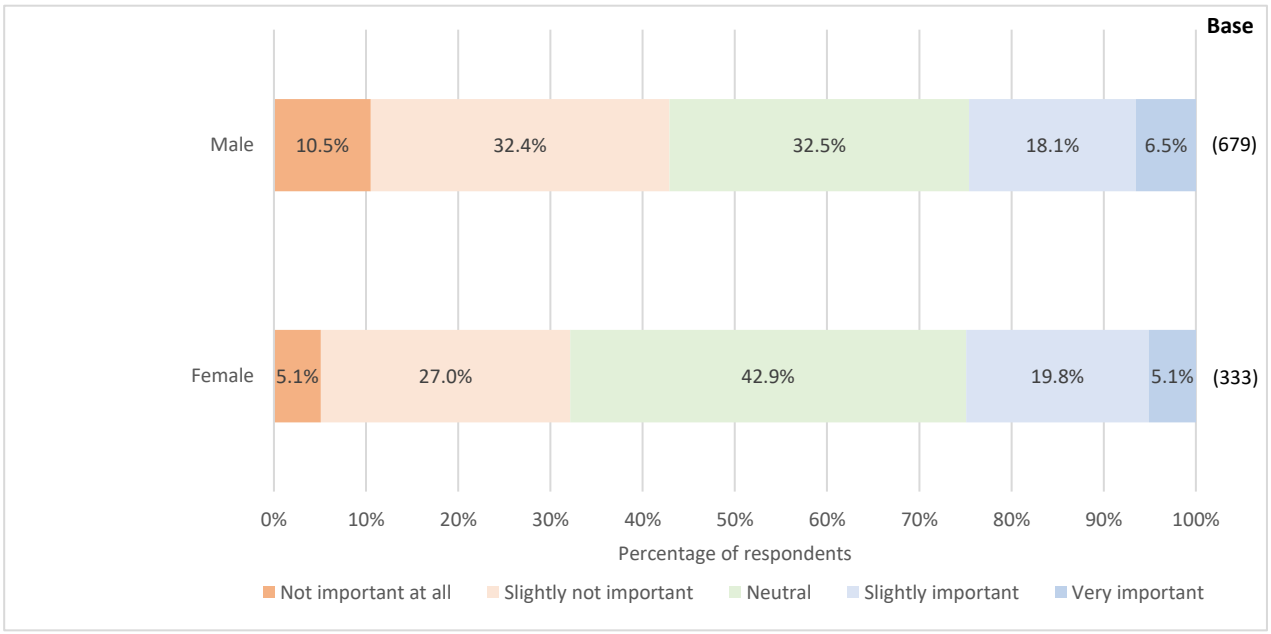
Respondents' perception on the importance of poor quality of antibiotics contributing to AMR was significantly associated with the respondents' gender and type of practice. (Table 39)

Table 39 Importance of poor quality of antibiotics (Q3c)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Not Important at all**	**Slightly not important**	**Neutral**	**Slightly important**	**Very Important**	**p-value** Mann-Whitney U Test
Gender	Male	679 (100.0%)	71 (10.5%)	220 (32.4%)	221 (32.5%)	123 (18.1%)	44 (6.5%)	0.01
	Female	333 (100.0%)	17 (5.1%)	90 (27.0%)	143 (42.9%)	66 (19.8%)	17 (5.1%)	
Type of practice	Primary Care	349 (100.0%)	24 (6.9%)	71 (20.3%)	129 (37.0%)	91 (26.1%)	34 (9.7%)	<0.005
	Non-Primary Care	673 (100.0%)	65 (9.7%)	243 (36.1%)	238 (35.4%)	98 (14.6%)	29 (4.3%)	

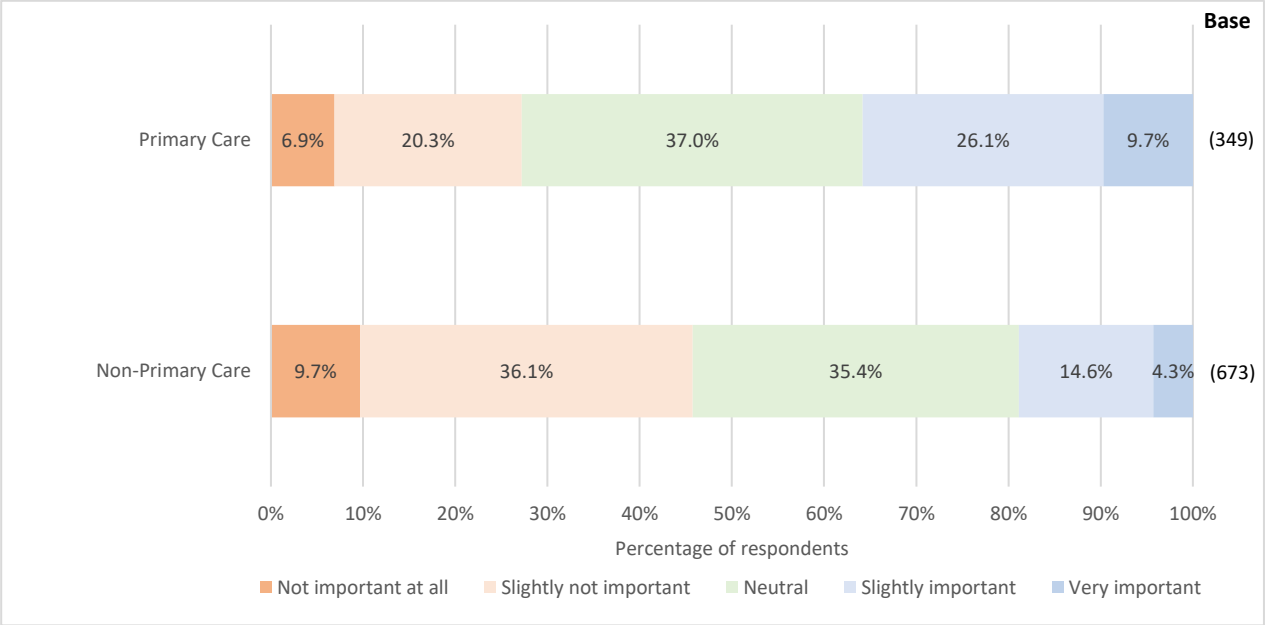
Compared to their female counterparts (32.1%), more male respondents (42.9%) considered poor quality of antibiotics "slightly not important"/"not important at all" factor contributing to AMR. (Chart 23)

Chart 23. Importance of poor quality of antibiotics by gender (Q3c)



Respondents who were primary care doctors (35.8%) were more prone to consider poor quality of antibiotics a "very important"/"slightly important" factor contributing to AMR, as compared to non-primary care doctors (18.9%). (Chart 24)

Chart 24. Importance of poor quality of antibiotics by type of practice (Q3c)



4.3 Prescription of antibiotics

4.3.1 Level of confidence in antibiotic prescription-related tasks

Respondents' level of confidence in knowing when to start antibiotic therapy was significantly associated respondents' gender, years of practice, type of institution and specialty. (Table 40)

Table 40 Level of confidence in knowing when to start antibiotic therapy (Q6a)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Not confident at all**	**Slightly not confident**	**Neutral**	**Slightly confident**	**Very confident**	**p-value**
Gender	Male	682 (100.0%)	2 (0.3%)	12 (1.8%)	96 (14.1%)	414 (60.7%)	158 (23.2%)	<0.005[a]
	Female	339 (100.0%)	(-)	8 (2.4%)	70 (20.6%)	215 (63.4%)	46 (13.6%)	
Years of practice	≤10	210 (100.0%)	1 (0.5%)	5 (2.4%)	38 (18.1%)	147 (70.0%)	19 (9.0%)	<0.005[b]

	11-20	281 (100.0%)	(-)	6 (2.1%)	48 (17.1%)	181 (64.4%)	46 (16.4%)	
	21-30	255 (100.0%)	(-)	6 (2.4%)	43 (16.9%)	152 (59.6%)	54 (21.2%)	
	>30	270 (100.0%)	1 (0.4%)	3 (1.1%)	37 (13.7%)	148 (54.8%)	81 (30.0%)	
Type of institution	Government	50 (100.0%)	(-)	1 (2.0%)	9 (18.0%)	33 (66.0%)	7 (14.0%)	<0.005[b]
	Hospital Authority	489 (100.0%)	1 (0.2%)	10 (2.0%)	84 (17.2%)	325 (66.5%)	69 (14.1%)	
	Academic Institution	18## (100.0%)	(-)	(-)	5 (27.8%)	9 (50.0%)	4 (22.2%)	
	Subvented Organisation	9## (100.0%)	(-)	(-)	3 (33.3%)	5 (55.6%)	1 (11.1%)	
	Private	469 (100.0%)	1 (0.2%)	9 (1.9%)	69 (14.7%)	263 (56.1%)	127 (27.1%)	
Specialty	Surgery-related	140 (100.0%)	(-)	1 (0.7%)	9 (6.4%)	94 (67.1%)	36 (25.7%)	<0.005[a]
	Non-surgery-related	695 (100.0%)	2 (0.3%)	11 (1.6%)	116 (16.7%)	428 (61.6%)	138 (19.9%)	

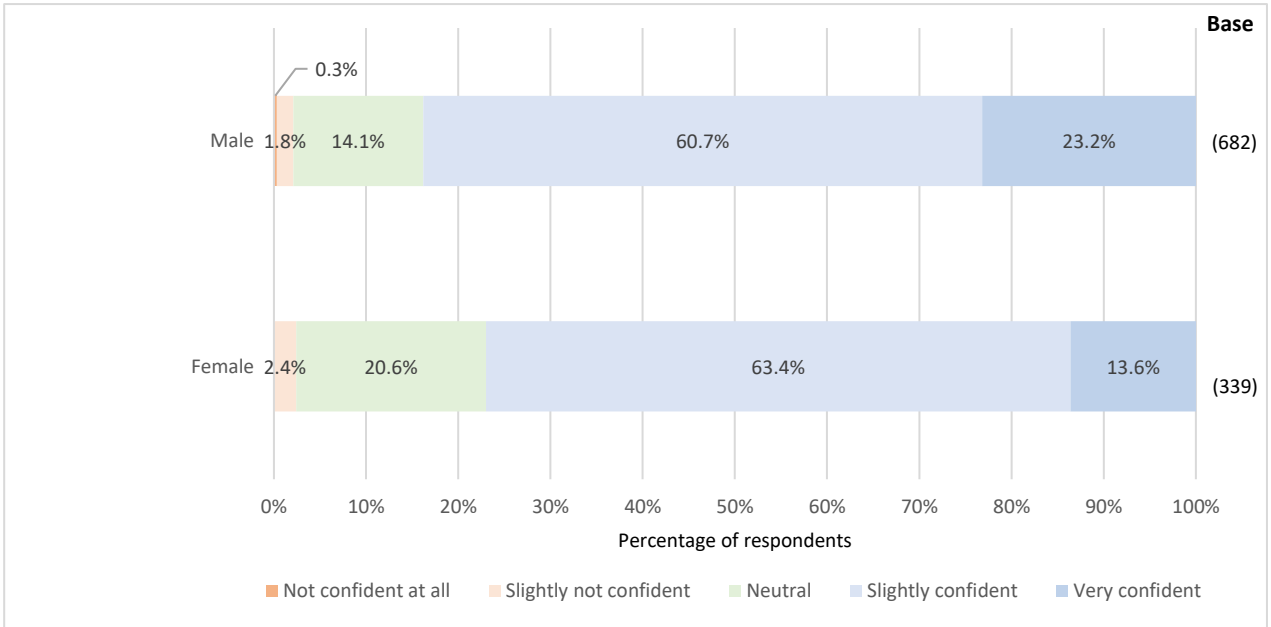
##: very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

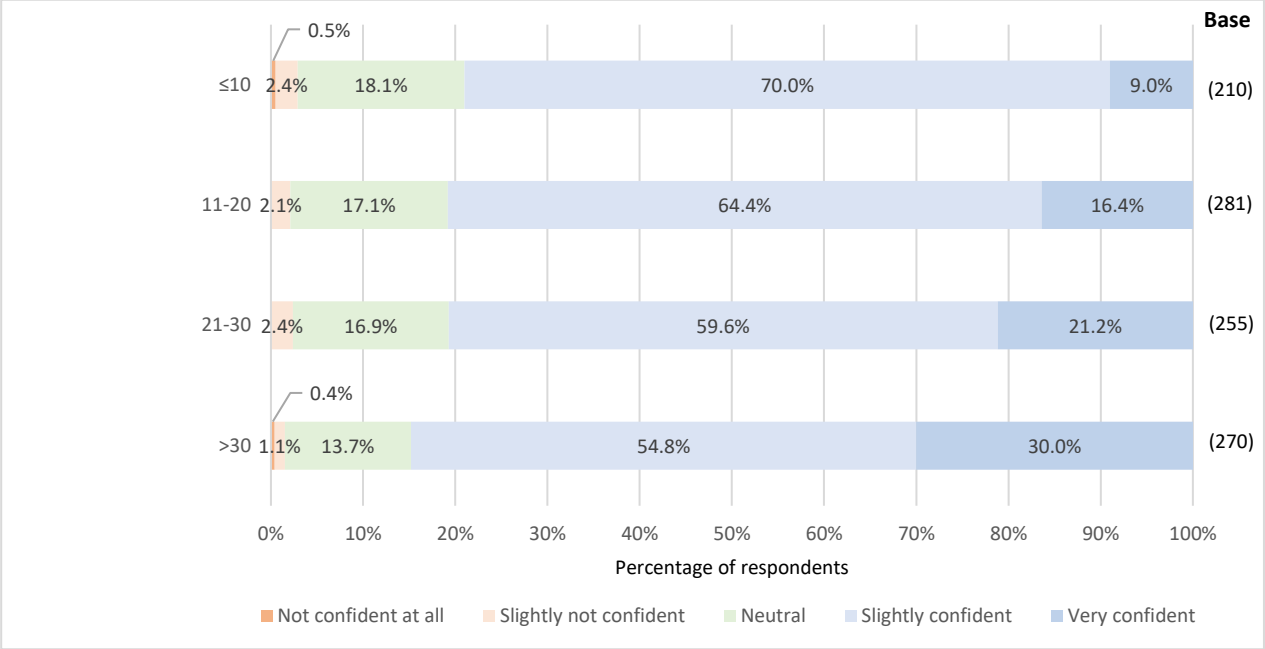
Compared to their female counterparts (13.6%), more male respondents (23.2%) considered themselves “very confident” in knowing when to start antibiotic therapy. (Chart 25)

Chart 25. Level of confidence in knowing when to start antibiotic therapy by gender (Q6a)



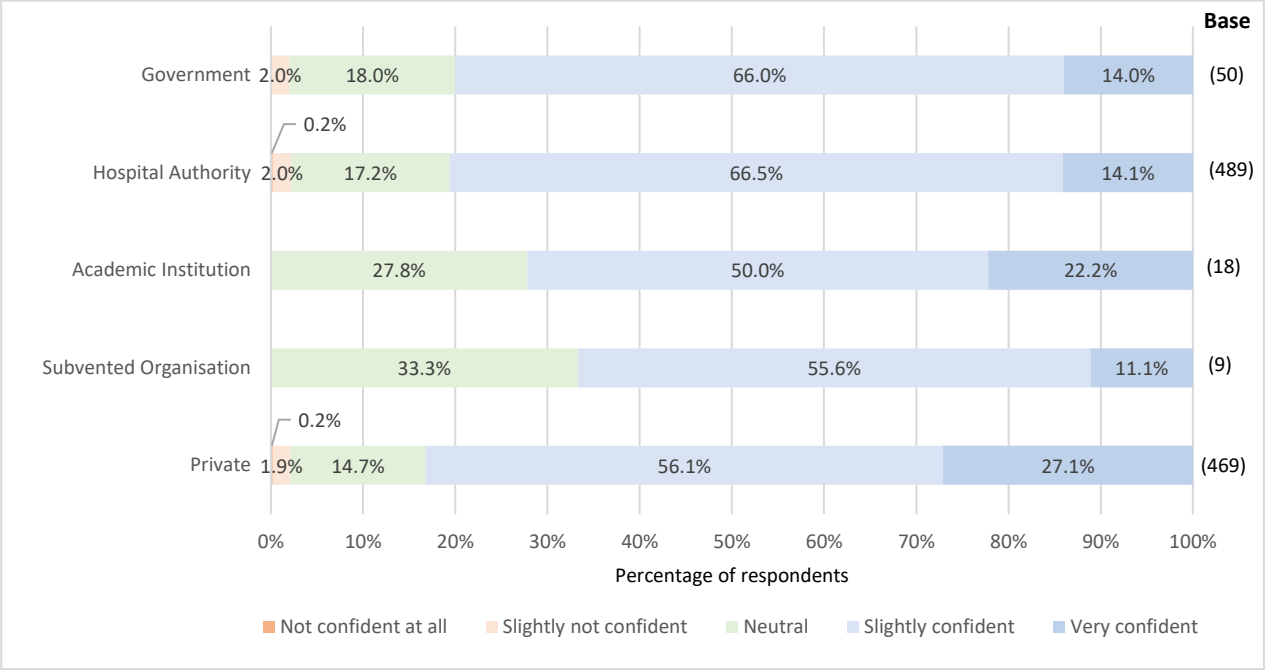
The more experienced the respondents, the higher the likelihood for them to consider themselves “very confident” in knowing when to start antibiotic therapy. (Chart 26)

Chart 26. Level of confidence in knowing when to start antibiotic therapy by years of practice (Q6a)



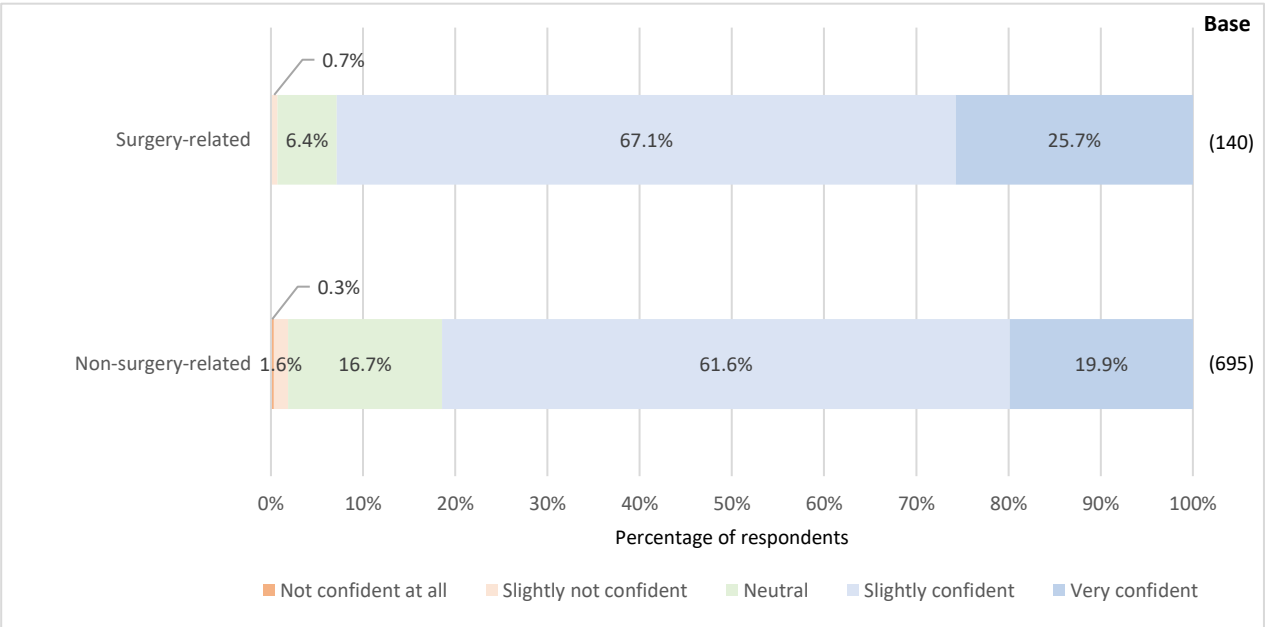
When compared with respondents working with other types of institution, respondents working in the private sector (27.1%) or academic institutions (22.2%) tended to opine that they were “very confident” in knowing when to start antibiotic therapy. (Chart 27)

Chart 27. Level of confidence in knowing when to start antibiotic therapy by type of institution (Q6a)



Respondents who were in a surgery-related specialty (92.9%) were more likely to feel confident ("very confident"/"slightly confident") in knowing when to start antibiotic therapy, as compared to the non-surgeon respondents (81.4%). (Chart 28)

Chart 28. Level of confidence in knowing when to start antibiotic therapy by specialty (Q6a)



Respondents' level of confidence in choosing the correct drug and dosage was associated significantly with the respondents' gender, years of practice and type of institution. (Table 41)

Table 41 Level of confidence in choosing the correct drug and dosage (Q6b)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Not confident at all**	**Slightly not confident**	**Neutral**	**Slightly confident**	**Very confident**	**p-value**
Gender	Male	679 (100.0%)	2 (0.3%)	15 (2.2%)	117 (17.2%)	408 (60.1%)	137 (20.2%)	<0.005[a]
	Female	338 (100.0%)	1 (0.3%)	15 (4.4%)	83 (24.6%)	209 (61.8%)	30 (8.9%)	
Years of practice	≤10	210 (100.0%)	1 (0.5%)	14 (6.7%)	51 (24.3%)	128 (61.0%)	16 (7.6%)	<0.005[b]
	11-20	281 (100.0%)	1 (0.4%)	7 (2.5%)	58 (20.6%)	176 (62.6%)	39 (13.9%)	
	21-30	254 (100.0%)	(-)	6 (2.4%)	49 (19.3%)	154 (60.6%)	45 (17.7%)	
	>30	267 (100.0%)	1 (0.4%)	3 (1.1%)	41 (15.4%)	157 (58.8%)	65 (24.3%)	
Type of institution	Government	49[#] (100.0%)	(-)	2 (4.1%)	11 (22.4%)	31 (63.3%)	5 (10.2%)	0.01[b]
	Hospital Authority	487 (100.0%)	2 (0.4%)	18 (3.7%)	107 (22.0%)	303 (62.2%)	57 (11.7%)	
	Academic Institution	18[##] (100.0%)	(-)	(-)	4 (22.2%)	10 (55.6%)	4 (22.2%)	
	Subvented Organisation	9[##] (100.0%)	(-)	(-)	2 (22.2%)	6 (66.7%)	1 (11.1%)	
	Private	468 (100.0%)	1 (0.2%)	10 (2.1%)	82 (17.5%)	270 (57.7%)	105 (22.4%)	

#: small sample size (<50)

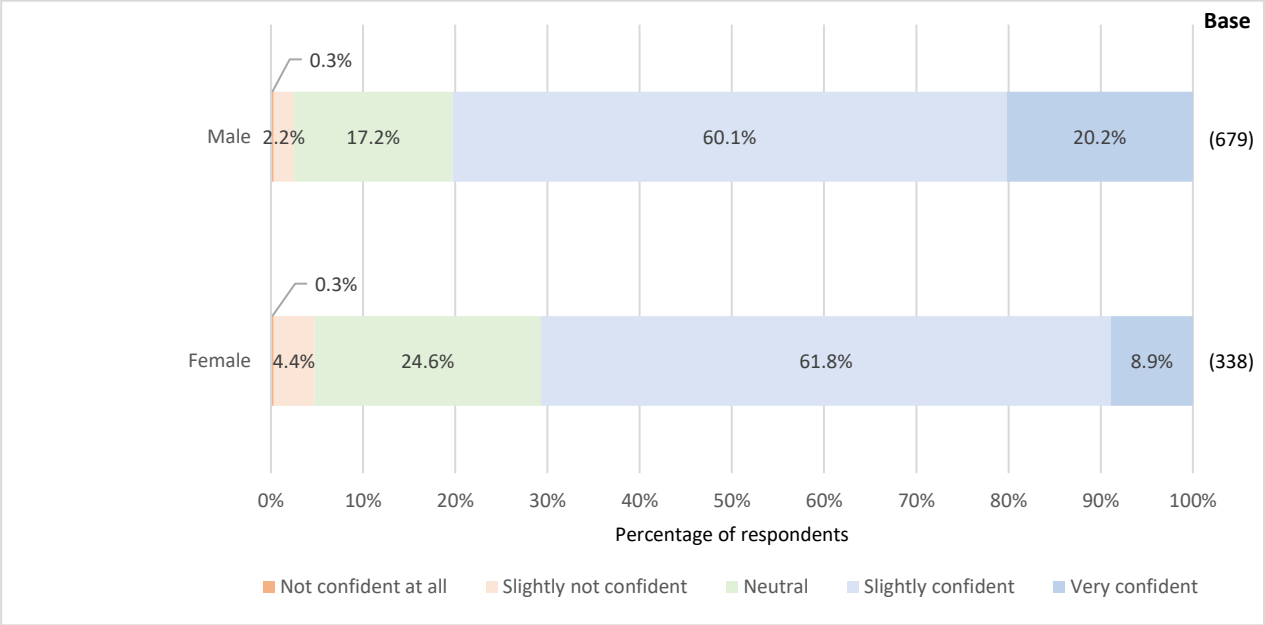
##: very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

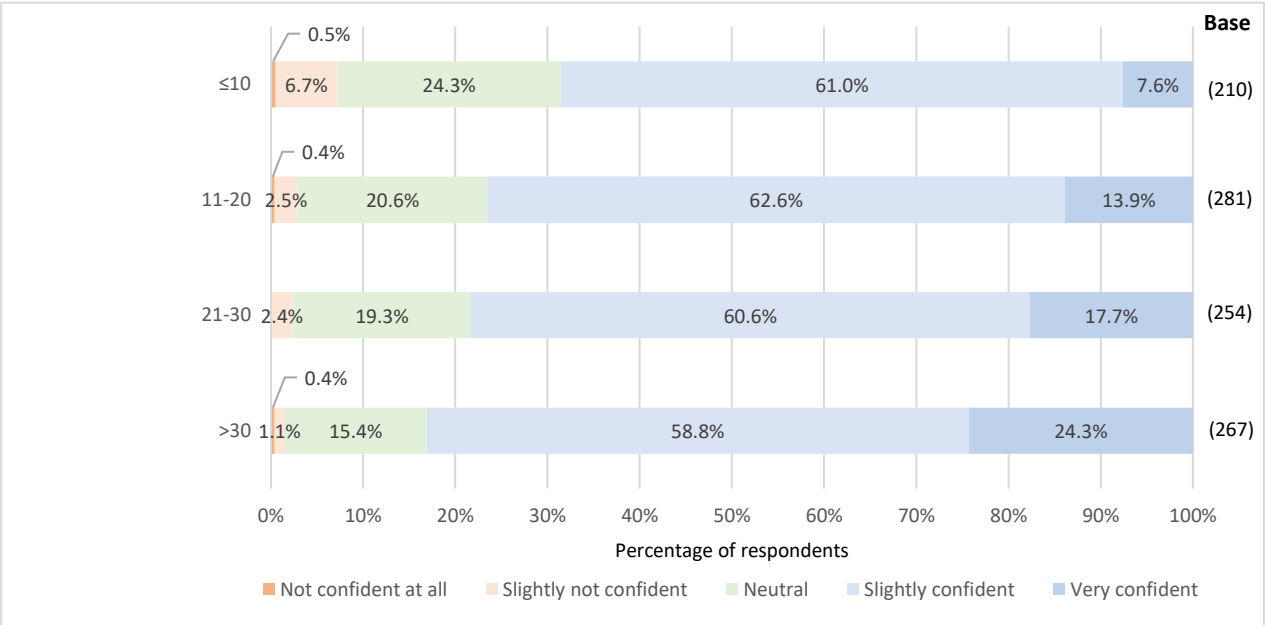
Compared to their female counterparts (8.9%), more male respondents (20.2%) considered themselves "very confident" in choosing the correct drug and dosage. (Chart 29)

Chart 29. Level of confidence in choosing the correct drug and dosage by gender (Q6b)



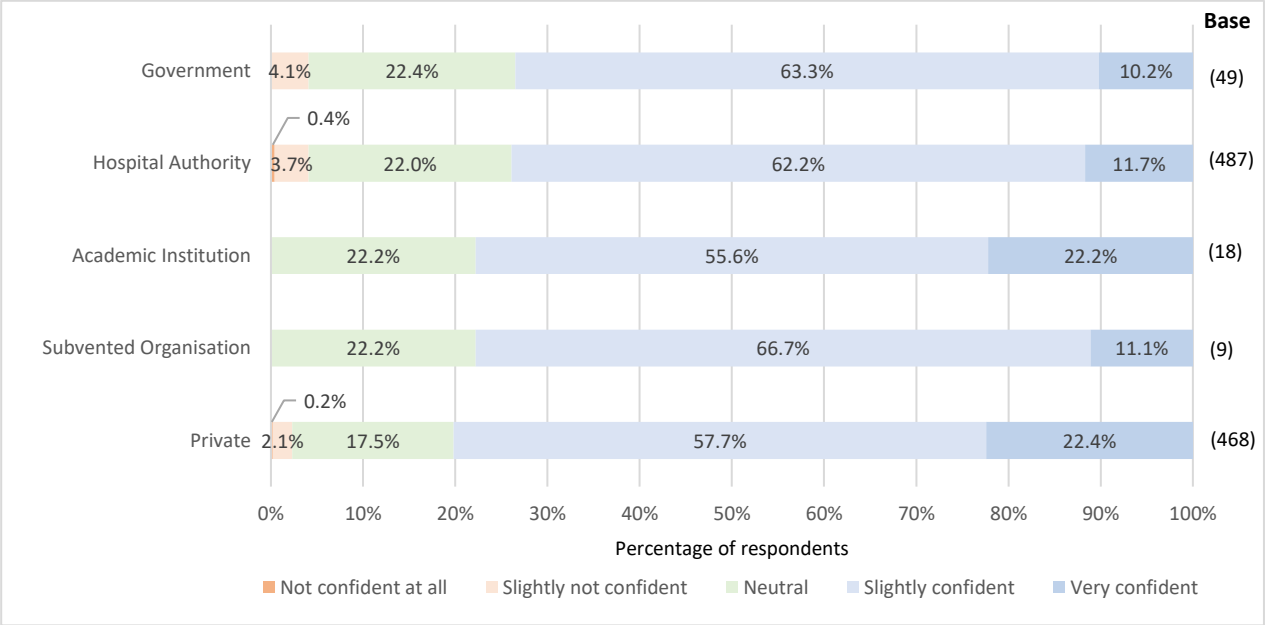
The more experienced the respondents, the higher the likelihood for them to consider themselves “very confident” in choosing the correct drug and dosage. (Chart 30)

Chart 30. Level of confidence in choosing the correct drug and dosage by years of practice (Q6b)



When compared with respondents working with other types of institution, relatively more respondents working in the private sector (22.4%) or academic institutions (22.2%) tended to opine that they were “very confident” in choosing the correct drug and dosage. (Chart 31)

Chart 31. Level of confidence in choosing the correct drug and dosage by type of institution (Q6b)



Respondents’ level of confidence in determining the right treatment duration was associated significantly with the respondents’ gender, years of practice and type of institution. (Table 42)

Table 42 Level of confidence in determining the right treatment duration (Q6c)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Not confident at all**	**Slightly not confident**	**Neutral**	**Slightly confident**	**Very confident**	**p-value**
Gender	Male	681 (100.0%)	2 (0.3%)	25 (3.7%)	133 (19.5%)	383 (56.2%)	138 (20.3%)	<0.005[a]
	Female	339 (100.0%)	1 (0.3%)	18 (5.3%)	94 (27.7%)	197 (58.1%)	29 (8.6%)	
Years of practice	≤10	210 (100.0%)	1 (0.5%)	18 (8.6%)	59 (28.1%)	119 (56.7%)	13 (6.2%)	<0.005[b]
	11-20	281 (100.0%)	1 (0.4%)	13 (4.6%)	71 (25.3%)	161 (57.3%)	35 (12.5%)	
	21-30	255 (100.0%)	(-)	9 (3.5%)	54 (21.2%)	144 (56.5%)	48 (18.8%)	

	>30	269 (100.0%)	1 (0.4%)	3 (1.1%)	43 (16.0%)	152 (56.5%)	70 (26.0%)	
Type of institution	Government	50 (100.0%)	(-)	3 (6.0%)	15 (30.0%)	26 (52.0%)	6 (12.0%)	<0.005[b]
	Hospital Authority	489 (100.0%)	2 (0.4%)	29 (5.9%)	129 (26.4%)	276 (56.4%)	53 (10.8%)	
	Academic Institution	18## (100.0%)	(-)	2 (11.1%)	4 (22.2%)	9 (50.0%)	3 (16.7%)	
	Subvented Organisation	9## (100.0%)	(-)	(-)	3 (33.3%)	5 (55.6%)	1 (11.1%)	
	Private	468 (100.0%)	1 (0.2%)	10 (2.1%)	80 (17.1%)	269 (57.5%)	108 (23.1%)	

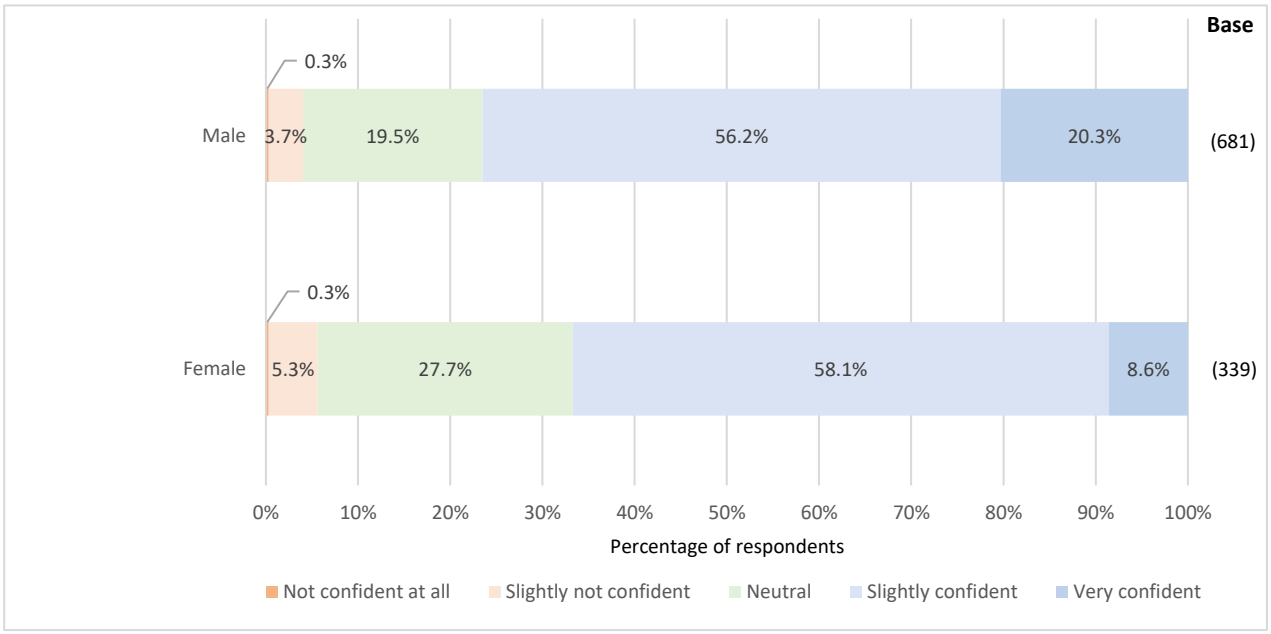
##: very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

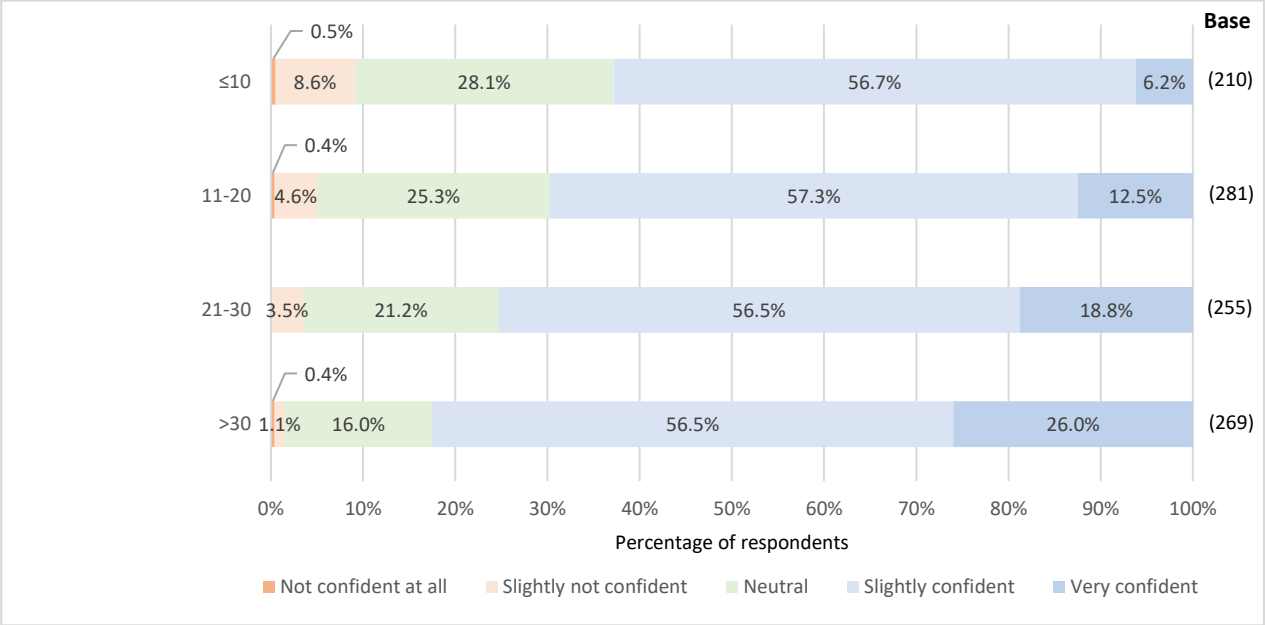
Compared to their female counterparts (8.6%), more male respondents (20.3%) considered themselves “very confident” in determining the right treatment duration. (Chart 32)

Chart 32. Level of confidence in determining the right treatment duration by gender (Q6c)



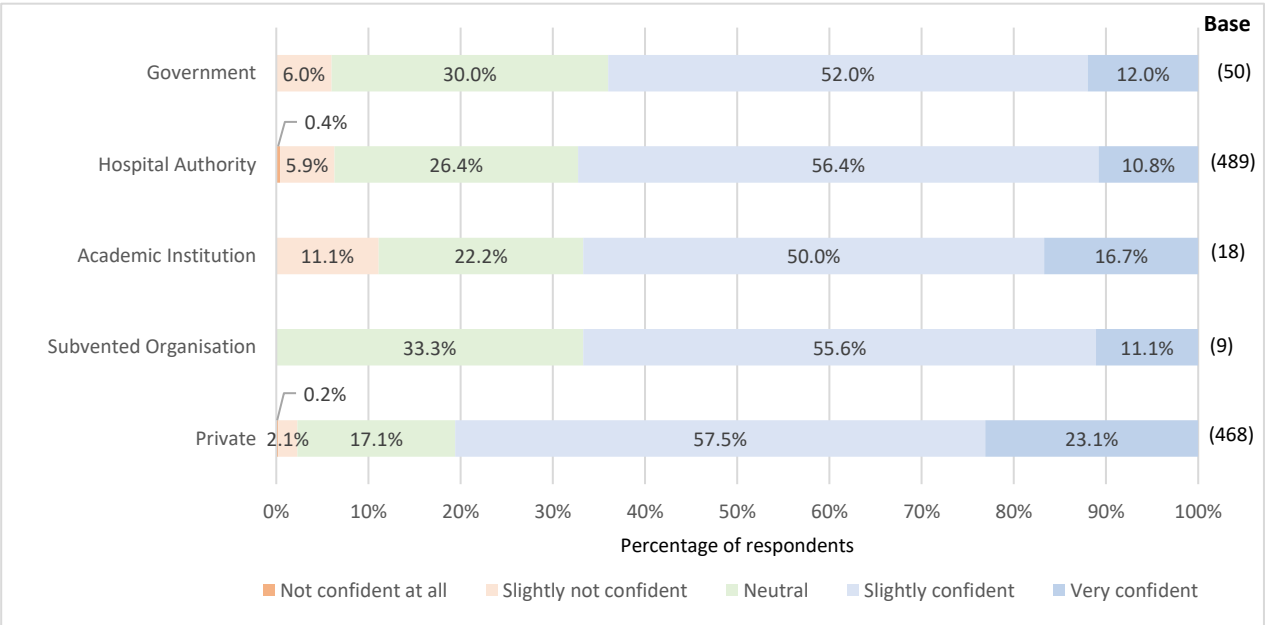
The more experienced the respondents, the higher the likelihood for them to consider themselves “very confident” in determining the right treatment duration. (Chart 33)

Chart 33. Level of confidence in determining the right treatment duration by years of practice (Q6c)



When compared with respondents working in other types of institution, respondents working in the private sector (23.1%) or academic institutions (16.7%) tended to opine that they were “very confident” in determining the right treatment duration. (Chart 34)

Chart 34. Level of confidence in determining the right treatment duration by type of institution (Q6c)



Respondents' level of confidence in differentiating broad-spectrum antibiotics from narrow-spectrum antibiotics, and avoid their unnecessary use was associated significantly with the respondents' type of practice, gender, major field of practice and specialty. (Table 43)

Table 43 Level of confidence in differentiating broad-spectrum antibiotics from narrow-spectrum antibiotics, and avoid their unnecessary use (Q6d)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Not confident at all**	**Slightly not confident**	**Neutral**	**Slightly confident**	**Very confident**	**p-value**
Type of practice	Primary Care	350 (100.0%)	(-)	9 (2.6%)	106 (30.3%)	169 (48.3%)	66 (18.9%)	0.04[a]
	Non-Primary Care	679 (100.0%)	4 (0.6%)	32 (4.7%)	141 (20.8%)	346 (51.0%)	156 (23.0%)	
Gender	Male	682 (100.0%)	3 (0.4%)	22 (3.2%)	151 (22.1%)	338 (49.6%)	168 (24.6%)	<0.005[a]
	Female	337 (100.0%)	1 (0.3%)	18 (5.3%)	93 (27.6%)	174 (51.6%)	51 (15.1%)	
Major field of practice	General Practice	326 (100.0%)	(-)	9 (2.8%)	100 (30.7%)	160 (49.1%)	57 (17.5%)	<0.005[b]
	Practice in a specialty	689 (100.0%)	4 (0.6%)	30 (4.4%)	145 (21.0%)	345 (50.1%)	165 (23.9%)	
	Administration/ Teaching	14[##] (100.0%)	(-)	2 (14.3%)	2 (14.3%)	10 (71.4%)	(-)	
Specialty	Surgery-related	140 (100.0%)	(-)	2 (1.4%)	30 (21.4%)	67 (47.9%)	41 (29.3%)	0.04[a]
	Non-surgery-related	693 (100.0%)	4 (0.6%)	31 (4.5%)	157 (22.7%)	352 (50.8%)	149 (21.5%)	

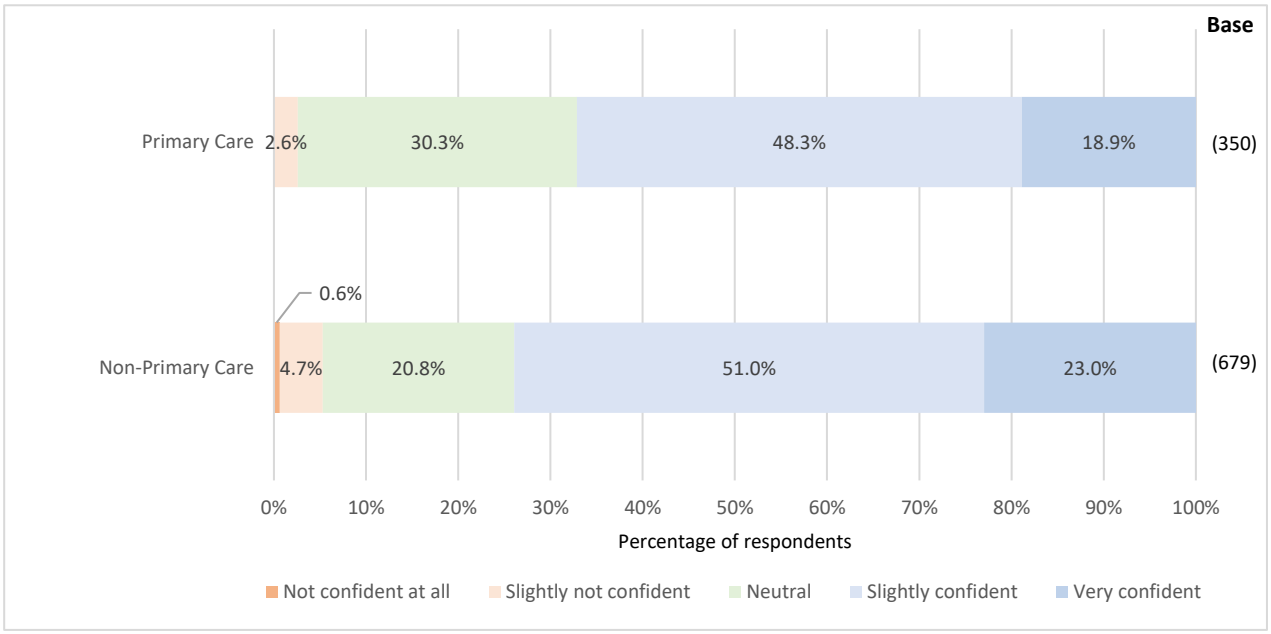
##: very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

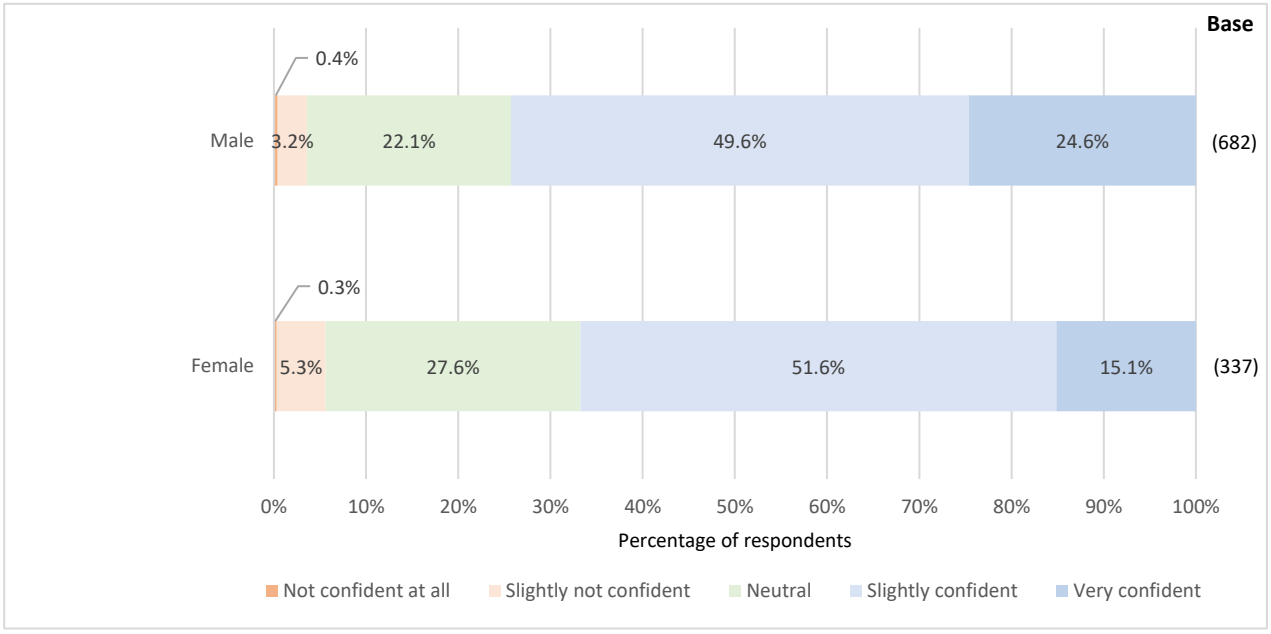
Non-primary care doctors (73.9%) were more prone to be confident ("very confident"/"slightly confident") in differentiating broad-spectrum antibiotics, while fewer primary care doctors (67.1%) were inclined to be confident in the area. (Chart 35)

Chart 35. Level of confidence in differentiating broad-spectrum antibiotics from narrow-spectrum antibiotics, and avoid their unnecessary use by type of practice (Q6d)



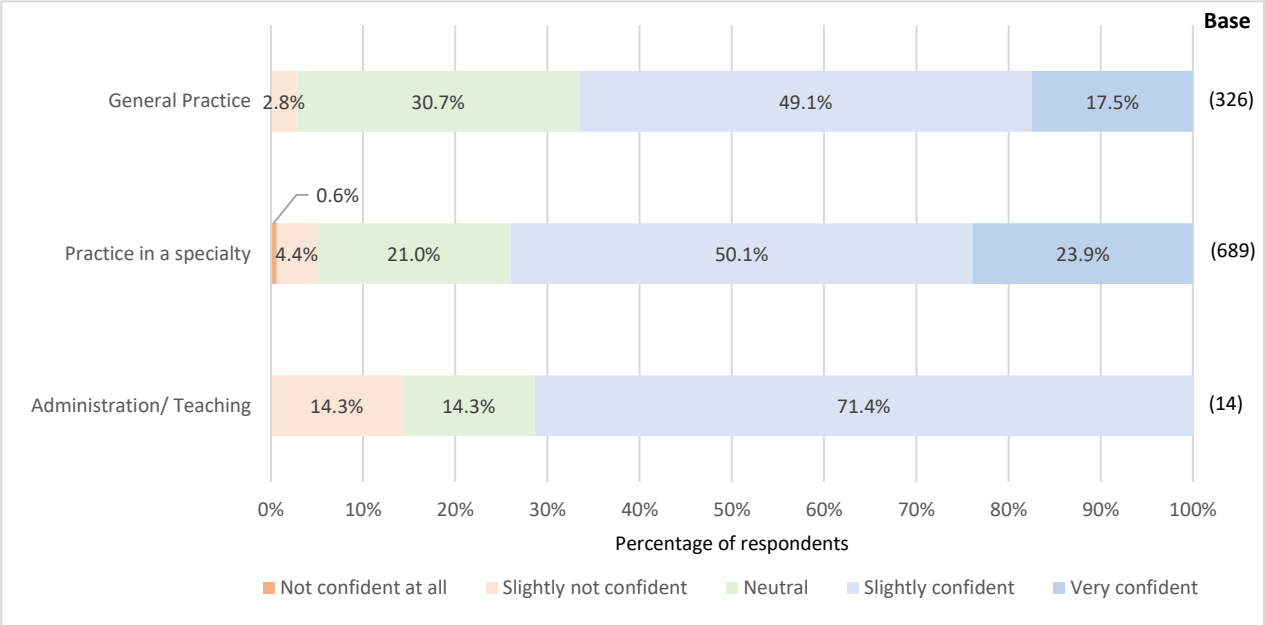
Compared to their female counterparts (15.1%), more male respondents (24.6%) considered themselves "very confident" in differentiating broad-spectrum antibiotics and avoid their unnecessary use. (Chart 36)

Chart 36. Level of confidence in differentiating broad-spectrum antibiotics from narrow-spectrum antibiotics, and avoid their unnecessary use by gender (Q6d)



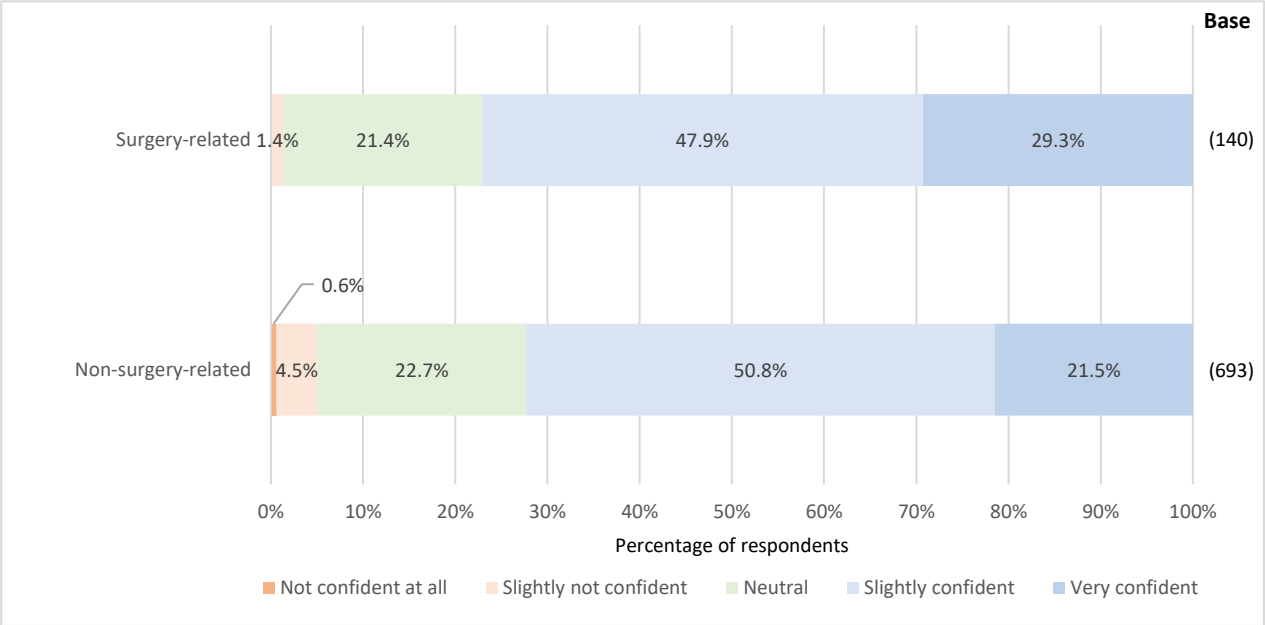
Respondents who were practising in a specialty (23.9%) were slightly more inclined to be “very confident” in their own competence in differentiating and avoiding unnecessary use of broad-spectrum antibiotics, as compared to respondents who were in general practice (17.5%). (Chart 37)

Chart 37. Level of confidence in differentiating broad-spectrum antibiotics from narrow-spectrum antibiotics, and avoid their unnecessary use by major field of practice (Q6d)



Respondents who were in a surgery-related specialty (77.1%) were more likely to feel confident (“very confident”/“slightly confident”) in differentiating and avoiding unnecessary use of broad-spectrum antibiotic, as compared to the non-surgeon respondents (72.3%). (0)

Chart 38. Level of confidence in differentiating broad-spectrum antibiotics from narrow-spectrum antibiotics, and avoid their unnecessary use by specialty (Q6d)



Respondents' level of confidence in interpreting antibiotic susceptibility test results are significantly associated with the respondents' gender, year of practice and type of institution. (Table 44)

Table 44 Level of confidence in interpreting antibiotic susceptibility test result (Q6e)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Not confident at all**	**Slightly not confident**	**Neutral**	**Slightly confident**	**Very confident**	**p-value**
Gender	Male	681 (100.0%)	1 (0.1%)	12 (1.8%)	75 (11.0%)	350 (51.4%)	243 (35.7%)	<0.005[a]
	Female	339 (100.0%)	(-)	9 (2.7%)	50 (14.7%)	192 (56.6%)	88 (26.0%)	
Year of practice	≤10	210 (100.0%)	(-)	4 (1.9%)	31 (14.8%)	116 (55.2%)	59 (28.1%)	0.04[b]
	11-20	281 (100.0%)	(-)	5 (1.8%)	37 (13.2%)	150 (53.4%)	89 (31.7%)	
	21-30	255 (100.0%)	(-)	7 (2.7%)	28 (11.0%)	147 (57.6%)	73 (28.6%)	
	>30	269 (100.0%)	1 (0.4%)	5 (1.9%)	27 (10.0%)	130 (48.3%)	106 (39.4%)	
Type of institution	Government	50 (100.0%)	(-)	1 (2.0%)	6 (12.0%)	31 (62.0%)	12 (24.0%)	<0.005[b]
	Hospital Authority	489 (100.0%)	(-)	8 (1.6%)	70 (14.3%)	272 (55.6%)	139 (28.4%)	

	Academic Institution	18## (100.0%)	(-)	(-)	2 (11.1%)	4 (22.2%)	12 (66.7%)	
	Subvented Organisation	9## (100.0%)	(-)	(-)	(-)	6 (66.7%)	3 (33.3%)	
	Private	468 (100.0%)	1 (0.2%)	12 (2.6%)	49 (10.5%)	237 (50.6%)	169 (36.1%)	

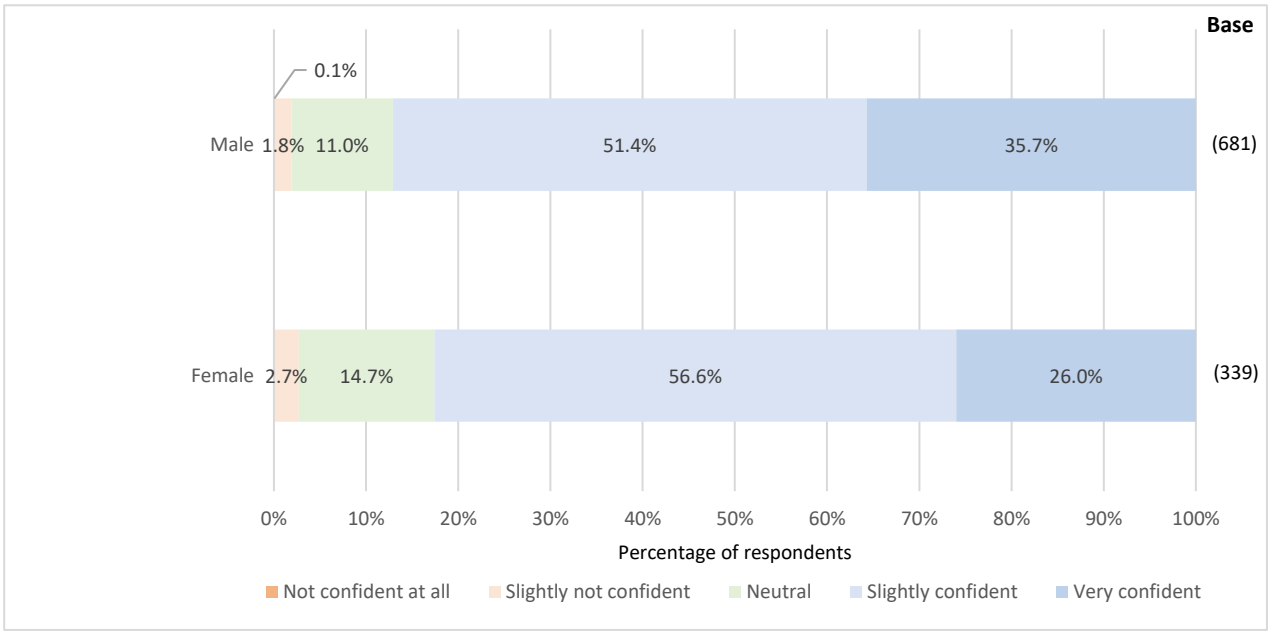
##: very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

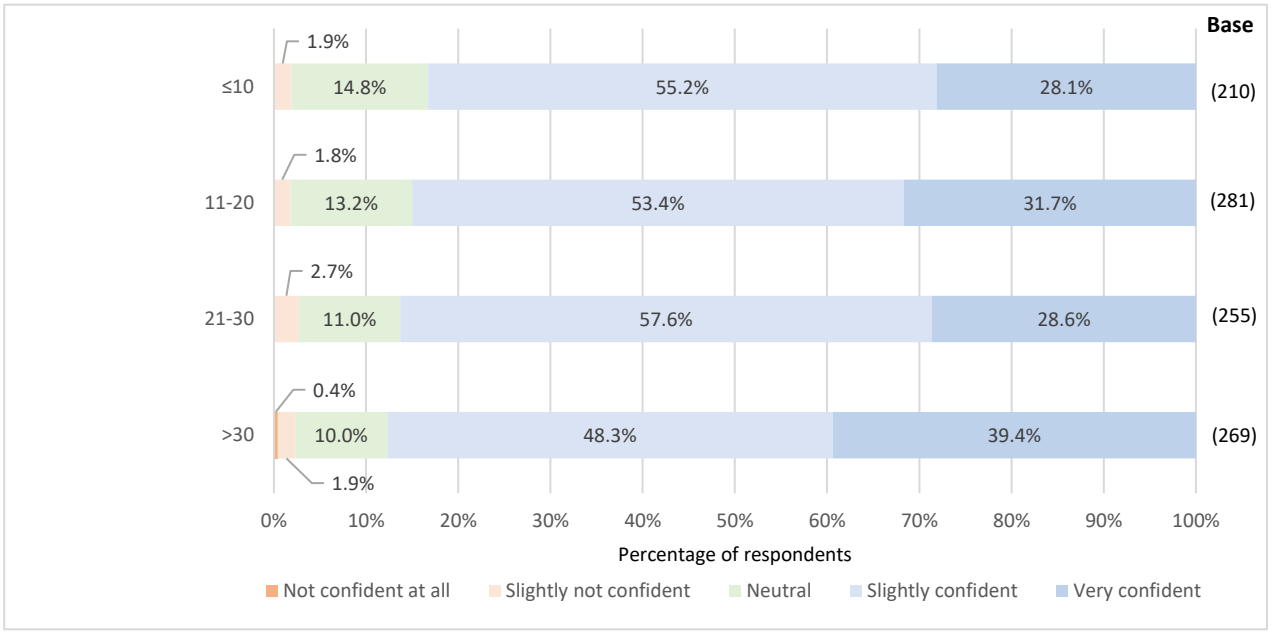
Compared to their female counterparts (26.0%), more male respondents (35.7%) considered themselves “very confident” in interpreting antibiotic susceptibility test result. (Chart 39)

Chart 39. Level of confidence in interpreting antibiotic susceptibility test result by gender (Q6e)



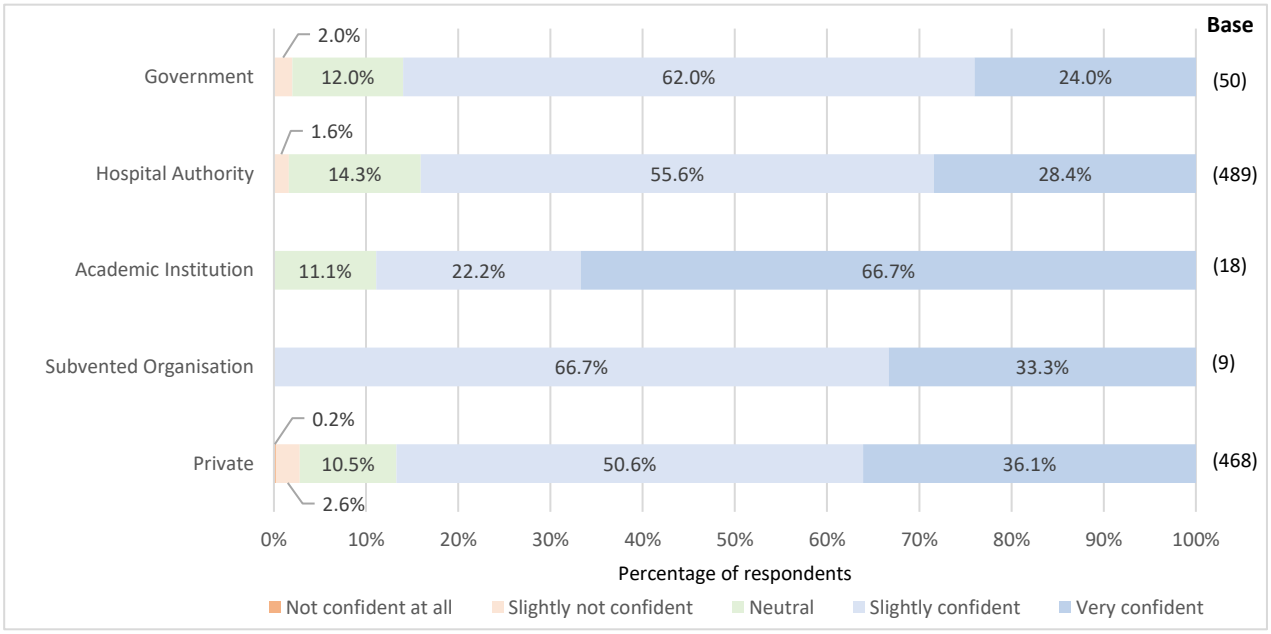
Respondents who had been practising for a longer time were more confident (“very confident”/“slightly confident”) in interpreting antibiotic susceptibility result. (Chart 40)

Chart 40. Level of confidence in interpreting antibiotic susceptibility test result by years of practice (Q6e)



When compared with respondents working in other types of institution, respondents working in academic institutions (66.7%) tended to opine that they were “very confident” in interpreting antibiotic susceptibility test result. (Chart 41)

Chart 41. Level of confidence in interpreting antibiotic susceptibility test result by type of institution (Q6e)



Respondents’ level of confidence in de-escalating antibiotic therapy according to clinical evaluation and diagnostic test result was significantly associated with

respondents' type of practice, gender, major field of practice and specialty. (Table 45)

Table 45 Level of confidence in de-escalate antibiotic therapy according to clinical evaluation and diagnostic test result (Q6f)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Not confident at all**	**Slightly not confident**	**Neutral**	**Slightly confident**	**Very confident**	**p-value**
Type of practice	Primary Care	350 (100.0%)	2 (0.6%)	21 (6.0%)	101 (28.9%)	168 (48.0%)	58 (16.6%)	0.03[a]
	Non-Primary Care	680 (100.0%)	6 (0.9%)	44 (6.5%)	150 (22.1%)	334 (49.1%)	146 (21.5%)	
Gender	Male	682 (100.0%)	6 (0.9%)	33 (4.8%)	160 (23.5%)	325 (47.7%)	158 (23.2%)	<0.005[a]
	Female	338 (100.0%)	2 (0.6%)	33 (9.8%)	86 (25.4%)	175 (51.8%)	42 (12.4%)	
Major field of practice	General Practice	326 (100.0%)	2 (0.6%)	19 (5.8%)	96 (29.4%)	155 (47.5%)	54 (16.6%)	0.02[b]
	Practice in a specialty	690 (100.0%)	5 (0.7%)	45 (6.5%)	152 (22.0%)	339 (49.1%)	149 (21.6%)	
	Administration/ Teaching	14[##] (100.0%)	1 (7.1%)	1 (7.1%)	3 (21.4%)	8 (57.1%)	1 (7.1%)	
Specialty	Surgery-related	140 (100.0%)	(-)	1 (0.7%)	27 (19.3%)	76 (54.3%)	36 (25.7%)	<0.005[a]
	Non-surgery-related	695 (100.0%)	7 (1.0%)	55 (7.9%)	165 (23.7%)	333 (47.9%)	135 (19.4%)	

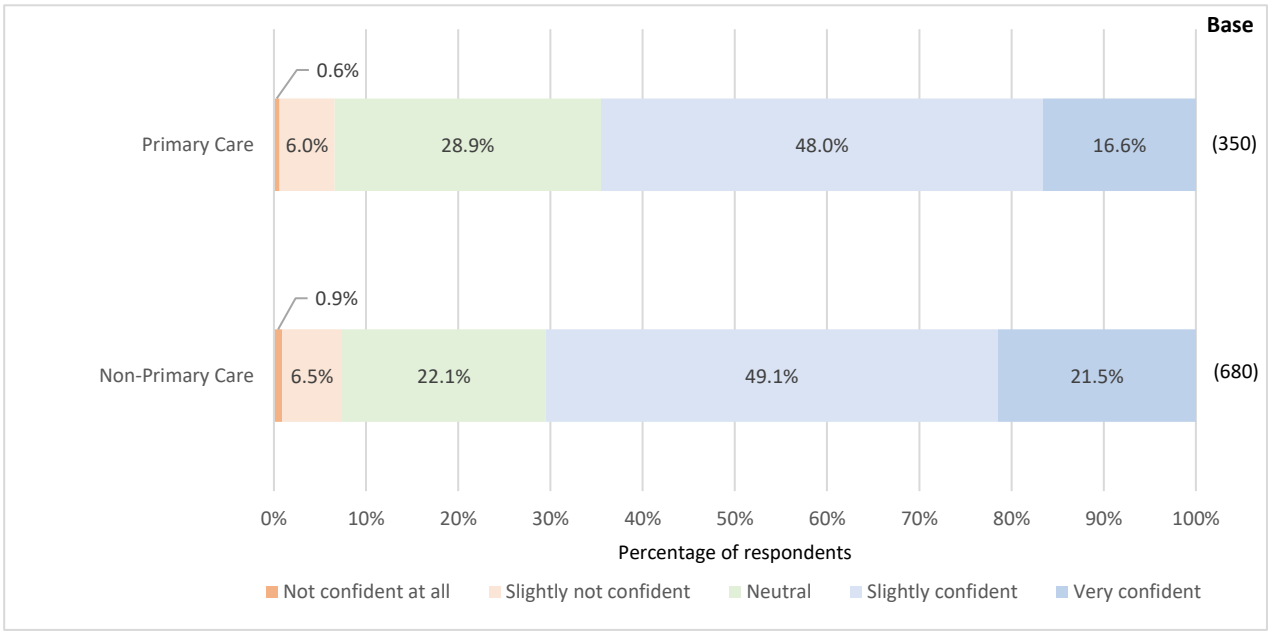
##: very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

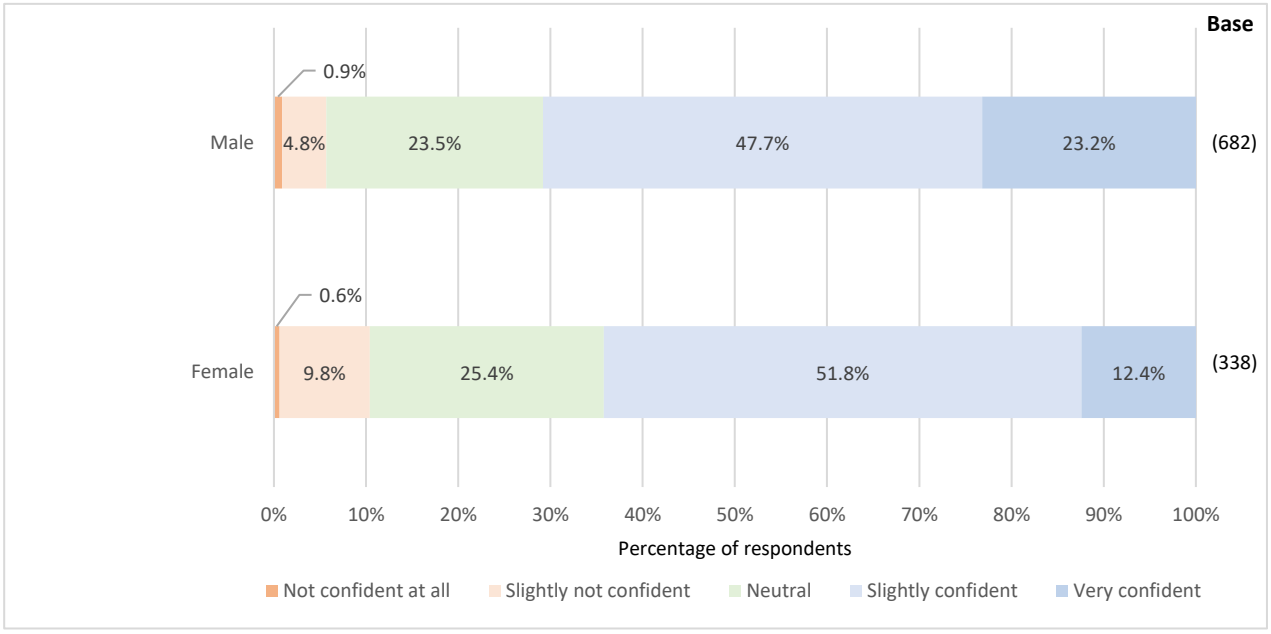
Non-primary care doctors (70.6%) were more prone to be confident ("very confident"/"slightly confident") in de-escalating antibiotic therapy according to clinical evaluation and diagnostic test results, while fewer primary care doctors (64.6%) were inclined to be confident in the area. (Chart 42)

Chart 42. Level of confidence in de-escalate antibiotic therapy according to clinical evaluation and diagnostic test result by type of practice (Q6f)



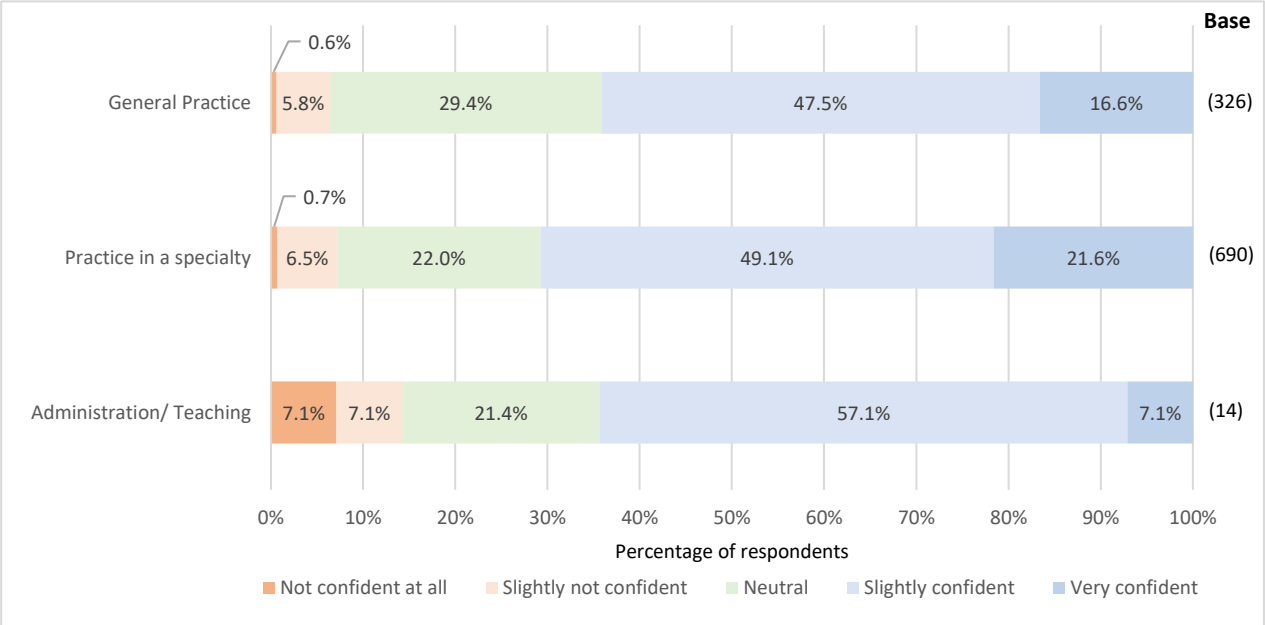
Compared to their female counterparts (12.4%), more male respondents (23.2%) considered themselves “very confident” in de-escalating antibiotic therapy. (Chart 43)

Chart 43. Level of confidence in de-escalate antibiotic therapy according to clinical evaluation and diagnostic test result by gender (Q6f)



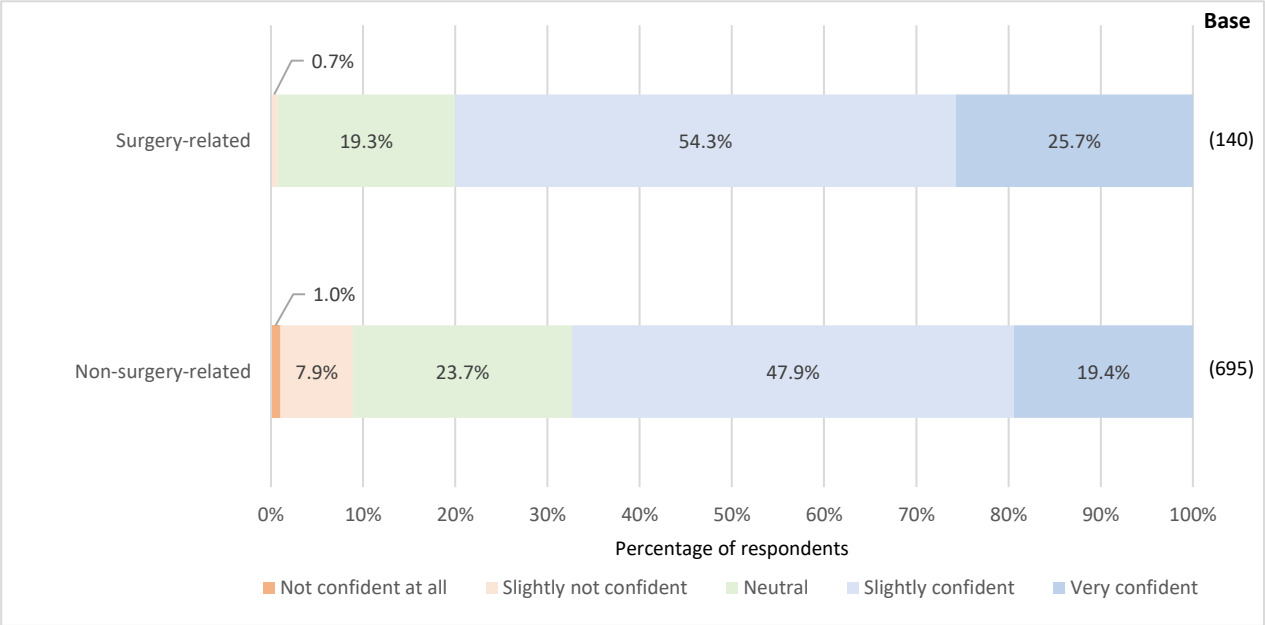
Respondents who were practising in a specialty (21.6%) were slightly more inclined to be "very confident" in de-escalating antibiotic therapy, as compared to respondents who were in general practice (16.6%) or in administration/teaching areas (7.1%). (Chart 44)

Chart 44. Level of confidence in de-escalate antibiotic therapy according to clinical evaluation and diagnostic test result by major field of practice (Q6f)



Respondents who were in a surgery-related specialty (80.0%) were more likely to feel confident ("very confident"/"slightly confident") in de-escalating antibiotic therapy, as compared to the non-surgeon respondents (67.3%). (Chart 45)

Chart 45. Level of confidence in de-escalate antibiotic therapy according to clinical evaluation and diagnostic test result by specialty (Q6f)



Respondents' level of confidence in educating patient on proper use of antibiotics was significantly associated with the respondents' type of practice, type of institution and major field of practice. (Table 46)

Table 46 Level of confidence in educating patient on proper use of antibiotics (Q6g)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Not confident at all**	**Slightly not confident**	**Neutral**	**Slightly confident**	**Very confident**	**p-value**
Type of practice	Primary Care	350 (100.0%)	(-)	9 (2.6%)	58 (16.6%)	183 (52.3%)	100 (28.6%)	<0.005[a]
	Non-Primary Care	680 (100.0%)	2 (0.3%)	31 (4.6%)	162 (23.8%)	357 (52.5%)	128 (18.8%)	
Type of institution	Government	50 (100.0%)	(-)	2 (4.0%)	11 (22.0%)	25 (50.0%)	12 (24.0%)	<0.005[b]
	Hospital Authority	488 (100.0%)	1 (0.2%)	23 (4.7%)	118 (24.2%)	276 (56.6%)	70 (14.3%)	
	Academic Institution	18[##] (100.0%)	(-)	(-)	5 (27.8%)	9 (50.0%)	4 (22.2%)	
	Subvented Organisation	9[##] (100.0%)	(-)	(-)	3 (33.3%)	4 (44.4%)	2 (22.2%)	
	Private	469 (100.0%)	1 (0.2%)	15 (3.2%)	85 (18.1%)	228 (48.6%)	140 (29.9%)	
Major field of practice	General Practice	326 (100.0%)	(-)	9 (2.8%)	57 (17.5%)	167 (51.2%)	93 (28.5%)	0.01[b]

	Practice in a specialty	690 (100.0%)	2 (0.3%)	30 (4.3%)	161 (23.3%)	364 (52.8%)	133 (19.3%)	
	Administration/ Teaching	14## (100.0%)	(-)	1 (7.1%)	2 (14.3%)	9 (64.3%)	2 (14.3%)	

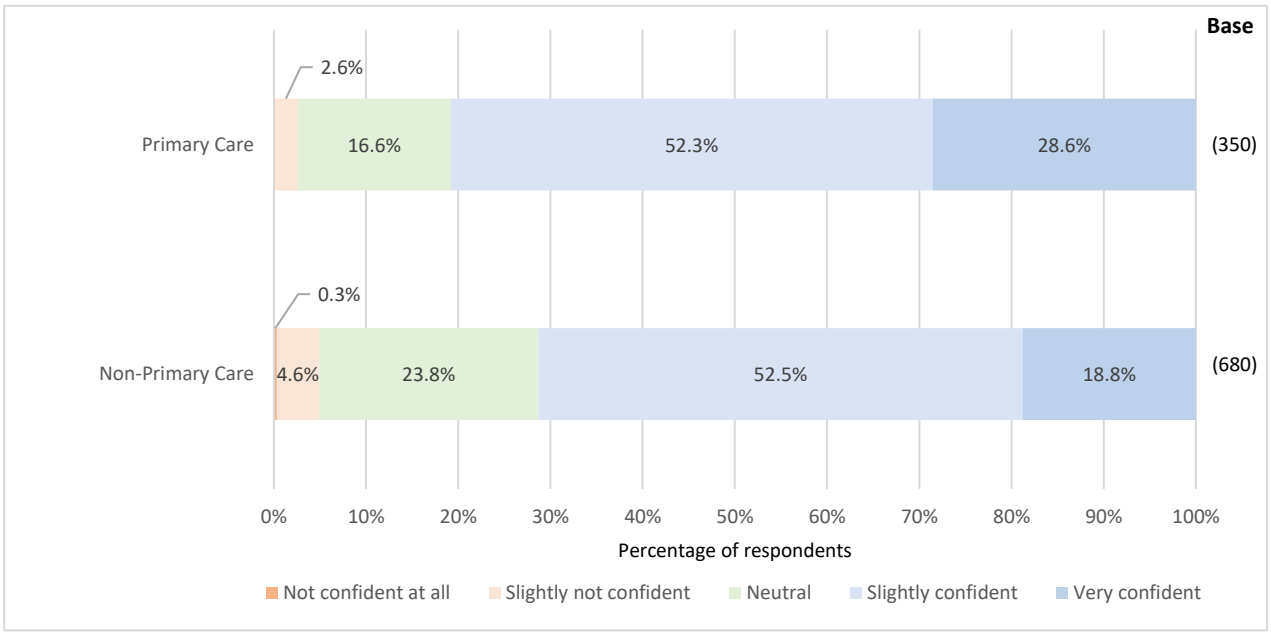
##: very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

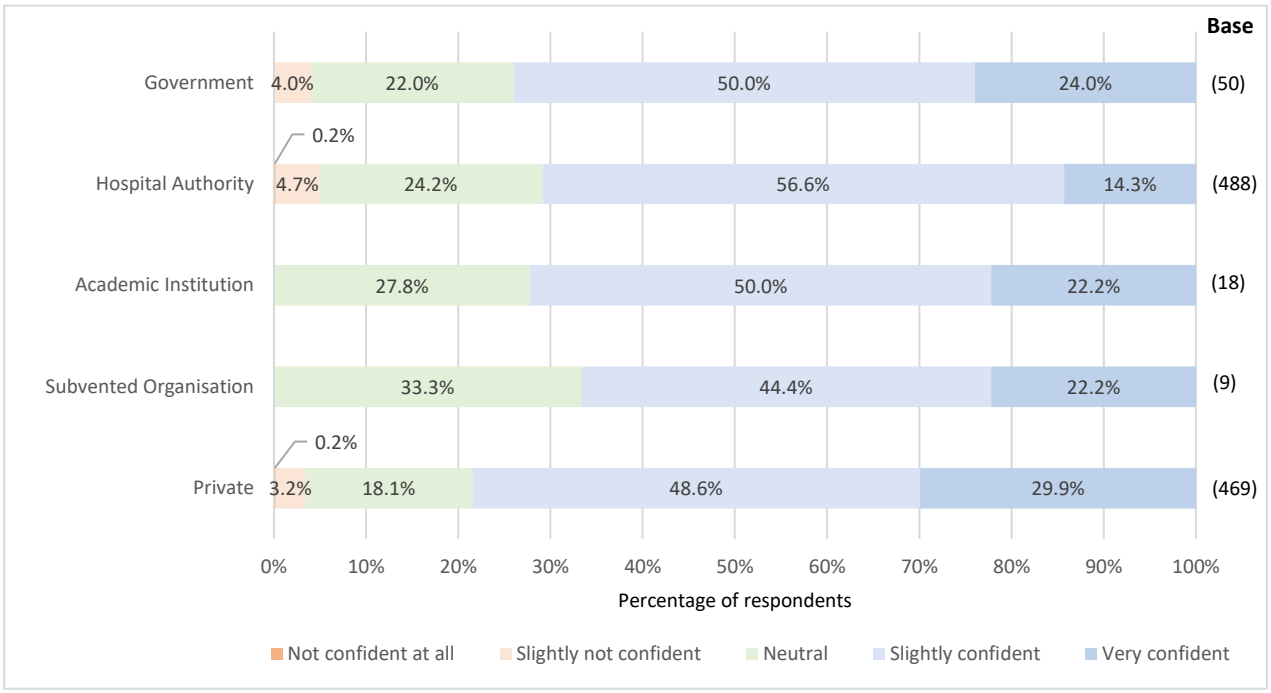
Primary care doctors (28.6%) were more prone to be “very confident” in educating patients on proper use of antibiotics, as compared to their counterpart in non-primary care (18.8%). (Chart 46)

Chart 46. Level of confidence in educating patient on proper use of antibiotics by type of practice (Q6g)



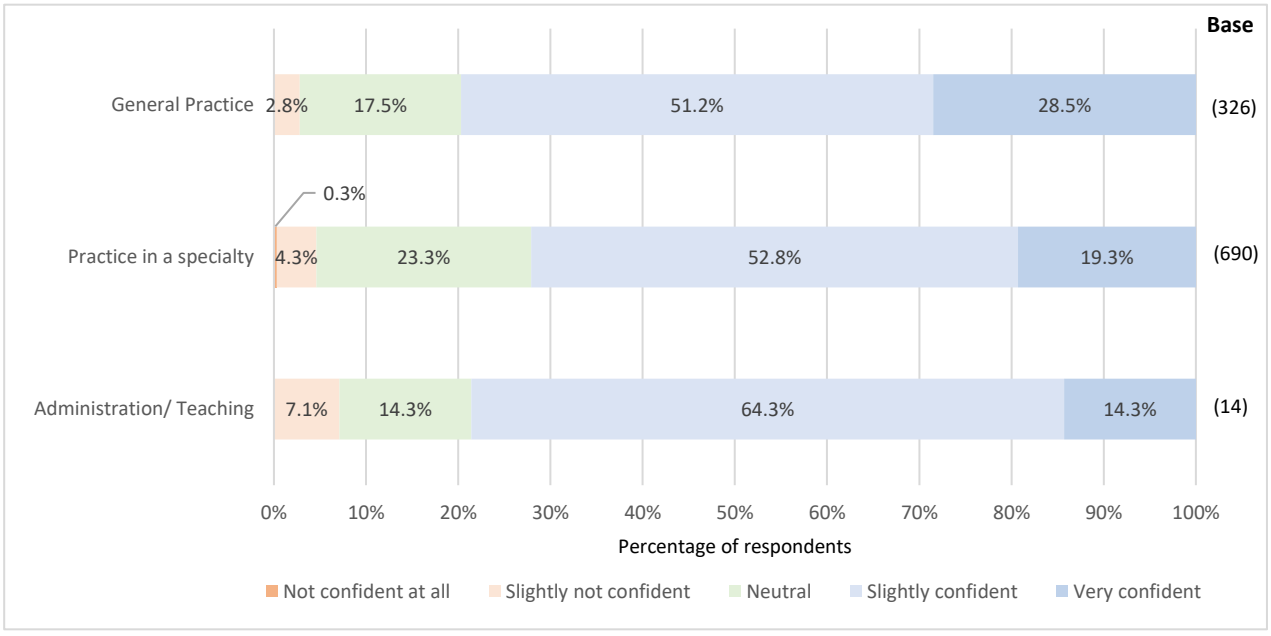
When compared with respondents working in other types of institution, respondents working in the private sector (29.9%) tended to opine that they were “very confident” in educating patient on the proper use of antibiotics. (Chart 47)

Chart 47. Level of confidence in educating patient on proper use of antibiotics by type of institution (Q6g)



Respondents who were general practitioners were more likely to be "very confident" in educating patients on the proper use of antibiotics (28.5%), as compared to respondents who were practising in a specialty (19.3%) or in administration/teaching areas (14.3%). (Chart 48)

Chart 48. Level of confidence in educating patient on proper use of antibiotics by major field of practice (Q6g)



4.3.2 Percentage of consultation that had led to antibiotic prescription

The percentage of consultations that had led to antibiotic prescription in the usual practice of respondents was significantly associated with the respondents' type of practice, type of institution and specialty. (Table 47)

Table 47 Percentage of consultation that had led to antibiotic prescription (Q7)

		Respondent count (Row percentage)								
Variable	**Label**	**Base**	**<5%**	**5 - <10%**	**10 - <15%**	**15 - <20%**	**20 - <25%**	**25 - <30%**	**≥30%**	**p-value**
Type of practice	Primary Care	350 (100.0%)	94 (26.9%)	105 (30.0%)	70 (20.0%)	45 (12.9%)	18 (5.1%)	14 (4.0%)	4 (1.1%)	<0.005[a]
	Non-Primary Care	677 (100.0%)	134 (19.8%)	116 (17.1%)	108 (16.0%)	85 (12.6%)	69 (10.2%)	95 (14.0%)	70 (10.3%)	
Type of institution	Government	50 (100.0%)	29 (58.0%)	10 (20.0%)	5 (10.0%)	4 (8.0%)	1 (2.0%)	1 (2.0%)	(-)	<0.005[b]
	Hospital Authority	489 (100.0%)	99 (20.2%)	76 (15.5%)	71 (14.5%)	60 (12.3%)	45 (9.2%)	75 (15.3%)	63 (12.9%)	
	Academic Institution	17[##] (100.0%)	4 (23.5%)	5 (29.4%)	1 (5.9%)	1 (5.9%)	2 (11.8%)	2 (11.8%)	2 (11.8%)	
	Subvented Organisation	9[##] (100.0%)	1 (11.1%)	2 (22.2%)	1 (11.1%)	3 (33.3%)	(-)	2 (22.2%)	-	
	Private Sector	466 (100.0%)	99 (21.2%)	128 (27.5%)	100 (21.5%)	62 (13.3%)	39 (8.4%)	29 (6.2%)	9 (1.9%)	
Specialty	Surgery-related	140 (100.0%)	13 (9.3%)	30 (21.4%)	34 (24.3%)	20 (14.3%)	11 (7.9%)	23 (16.4%)	9 (6.4%)	0.01[a]
	Non-surgery-related	693 (100.0%)	182 (26.3%)	131 (18.9%)	100 (14.4%)	81 (11.7%)	61 (8.8%)	76 (11.0%)	62 (8.9%)	

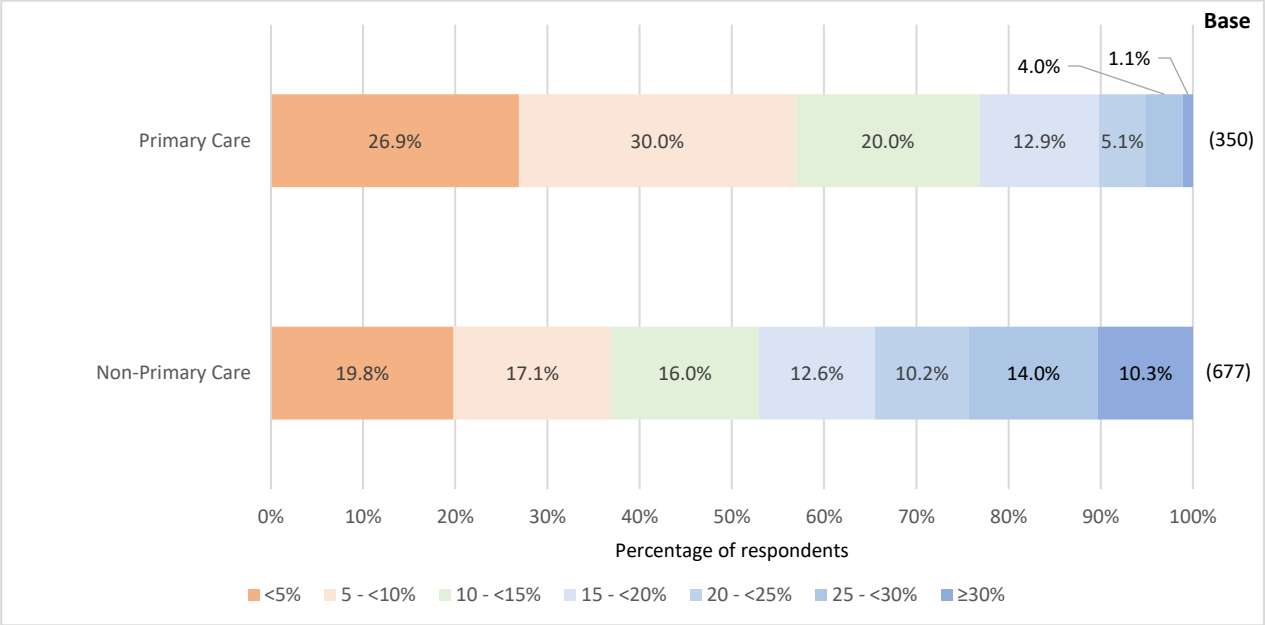
##: Very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

More primary care doctors prescribed antibiotics in lower percentage of consultations in their usual practice, as compared to non-primary care doctors. There were slightly more than half (56.9%) of primary care doctors prescribed antibiotics in less than ten percent of their consultations, compared to about one-third (36.9%) of their counterparts in non-primary care. (Chart 49)

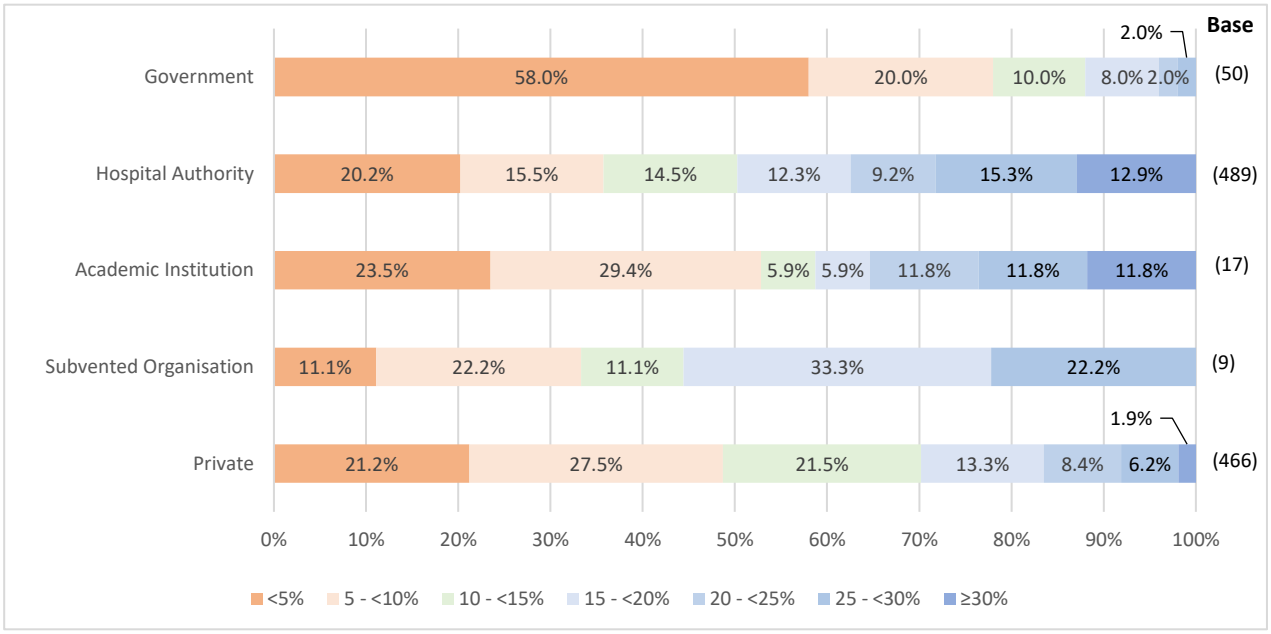
Chart 49. Percentage of consultation that had led to antibiotic prescription by type of practice (Q7)



In terms of prescribing antibiotics for less than ten percent of consultations in usual practice, there were most respondents from the government (78.0%), followed by those working in academic institutions (52.9%), private sector (48.7%), Hospital Authority (35.8%) and subvented organisations (33.3%).

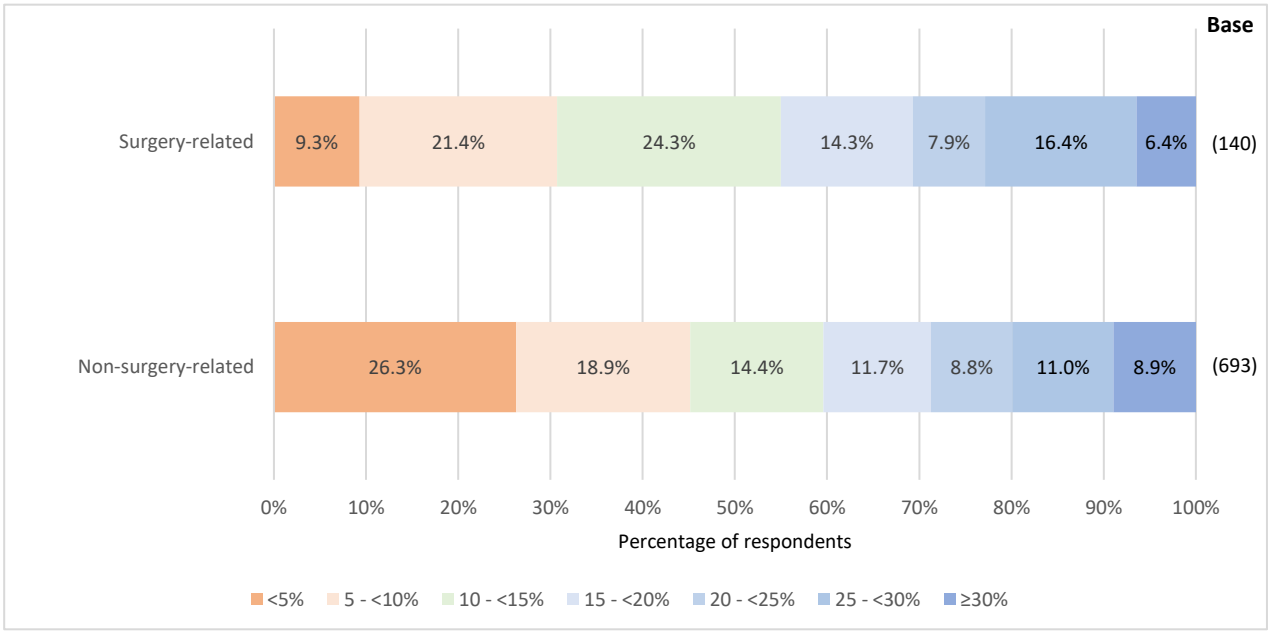
Slightly more than one tenth of respondents working in the Hospital Authority (12.9%) and academic institutions (11.8%) reported that antibiotic was prescribed in not less than 30% of consultations in their usual practice. (Chart 50)

Chart 50. Percentage of consultation that had led to antibiotic prescription by type of institution (Q7)



More respondents in surgery-related specialties (22.9%) prescribed antibiotics in not less than 25% of consultations, as compared to the non-surgeon respondents (19.9%). (Chart 51)

Chart 51. Percentage of consultation that had led to antibiotic prescription by specialty (Q7)



4.3.3 Frequency of prescribing antibiotics for cold/flu/upper respiratory tract infection (URTI)

Frequency of prescribing antibiotics for cold/flu/URTI was significantly associated with the respondents' gender, year of practice, type of institution and specialty. (Table 48)

Table 48 Frequency of prescribing antibiotics for cold/flu/URTI (Q8)

		Respondent count (Row percentage)								
Variable	**Label**	**Base**	**<5%**	**5 - <10%**	**10 - <15%**	**15 - <20%**	**20 - <25%**	**25 - <30%**	**≥30%**	**p-value**
Gender	Male	679 (100.0%)	362 (53.3%)	142 (20.9%)	67 (9.9%)	48 (7.1%)	22 (3.2%)	25 (3.7%)	13 (1.9%)	<0.005[a]
	Female	338 (100.0%)	217 (64.2%)	55 (16.3%)	27 (8.0%)	15 (4.4%)	10 (3.0%)	11 (3.3%)	3 (0.9%)	
Years of practice	≤10	210 (100.0%)	124 (59.0%)	34 (16.2%)	17 (8.1%)	15 (7.1%)	9 (4.3%)	8 (3.8%)	3 (1.4%)	0.02[b]
	11-20	281 (100.0%)	181 (64.4%)	47 (16.7%)	28 (10.0%)	13 (4.6%)	2 (0.7%)	7 (2.5%)	3 (1.1%)	
	21-30	254 (100.0%)	140 (55.1%)	57 (22.4%)	18 (7.1%)	14 (5.5%)	10 (3.9%)	11 (4.3%)	4 (1.6%)	
	>30	267 (100.0%)	132 (49.4%)	58 (21.7%)	29 (10.9%)	21 (7.9%)	11 (4.1%)	10 (3.7%)	6 (2.2%)	
Type of institution	Government	50 (100.0%)	42 (84.0%)	4 (8.0%)	3 (6.0%)	1 (2.0%)	(-)	(-)	(-)	<0.005[b]
	Hospital Authority	489 (100.0%)	296 (60.5%)	81 (16.6%)	40 (8.2%)	28 (5.7%)	14 (2.9%)	20 (4.1%)	10 (2.0%)	
	Academic Institution	17[##] (100.0%)	12 (70.6%)	3 (17.6%)	1 (5.9%)	(-)	(-)	(-)	1 (5.9%)	
	Subvented Organisation	9[##] (100.0%)	5 (55.6%)	(-)	2 (22.2%)	(-)	1 (11.1%)	1 (11.1%)	(-)	
	Private Sector	466 (100.0%)	231 (49.6%)	111 (23.8%)	49 (10.5%)	36 (7.7%)	18 (3.9%)	15 (3.2%)	6 (1.3%)	
Specialty	Surgery-related	139 (100.0%)	95 (68.3%)	24 (17.3%)	6 (4.3%)	5 (3.6%)	2 (1.4%)	4 (2.9%)	3 (2.2%)	0.02[a]
	Non-surgery-related	692 (100.0%)	404 (58.4%)	123 (17.8%)	60 (8.7%)	40 (5.8%)	25 (3.6%)	27 (3.9%)	13 (1.9%)	

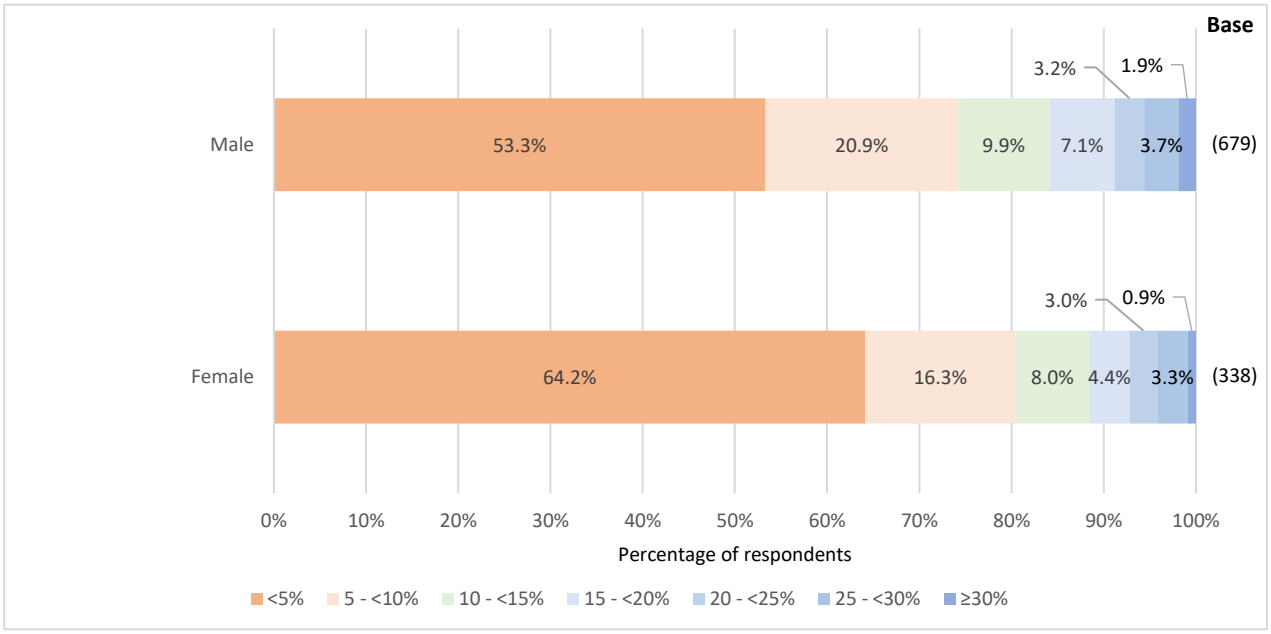
##: Very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

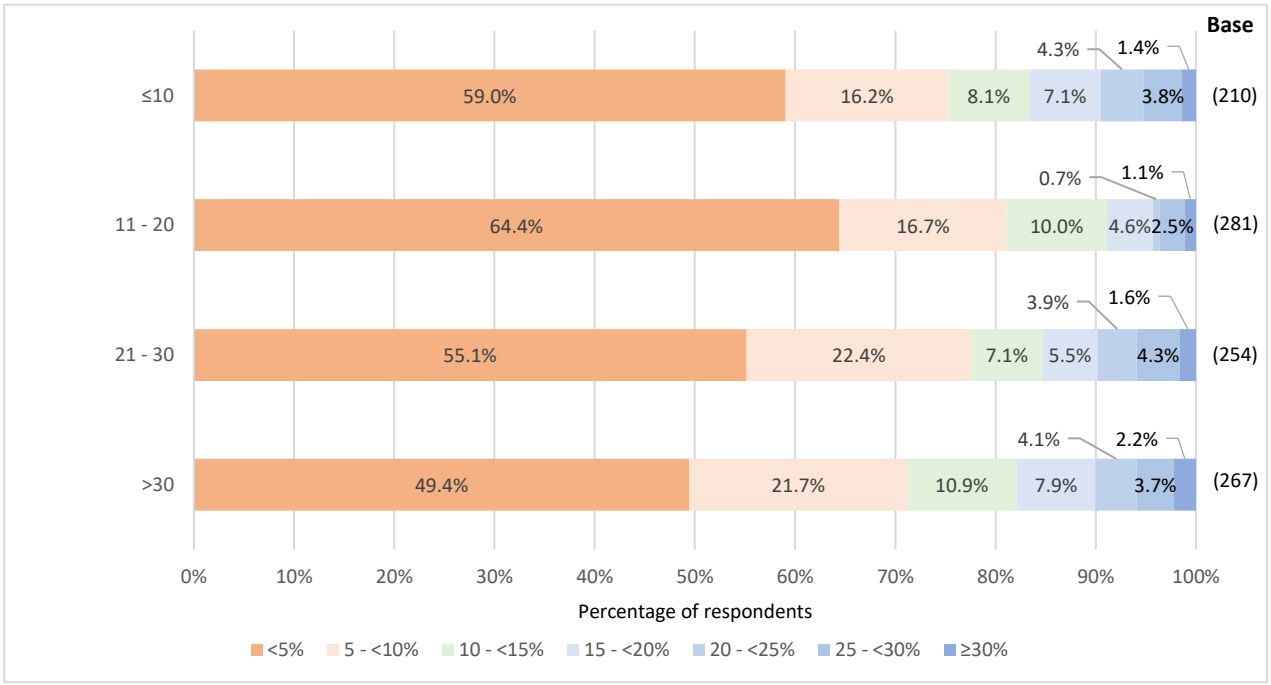
Female respondents were relatively less likely to prescribe antibiotics for cold/flu/URTI, with almost two-thirds (64.2%) of the female doctors having prescribed antibiotics for less than five percent of their consultations for cold/flu/URTI, as compared to half (53.3%) of the male doctors. (Chart 52)

Chart 52. Frequency of prescribing antibiotics for cold/flu/URTI by gender (Q8)



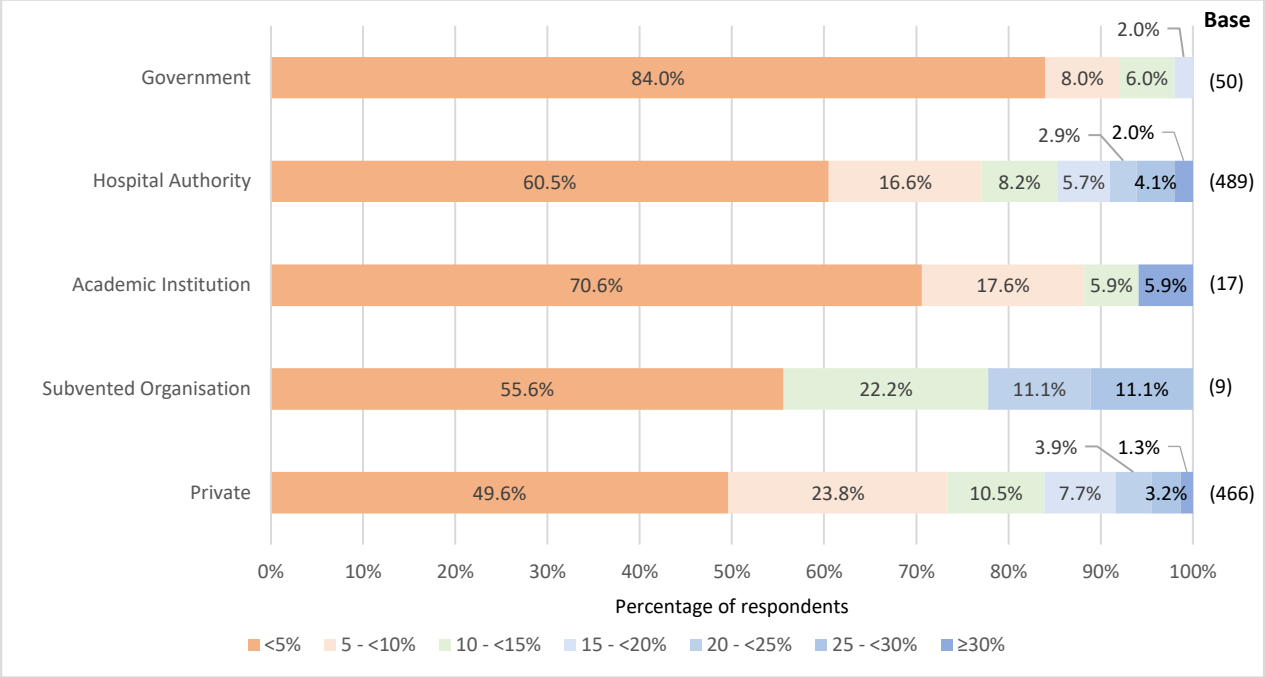
The more experienced respondents, especially those who had practised for more than 30 years, were more prone to prescribe antibiotics for cold/flu/URTI. (Chart 53)

Chart 53. Frequency of prescribing antibiotics for cold/flu/URTI by years of practice (Q8)



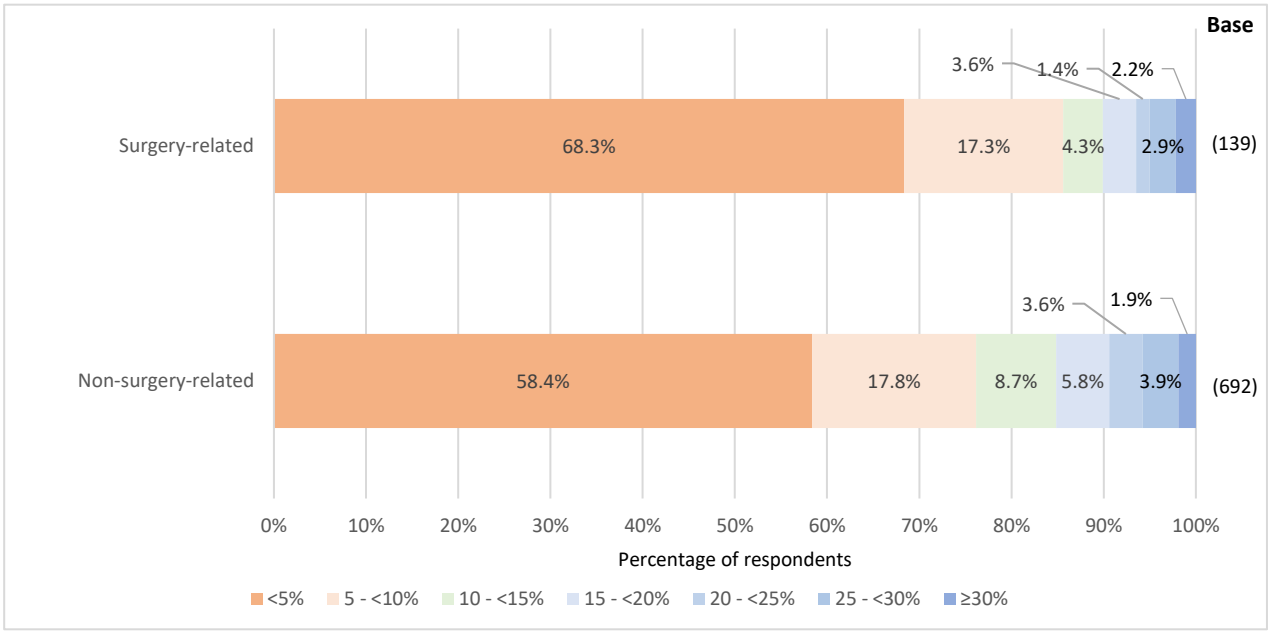
Respondents working in the government and academic institutions tended to prescribe less antibiotics for cold/flu/URTI, with the majority of them prescribing antibiotics for only less than five percent of such consultations (84.0% and 70.6% respectively), while the corresponding figure from respondents working in the private sector was 49.6%. (Chart 54)

Chart 54. Frequency of prescribing antibiotics for cold/flu/URTI by type of institution (Q8)



Compared to the respondents in non-surgery related practice (58.4%), more respondents in surgery-related specialties (68.3%) prescribed antibiotics for less than five percent of their consultations for cold/flu/URTI. (Chart 55)

Chart 55. Frequency of prescribing antibiotics for cold/flu/URTI by specialty (Q8)



4.3.4 Frequency of patients requesting antibiotics for cold/flu/URTI

Respondents' frequency of encountering patient requesting antibiotics for cold/flu/URTI was associated significantly with the respondents' type of practice, gender and major field of practice. (Table 49)

Table 49 Frequency of patient requesting antibiotics for cold/flu/URTI (Q9)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**	**p-value**
Type of practice	Primary Care	352 (100.0%)	12 (3.4%)	100 (28.4%)	222 (63.1%)	18 (5.1%)	(-)	<0.005[a]
	Non-Primary Care	675 (100.0%)	77 (11.4%)	227 (33.6%)	299 (44.3%)	69 (10.2%)	3 (0.4%)	
Gender	Male	679 (100.0%)	49 (7.2%)	214 (31.7%)	353 (52.0%)	61 (9.0%)	2 (0.3%)	0.02[a]
	Female	338 (100.0%)	40 (11.8%)	111 (32.8%)	163 (48.2%)	23 (6.8%)	1 (0.3%)	
Major field of practice	General Practice	328 (100%)	8 (2.4%)	93 (28.4%)	209 (63.7%)	18 (5.5%)	(-)	<0.005[b]
	Practice in a specialty	686 (100%)	77 (11.2%)	228 (33.2%)	309 (45.0%)	69 (10.2%)	3 (0.4%)	
	Administration/ Teaching	13[##] (100%)	4 (30.8%)	6 (46.2%)	3 (23.1%)	(-)	(-)	

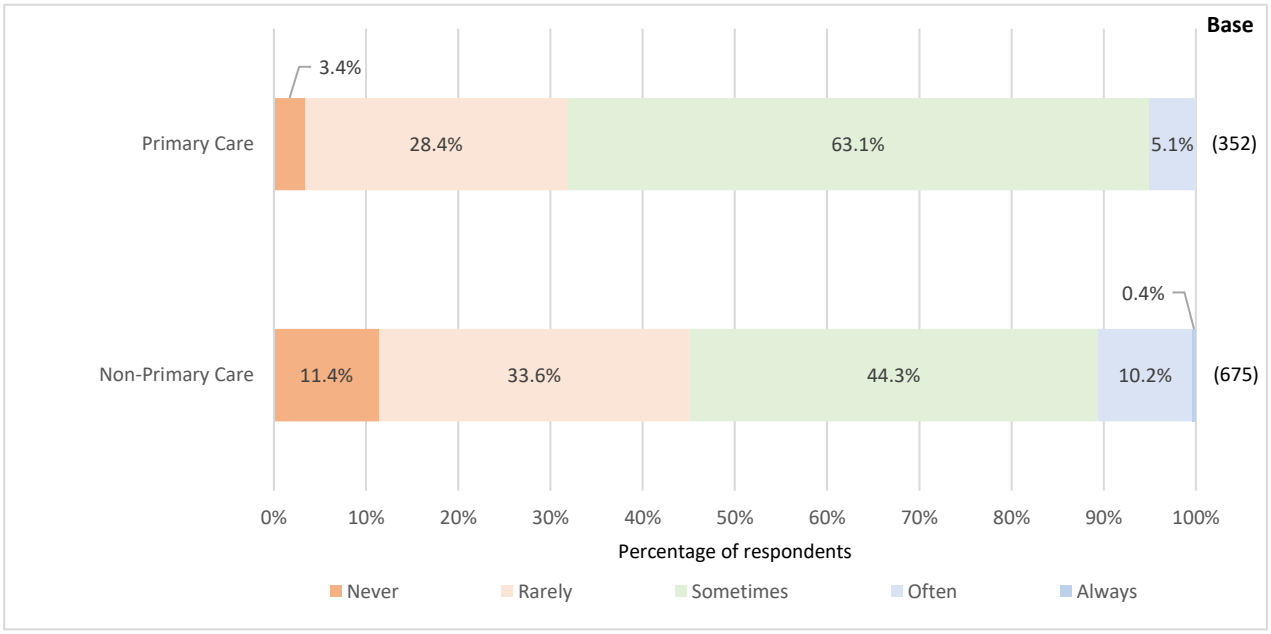
##: Very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

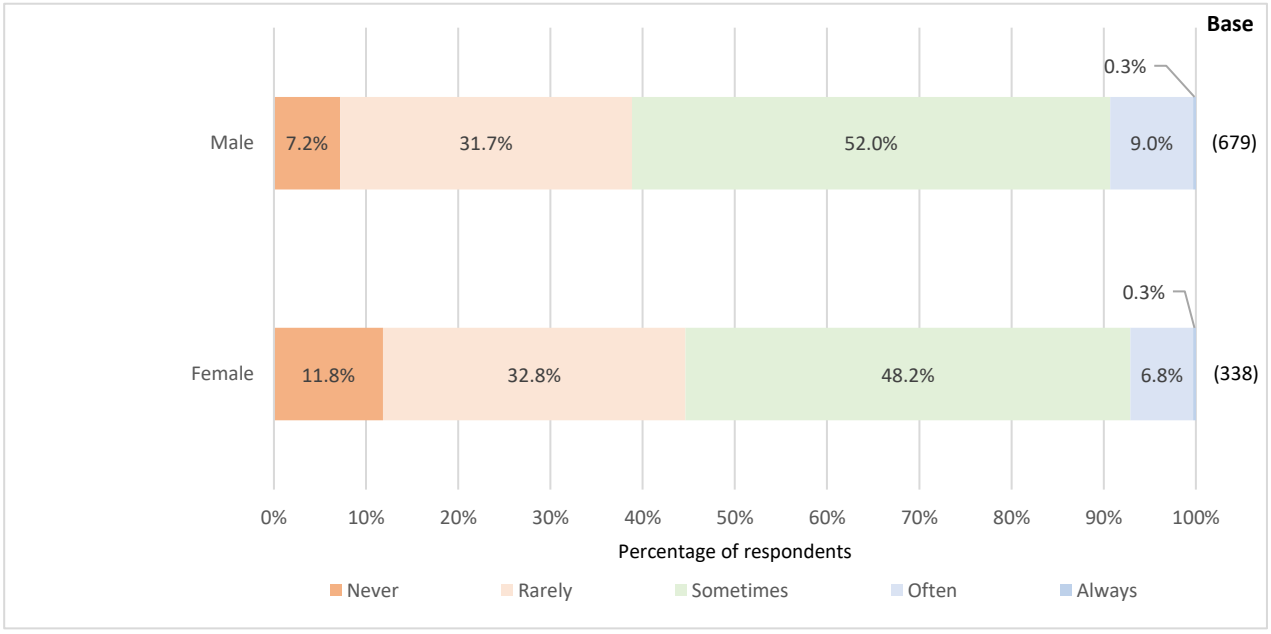
Relatively more non-primary care doctors “always”/“often” requested by patients to prescribe antibiotics for cold/flu/URTI (10.7%), as compared to the primary care doctors (5.1%). (Chart 56)

Chart 56. Frequency of patient requesting antibiotics for cold/flu/URTI by type of practice (Q9)



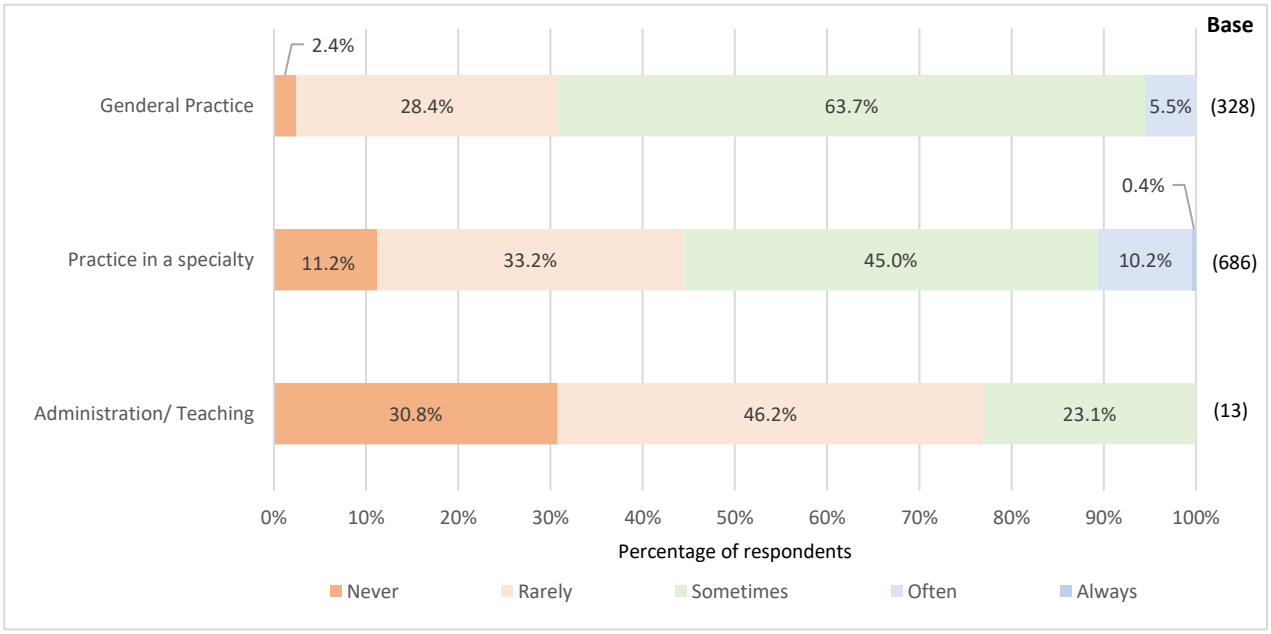
Relatively more male respondents (9.3%) “always”/“often” requested by patients to prescribe antibiotics for cold/flu/URTI, as compared to the female respondents (7.1%). (Chart 57)

Chart 57. Frequency of patient requesting antibiotics for cold/flu/URTI by gender (Q9)



Relatively more respondents who were practising in a specialty (10.5%) "always"/"often" requested by patients to prescribe antibiotics for cold/flu/URTI, as compared to the respondents who were in general practice (5.5%). (Chart 58)

Chart 58. Frequency of patient requesting antibiotics for cold/flu/URTI by major field of practice (Q9)



4.3.5 Prescription behaviour for patients with uncomplicated URTI (including common cold and flu)

The practice of prescribing antibiotics for uncomplicated URTI whenever patients requested was significantly associated with the respondents' gender, year of practice and type of institution. (Table 50)

Table 50 Prescribing antibiotics for uncomplicated URTI whenever patients requested (Q10a)

Variable	Label	Base	Never	Rarely	Sometimes	Often	Always	p-value
Gender	Male	679 (100.0%)	241 (35.5%)	309 (45.5%)	112 (16.5%)	16 (2.4%)	1 (0.1%)	<0.005[a]
	Female	336 (100.0%)	147 (43.8%)	147 (43.8%)	37 (11.0%)	5 (1.5%)	(-)	
Years of practice	≤10	210 (100.0%)	102 (48.6%)	79 (37.6%)	24 (11.4%)	5 (2.4%)	(-)	<0.005[b]
	11-20	279 (100.0%)	123 (44.1%)	117 (41.9%)	34 (12.2%)	5 (1.8%)	(-)	
	21-30	253 (100.0%)	78 (30.8%)	135 (53.4%)	35 (13.8%)	4 (1.6%)	1 (0.4%)	
	>30	268 (100.0%)	83 (31.0%)	124 (46.3%)	54 (20.1%)	7 (2.6%)	(-)	
Type of institution	Government	49[#] (100.0%)	20 (40.8%)	24 (49.0%)	3 (6.1%)	2 (4.1%)	(-)	<0.005[b]
	Hospital Authority	486 (100.0%)	210 (43.2%)	216 (44.4%)	51 (10.5%)	9 (1.9%)	(-)	
	Academic Institution	17[##] (100.0%)	10 (58.8%)	3 (17.6%)	4 (23.5%)	(-)	(-)	
	Subvented Organisation	10[##] (100.0%)	5 (50.0%)	4 (40.0%)	1 (10.0%)	(-)	(-)	
	Private Sector	467 (100.0%)	149 (31.9%)	213 (45.6%)	94 (20.1%)	10 (2.1%)	1 (0.2%)	

#: Small sample size (<50)

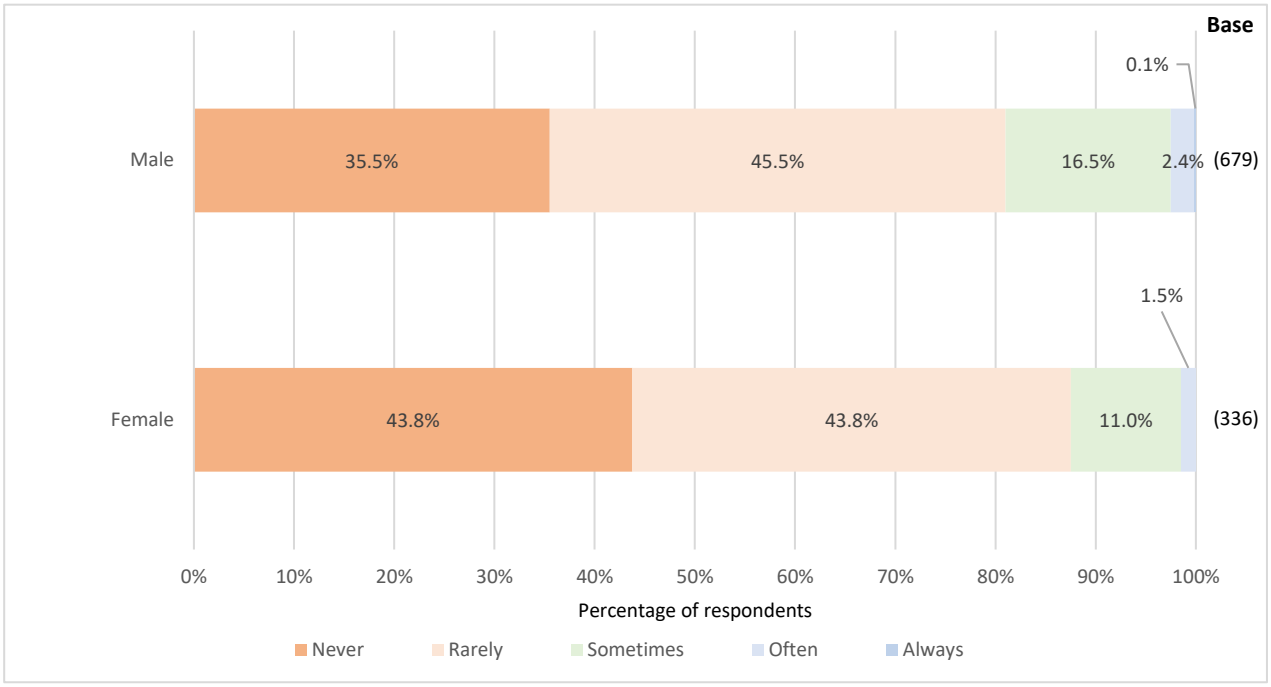
##: Very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

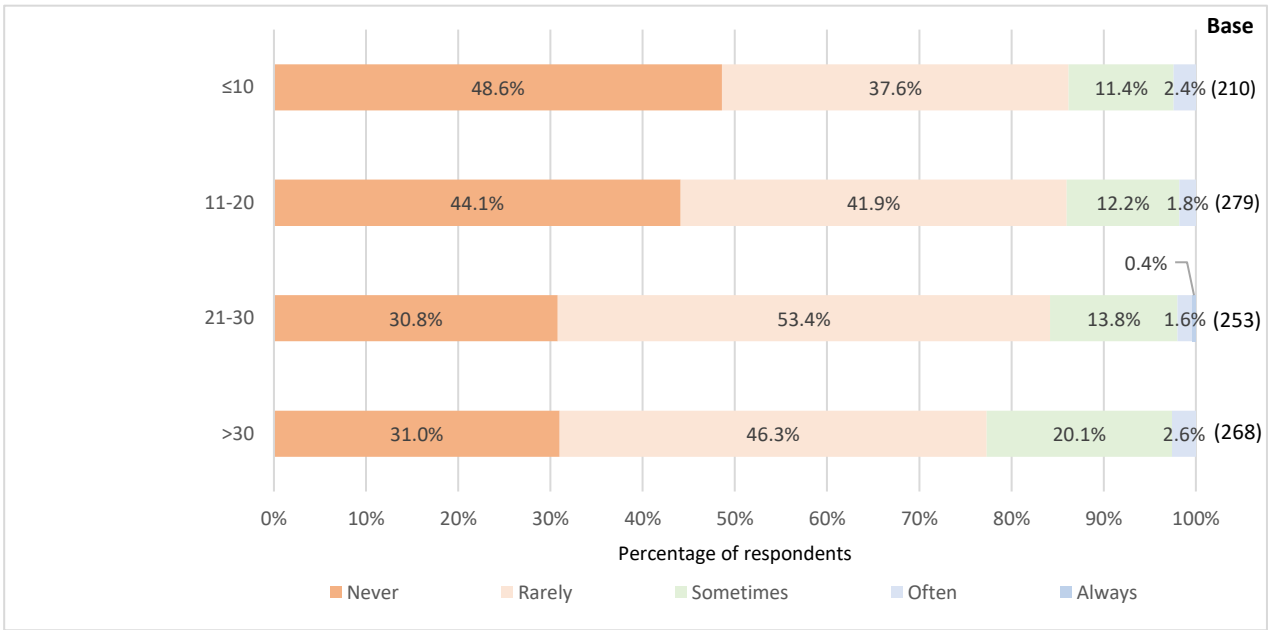
Compared to their male counterparts (35.5%), more female respondents (43.8%) "never" prescribe antibiotics whenever patients with uncomplicated URTI requested. (Chart 59)

Chart 59. Prescribing antibiotics for uncomplicated URTI whenever patients requested by gender (Q10a)



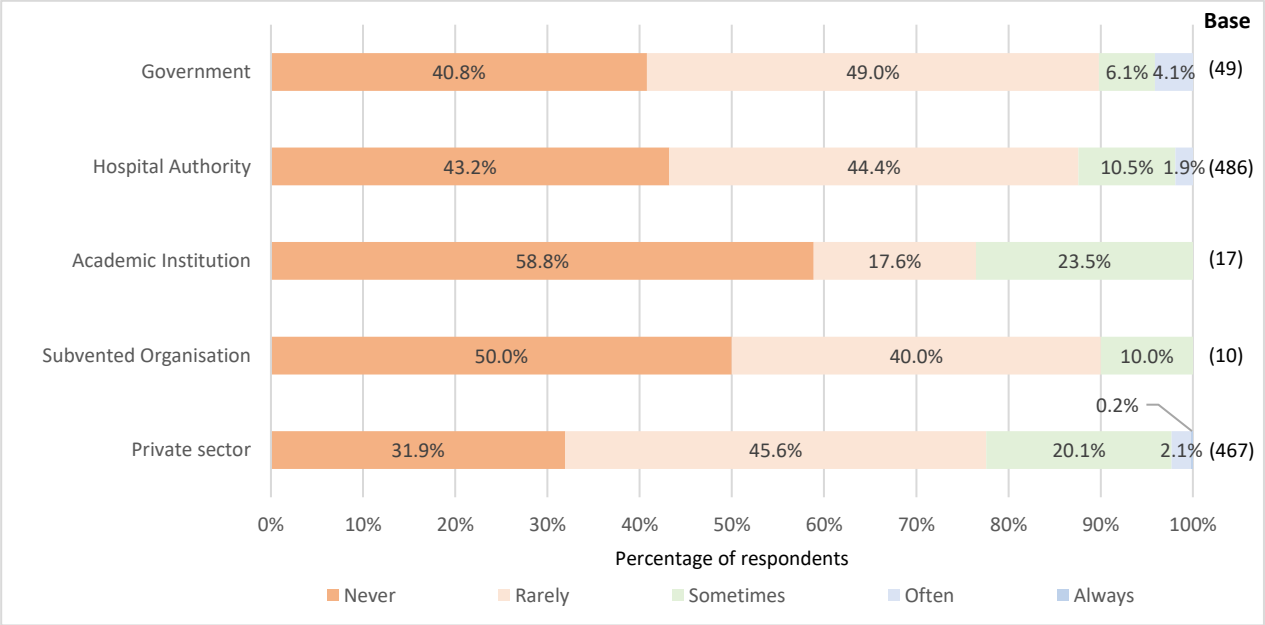
The less experienced the respondents, the more likely of them to seldom ("rarely"/"never") prescribe antibiotics whenever patients with uncomplicated URTI requested. (Chart 60)

Chart 60. Prescribing antibiotics for uncomplicated URTI whenever patients requested by years of practice (Q10a)



Despite being requested by patients, more than half of the respondents working in academic institutions (58.8%) “never” prescribed antibiotics for uncomplicated URTI, compared to slightly less than one third (31.9%) of respondents from the private sector. (Chart 61)

Chart 61. Prescribing antibiotics for uncomplicated URTI whenever patients requested by type of institution (Q10a)



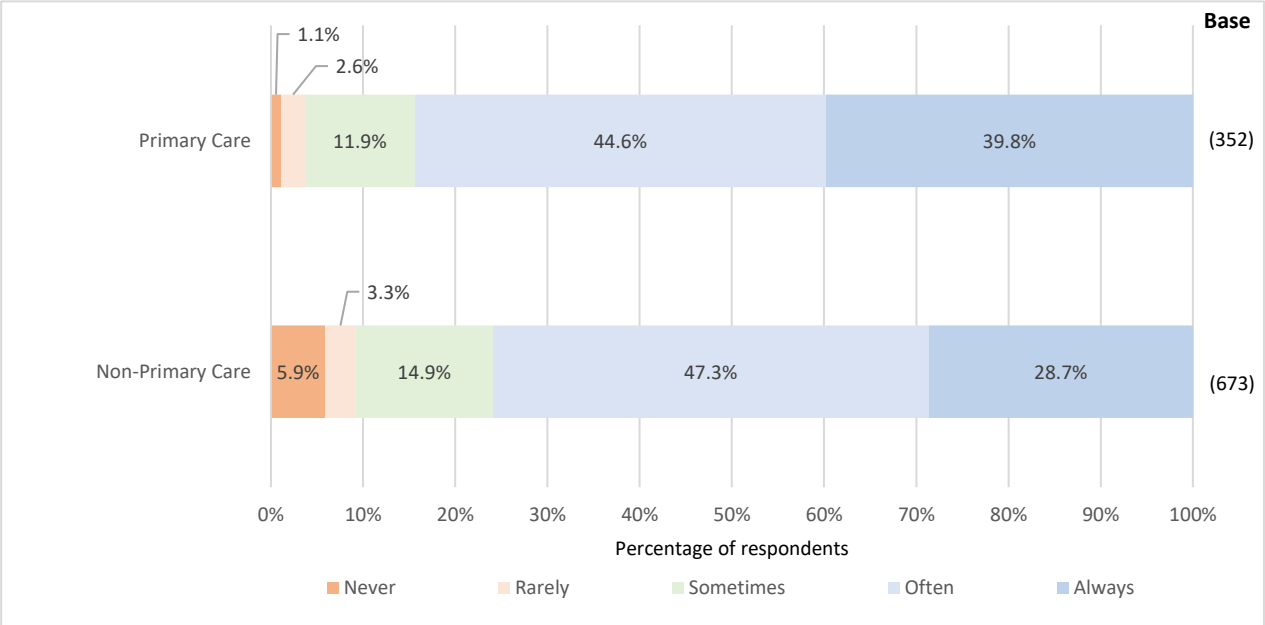
The practice of refraining from prescribing antibiotics for uncomplicated URTI and explained to patients why they were not indicated was significantly associated with the respondents’ type of practice. (Table 51)

Table 51 Refraining from prescribing antibiotics for uncomplicated URTI and explained to patients why they were not indicated (Q10b)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**	**p-value** **Mann-Whitney U test**
Type of practice	Primary Care	352 (100.0%)	4 (1.1%)	9 (2.6%)	42 (11.9%)	157 (44.6%)	140 (39.8%)	<0.005
	Non-Primary Care	673 (100.0%)	40 (5.9%)	22 (3.3%)	100 (14.9%)	318 (47.3%)	193 (28.7%)	

Relatively more primary care doctors (84.4%) “always”/“often” refrained from prescribing antibiotics to patients with uncomplicated URTI and explained to patients why they were not indicated, as compared to non-primary care doctors (75.9%). (Chart 62)

Chart 62. Refraining from prescribing antibiotics for uncomplicated URTI and explained to patients why they were not indicated by type of practice (Q10b)



The use of Point-of-Care test to guide antibiotic prescription when treating patients with uncomplicated URTI was significantly associated with the respondents’ type of institution. (Table 52)

Table 52 Using Point-of-Care test to guide antibiotic prescription when treating patients with uncomplicated URTI (Q10c)

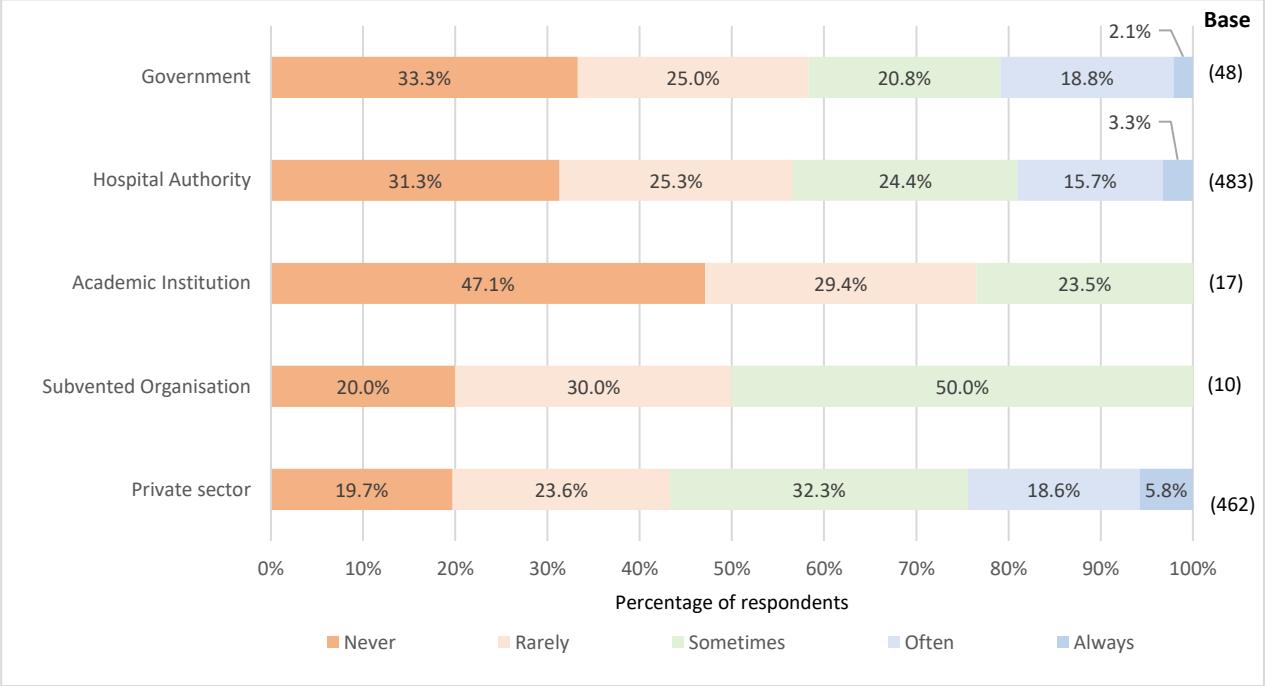
Variable	Label	Base	Never	Rarely	Sometimes	Often	Always	p-value
								Kruskal-Wallis test
Type of institution	Government	48# (100.0%)	16 (33.3%)	12 (25.0%)	10 (20.8%)	9 (18.8%)	1 (2.1%)	0.02
	Hospital Authority	483 (100.0%)	151 (31.3%)	122 (25.3%)	118 (24.4%)	76 (15.7%)	16 (3.3%)	
	Academic Institution	17## (100.0%)	8 (47.1%)	5 (29.4%)	4 (23.5%)	(-)	(-)	
	Subvented Organisation	10## (100.0%)	2 (20.0%)	3 (30.0%)	5 (50.0%)	(-)	(-)	
	Private Sector	462 (100.0%)	91 (19.7%)	109 (23.6%)	149 (32.3%)	86 (18.6%)	27 (5.8%)	

#: Small sample size (<50)

##: Very small sample size (<30)

Respondents from the private sector had the highest percentage of using Point-of-Care test frequently to guide antibiotic prescription when treating patients with uncomplicated URTI. There were around a quarter (24.5%) of respondents from the private sector "always"/"often" use the test, followed by the government (20.8%) and the Hospital Authority (19.0%). (Chart 63)

Chart 63. Frequency of using Point-of-Care test to guide antibiotic prescription when treating patients with uncomplicated URTI by type of institution (Q10c)



4.3.6 Importance of different reasons for unindicated antibiotic prescription

The importance of patients' or carers' expectation/request as a reason leading to unindicated antibiotic prescription was significantly associated with the respondents' type of practice. (0)

Table 53 Importance of "expectation/request of antibiotics by patients or carers" for unindicated antibiotic prescription (Q11b)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Not important at all**	**Slightly not important**	**Neutral**	**Slightly Important**	**Very important**	**p-value** Mann-Whitney U test
Type of practice	Primary Care	350 (100.0%)	41 (11.7%)	94 (26.9%)	123 (35.1%)	78 (22.3%)	14 (4.0%)	0.02
	Non-Primary Care	676 (100.0%)	113 (16.7%)	201 (29.7%)	209 (30.9%)	126 (18.6%)	27 (4.0%)	

Primary care doctors were more likely to consider the "expectation/request of antibiotics by patients or carers" an important reason for unindicated prescription. Relatively more primary care respondents rated the reason "very important"/"slightly important" (26.3%), as compared to the non-primary care doctors (22.6%). (Chart 64)

Chart 64. Importance of "expectation/request of antibiotics by patients or carers" for unindicated antibiotic prescription by type of practice (Q11b)

The importance of "cannot ensure return of patient for follow up" as a reason for unindicated antibiotic prescription was significantly associated with the respondents' type of institution. (0)

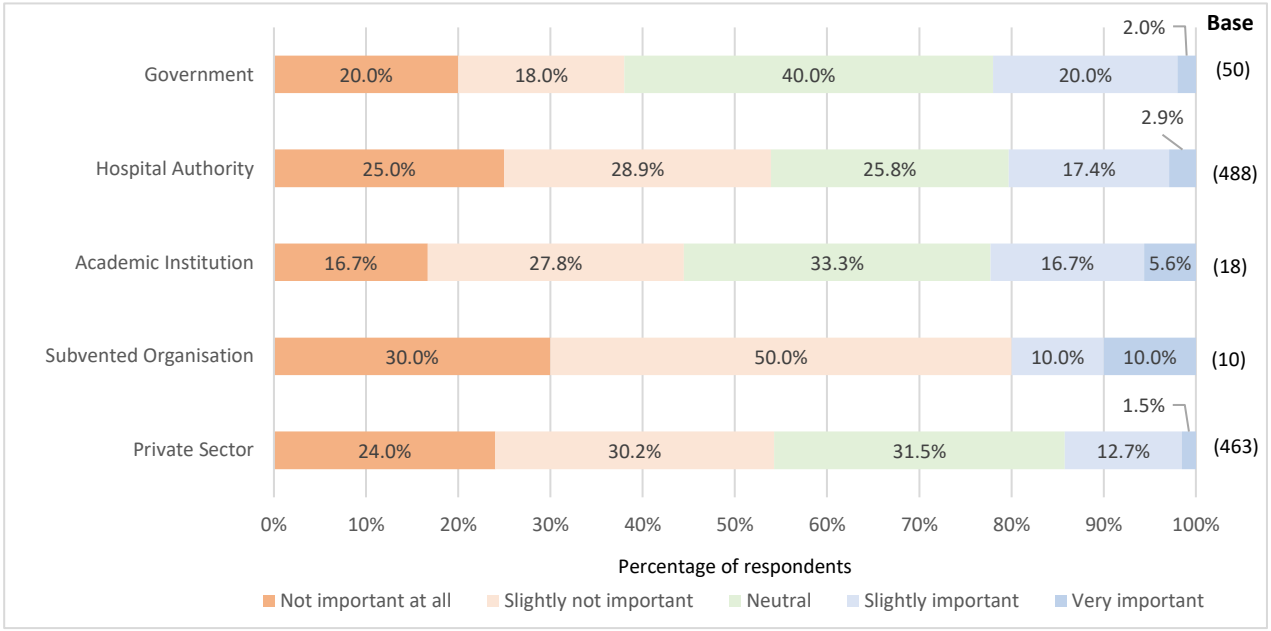
Table 54 Importance of "cannot ensure return of patient for follow up" as a reason for unindicated antibiotic prescription (Q11c)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Not important at all**	**Slightly not important**	**Neutral**	**Slightly Important**	**Very important**	**p-value** Kruskal-Wallis test
Type of institution	Government	50 (100.0%)	10 (20.0%)	9 (18.0%)	20 (40.0%)	10 (20.0%)	1 (2.0%)	0.04
	Hospital Authority	488 (100.0%)	122 (25.0%)	141 (28.9%)	126 (25.8%)	85 (17.4%)	14 (2.9%)	
	Academic Institution	18## (100.0%)	3 (16.7%)	5 (27.8%)	6 (33.3%)	3 (16.7%)	1 (5.6%)	
	Subvented Organisation	10## (100.0%)	3 (30.0%)	5 (50.0%)	(-)	1 (10.0%)	1 (10.0%)	
	Private Sector	463 (100.0%)	111 (24.0%)	140 (30.2%)	146 (31.5%)	59 (12.7%)	7 (1.5%)	

##: Very small sample size (<30)

Respondents working in academic institutions (22.2%) and the government (22.0%) were more likely to opine that "cannot ensure return of patient for follow up" was an important ("very important"/"slightly important") reason for unindicated antibiotic prescription, while those in the private sector had the lowest percentage (14.3%). (Chart 65)

Chart 65. Importance of "cannot ensure return of patient for follow up" as a reason for unindicated antibiotic prescription by type of institution (Q11c)



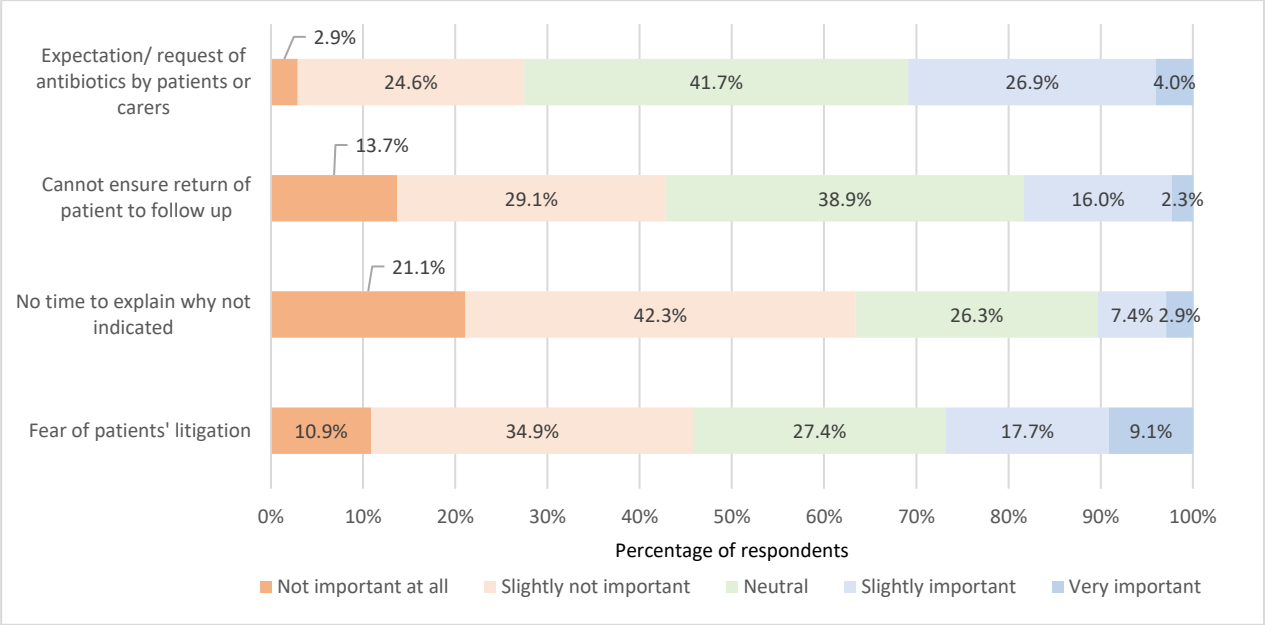
The frequency of prescribing antibiotics for uncomplicated URTI whenever patients requested was significantly associated with the importance of reasons including patients' or carers' expectation/request, being unable to ensure the return of patient for follow up, no time to explain why not indicated and fear off patient's litigation. (Table 55)

Table 55 Importance of various reasons (Q11b-e) of prescribing antibiotics for uncomplicated URTI whenever patients requested (Q10a)

		Respondent count (Column percentage)		
Reasons	**Label**	**Never/Rarely**	**Sometimes/Often/ Always**	**p-value** **Mann-Whitney U test**
Patients' or carers' expectation/ request	Not important at all	150 (17.7%)	5 (2.9%)	<0.005
	Slightly not important	251 (29.6%)	43 (24.6%)	
	Neutral	260 (30.7%)	73 (41.7%)	
	Slightly important	154 (18.2%)	47 (26.9%)	
	Very important	33 (3.9%)	7 (4.0%)	
	Column total	848 (100%)	175 (100%)	
Cannot ensure return of patient for follow up	Not important at all	222 (26.2%)	24 (13.7%)	<0.005
	Slightly not important	249 (29.4%)	51 (29.1%)	
	Neutral	229 (27.0%)	68 (38.9%)	
	Slightly important	128 (15.1%)	28 (16.0%)	
	Very important	20 (2.4%)	4 (2.3%)	
	Column total	848 (100%)	175 (100%)	
No time to explain why not indicated	Not important at all	326 (38.5%)	37 (21.1%)	<0.005
	Slightly not important	248 (29.3%)	74 (42.3%)	
	Neutral	197 (23.3%)	46 (26.3%)	
	Slightly important	61 (7.2%)	13 (7.4%)	
	Very important	15 (1.8%)	5 (2.9%)	
	Column total	847 (100%)	175 (100%)	
Fear of patient's litigation	Not important at all	251 (29.6%)	19 (10.9%)	<0.005
	Slightly not important	275 (32.4%)	61 (34.9%)	
	Neutral	202 (23.8%)	48 (27.4%)	
	Slightly important	103 (12.1%)	31 (17.7%)	
	Very important	18 (2.1%)	16 (9.1%)	
	Column total	849 (100%)	175 (100%)	

Among the above significant reasons, most respondents who "always"/"often"/"sometimes" prescribed antibiotics for uncomplicated URTI whenever patients requested considered "expectation/request of antibiotics by patients or carers" (30.9%) an important ("very important"/"slightly important") reason, followed by "fear of patient's litigation" (26.9%), "cannot ensure return of patient for follow up" (18.3%) and "no time to explain why not indicated" (10.3%). (Chart 66)

Chart 66. Importance of different reasons for unindicated antibiotic prescription among respondents who "always"/"often"/"sometimes" prescribed antibiotics for uncomplicated URTI whenever patients requested (Q11b-e)



Base: Only respondents who were practising in Hong Kong and "always"/"often"/"sometimes" prescribed antibiotics for uncomplicated URTI whenever patients requested excluding missing (n=175)

4.3.7 Frequency of explaining to patients upon antibiotic prescription

The frequency of explaining to patients about indication of antibiotic prescription was associated significantly with the respondents' years of practice, type of practice, type of institution and major field of practice. (Table 56)

Table 56 Frequency of explaining to patients about indication of antibiotic prescription (Q12a)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**	**p-value**
Years of practice	≤10	210 (100.0%)	2 (1.0%)	8 (3.8%)	66 (31.4%)	99 (47.1%)	35 (16.7%)	<0.005[a]
	11 - 20	279 (100.0%)	5 (1.8%)	9 (3.2%)	50 (17.9%)	123 (44.1%)	92 (33.0%)	
	21 - 30	254 (100.0%)	3 (1.2%)	3 (1.2%)	32 (12.6%)	133 (52.4%)	83 (32.7%)	
	>30	270 (100.0%)	(-)	9 (3.3%)	28 (10.4%)	134 (49.6%)	99 (36.7%)	
Type of practice	Primary Care	352 (100.0%)	(-)	3 (0.9%)	33 (9.4%)	173 (49.1%)	143 (40.6%)	<0.005[b]
	Non Primary Care	676 (100.0%)	10 (1.5%)	26 (3.8%)	147 (21.7%)	322 (47.6%)	171 (25.3%)	
Type of institution	Government	49[#] (100.0%)	1 (2.0%)	1 (2.0%)	6 (12.2%)	20 (40.8%)	21 (42.9%)	<0.005[a]
	Hospital Authority	487 (100.0%)	6 (1.2%)	17 (3.5%)	128 (26.3%)	242 (49.7%)	94 (19.3%)	
	Academic Institution	17[##] (100.0%)	(-)	(-)	4 (23.5%)	7 (41.2%)	6 (35.3%)	
	Subvented Organisation	10[#] (100.0%)	(-)	(-)	1 (10.0%)	6 (60.0%)	3 (30.0%)	
	Private Sector	469 (100.0%)	3 (0.6%)	11 (2.3%)	43 (9.2%)	220 (46.9%)	192 (40.9%)	
Major field of practice	General Practice	328 (100.0%)	(-)	3 (0.9%)	31 (9.5%)	161 (49.1%)	133 (40.6%)	<0.005[a]
	Practice in a specialty	687 (100.0%)	9 (1.3%)	25 (3.6%)	147 (21.4%)	329 (47.9%)	177 (25.8%)	
	Administration/ Teaching	13[##] (100.0%)	1 (7.7%)	1 (7.7%)	2 (15.4%)	5 (38.5%)	4 (30.8%)	

#: small sample size (<50)

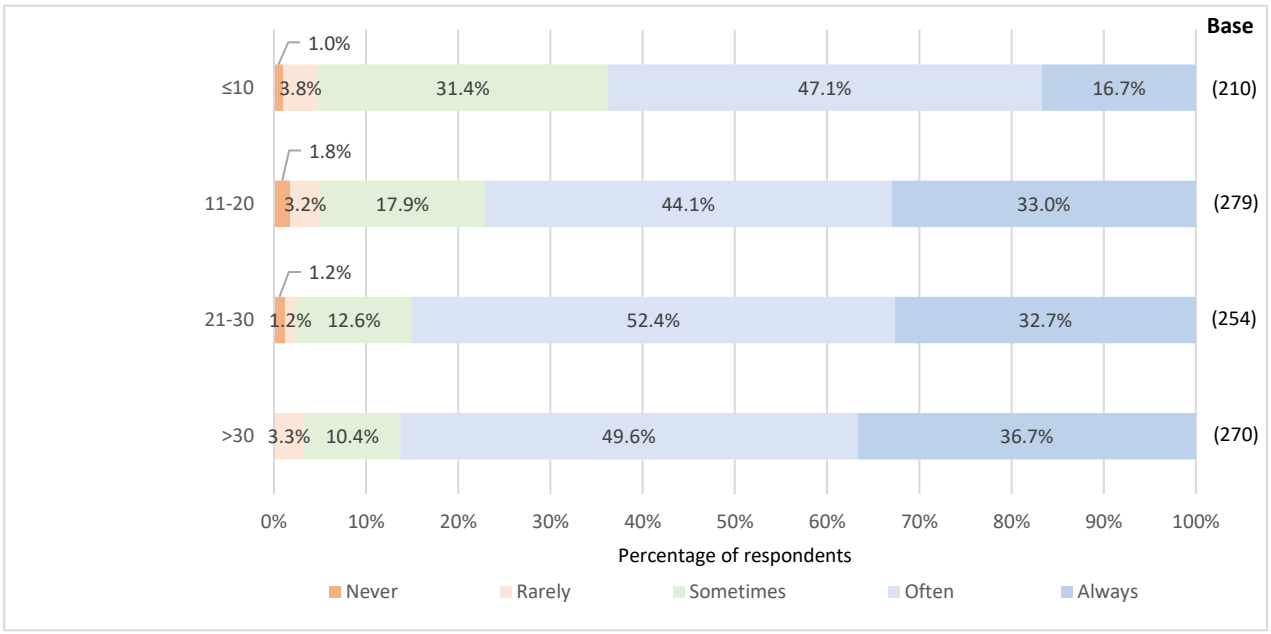
##: very small sample size (<30)

a: Kruskal-Wallis Test

b: Mann-Whitney U Test

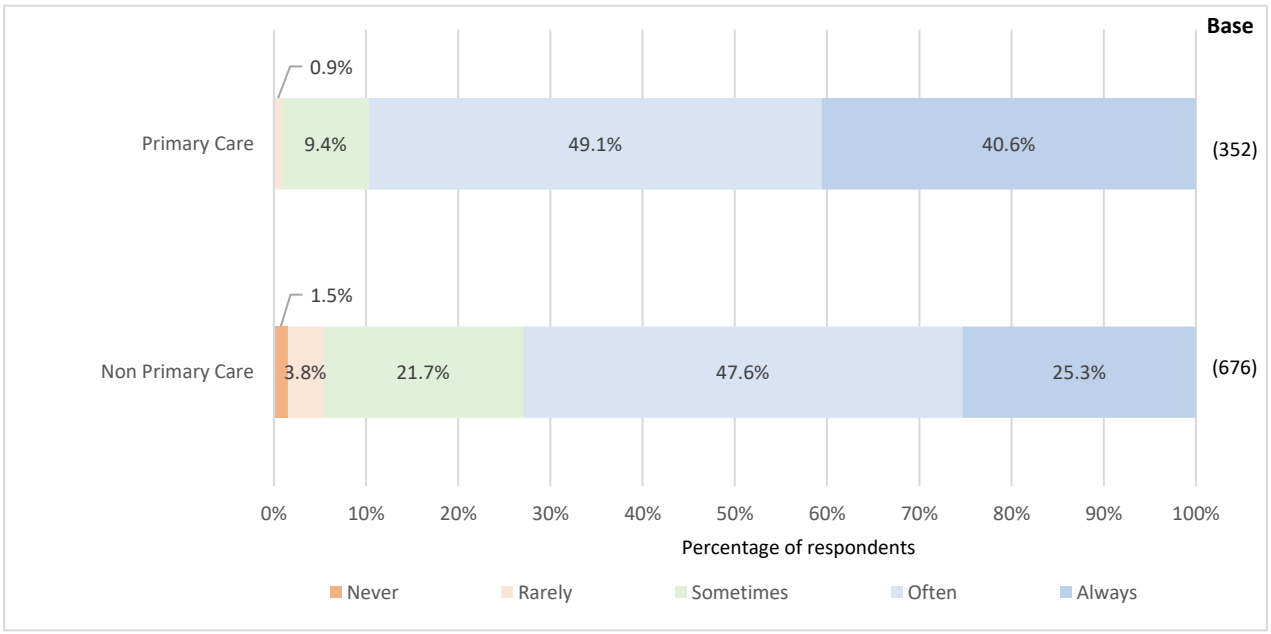
The more experienced respondents, especially those who had practised for over 30 years (86.3%), were more likely to “always”/“often” explain to their patients about the indication of antibiotic upon prescription. (Chart 67)

Chart 67. Frequency of explaining to patients about indication of antibiotic prescription by years of practice (Q12a)



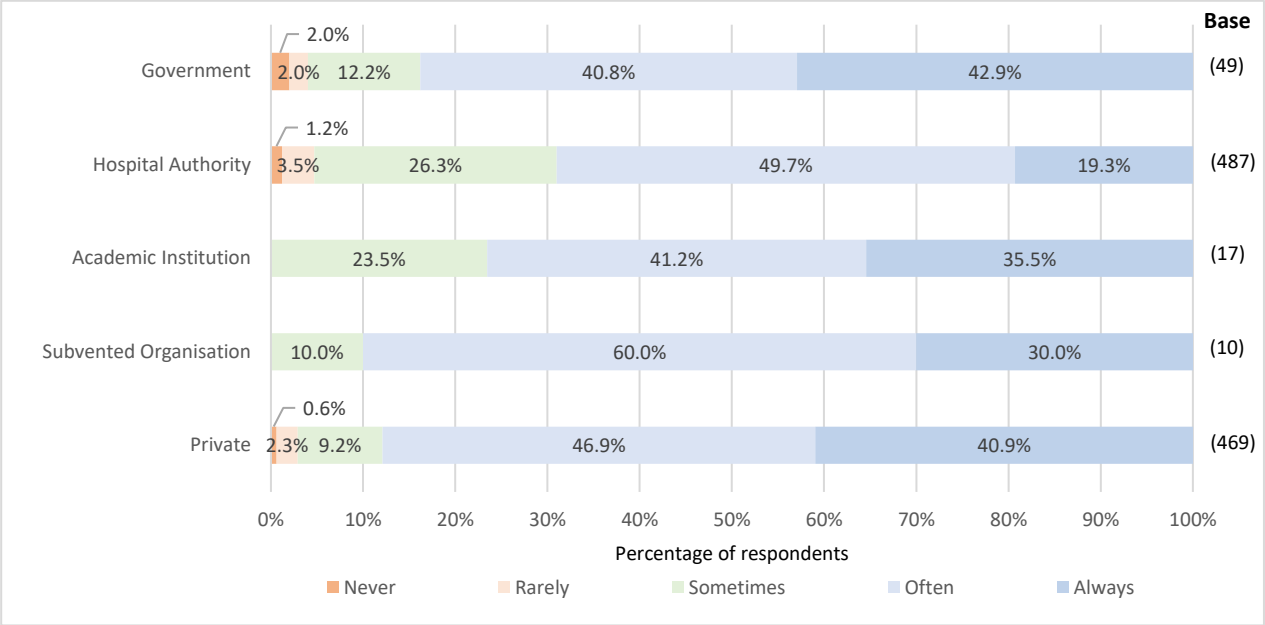
Primary care doctors tended to “always”/“often” explain to their patients about the indication of antibiotic prescription (89.8%), as compared to non-primary care doctors (72.9%). (Chart 68)

Chart 68. Frequency of explaining to patients about indication of antibiotic prescription by type of practice (Q12a)



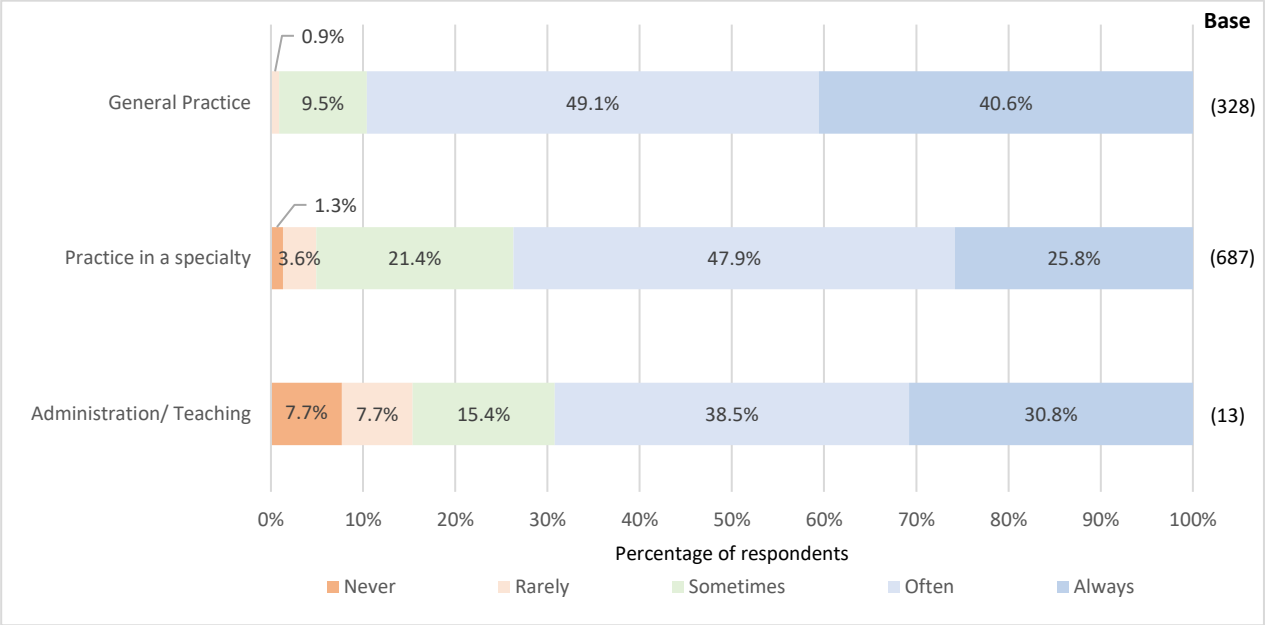
Majority of respondents “always”/“often” explained to their patients about indication of antibiotic, with those in subvented organisations had the highest proportion (90.0%), followed by those in private sector (87.8%) and the government (83.7%). (Chart 69)

Chart 69. Frequency of explaining to patients about indication of antibiotic prescription by type of institution (Q12a)



Respondents who were in general practice were more inclined to “always” explain to patients about indication of antibiotic prescription (40.6%), as compared to respondents who were practising in administration/teaching areas (30.8%) or in a specialty (25.8%). (Chart 70)

Chart 70. Frequency of explaining to patients about indication of antibiotic prescription by major field of practice (Q12a)



The respondents' frequency of explaining to patients about side effects of antibiotics was significantly associated with the respondents' years of practice, type of practice, type of institution and major field of practice. (Table 57)

Table 57 Frequency of explaining to patients about side effects of antibiotics (Q12b)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**	**p-value**
Years of practice	≤10	210 (100.0%)	5 (2.4%)	43 (20.5%)	88 (41.9%)	58 (27.6%)	16 (7.6%)	<0.005[a]
	11 - 20	279 (100.0%)	5 (1.8%)	34 (12.2%)	94 (33.7%)	98 (35.1%)	48 (17.2%)	
	21 - 30	254 (100.0%)	3 (1.2%)	16 (6.3%)	85 (33.5%)	92 (36.2%)	58 (22.8%)	
	>30	269 (100.0%)	(-)	9 (3.3%)	76 (28.3%)	117 (43.5%)	67 (24.9%)	
Type of practice	Primary Care	351 (100.0%)	1 (0.3%)	19 (5.4%)	121 (34.5%)	129 (36.8%)	81 (23.1%)	<0.005[b]
	Non Primary Care	676 (100.0%)	12 (1.8%)	83 (12.3%)	225 (33.3%)	241 (35.7%)	115 (17.0%)	
Type of institution	Government	49[#] (100.0%)	1 (2.0%)	1 (2.0%)	16 (32.7%)	18 (36.7%)	13 (26.5%)	<0.005[a]
	Hospital Authority	487 (100.0%)	9 (1.8%)	84 (17.2%)	178 (36.6%)	153 (31.4%)	63 (12.9%)	

	Academic Institution	17## (100.0%)	(-)	1 (5.9%)	6 (35.3%)	7 (41.2%)	3 (17.6%)	
	Subvented Organisation	10## (100.0%)	(-)	(-)	6 (60.0%)	4 (40.0%)	(-)	
	Private Sector	468 (100.0%)	3 (0.6%)	16 (3.4%)	144 (30.8%)	188 (40.2%)	117 (25.0%)	
Major field of practice	General Practice	327 (100.0%)	1 (0.3%)	16 (4.9%)	113 (34.6)	120 (36.7)	77 (23.5)	0.03[a]
	Practice in a specialty	687 (100.0%)	11 (1.6%)	86 (12.5%)	230 (33.5)	247 (36.0)	113 (16.4)	
	Administration/ Teaching	13## (100.0%)	1 (7.7%)	(-)	3 (23.1)	3 (23.1)	6 (46.2)	

#: small sample size (<50)

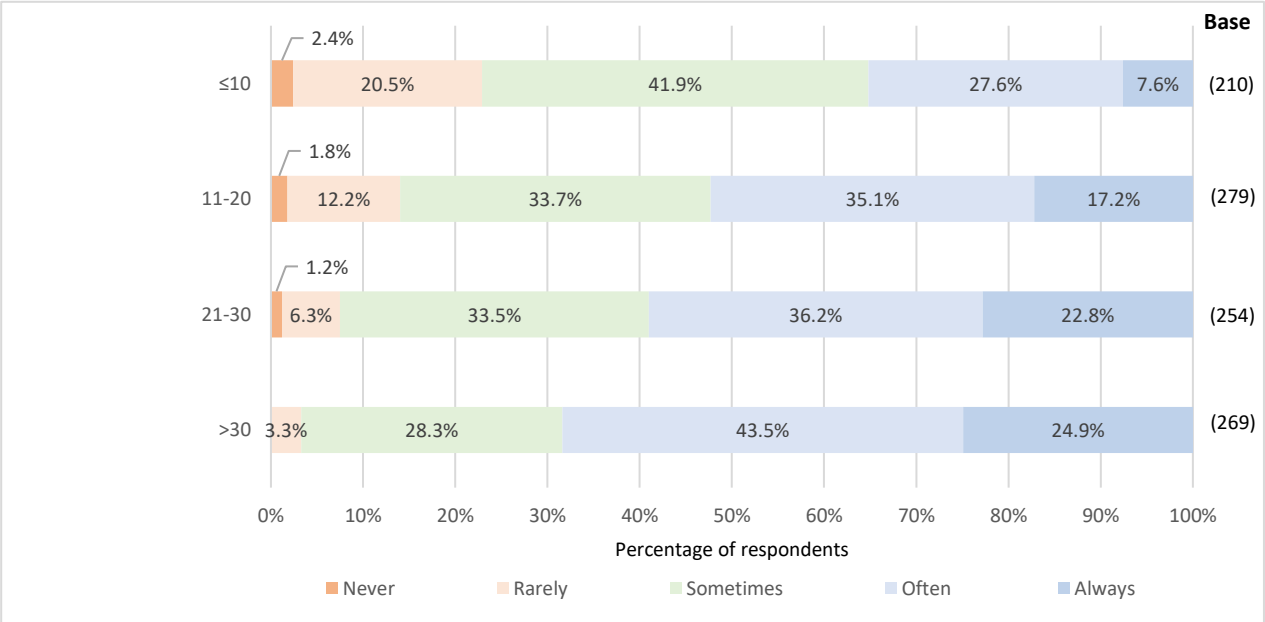
##: very small sample size (<30)

a: Kruskal-Wallis Test

b: Mann-Whitney U Test

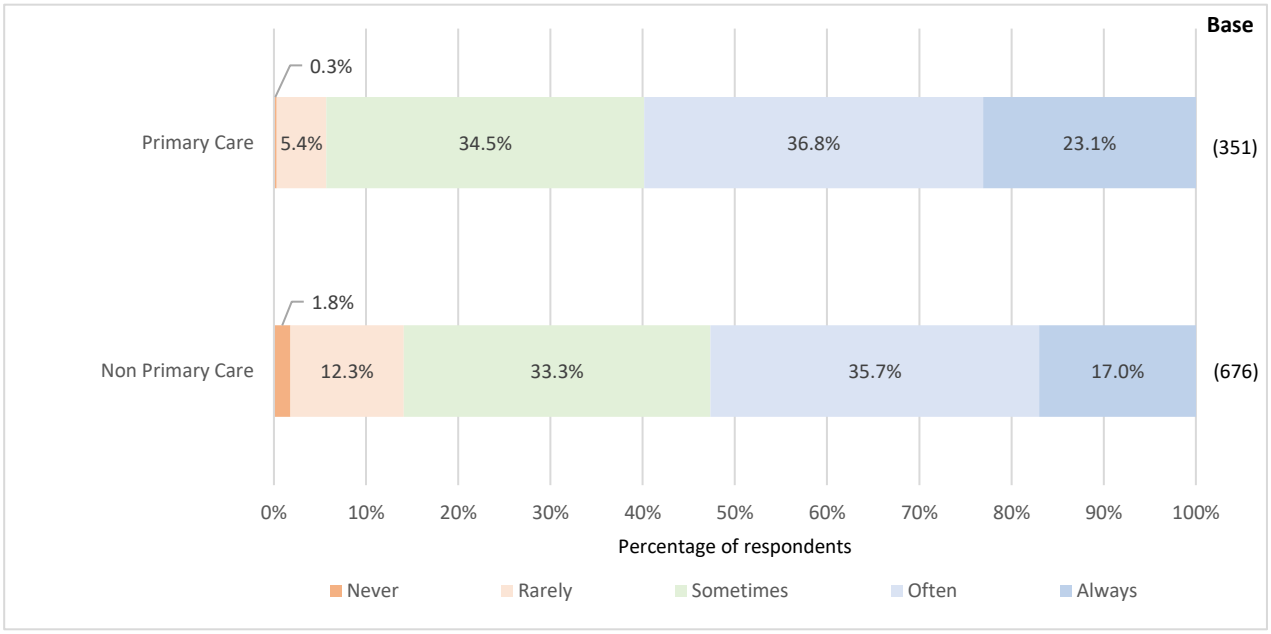
The more experienced respondents, especially those who had practised for over 30 years (68.4%), were more likely to "always"/"often" explain to their patients about side effects of antibiotics. (Chart 71)

Chart 71. Frequency of explaining to patients about side effects of antibiotics by years of practice (Q12b)



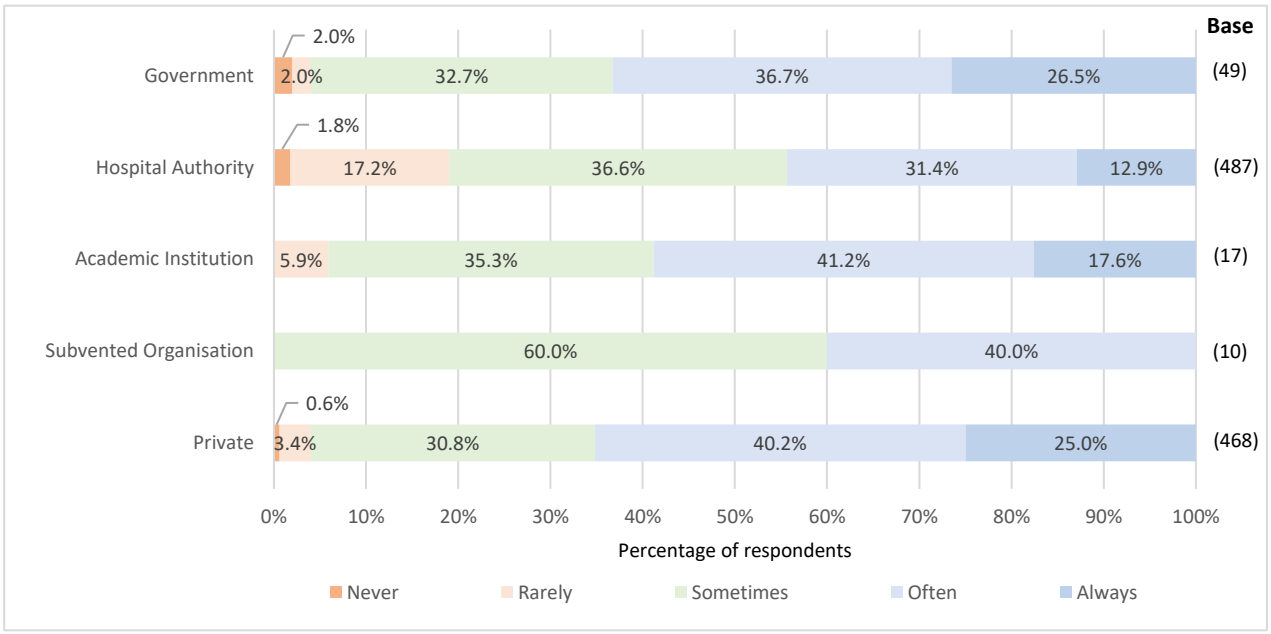
Primary care doctors tended to "always"/"often" explain to their patients about side effects of antibiotics (59.8%), as compared to non-primary care doctors (52.7%). (Chart 72)

Chart 72. Frequency of explaining to patients about side effects of antibiotics by type of practice (Q12b)



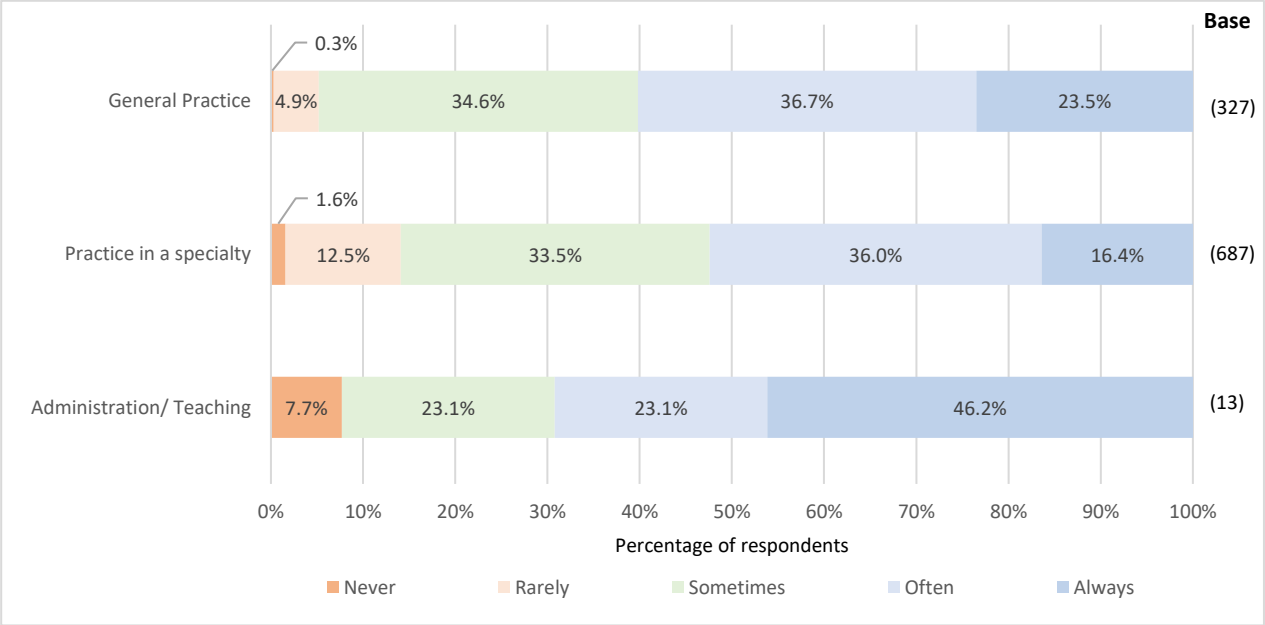
More respondents working in the private sector (65.2%) and the government (63.3%) "always"/"often" explained to their patients about side effects of antibiotics. (Chart 73)

Chart 73. Frequency of explaining to patients about side effects of antibiotics by type of institution (Q12b)



Respondents who were practising in administration/teaching areas had the highest percentage (46.2%) of “always” explaining to their patients about side effects of antibiotics, followed by those in general practice (23.5%), and those practised in a specialty (16.4%). (Chart 74)

Chart 74. Frequency of explaining to patients about side effects of antibiotics by major field of practice (Q12b)



The respondents’ frequency of reminding patients to complete course of antibiotics as prescribed was associated significantly with the respondents’ gender, years of practice, type of practice, type of institution and major field of practice. (Table 58)

Table 58 Frequency of reminding patients to complete course of antibiotics as prescribed (Q12c)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**	**p-value**
Gender	Male	680 (100.0%)	3 (0.4%)	15 (2.2%)	75 (11.0%)	294 (43.2%)	293 (43.1%)	0.01[a]
	Female	336 (100.0%)	5 (1.5%)	3 (0.9%)	32 (9.5%)	117 (34.8%)	179 (53.3%)	
Years of practice	≤10	210 (100.0%)	2 (1.0%)	5 (2.4%)	28 (13.3%)	93 (44.3%)	82 (39.0%)	<0.005[b]
	11 - 20	279 (100.0%)	3 (1.1%)	7 (2.5%)	31 (11.1%)	100 (35.8%)	138 (49.5%)	
	21 - 30	254 (100.0%)	3 (1.2%)	2 (0.8%)	26 (10.2%)	118 (46.5%)	105 (41.3%)	

	>30	268 (100.0%)	(-)	5 (1.9%)	21 (7.8%)	97 (36.2%)	145 (54.1%)	
Type of practice	Primary Care	350 (100.0%)	(-)	1 (0.3%)	22 (6.3%)	116 (33.1%)	211 (60.3%)	<0.005[a]
	Non Primary Care	676 (100.0%)	8 (1.2%)	17 (2.5%)	86 (12.7%)	299 (44.2%)	266 (39.3%)	
Type of institution	Government	49[#] (100.0%)	(-)	1 (2.0%)	1 (2.0%)	21 (42.9%)	26 (53.1%)	<0.005[b]
	Hospital Authority	486 (100.0%)	5 (1.0%)	13 (2.7%)	68 (14.0%)	227 (46.7%)	173 (35.6%)	
	Academic Institution	17[##] (100.0%)	(-)	(-)	1 (5.9%)	6 (35.3%)	10 (58.8%)	
	Subvented Organisation	10[##] (100.0%)	(-)	(-)	1 (10.0%)	4 (40.0%)	5 (50.0%)	
	Private Sector	468 (100.0%)	3 (0.6%)	5 (1.1%)	38 (8.1%)	158 (33.8%)	264 (56.4%)	
Major field of practice	General Practice	326 (100.0%)	(-)	1 (0.3%)	20 (6.1%)	108 (33.1%)	197 (60.4%)	<0.005[b]
	Practice in a specialty	687 (100.0%)	8 (1.2%)	17 (2.5%)	86 (12.5%)	305 (44.4%)	271 (39.4%)	
	Administration/ Teaching	13[##] (100.0%)	(-)	(-)	2 (15.4%)	2 (15.4%)	9 (69.2%)	

#: small sample size (<50)

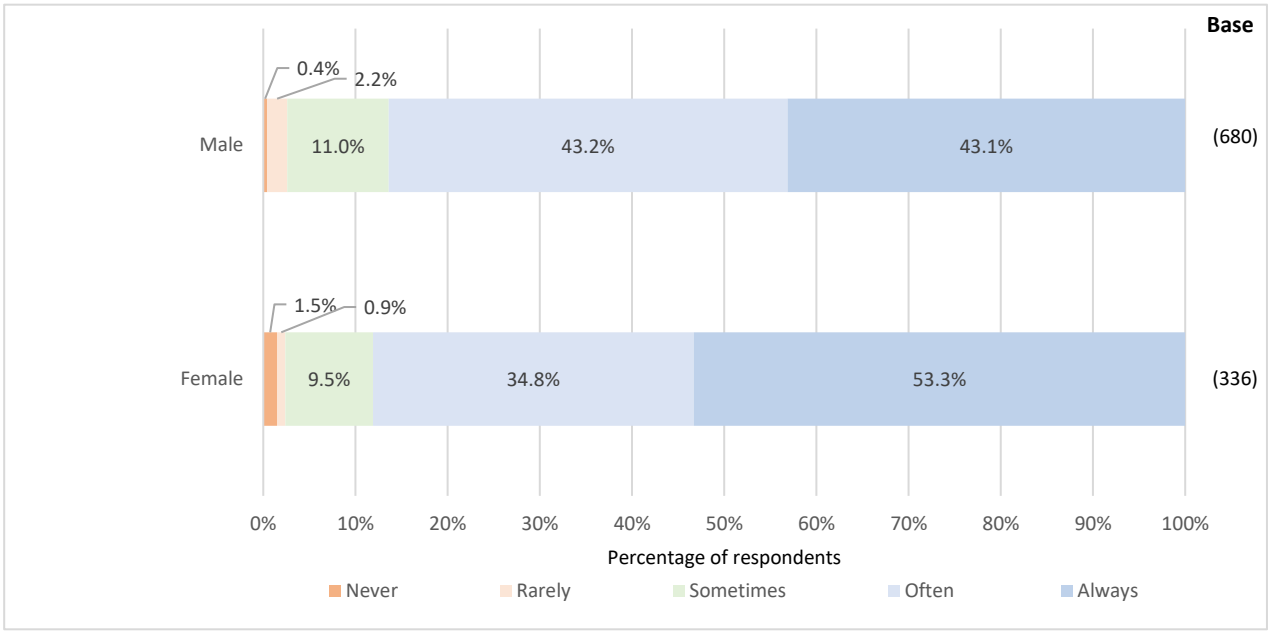
##: very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

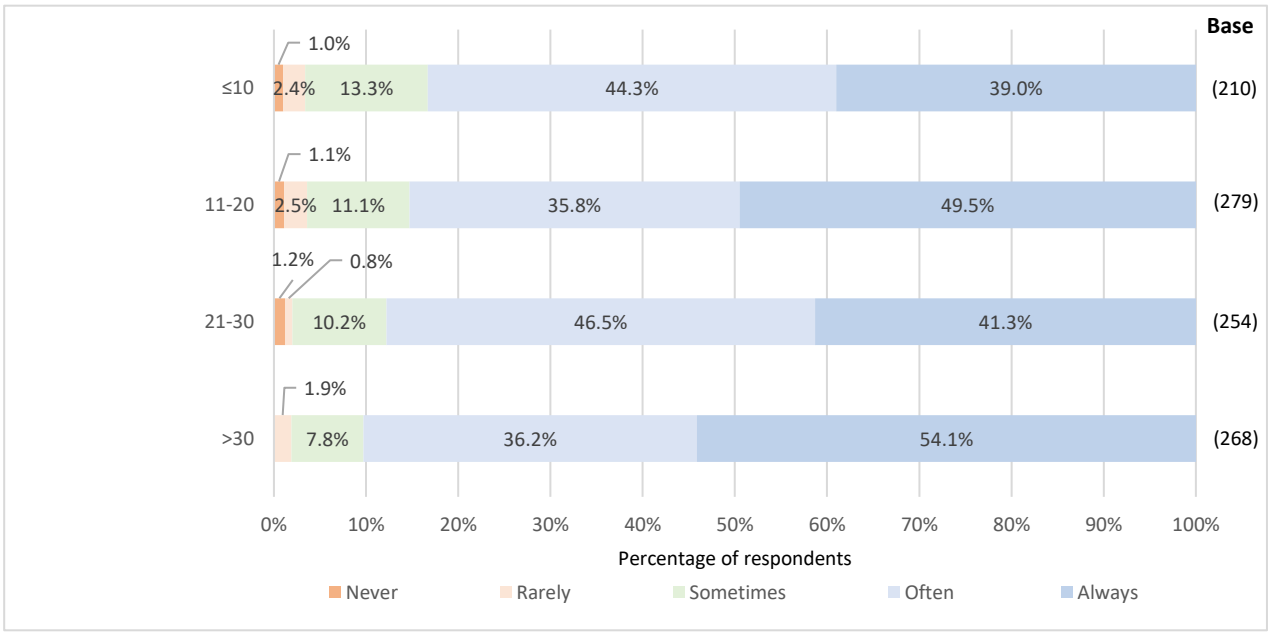
Female respondents tended to “always”/“often” remind patients to complete course of antibiotics as prescribed (88.1%), as compared to male respondents (86.3%). (Chart 75)

Chart 75. Frequency of reminding patients to complete course of antibiotics as prescribed by gender (Q12c)



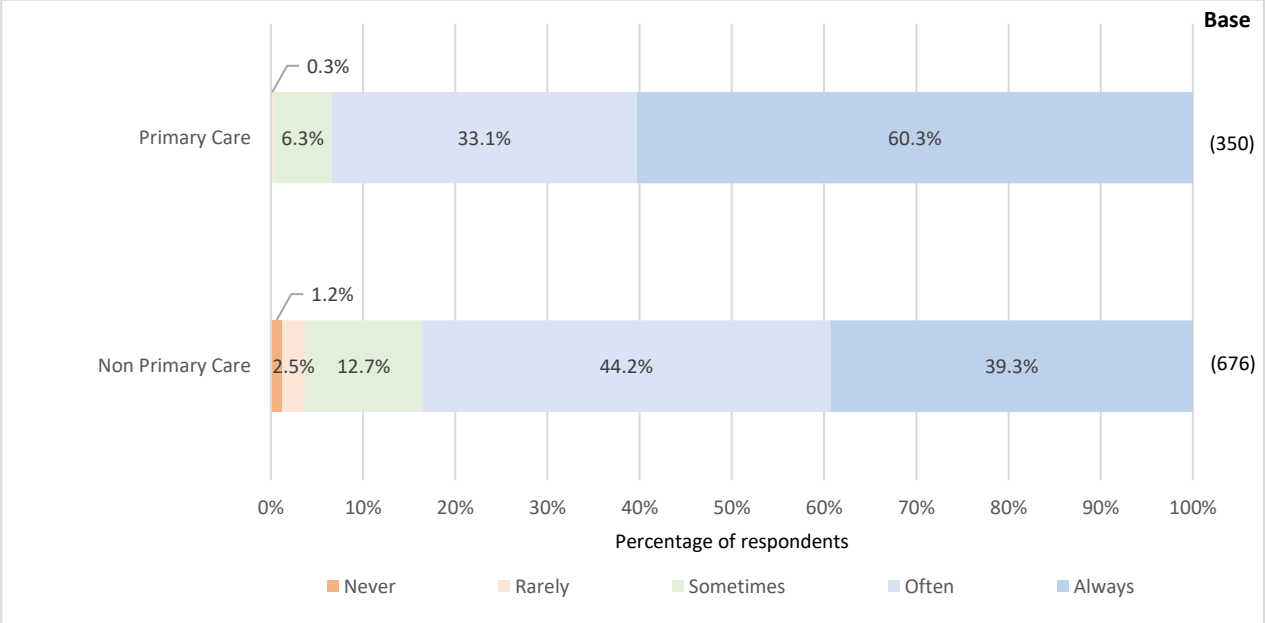
The more experienced respondents, especially those who had practised for over 30 years (90.3%), were more likely “always”/“often” remind their patients to complete course of antibiotics as prescribed. (Chart 76)

Chart 76. Frequency of reminding patients to complete course of antibiotics as prescribed by years of practice (Q12c)



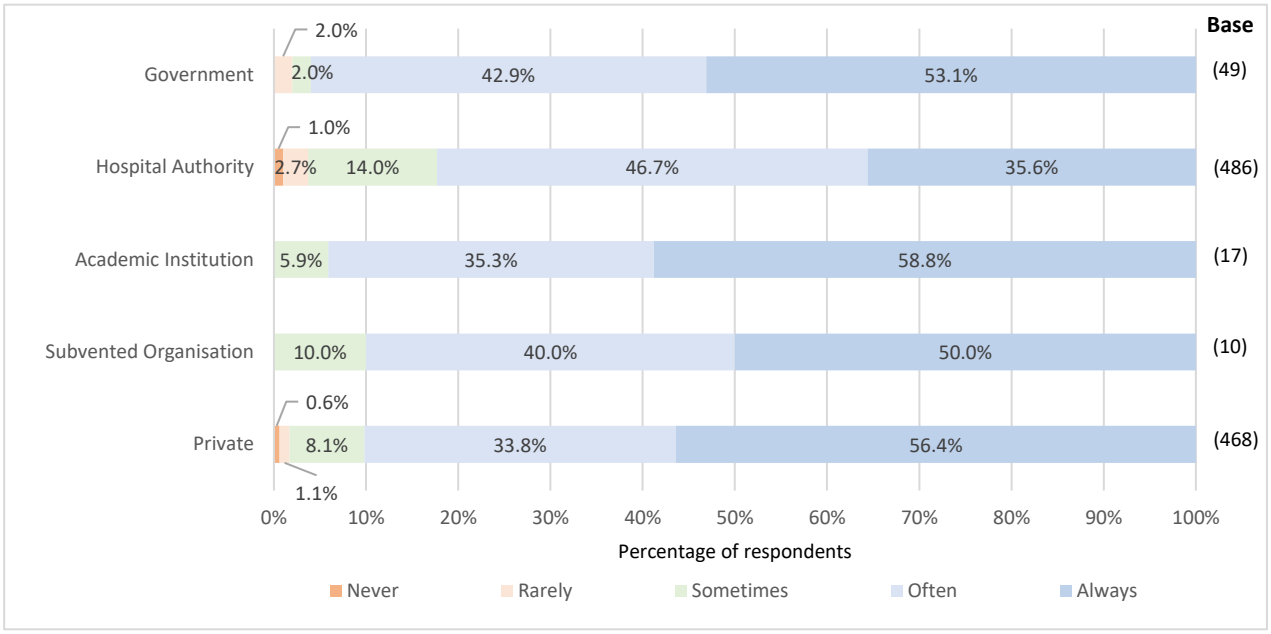
Primary care doctors tended to “always”/“often” remind their patients to complete course of antibiotics as prescribed (93.4%), as compared to non-primary care doctors (83.6%). (Chart 77)

Chart 77. Frequency of reminding patients to complete course of antibiotics as prescribed by type of practice (Q12c)



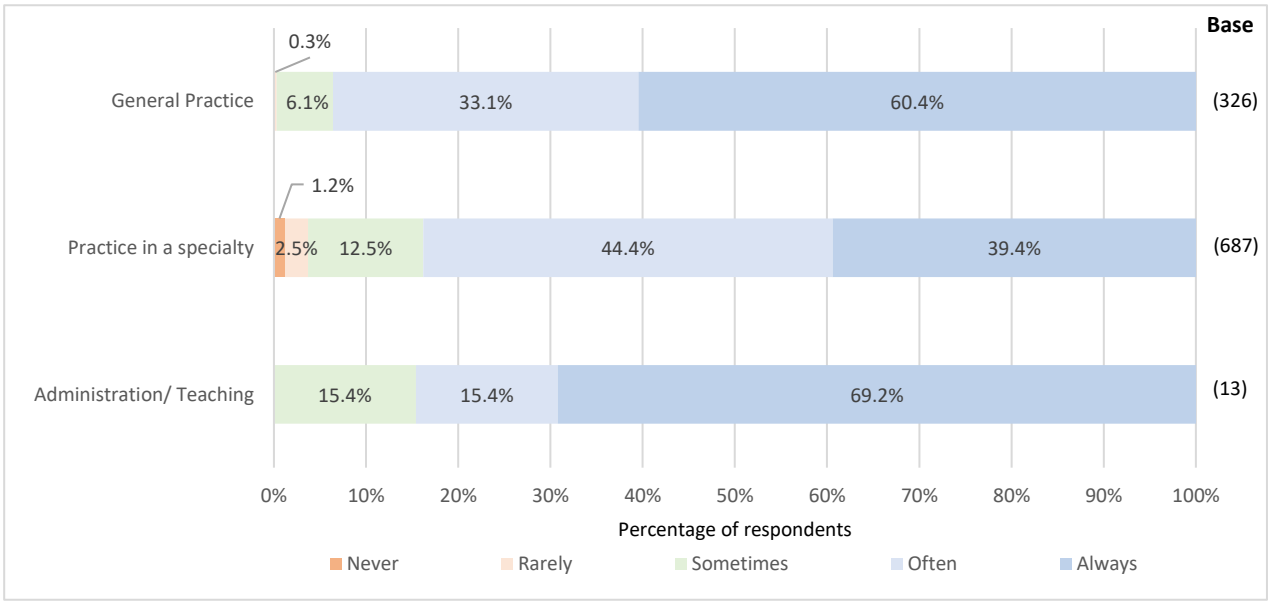
Majority of respondents “always”/“often” reminded patients to complete course of antibiotics, with those working in the government had the highest proportion (95.9%), followed by those in academic institutions (94.1%) and in the private sector (90.2%). (Chart 78)

Chart 78. Frequency of reminding patients to complete course of antibiotics as prescribed by type of institution (Q12c)



Respondents who were in administration/teaching areas (69.2%) and in general practice (60.4%) were more inclined to "always" remind patients to complete course of antibiotics as prescribed, as compared to respondents who were practising in a specialty (39.4%). (Chart 79)

Chart 79. Frequency of reminding patients to complete course of antibiotics as prescribed by major field of practice (Q12c)



Respondent's frequency of explaining to patients about improper use of antibiotics would increase AMR was significantly associated with the respondents' years of practice, type of practice, type of institution and major field of practice. (Table 59)

Table 59 Frequency of explaining to patients about improper use of antibiotics would increase AMR (Q12d)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**	**p-value**
Years of practice	≤10	209 (100.0%)	6 (2.9%)	47 (22.5%)	65 (31.1%)	61 (29.2%)	30 (14.4%)	<0.005[a]
	11 - 20	279 (100.0%)	8 (2.9%)	33 (11.8%)	91 (32.6%)	89 (31.9%)	58 (20.8%)	
	21 - 30	253 (100.0%)	5 (2.0%)	26 (10.3%)	68 (26.9%)	93 (36.8%)	61 (24.1%)	
	>30	269 (100.0%)	1 (0.4%)	24 (8.9%)	52 (19.3%)	99 (36.8%)	93 (34.6%)	
Type of practice	Primary care	351 (100.0%)	4 (1.1%)	33 (9.4%)	80 (22.8%)	129 (36.8%)	105 (29.9%)	<0.005[b]
	Non-primary care	674 (100.0%)	16 (2.4%)	96 (14.2%)	198 (29.4%)	221 (32.8%)	143 (21.2%)	
Type of institution	Government	49[#] (100.0%)	2 (4.1%)	6 (12.2%)	13 (26.5%)	16 (32.7%)	12 (24.5%)	<0.005[a]
	Hospital Authority	485 (100.0%)	15 (3.1%)	79 (16.3%)	160 (33.0%)	157 (32.4%)	74 (15.3%)	
	Academic Institution	17[##] (100.0%)	(-)	3 (17.6%)	8 (47.1%)	3 (17.6%)	3 (17.6%)	
	Subvented Organisation	10[##] (100.0%)	(-)	3 (30.0%)	3 (30.0%)	3 (30.0%)	1 (10.0%)	
	Private Sector	468 (100.0%)	3 (0.6%)	40 (8.5%)	96 (20.5%)	171 (36.5%)	158 (33.8%)	
Major field of practice	General Practice	327 (100.0%)	4 (1.2%)	30 (9.2%)	75 (22.9%)	119 (36.4%)	99 (30.3%)	<0.005[a]
	Practice in a specialty	685 (100.0%)	15 (2.2%)	97 (14.2%)	201 (29.3%)	228 (33.3%)	144 (21.0%)	
	Administration/ Teaching	13[##] (100.0%)	1 (7.7%)	2 (15.4%)	2 (15.4%)	3 (23.1%)	5 (38.5%)	

#: small sample size (<50)

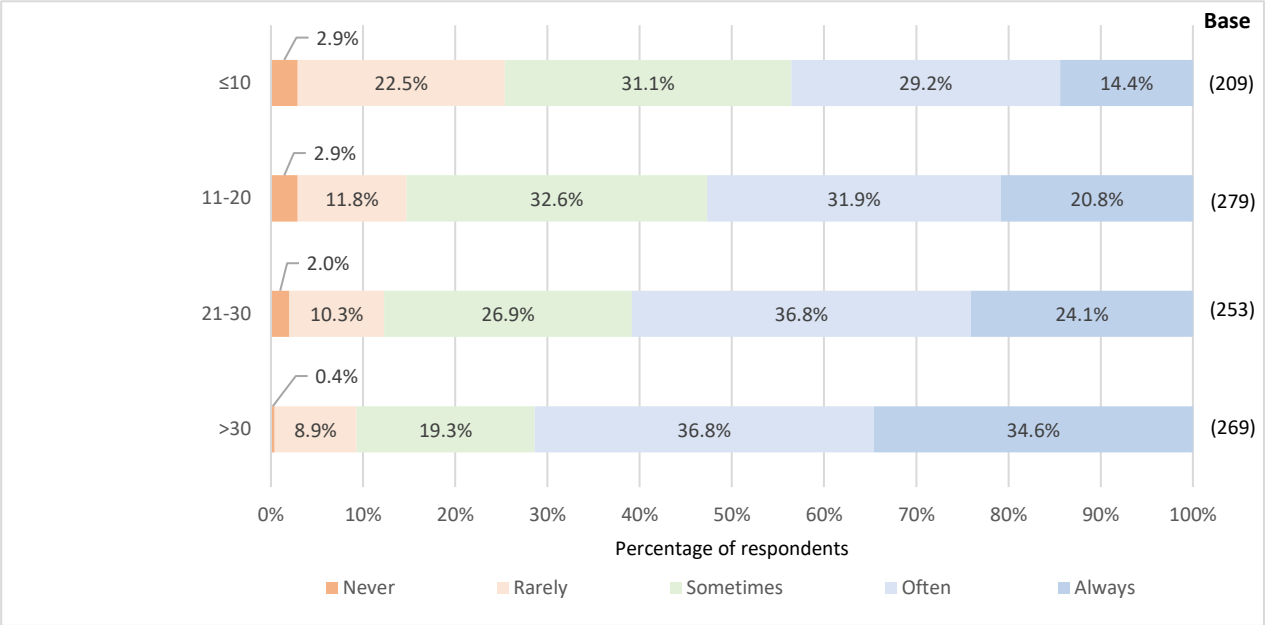
##: very small sample size (<30)

a: Kruskal-Wallis Test

b: Mann-Whitney U Test

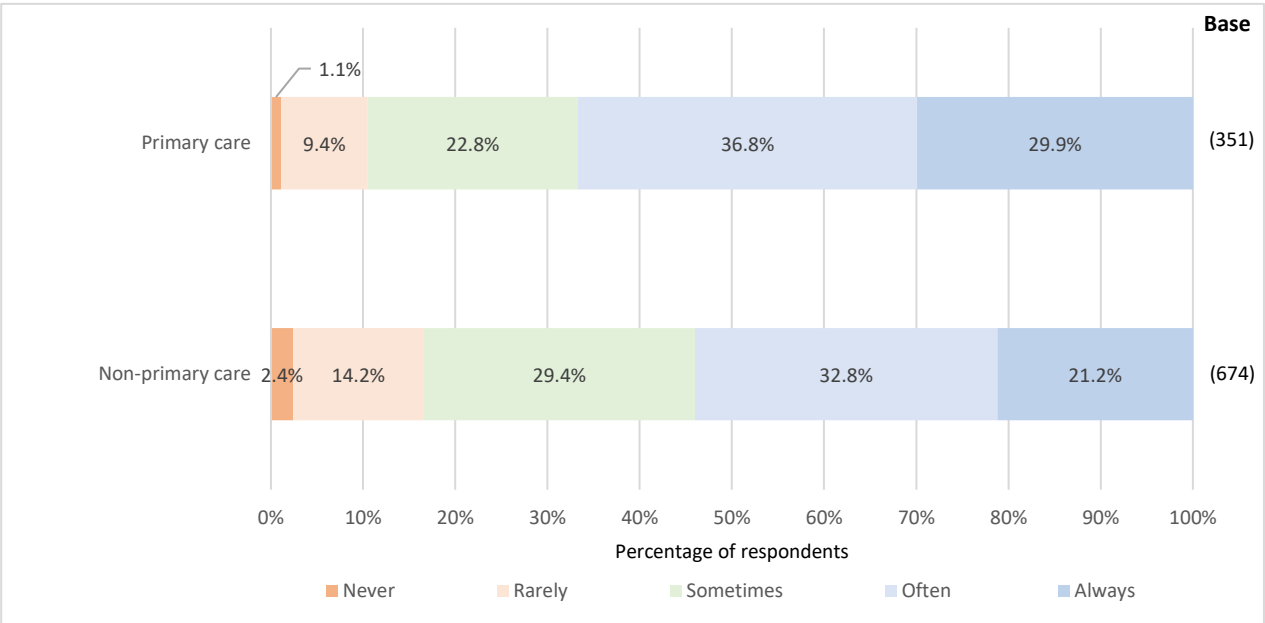
The more experienced respondents, especially those who had practised for over 30 years (71.4%), were more likely to "always"/"often" explain to their patients about improper use of antibiotics would increase AMR. (Chart 80)

Chart 80. Frequency of explaining to patients about improper use of antibiotics would increase AMR by years of practice (Q12d)



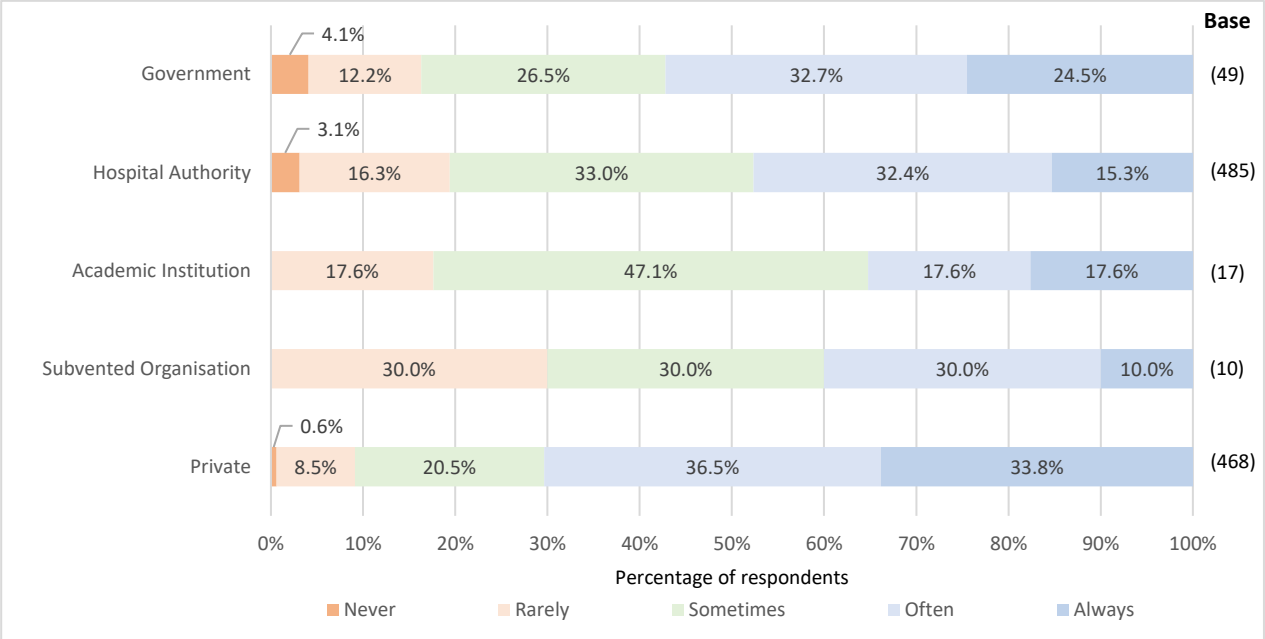
Primary care doctors were more prone to “always”/“often” explain to patients about improper use of antibiotics would increase AMR (66.7%), as compared to non-primary care doctors (54.0%). (Chart 81)

Chart 81. Frequency of explaining to patients about improper use of antibiotics would increase AMR by type of practice (Q12d)



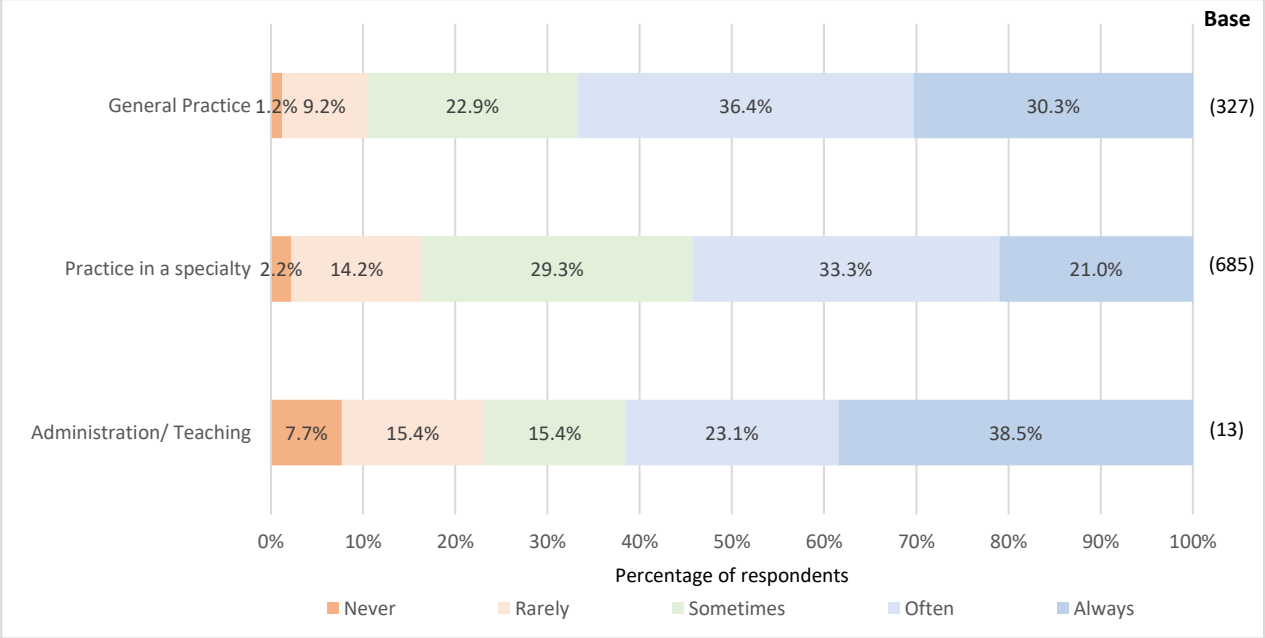
Respondents in the private sector (70.3%) were more likely to "always"/"often" explain to their patients about improper use of antibiotics would increase antimicrobial resistance, followed by those working in the government (57.1%) and the Hospital Authority (47.6%). (Chart 82)

Chart 82. Frequency of explaining to patients about improper use of antibiotics would increase AMR by type of institution (Q12d)



Respondents who were in general practice (66.7%) and in administration/teaching areas (61.5%) were slightly more inclined to "always"/"often" explain to patients about improper use of antibiotics would increase AMR, as compared to respondents who were practising in a specialty (54.3%). (Chart 83)

Chart 83. Frequency of explaining to patients about improper use of antibiotics would increase AMR by major field of practice (Q12d)



4.3.8 Frequency of re-assessing patients' antibiotic regimen after 48-72 hours of starting treatment

Respondents' frequency of re-assessing patients' antibiotic regimen after 48-72 hours of starting treatment was significantly associated with respondents' gender, type of practice, type of institution, major field of practice and specialty. (Table 60)

Table 60 Frequency of re-assessing patients' antibiotic regime after 48-72 hours of starting treatment (Q13)

		Respondent count (Row percentage)						
Variable	**Label**	**Base**	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**	**p-value**
Gender	Male	682 (100.0%)	31 (4.5%)	143 (21.0%)	231 (33.9%)	207 (30.4%)	70 (10.3%)	0.02[a]
	Female	337 (100.0%)	24 (7.1%)	83 (24.6%)	118 (35.0%)	76 (22.6%)	36 (10.7%)	
Type of practice	Primary Care	353 (100.0%)	20 (5.7%)	110 (31.2%)	134 (38.0%)	72 (20.4%)	17 (4.8%)	<0.005[a]
	Non-Primary Care	676 (100.0%)	34 (5.0%)	116 (17.2%)	218 (32.2%)	218 (32.2%)	90 (13.3%)	
Type of institution	Government	50 (100.0%)	3 (6.0%)	20 (40.0%)	18 (36.0%)	8 (16.0%)	1 (2.0%)	<0.005[b]
	Hospital Authority	487 (100.0%)	28 (5.7%)	114 (23.4%)	131 (26.9%)	148 (30.4%)	66 (13.6%)	
	Academic Institution	17[##] (100.0%)	(-)	4 (23.5%)	5 (29.4%)	6 (35.3%)	2 (11.8%)	

	Subvented Organisation	10## (100.0%)	2 (20.0%)	3 (30.0%)	2 (20.0%)	1 (10.0%)	2 (20.0%)	
	Private Sector	469 (100.0%)	23 (4.9%)	87 (18.6%)	196 (41.8%)	127 (27.1%)	36 (7.7%)	
Major field of practice	General Practice	329 (100.0%)	18 (5.5%)	103 (31.3%)	124 (37.7%)	68 (20.7%)	16 (4.9%)	<0.005[b]
	Practice in a specialty	687 (100.0%)	32 (4.7%)	122 (17.8%)	225 (32.8%)	220 (32.0%)	88 (12.8%)	
	Administration/ Teaching	13## (100.0%)	4 (30.8%)	1 (7.7%)	3 (23.1%)	2 (15.4%)	3 (23.1%)	
Specialty	Surgery-related	140 (100.0%)	1 (0.7%)	14 (10.0%)	45 (32.1%)	58 (41.4%)	22 (15.7%)	<0.005[a]
	Non-surgery-related	692 (100.0%)	45 (6.5%)	163 (23.6%)	228 (32.9%)	183 (26.4%)	73 (10.5%)	

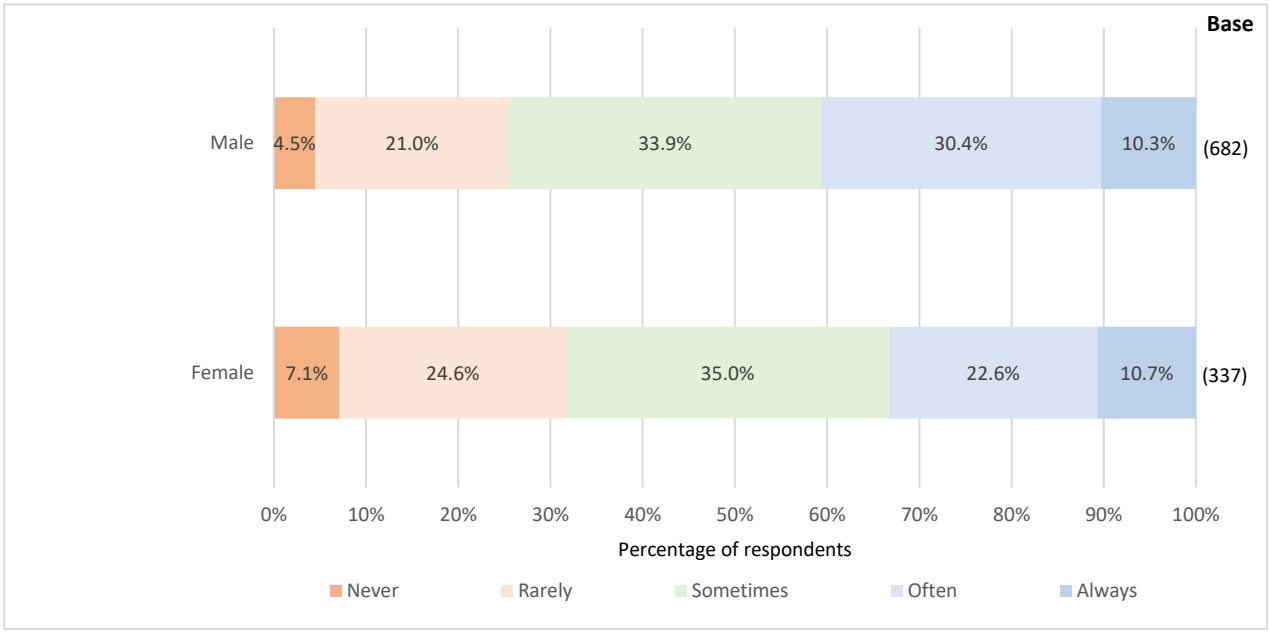
##: Very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

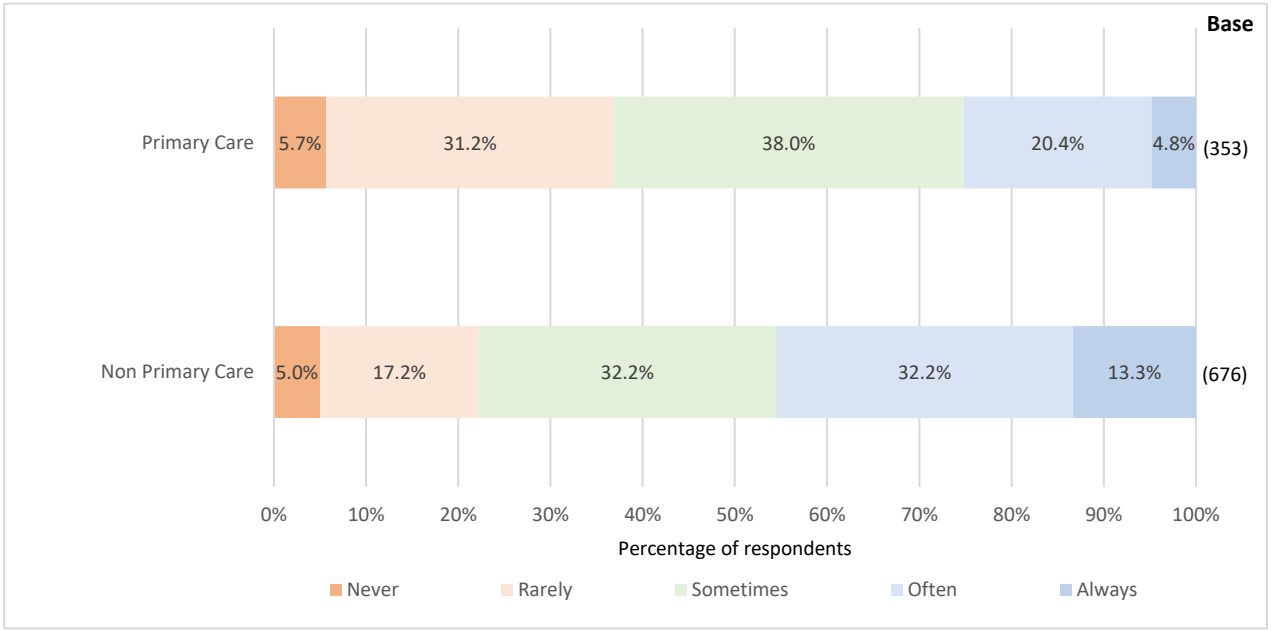
Compared to their female counterparts (33.2%), more male respondents (40.6%) “always”/“often” reassess patients’ antibiotic regimen. (Chart 84)

Chart 84. Frequency of re-assessing patients’ antibiotic regimen after 48-72 hours of starting treatment by gender (Q13)



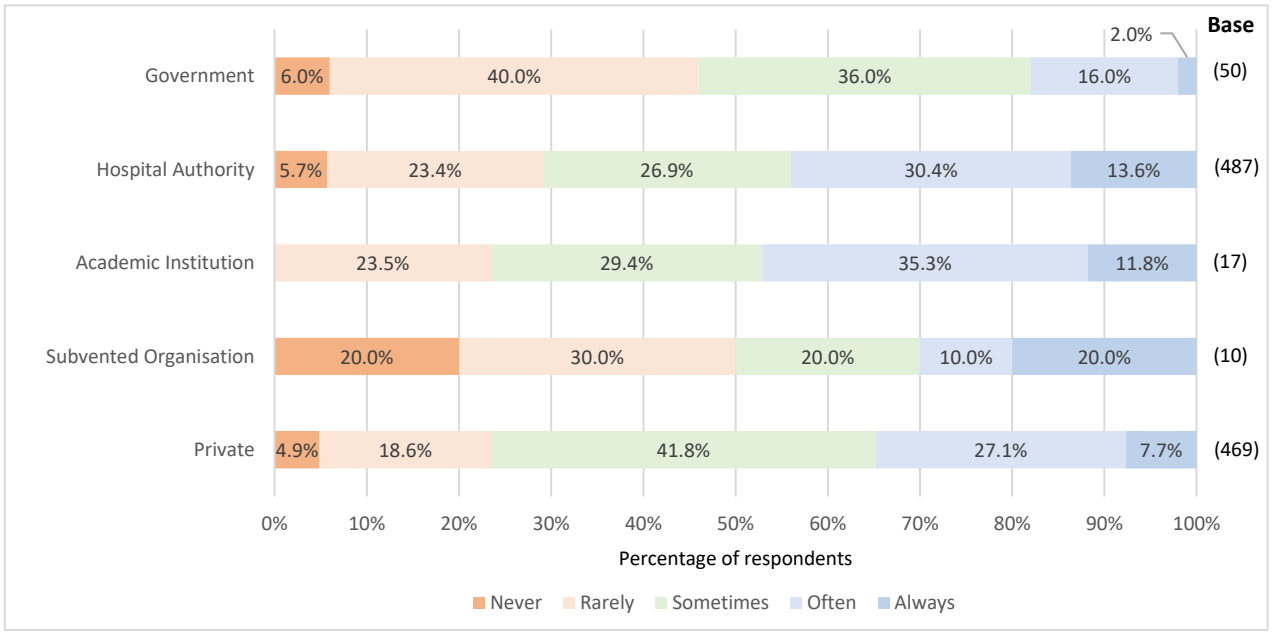
More non-primary care doctors (45.6%) tended to reassess their patients’ antibiotic regimen frequently (“always”/“often”) than the primary care doctors (25.2%). (Chart 85)

Chart 85. Frequency of re-assessing patients' antibiotic regimen after 48-72 hours of starting treatment by type of practice (Q13)



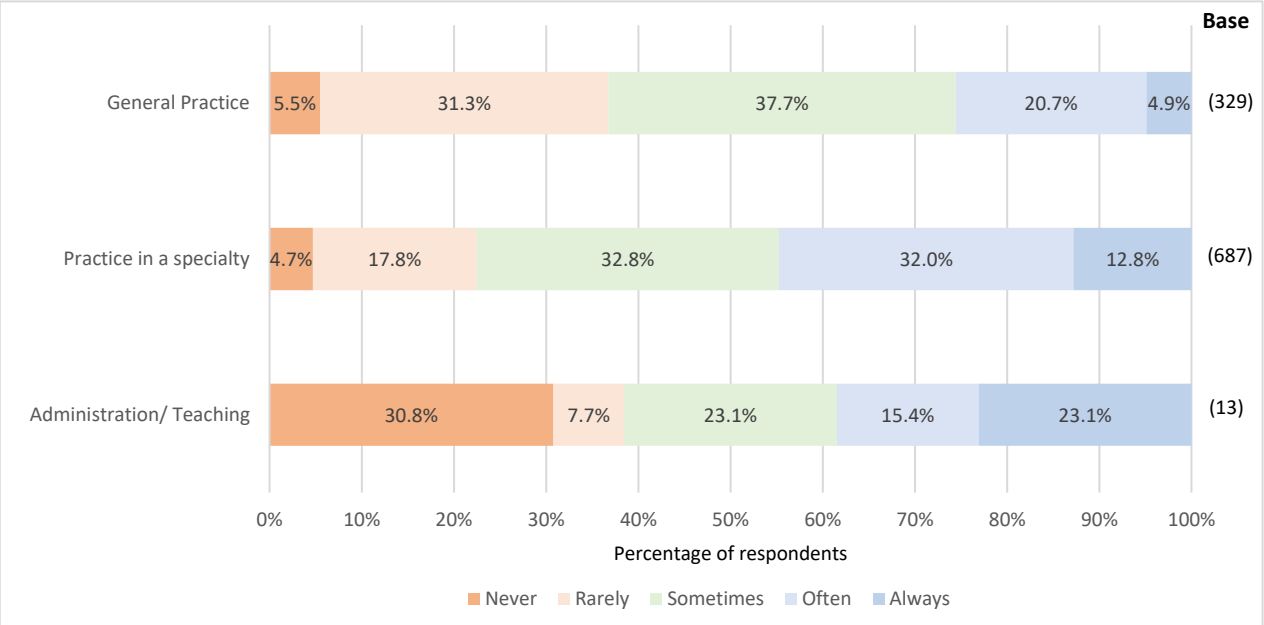
Relatively more respondents working with the academic institutions (47.1%) and the Hospital Authority (43.9%) "always"/"often" re-assessed their patients' antibiotic regimen, compared to less than one fifth (18.0%) of respondents from the government. (Chart 86)

Chart 86. Frequency of re-assessing patients' antibiotic regimen after 48-72 hours of starting treatment by type of institution (Q13)



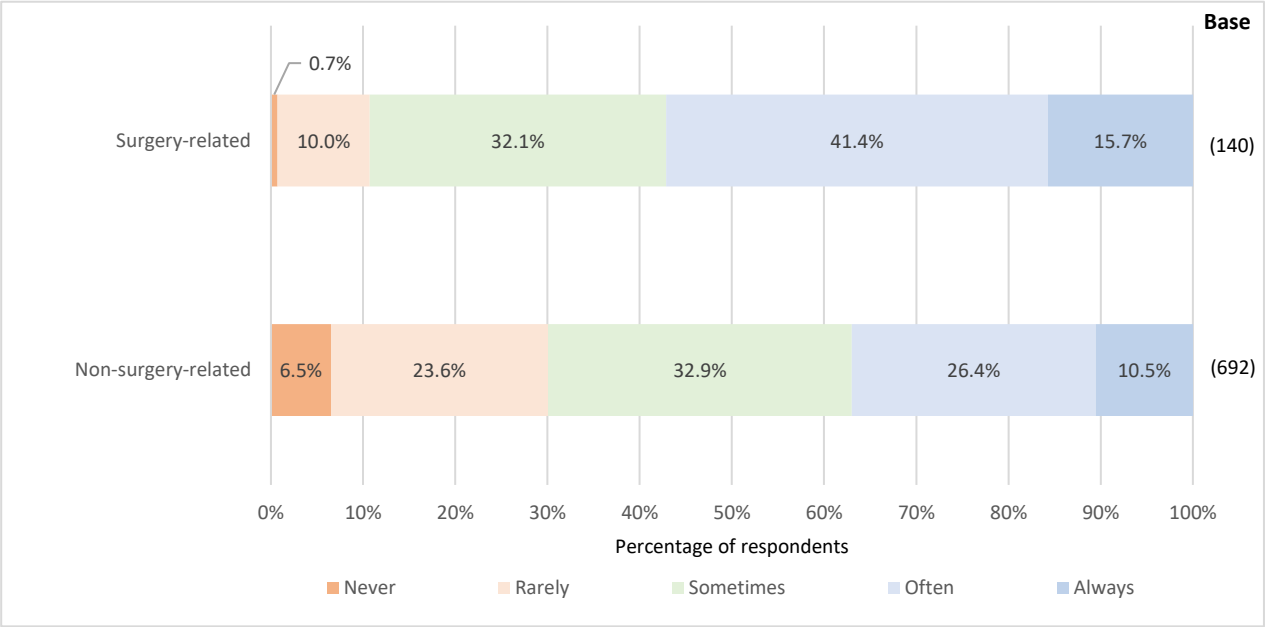
Respondents who were practising in a specialty were more prone to "always"/"often" reassess patients' antibiotic regimen (44.8%), as compared to respondents who were in administration/teaching areas (38.5%) and in general practice (25.5%). (Chart 87)

Chart 87. Frequency of re-assessing patients' antibiotic regimen after 48-72 hours of starting treatment by major field of practice (Q13)



More respondents in surgery-related specialties (57.1%) re-assessed their patients' antibiotic regimen frequently ("always"/"often"), compared to non-surgeon respondents (37.0%). (Chart 88)

Chart 88. Frequency of re-assessing patients' antibiotic regimen after 48-72 hours of starting treatment by specialty (Q13)



4.3.9 Whether respondents considered themselves adequately trained on antibiotic use

Respondents' perception on being adequately trained on antibiotic use was significantly associated with their gender, years of practice and type of institution. (Table 61)

Table 61 Respondents opinion on whether they were adequately trained on antibiotic use (Q14)

		Respondents count (Row percentage)			
Variable	**Label**	**Base**	**Yes**	**No**	**p-value**
Gender	Male	660 (100.0%)	497 (75.3%)	163 (24.7%)	<0.005[a]
	Female	331 (100.0%)	217 (65.6%)	114 (34.4%)	
Years of practice	≤10	208 (100.0%)	122 (58.7%)	86 (41.3%)	<0.005[a]
	11-20	275 (100.0%)	182 (66.2%)	93 (33.8%)	
	21-30	247 (100.0%)	189 (76.5%)	58 (23.5%)	
	>30	255 (100.0%)	216 (84.7%)	39 (15.3%)	
Type of institution	Government	48[#] (100.0%)	27 (56.3%)	21 (43.8%)	<0.005[b]
	Hospital Authority	479 (100.0%)	307 (64.1%)	172 (35.9%)	

	Academic Institution	17## (100.0%)	14 (82.4%)	3 (17.6%)	
	Subvented Organisation	9## (100.0%)	7 (77.8%)	2 (22.2%)	
	Private Sector	449 (100.0%)	365 (81.3%)	84 (18.7%)	

#: small sample size (<50)

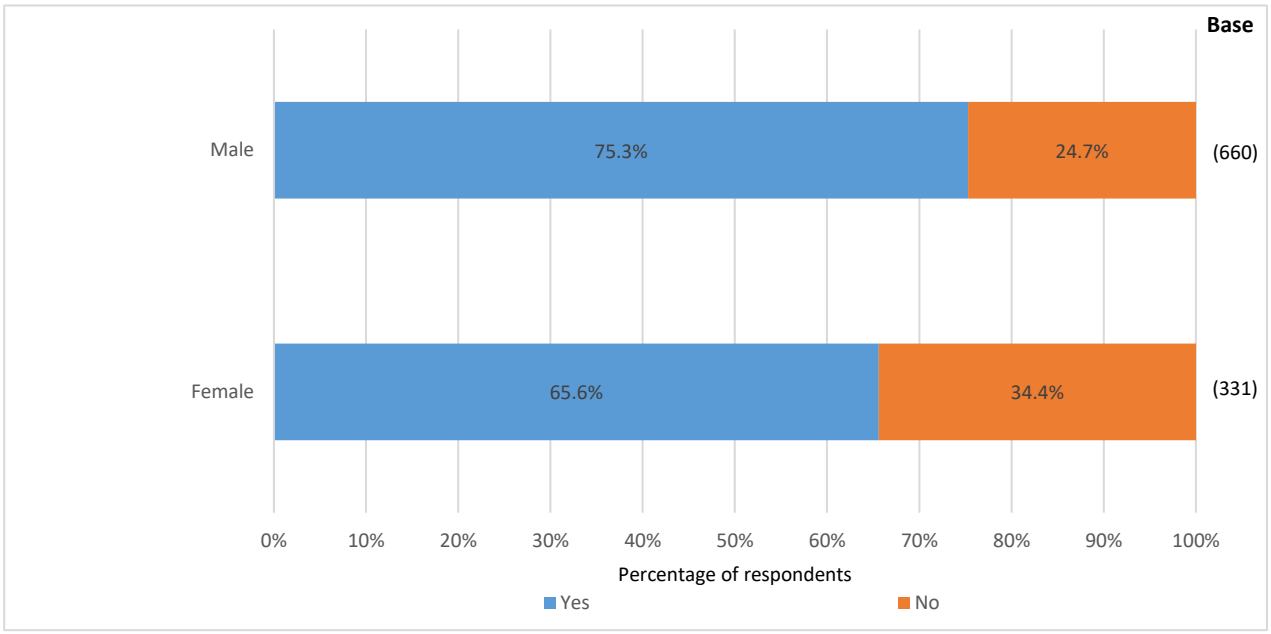
##: very small sample size (<30)

a: Chi-squared test

b: Fisher exact test

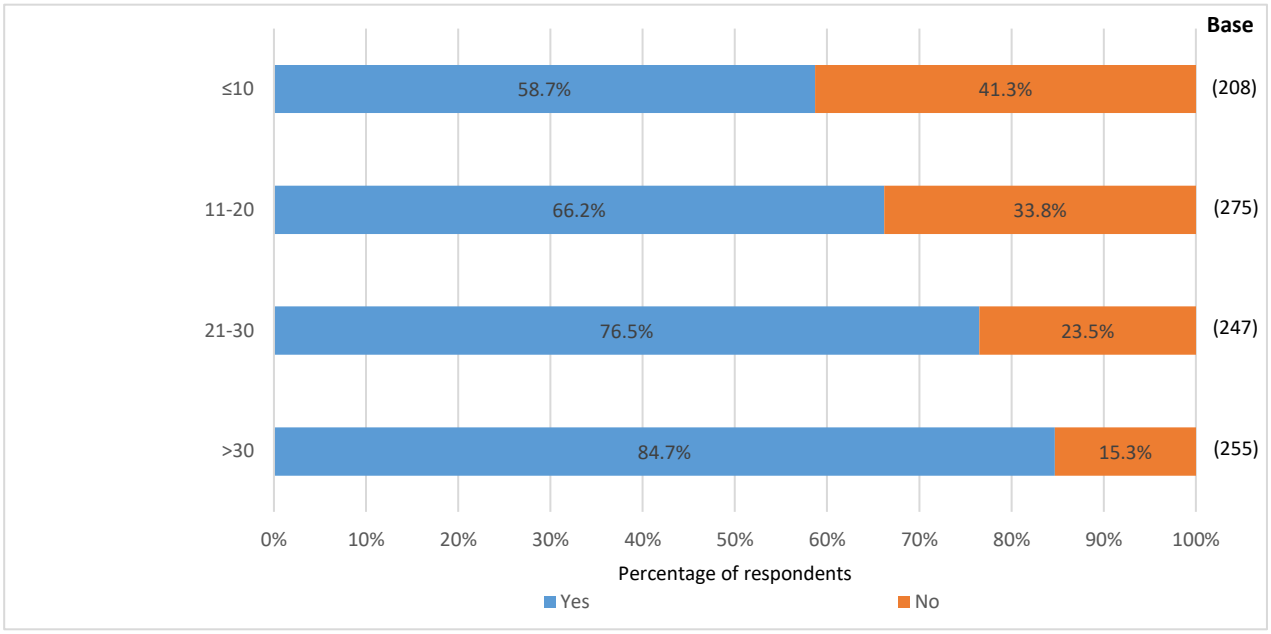
More male respondents considered themselves adequately trained on antibiotic use (75.3%), as compared to female respondents (65.6%). (Chart 89)

Chart 89. Respondents considered themselves adequately trained on antibiotic use by gender (Q14)



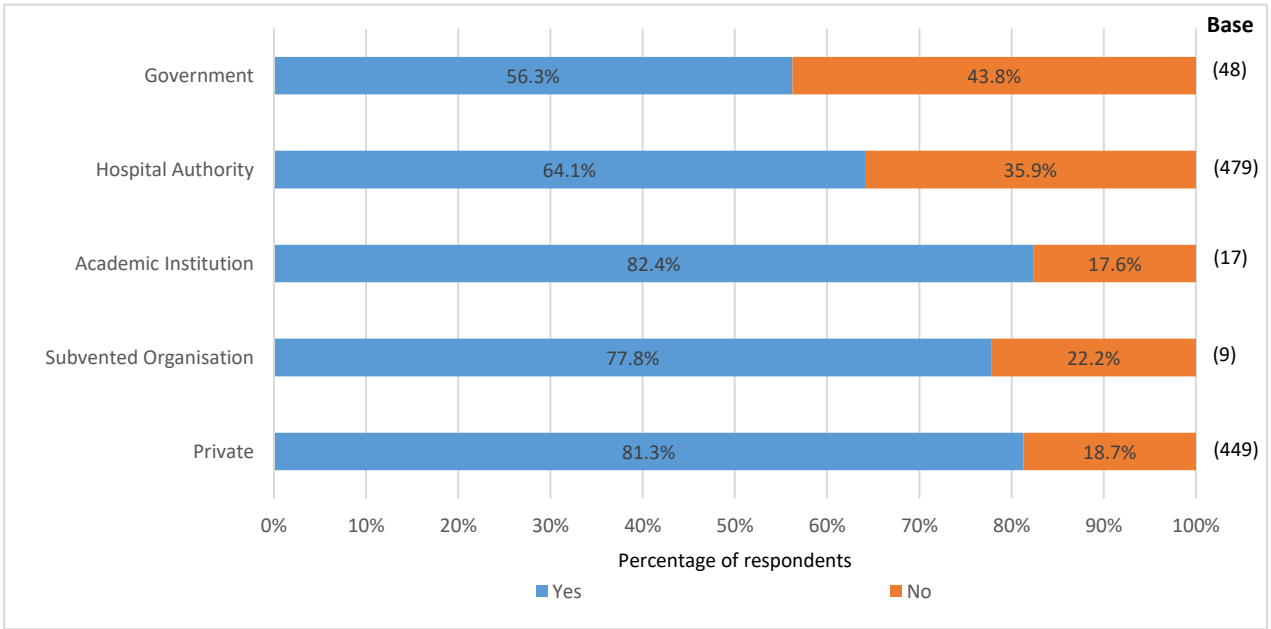
The more experienced the respondents, the more likely for them to consider themselves adequately trained on antibiotic use. (Chart 90)

Chart 90. Respondents considered themselves adequately trained on antibiotic use by years of practice (Q14)



Most respondents working in academic institutions (82.4%) considered themselves adequately trained on antibiotic use, compared to about half of respondents working in the government (56.3%). (Chart 91)

Chart 91. Respondents considered themselves adequately trained on antibiotic use by type of institution (Q14)



4.4 Evaluation of tools

4.4.1 Awareness of availability of the selected antibiotic prescription guiding tools

Respondents' awareness of the availability of antibiogram for public and private hospitals was significantly associated with the respondents' type of practice, type of institution and major field of practice. (Table 62)

Table 62 Awareness of the availability of antibiogram for public and private hospitals (Q4a)

		Respondent count (Row percentage)			
Variable	**Label**	**Base**	**Yes**	**No**	**p-value**
Type of practice	Primary Care	353 (100.0%)	208 (58.9%)	145 (41.1%)	<0.005[a]
	Non-Primary Care	684 (100.0%)	499 (73.0%)	185 (27.0%)	
Type of institution	Government	51 (100.0%)	29 (56.9%)	22 (43.1%)	<0.005[b]
	Hospital Authority	489 (100.0%)	363 (74.2%)	126 (25.8%)	
	Academic Institution	19[##] (100.0%)	15 (78.9%)	4 (21.1%)	
	Subvented Organisation	10[##] (100.0%)	6 (60.0%)	4 (40.0%)	
	Private Sector	472 (100.0%)	297 (62.9%)	175 (37.1%)	
Major field of practice	General Practice	329 (100.0%)	190 (57.8%)	139 (42.2%)	<0.005[a]
	Practice in a specialty	692 (100.0%)	505 (73.0%)	187 (27.0%)	
	Administration/ Teaching	16[##] (100.0%)	12 (75.0%)	4 (25.0%)	

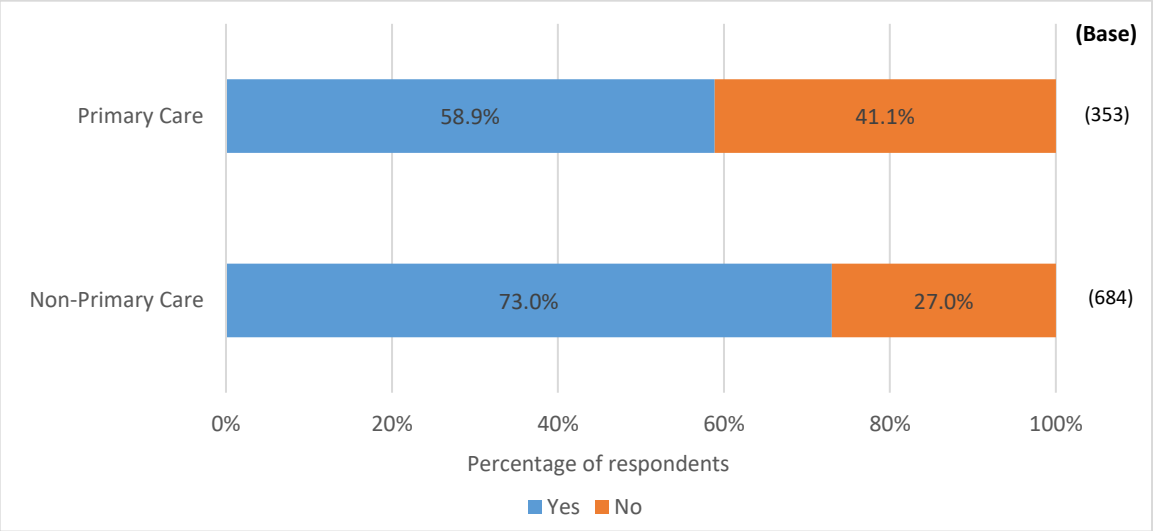
##: very small sample size (<30)

a: Chi-squared test

b: Fisher exact test

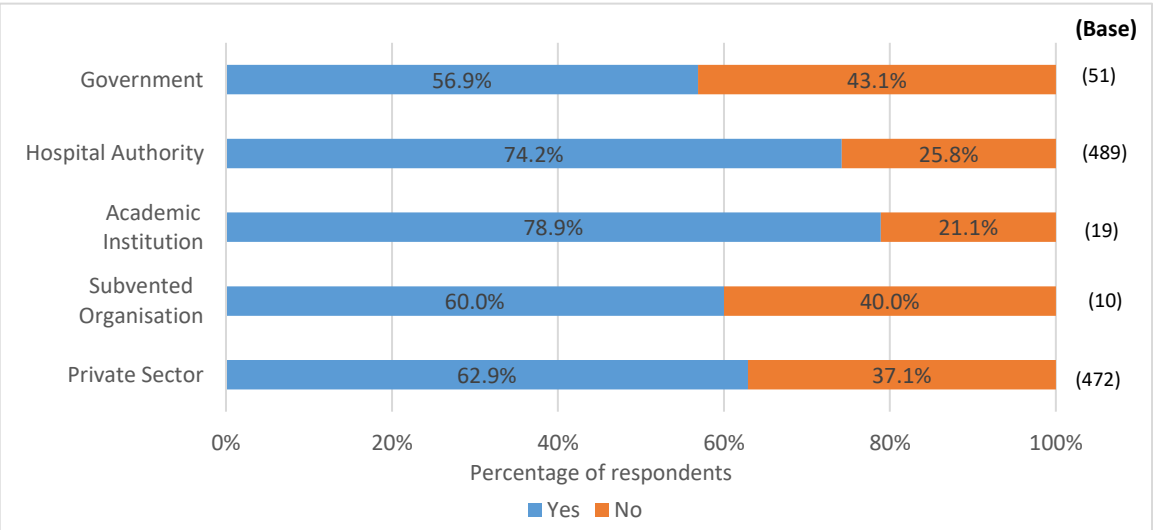
Less primary care doctors were aware of the availability of antibiogram (58.9%) compared to the non-primary care doctors (73.0%). (Chart 92)

Chart 92. Awareness of the availability of antibiogram for public and private hospitals by type of practice (Q4a)



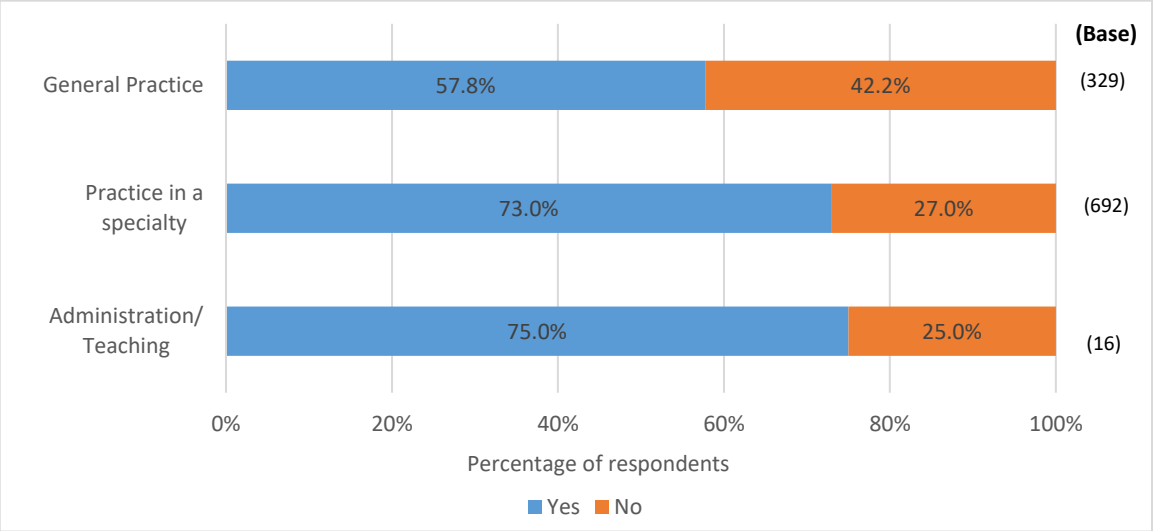
More respondents working in academic institutions (78.9%) and in the Hospital Authority (74.2%) were aware of the availability of antibiograms, compared to respondents working in the government (56.9%). (Chart 93)

Chart 93. Awareness of the availability of antibiogram for public and private hospitals by type of institution (Q4a)



Respondents practising in administration/teaching areas (75.0%) and in specialty (73.0%) were more aware of the availability of antibiograms, as compared to respondents in general practice (57.8%). (0)

Chart 94. Awareness of the availability of antibiogram for public and private hospitals by major field of practice (Q4a)



Respondents' awareness of the availability of IMPACT guideline was significantly associated with their type of practice, years of practice, type of institution and major field of practice. (Table 63)

Table 63 Awareness of the availability of IMPACT guideline (Q4b)

		Respondent count (Row percentage)			
Variable	**Label**	**Base**	**Yes**	**No**	**p-value**
Type of practice	Primary Care	352 (100.0%)	254 (72.2%)	98 (27.8%)	<0.005[a]
	Non-Primary Care	685 (100.0%)	561 (81.9%)	124 (18.1%)	
Years of practice	≤10	210 (100.0%)	184 (87.6%)	26 (12.4%)	<0.005[a]
	11 - 20	281 (100.0%)	243 (86.5%)	38 (13.5%)	
	21 - 30	258 (100.0%)	201 (77.9%)	57 (22.1%)	
	>30	273 (100.0%)	179 (65.6%)	94 (34.4%)	
Type of institution	Government	51 (100.0%)	43 (84.3%)	8 (15.7%)	<0.005[b]
	Hospital Authority	490 (100.0%)	443 (90.4%)	47 (9.6%)	
	Academic Institution	19[##] (100.0%)	16 (84.2%)	3 (15.8%)	
	Subvented Organisation	10[##] (100.0%)	8 (80.0%)	2 (20.0%)	
	Private Sector	471 (100.0%)	309 (65.6%)	162 (34.4%)	

Major field of practice	General Practice	328 (100.0%)	235 (71.6%)	93 (28.4%)	<0.005[b]
	Practice in a specialty	693 (100.0%)	567 (81.8%)	126 (18.2%)	
	Administration/ Teaching	16[##] (100.0%)	13 (81.3%)	3 (18.8%)	

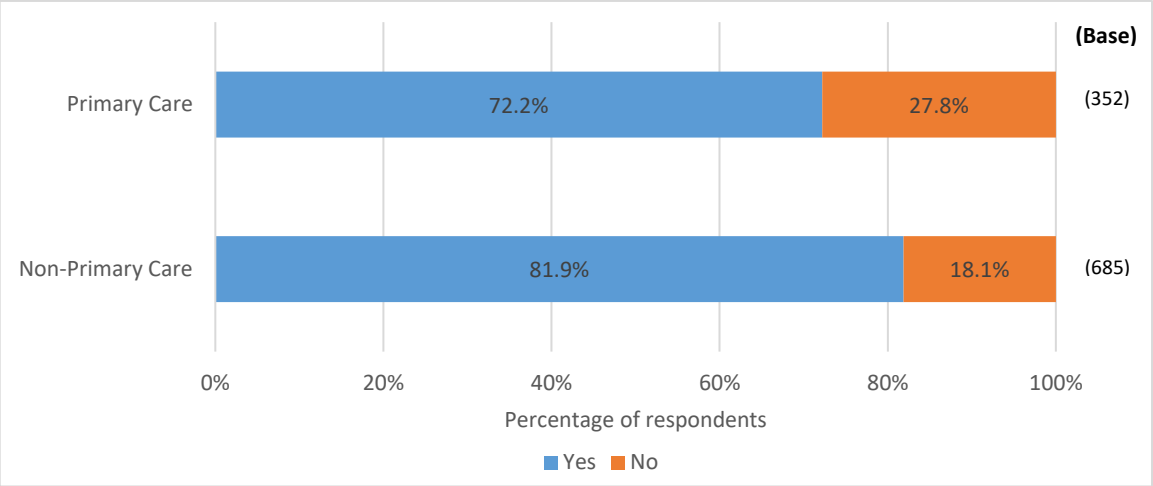
##: very small sample size (<30)

a: Chi-squared test

b: Fisher exact test

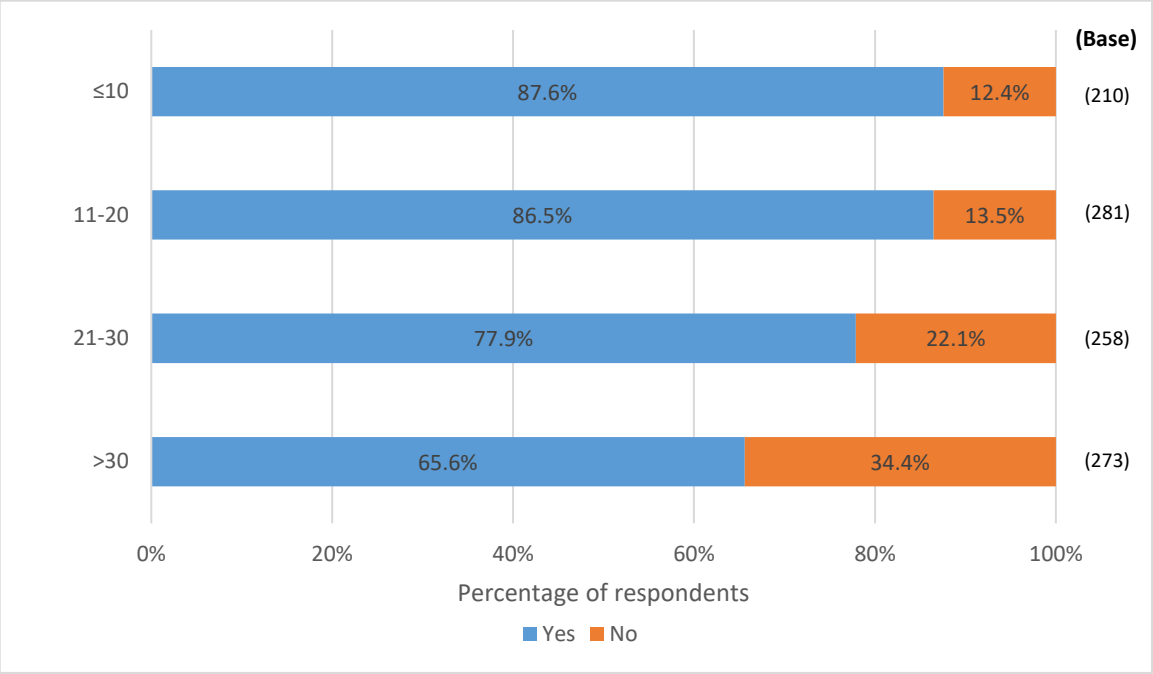
Less primary care doctors were aware of the availability of IMPACT guideline (72.2%) compared to the non-primary care doctors (81.9%). (Chart 95)

Chart 95. Awareness of availability of IMPACT guideline by type of practice (Q4b)



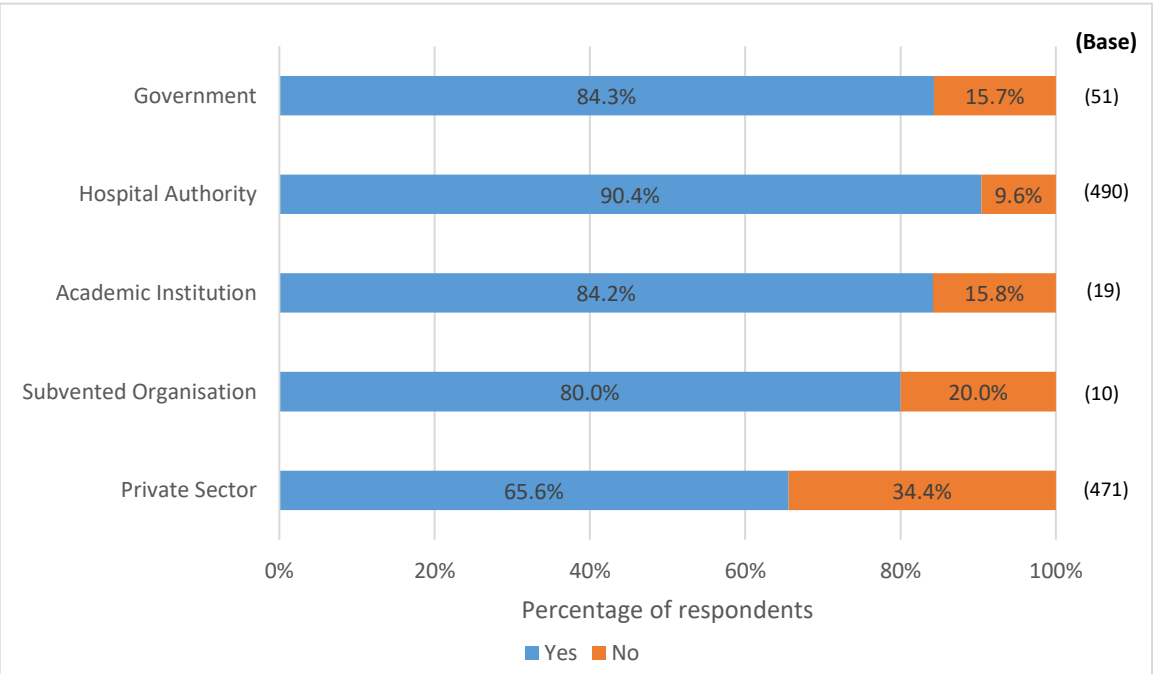
The more experienced respondents were relatively less aware of the availability of IMPACT guideline. While close to nine in ten (87.6%) respondents who had been practising for ten years or less knew there is an IMPACT guideline, there were only 65.6% of those who had practiced for over 30 years were aware of it. (Chart 96)

Chart 96. Awareness of the availability of IMPACT guideline by years of practice (Q4b)



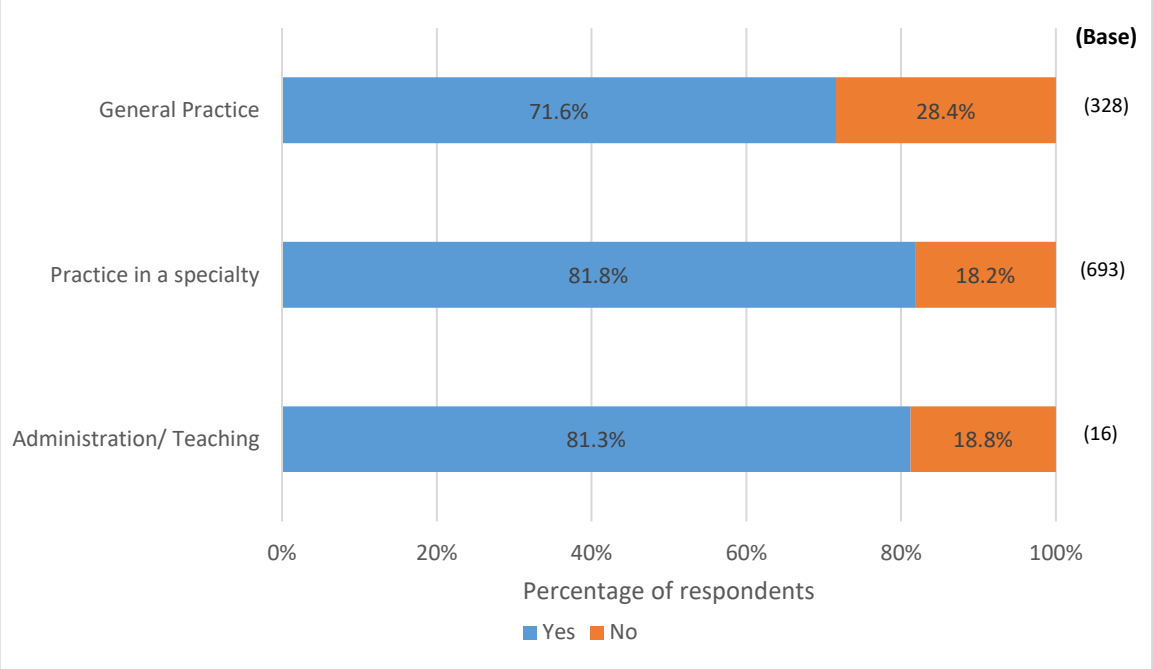
More respondents working in the Hospital Authority (90.4%) and the government (84.3%) were aware of the availability of IMPACT guideline, compared to less than two-thirds (65.6%) of respondents working in the private sector. (Chart 97)

Chart 97. Awareness of availability of IMPACT guideline by type of institution (Q4b)



Respondents who were practising in a specialty (81.8%) and in administration/teaching areas (81.3%), were more likely to be aware of the availability of IMPACT guideline, compared to respondents in general practice (71.6%). (Chart 98)

Chart 98. Awareness of availability of IMPACT guideline by major field of practice (Q4b)



Respondents' awareness of the availability of Antibiotic Stewardship Programme (ASP) in Primary Care/Hospital was significantly associated with their type of practice and type of institution. (Table 64)

Table 64 Awareness of the availability of ASP in Primary Care/Hospital (Q4c)

		Respondent count (Row percentage)			
Variable	**Label**	**Base**	**Yes**	**No**	**p-value**
Type of practice	Primary Care	354 (100.0%)	209 (59.0%)	145 (41.0)	0.01[a]
	Non-Primary Care	685 (100.0%)	461 (67.3%)	224 (32.7%)	
Type of institution	Government	51 (100.0%)	32 (62.7%)	19 (37.3%)	<0.005[b]
	Hospital Authority	490 (100.0%)	344 (70.2%)	146 (29.8%)	
	Academic Institution	19[##] (100.0%)	14 (73.7%)	5 (26.3%)	

	Subvented Organisation	10## (100.0%)	6 (60.0%)	4 (40.0%)	
	Private Sector	473 (100.0%)	276 (58.4%)	197 (41.6%)	

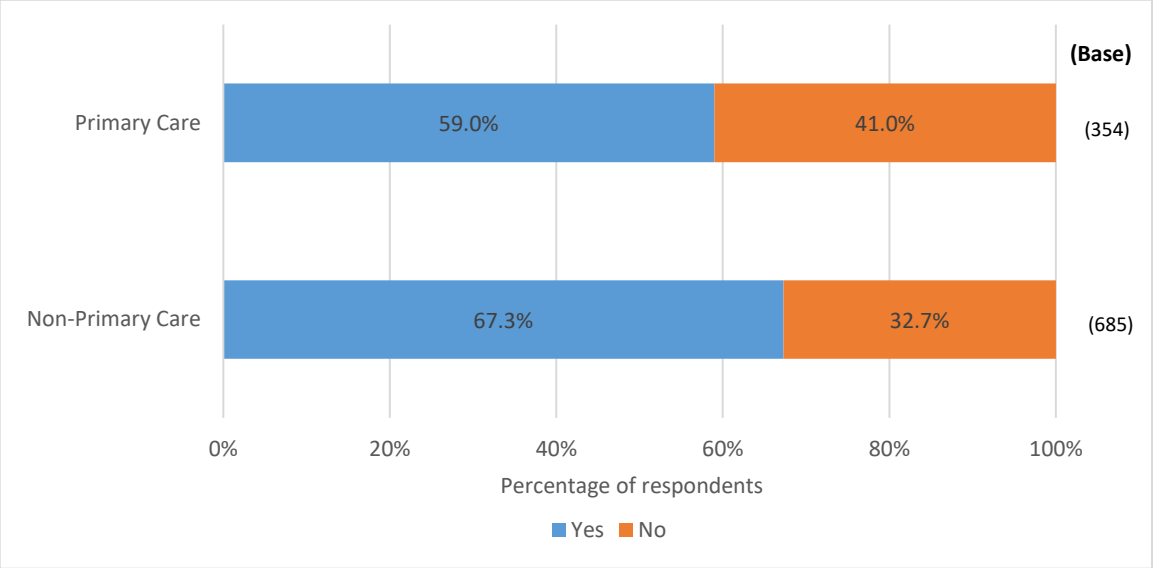
##: very small sample size (<30)

a: Chi-squared test

b: Fisher exact test

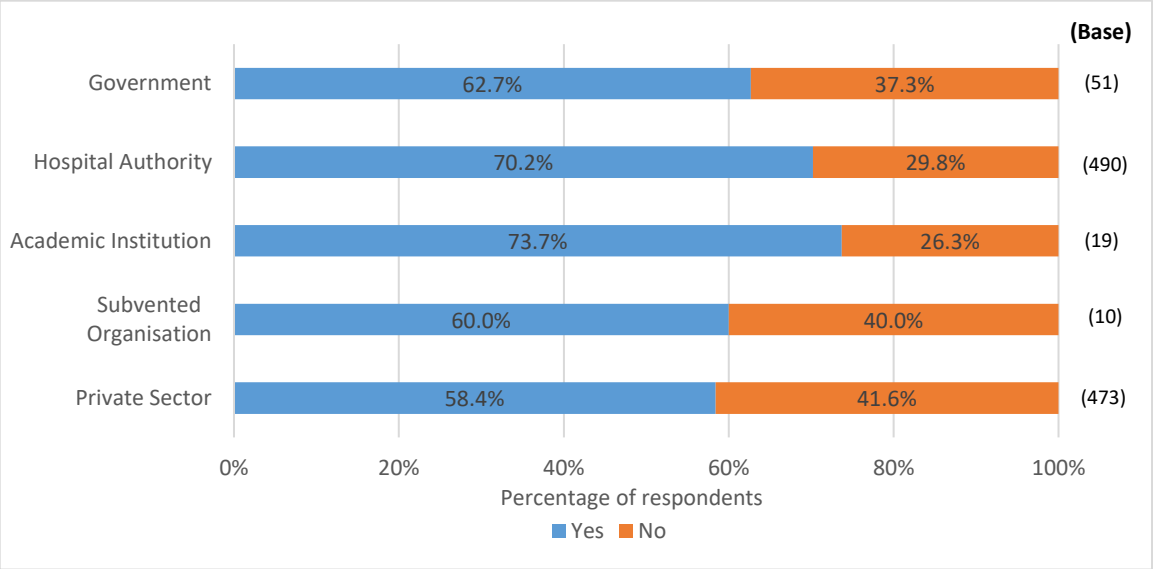
Relatively fewer primary care doctors were aware of the availability of ASP (59.0%), as compared to their counterparts in non-primary care (67.3%). (Chart 99)

Chart 99. Awareness of the availability of ASP in Primary Care/Hospital by type of practice (Q4c)



Only about half of respondents in the private sector (58.4%) were aware of the availability of ASP. The percentage was increased slightly in the subvented organisations (60.0%) and the government (62.7%). (Chart 100)

Chart 100. Awareness of the availability of ASP in Primary Care/Hospital by type of institution (Q4c)



4.4.2 Use of the antibiotic prescription guiding tools/reference

Respondents' frequency of use of the antibiogram for public and private hospitals, IMPACT guideline, and the ASP in primary care/hospital by respondents who were aware of the availability of the corresponding tools was not significantly associated with any of their demographics.

Respondents' frequency of making decisions on antibiotic prescription with reference to guidelines/recommendations from foreign health authorities/agencies (e.g. WHO, CDC[3]) was significantly associated with respondents' gender, and specialty. (Table 65)

Table 65 Frequency of making decisions on antibiotic prescription with reference to guidelines/recommendations from foreign health authorities/agencies (Q5d)

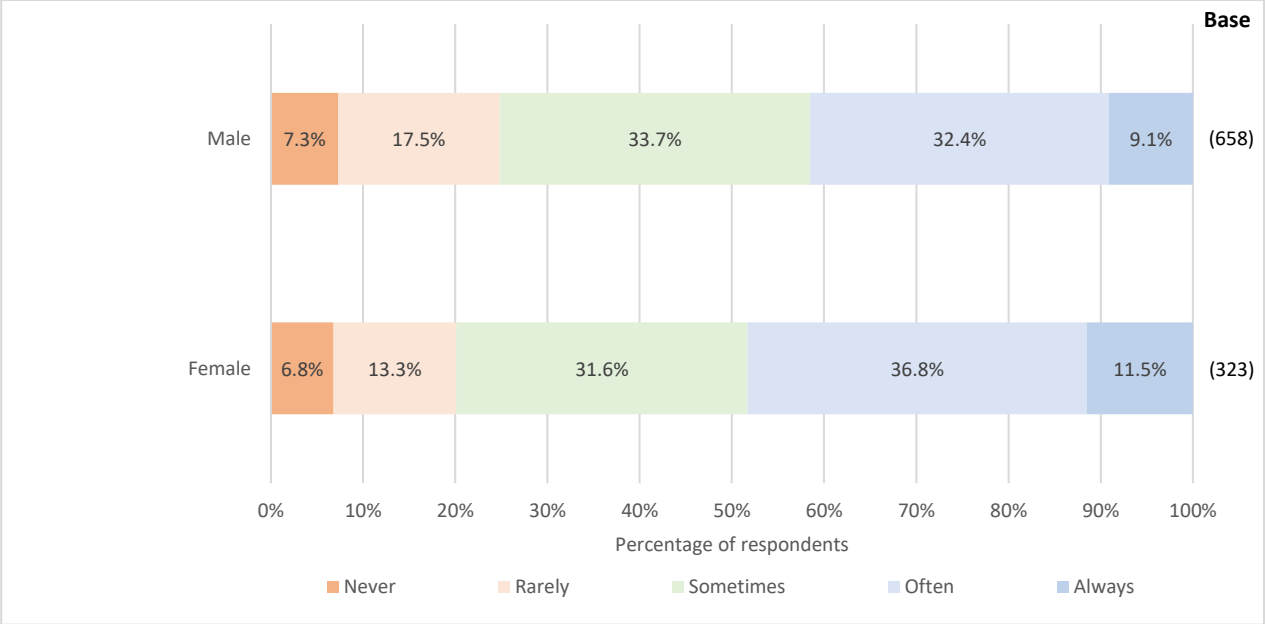
		Respondent count (Row percentage)							
Variable	**Label**	**Base**	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**	**Not applicable**	**p-value** Mann-Whitney U Test
Gender	Male	658 (100.0%)	48 (7.3%)	115 (17.5%)	222 (33.7%)	213 (32.4%)	60 (9.1%)	20	0.03
	Female	323 (100.0%)	22 (6.8%)	43 (13.3%)	102 (31.6%)	119 (36.8%)	37 (11.5%)	15	
Specialty	Surgery-related	138 (100.0%)	11 (8.0%)	31 (22.5%)	43 (31.2%)	46 (33.3%)	7 (5.1%)	2	0.02

[3] WHO: World Health Organization, CDC: Centers for Disease Control and Prevention

	Non-surgery-related	664 (100.0%)	43 (6.5%)	102 (15.4%)	219 (33.0%)	226 (34.0%)	74 (11.1%)	28	

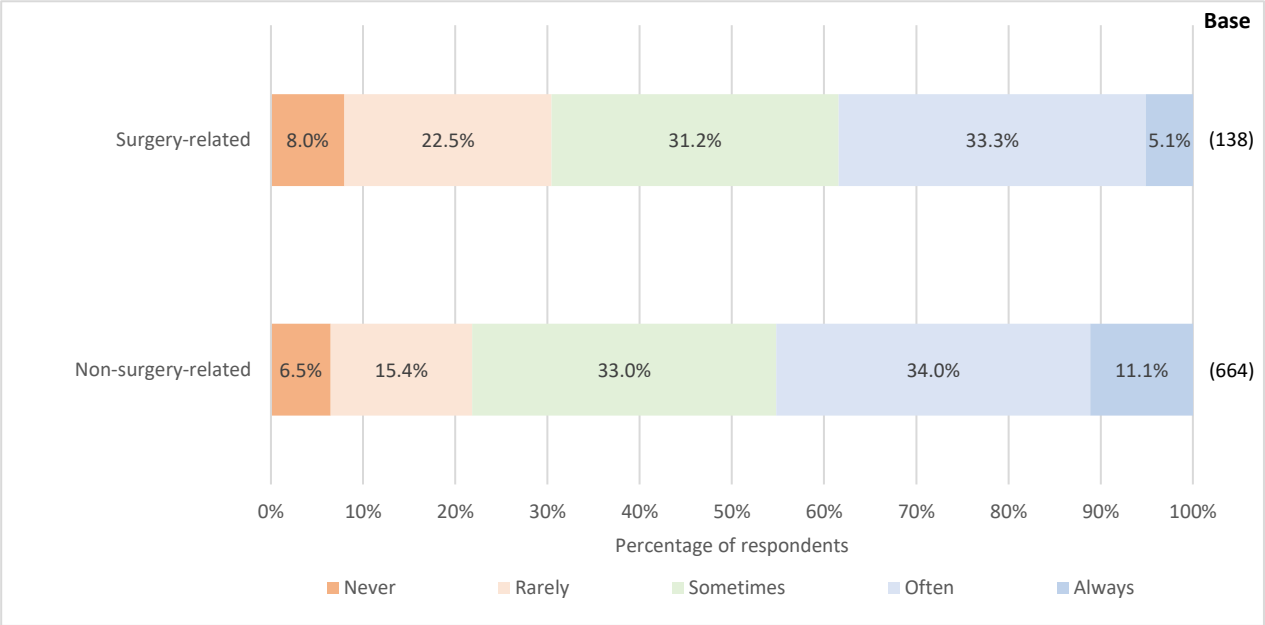
Compared to their male counterparts (9.1%), more female respondents (11.5%) "always" make decisions on antibiotic prescription with reference to guidelines/recommendations from foreign health authorities/agencies. (Chart 101)

Chart 101. Frequency of making decisions on antibiotic prescription with reference to guidelines/recommendations from foreign health authorities/agencies by gender (Q5d)



Respondents from non-surgery-related specialities were more inclined to "always" (11.1%) make reference to guidelines/recommendations from foreign health authorities/agencies. (Chart 102)

Chart 102. Frequency of making decisions on antibiotic prescription with reference to guidelines/recommendations from foreign health authorities/agencies by specialty (Q5d)



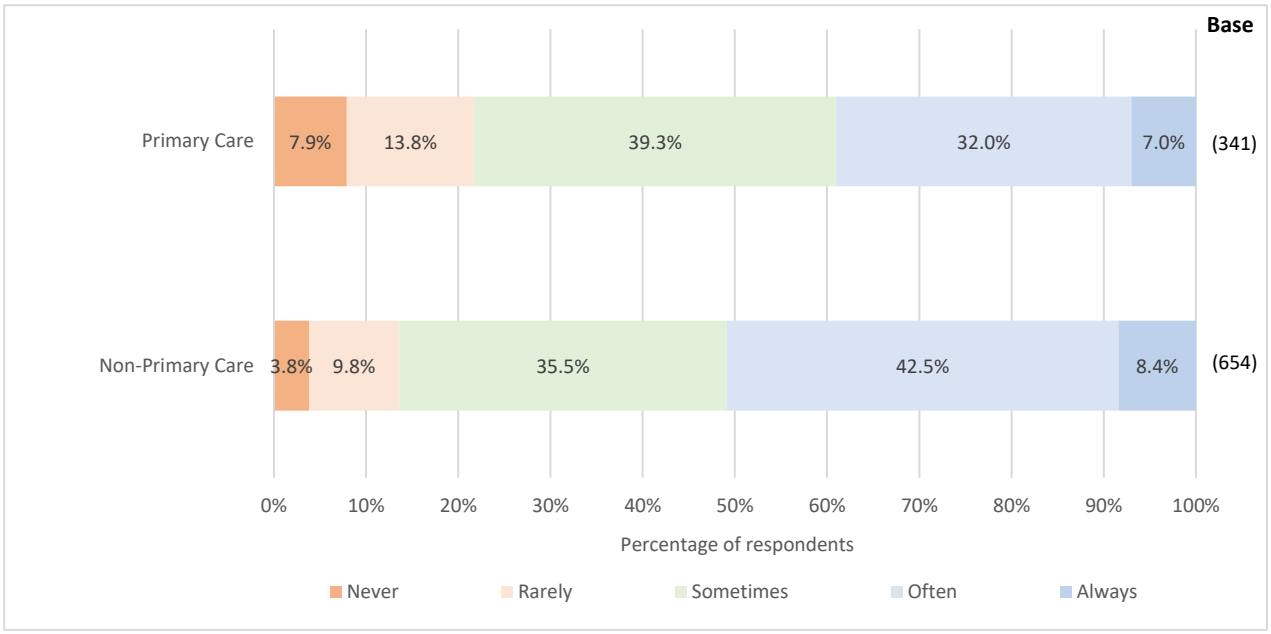
Respondents' frequency of making decisions on antibiotic prescription with reference to peers' suggestion was significantly associated with their type of practice and gender. (Table 66)

Table 66 Frequency of making decisions on antibiotic prescription with reference to peers' suggestion (Q5e)

		Respondent count (Row percentage)							
Variable	Label	Base	Never	Rarely	Sometimes	Often	Always	Not applicable	p-value Mann-Whitney U Test
Type of practice	Primary care	341 (100.0%)	27 (7.9%)	47 (13.8%)	134 (39.3%)	109 (32.0%)	24 (7.0%)	8	<0.005
	Non-primary care	654 (100.0%)	25 (3.8%)	64 (9.8%)	232 (35.5%)	278 (42.5%)	55 (8.4%)	24	
Gender	Male	662 (100.0%)	35 (5.3%)	83 (12.5%)	253 (38.2%)	245 (37.0%)	46 (6.9%)	17	0.01
	Female	323 (100.0%)	16 (5.0%)	28 (8.7%)	111 (34.4%)	137 (42.4%)	31 (9.6%)	15	

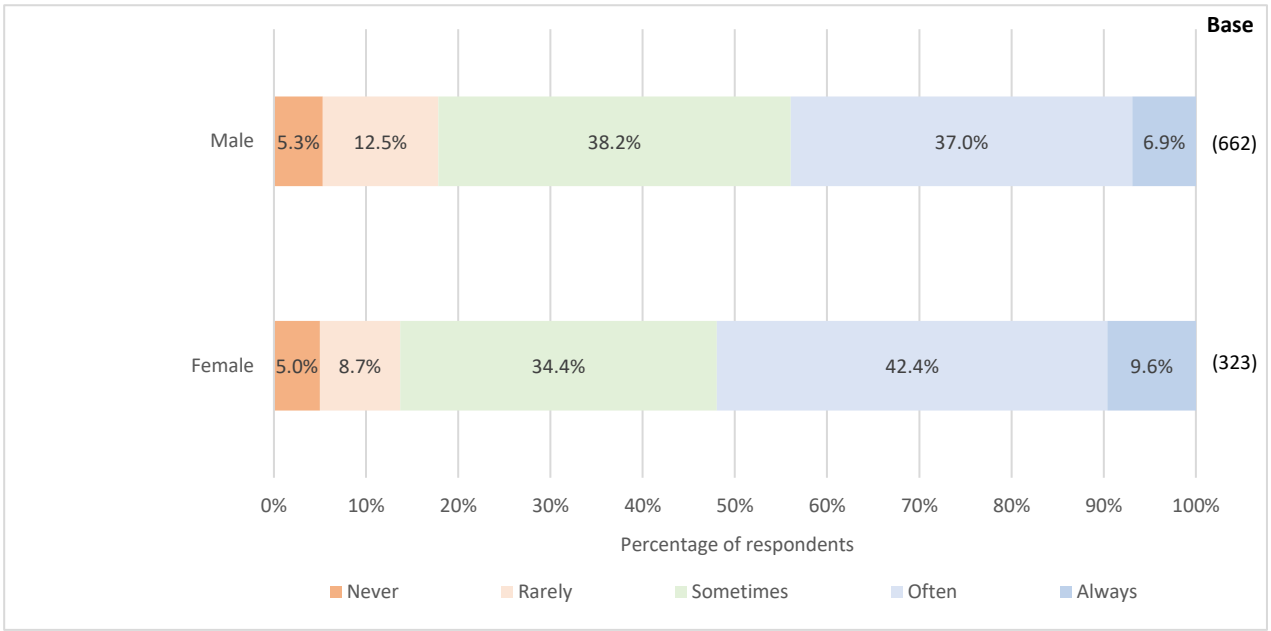
Non-primary care doctors were more inclined to "always"/"often" make reference to their peers' suggestions (50.9%), when making decisions on antibiotic prescription, compared to primary care doctors (39.0%). (Chart 103)

Chart 103. Frequency of making decisions on antibiotic prescription with reference to peers' suggestion by type of practice (Q5e)



Compared to their male counterparts (44.0%), more female respondents (52.0%) "always"/"often" made reference to peers' suggestion when making decisions on antibiotic prescription. (Chart 104)

Chart 104. Frequency of making decisions on antibiotic prescription with reference to peers' suggestion by gender (Q5e)



Respondents' frequency of making decisions on antibiotic prescription with reference to specialist consultation (e.g. microbiologist, infectious disease specialist) was significantly associated with their type of practice, gender, year of practice, type of institution, major field of practice and specialty. (Table 67)

Table 67 Frequency of making decisions on antibiotic prescription with reference to specialist consultation (Q5f)

		Respondent count (Row percentage)							
Variable	**Level**	**Base**	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**	**Not applicable**	**p-value**
Type of practice	Primary care	336 (100.0%)	44 (13.1%)	107 (31.8%)	92 (27.4%)	65 (19.3%)	28 (8.3%)	14	<0.005[a]
	Non-primary care	648 (100.0%)	26 (4.0%)	81 (12.5%)	194 (29.9%)	208 (32.1%)	139 (21.5%)	30	
Gender	Male	654 (100.0%)	53 (8.1%)	134 (20.5%)	192 (29.4%)	175 (26.8%)	100 (15.3%)	26	0.02[a]
	Female	320 (100.0%)	18 (5.6%)	54 (16.9%)	92 (28.8%)	94 (29.4%)	62 (19.4%)	18	
Year of practice	≤10	200 (100.0%)	8 (4.0%)	21 (10.5%)	37 (18.5%)	69 (34.5%)	65 (32.5%)	10	<0.005[b]
	11-20	267 (100.0%)	23 (8.6%)	63 (23.6%)	73 (27.3%)	68 (25.5%)	40 (15.0%)	14	
	21-30	245 (100.0%)	18 (7.3%)	54 (22.0%)	78 (31.8%)	63 (25.7%)	32 (13.1%)	9	
	>30	258 (100.0%)	22 (8.5%)	50 (19.4%)	93 (36.0%)	67 (26.0%)	26 (10.1%)	11	
Type of institution	Government	41[#] (100.0%)	2 (4.9%)	13 (31.7%)	12 (29.3%)	9 (22.0%)	5 (12.2%)	8	<0.005[b]
	Hospital Authority	471 (100.0%)	16 (3.4%)	61 (13.0%)	118 (25.1%)	160 (34.0%)	116 (24.6%)	18	
	Academic Institution	17[##] (100.0%)	1 (5.9%)	6 (35.3%)	3 (17.6%)	3 (17.7%)	4 (23.5%)	1	
	Subvented Organisation	8[##] (100.0%)	1 (12.5)	4 (50.0%)	3 (37.5%)	(-)	(-)	1	
	Private Sector	451 (100.0%)	51 (11.3%)	105 (23.3%)	152 (33.7%)	101 (22.4%)	42 (9.3%)	16	
Major field of practice	General Practice	314 (100.0%)	42 (13.4%)	100 (31.8%)	85 (27.1%)	62 (19.7%)	25 (8.0%)	12	0.01[b]
	Practice in a specialty	660 (100.0%)	27 (4.1%)	86 (13.0%)	200 (30.3%)	207 (31.4%)	140 (21.2%)	28	
	Administration/ Teaching	10[##] (100.0%)	1 (10.0%)	2 (20.0%)	1 (10.0%)	4 (40.0%)	2 (20.0%)	4	
Specialty	Surgery-related	140 (100.0%)	4 (2.9%)	17 (12.1%)	40 (28.6%)	41 (29.3%)	38 (27.1%)	(-)	<0.005[a]
	Non-surgery-related	659 (100.0%)	40 (6.1%)	125 (19.0%)	192 (29.1%)	187 (28.4%)	115 (17.5%)	33	

#: small sample size (<50)

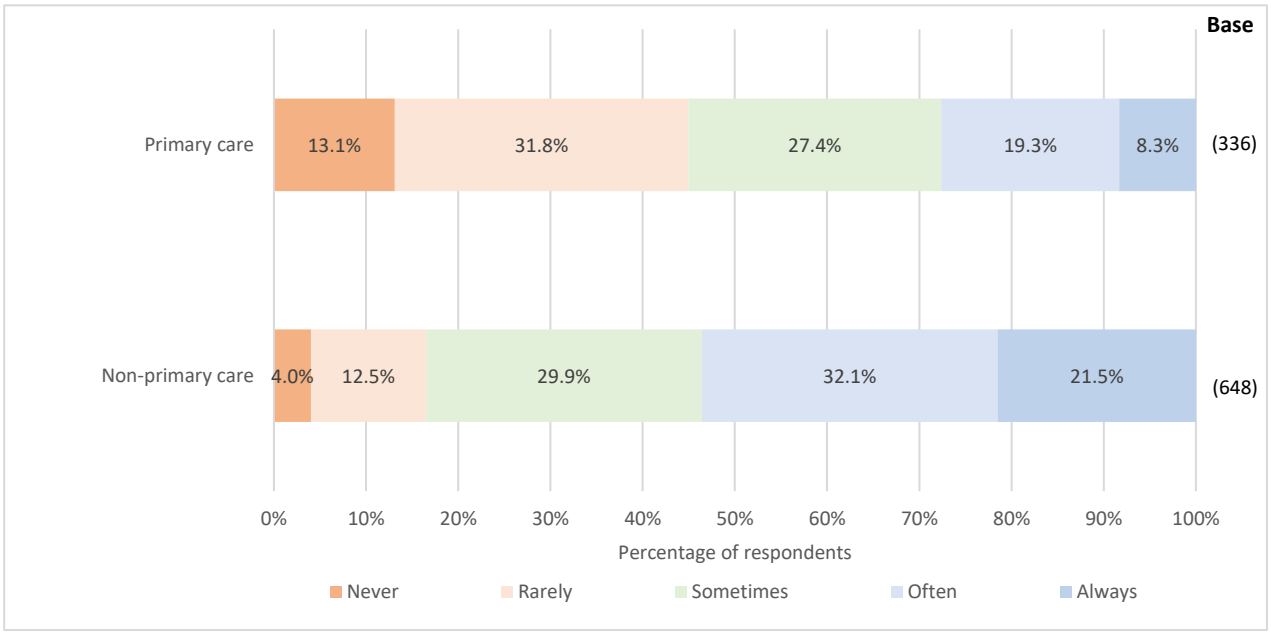
##: very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

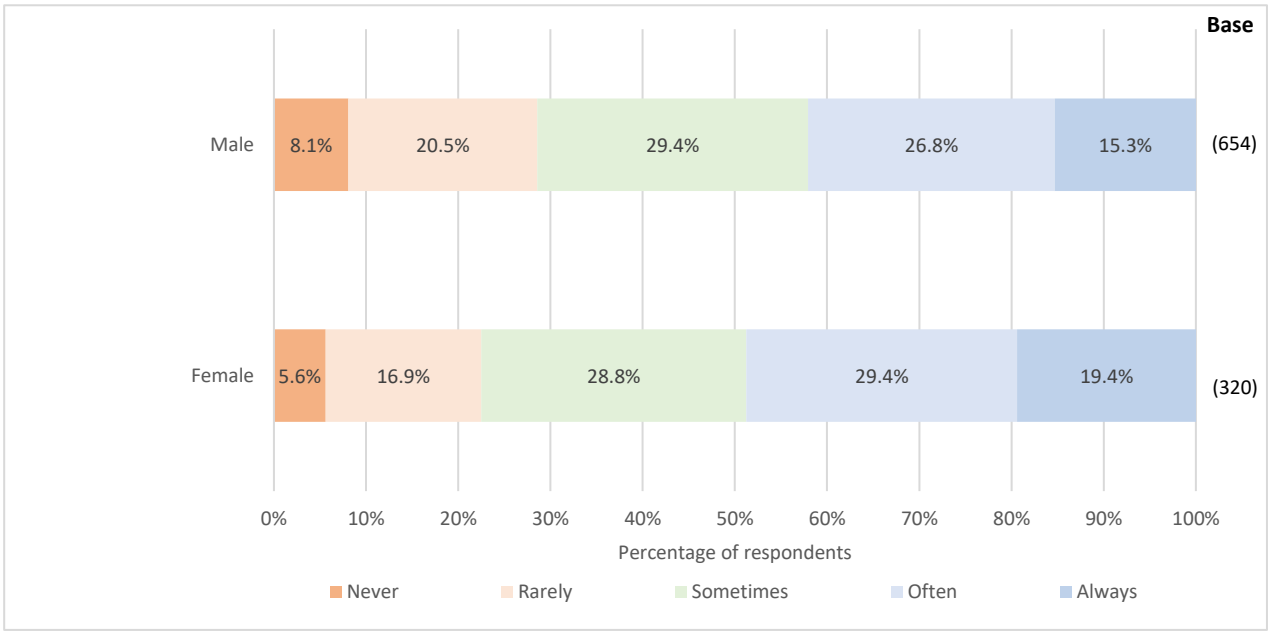
Non-primary care doctors (53.5%) were more prone to “always”/“often” prescribe antibiotics with reference to specialist consultation, as compared to their counterpart in primary care (27.7%). (Chart 105)

Chart 105. Frequency of making decisions on antibiotic prescription with reference to specialist consultation by type of practice (Q5f)



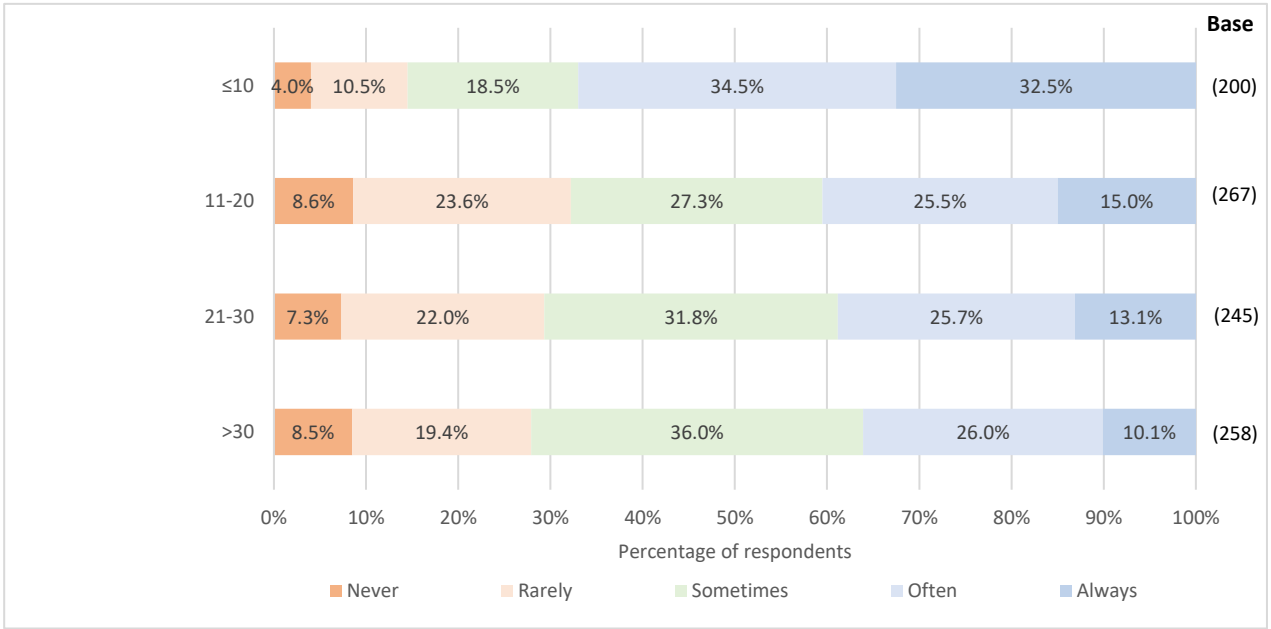
Compared to their male counterparts (42.0%), more female respondents (48.8%) “always”/“often” made decision on antibiotic prescription with reference to specialist consultation. (0)

Chart 106. Frequency of making decisions on antibiotic prescription with reference to specialist consultation by gender (Q5f)



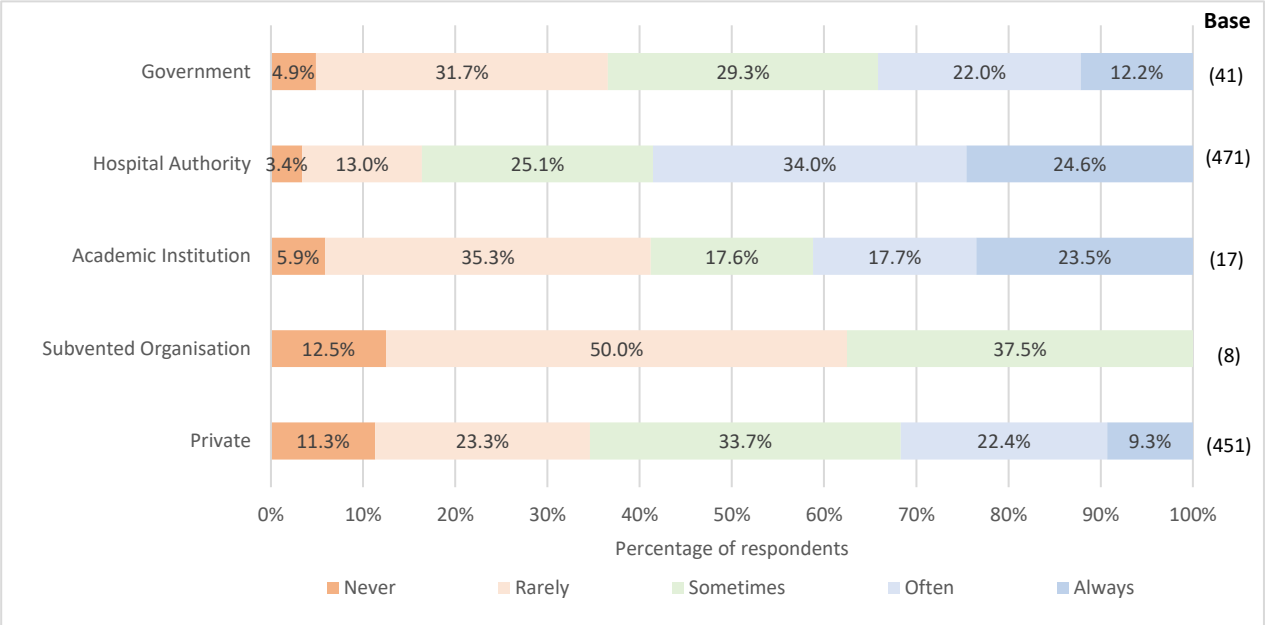
The less experienced, especially those who had practised for ten years or less (67.0%), were more likely to "always"/"often" make decision on antibiotic prescription with reference to specialist consultation. (Chart 107)

Chart 107. Frequency of making decisions on antibiotic prescription with reference to specialist consultation by year of practice (Q5f)



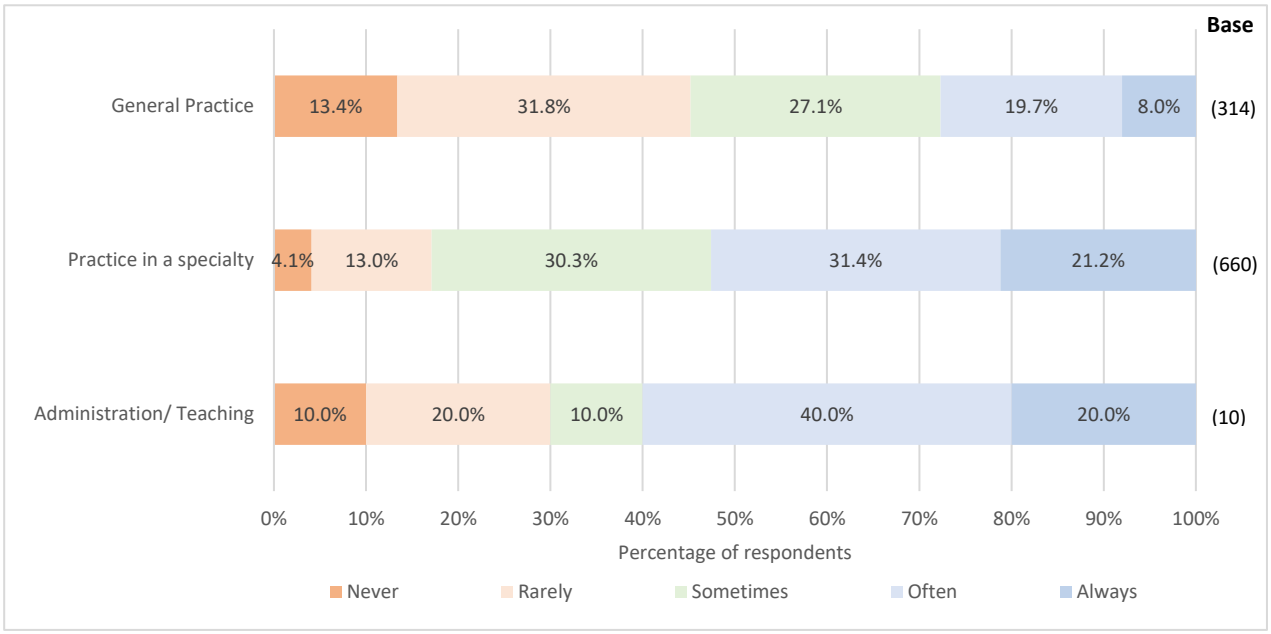
Respondents in the Hospital Authority were more likely (58.6%) to “always”/“often” make decision on antibiotic prescription with reference to specialist consultation, in contrast with those in academic institutions (41.2%) and the government (34.1%). (Chart 108)

Chart 108. Frequency of making decisions on antibiotic prescription with reference to specialist consultation by type of institution (Q5f)



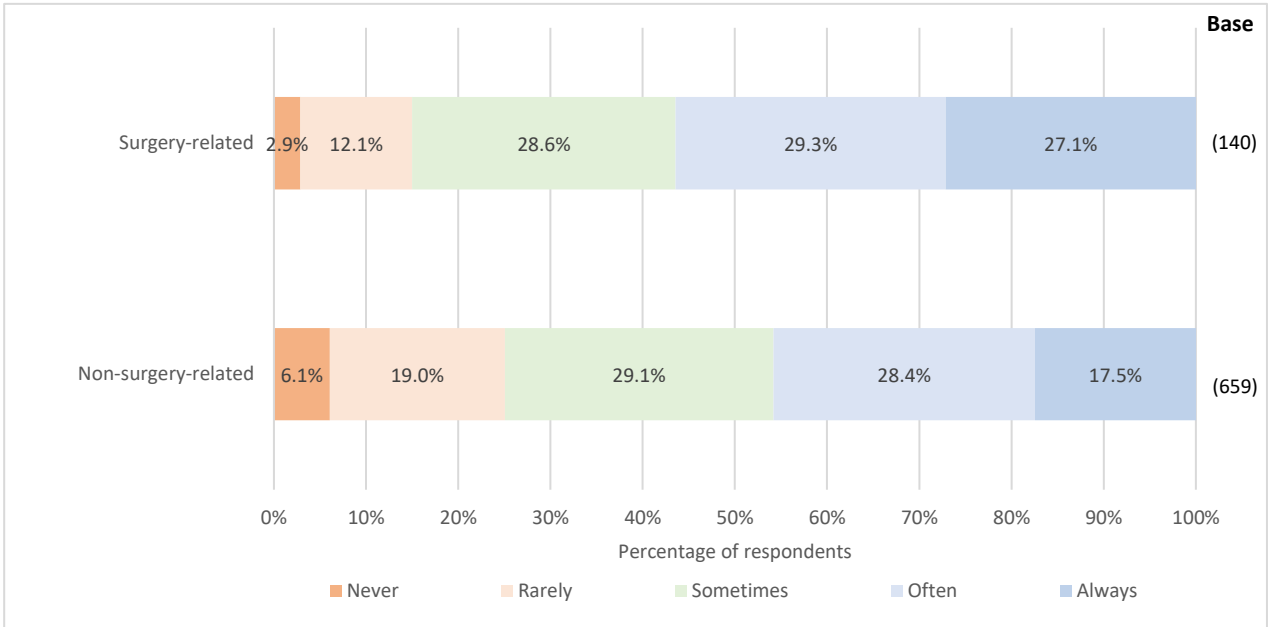
More respondents in administration/teaching areas (60.0%) and practising in a specialty (52.6%) “always”/“often” made decision on antibiotic prescription with reference to specialist consultation, as compared to their counterparts in general practice (27.7%). (0)

Chart 109. Frequency of making decisions on antibiotic prescription with reference to specialist consultation by major field of practice (Q5f)



Respondents from surgery-related specialities (56.4%) were more inclined to "always"/"often" make decision on antibiotic prescription with reference to specialist consultation, compared to non-surgery-related specialities (45.8%). (Chart 110)

Chart 110. Frequency of making decisions on antibiotic prescription with reference to specialist consultation by specialty (Q5f)



Respondents' frequency of making decisions on antibiotic prescription with reference to laboratory test/Point-of-Care test was significantly associated with their type of practice, gender, year of practice, type of institution, major field of practice and speciality. (Table 68)

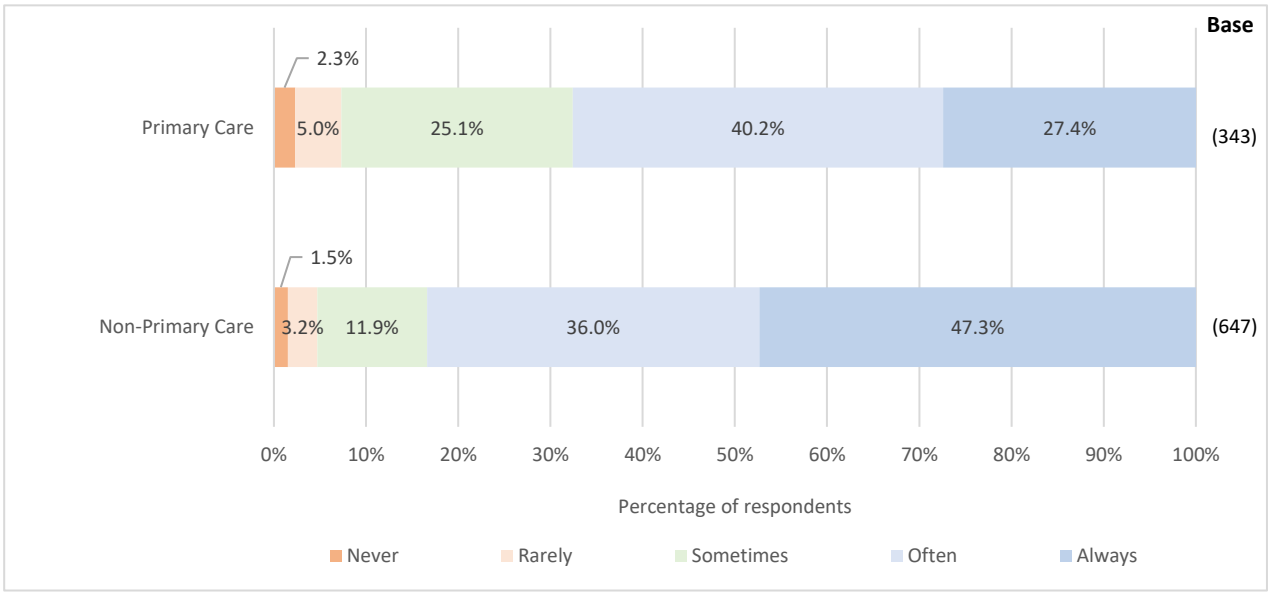
Table 68 Frequency of making decisions on antibiotic prescription with reference to laboratory test/Point-of-Care test (Q5g)

		Respondent count (Row percentage)							
Variable	**Level**	**Base**	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**	**Not applicable**	**p-value**
Type of practice	Primary care	343 (100.0%)	8 (2.3%)	17 (5.0%)	86 (25.1%)	138 (40.2%)	94 (27.4%)	6	<0.005[a]
	Non-primary care	647 (100.0%)	10 (1.5%)	21 (3.2%)	77 (11.9%)	233 (36.0%)	306 (47.3%)	30	
Gender	Male	657 (100.0%)	12 (1.8%)	25 (3.8%)	118 (18.0%)	257 (39.1%)	245 (37.3%)	22	0.02[a]
	Female	323 (100.0%)	7 (2.2%)	12 (3.7%)	43 (13.3%)	114 (35.3%)	147 (45.5%)	14	
Year of practice	≤10	199 (100.0%)	4 (2.0%)	9 (4.5%)	20 (10.1%)	63 (31.7%)	103 (51.8%)	9	<0.005[b]
	11-20	271 (100.0%)	5 (1.8%)	7 (2.6%)	48 (17.7%)	107 (39.5%)	104 (38.4%)	10	
	21-30	246 (100.0%)	7 (2.8%)	10 (4.1%)	40 (16.3%)	95 (38.6%)	94 (38.2%)	8	
	>30	260 (100.0%)	3 (1.2%)	10 (3.8%)	53 (20.4%)	103 (39.6%)	91 (35.0%)	9	
Type of institution	Government	43[#] (100.0%)	1 (2.3%)	1 (2.3%)	10 (23.3%)	17 (39.5%)	14 (32.6%)	6	<0.005[b]
	Hospital Authority	473 (100.0%)	7 (1.5%)	14 (3.0%)	51 (10.8%)	172 (36.4%)	229 (48.4%)	14	
	Academic Institution	16[##] (100.0%)	1 (6.3%)	1 (6.3%)	2 (12.5%)	7 (43.8%)	5 (31.3%)	2	
	Subvented Organisation	9[##] (100.0%)	(-)	(-)	1 (11.1%)	7 (77.8%)	1 (11.1%)	(-)	
	Private Sector	453 (100.0%)	10 (2.2%)	22 (4.9%)	99 (21.9%)	170 (37.5%)	152 (33.6%)	14	
Major field of practice	General Practice	319 (100.0%)	8 (2.5%)	16 (5.0%)	81 (25.4%)	130 (40.8%)	84 (26.3%)	6	<0.005[b]
	Practice in a specialty	662 (100.0%)	9 (1.4%)	21 (3.2%)	80 (12.1%)	237 (35.8%)	315 (47.6%)	25	
	Administration/ Teaching	9[##] (100.0%)	1 (11.1%)	1 (11.1%)	2 (22.2%)	4 (44.4%)	1 (11.1%)	5	
Specialty	Surgery-related	138 (100.0%)	1 (0.7%)	2 (1.4%)	12 (8.7%)	52 (37.7%)	71 (51.4%)	2	0.01[a]
	Non-surgery-related	662 (100.0%)	12 (1.8%)	27 (4.1%)	101 (15.3%)	247 (37.3%)	275 (41.5%)	29	

#: small sample size (<50)
##: very small sample size (<30)
a: Mann-Whitney U Test
b: Kruskal-Wallis Test

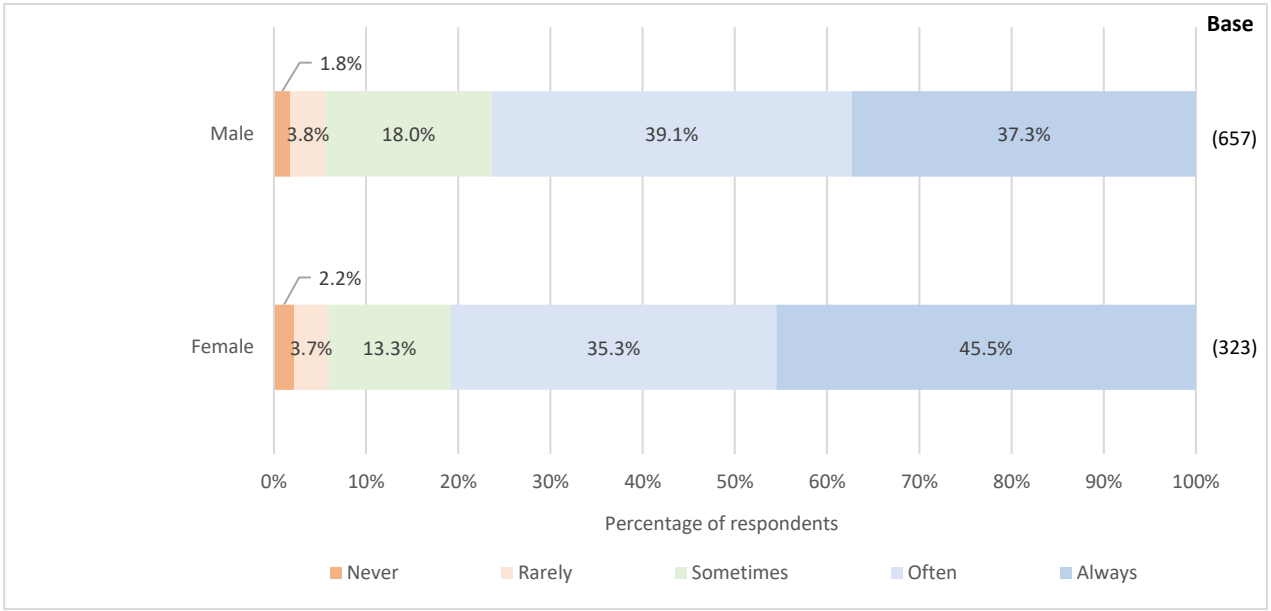
Significantly more respondents who were non-primary care doctors "always" (47.3%) made reference to laboratory test/Point-of-Care test when prescribing antibiotics, as compared to their counterpart in primary care (27.4%). (Chart 111)

Chart 111. Frequency of making decisions on antibiotic prescription with reference to laboratory test/Point-of-Care test by type of practice (Q5g)



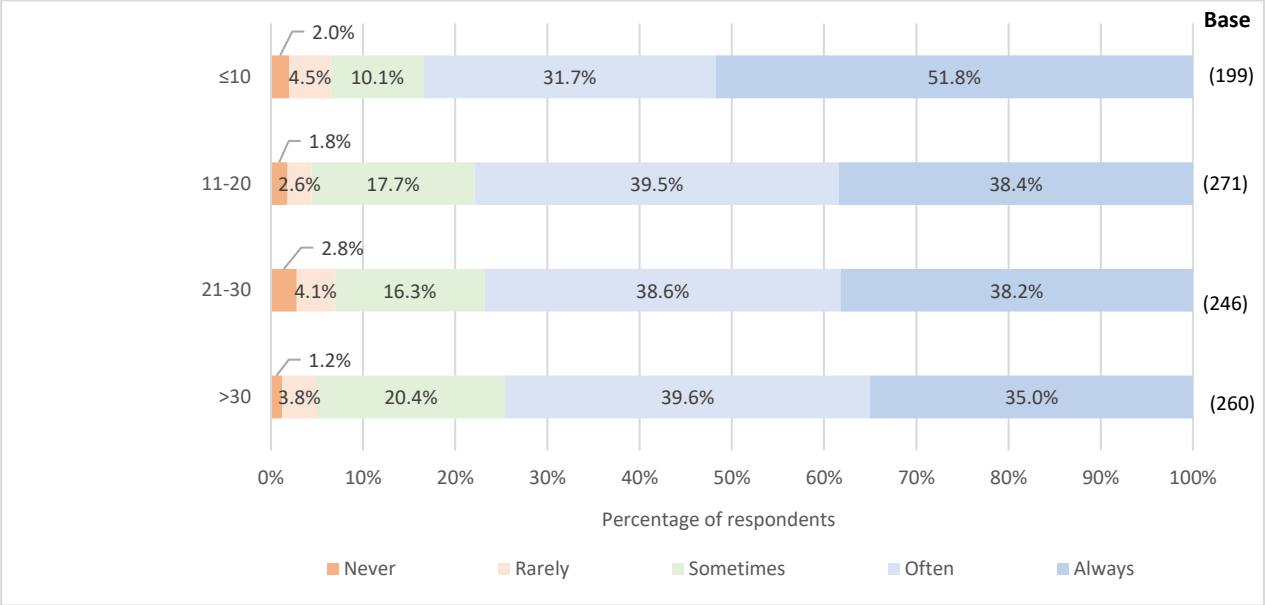
Compared to their male counterparts (37.3%), more female respondents (45.5%) "always" made reference to laboratory test/Point-of-Care test when prescribing antibiotics. (Chart 112)

Chart 112. Frequency of making decisions on antibiotic prescription with reference to laboratory test/Point-of-Care test by gender (Q5g)



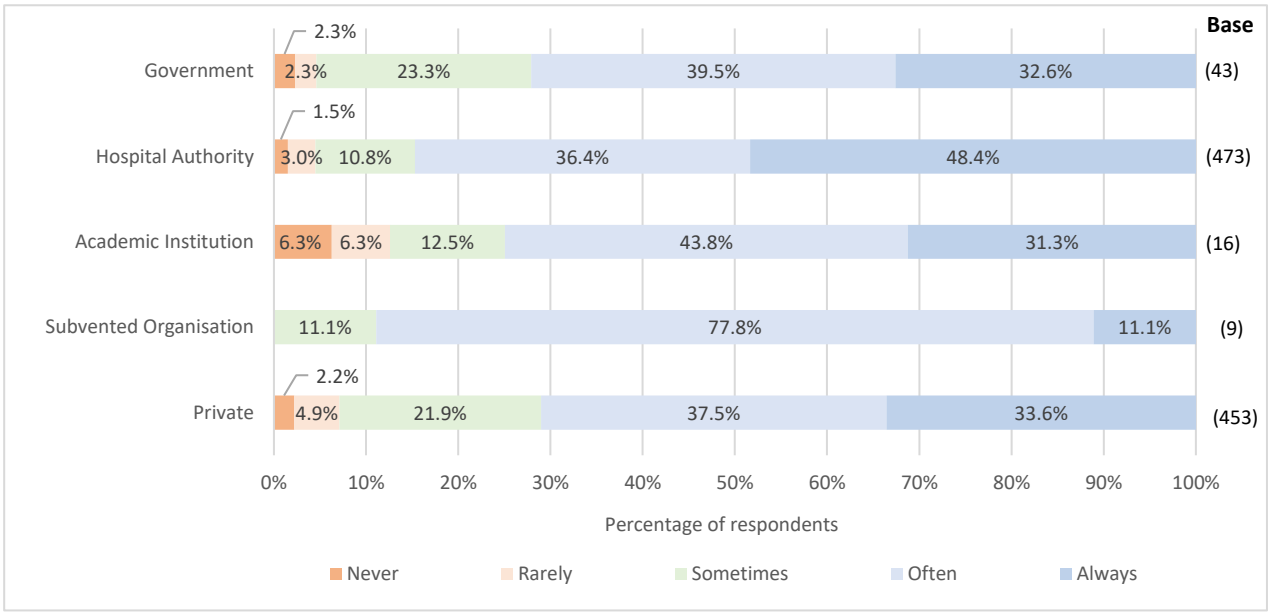
The less experienced, especially those who had practised for ten years or less (51.8%), were more likely to “always” make reference to laboratory test/Point-of-Care test in making decisions on antibiotic prescription. (Chart 113)

Chart 113. Frequency of making decisions on antibiotic prescription with reference to laboratory test/Point-of-Care test by year of practice (Q5g)



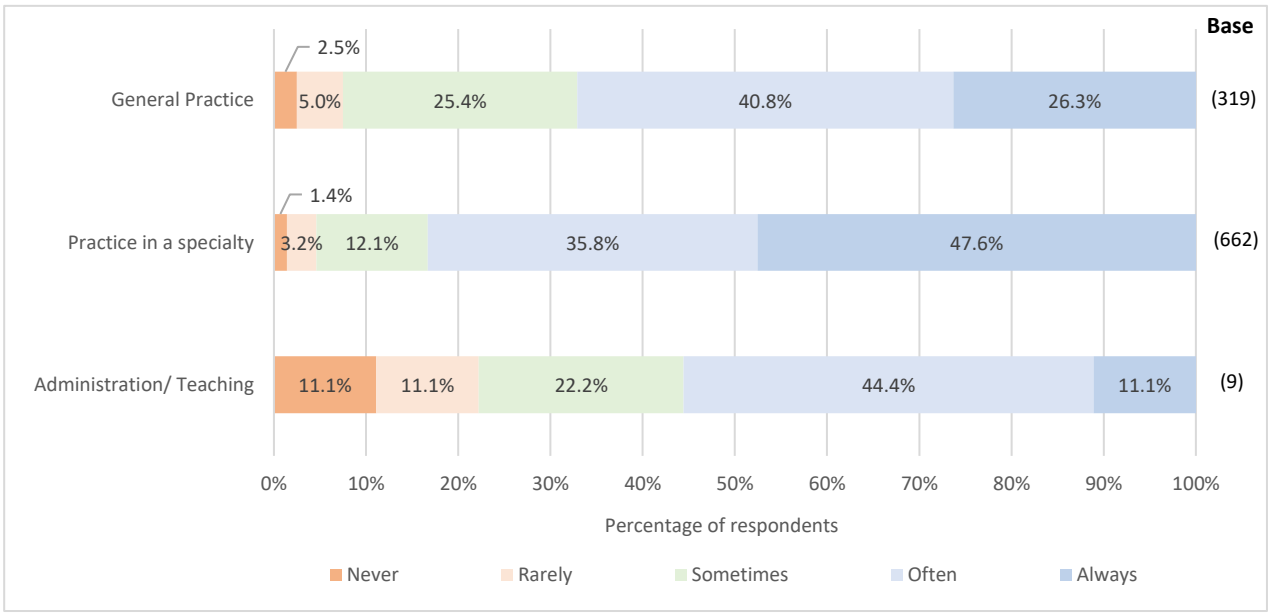
Respondents in the Hospital Authority were more likely (48.4%) to “always” make reference to laboratory test/Point-of-Care test in making decisions on antibiotic prescription, followed by those in private sector (33.6%) and the government (32.6%). (0)

Chart 114. Frequency of making decisions on antibiotic prescription with reference to laboratory test/Point-of-Care test by type of institution (Q5g)



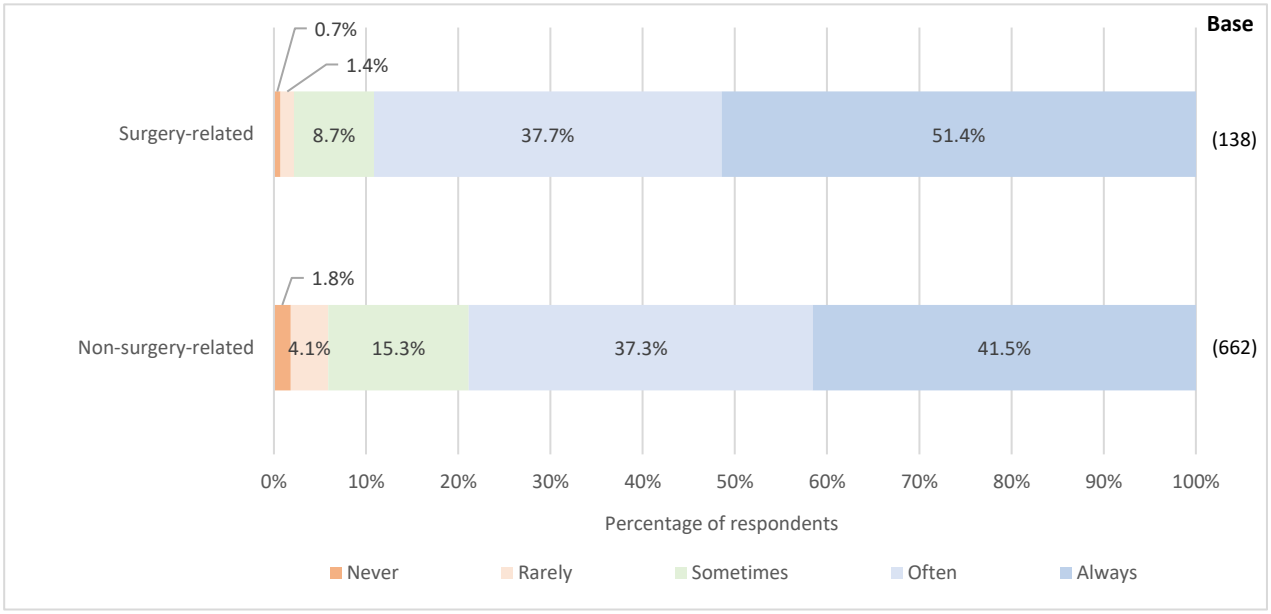
More respondents practising in a specialty (47.6%) "always" made reference to laboratory test/Point-of-Care test when making decisions on antibiotic prescription, as compared to respondents in general practice (26.3%) and in administration/teaching areas (11.1%). (Chart 115)

Chart 115. Frequency of making decisions on antibiotic prescription with reference to laboratory test/Point-of-Care test by major field of practice (Q5g)



Respondents from surgery-related specialities were more inclined to "always"/"often" make reference to laboratory test/Point-of-Care test (89.1%), compared to non-surgery-related specialities (78.9%). (Chart 116)

Chart 116. Frequency of making decisions on antibiotic prescription with reference to laboratory test/Point-of-Care test by specialty (Q5g)



4.4.3 Perceived effectiveness of various tools/reference on improving doctors' knowledge on proper use of antibiotics

Perceived effectiveness of the antibiogram for public and private hospitals, IMPACT guideline and the ASP in primary care/hospital by respondents who were aware of the availability and had ever used the corresponding tools was not significantly associated with any of their demographics.

Perceived effectiveness of CME accredited formal lecture in improving doctors' knowledge on proper use of antibiotics was significantly associated with respondents' type of practice, year of practice, type of institution and major field of practice. (Table 69)

Table 69 Perceived effectiveness of CME accredited formal lecture in improving doctors' knowledge on proper use of antibiotics (Q15a)

		Respondent count (Row percentage)							
Variable	**Level**	**Base**	**Not useful at all**	**Slightly not useful**	**Neutral**	**Slightly useful**	**Very useful**	**Not applicable**	**p-value**
Type of practice	Primary Care	347 (100.0%)	2 (0.6%)	11 (3.2%)	41 (11.8%)	110 (31.7%)	183 (52.7%)	5	<0.005[a]
	Non-Primary Care	665 (100.0%)	11 (1.7%)	37 (5.6%)	139 (20.9%)	258 (38.8%)	220 (33.1%)	13	
Year of practice	≤10	203 (100.0%)	1 (0.5%)	15 (7.4%)	54 (26.6%)	85 (41.9%)	48 (23.6%)	7	<0.005[b]
	11-20	279 (100.0%)	2 (0.7%)	13 (4.7%)	39 (14.0%)	114 (40.9%)	111 (39.8%)	2	
	21-30	249 (100.0%)	6 (2.4%)	8 (3.2%)	36 (14.5%)	87 (34.9%)	112 (45.0%)	7	
	>30	266 (100.0%)	3 (1.1%)	11 (4.1%)	50 (18.8%)	76 (28.6%)	126 (47.4%)	2	
Type of institution	Government	49[#] (100.0%)	(-)	3 (6.1%)	10 (20.4%)	19 (38.8%)	17 (34.7%)	1	<0.005[b]
	Hospital Authority	477 (100.0%)	4 (0.8%)	27 (5.7%)	103 (21.6%)	193 (40.5%)	150 (31.4%)	12	
	Academic Institution	18[##] (100.0%)	(-)	1 (5.6%)	4 (22.2%)	4 (22.2%)	9 (50.0%)	(-)	
	Subvented Organisation	10[##] (100.0%)	(-)	(-)	2 (20.0%)	2 (20.0%)	6 (60.0%)	(-)	
	Private Sector	462 (100.0%)	9 (1.9%)	17 (3.7%)	62 (13.4%)	152 (32.9%)	222 (48.1%)	5	
Major field of practice	General Practice	323 (100.0%)	2 (0.6%)	10 (3.1%)	40 (12.4%)	101 (31.3%)	170 (52.6%)	5	<0.005[b]
	Practice in a specialty	676 (100.0%)	11 (1.6%)	38 (5.6%)	136 (20.1%)	264 (39.1%)	227 (33.6%)	12	
	Administration/ Teaching	13[##] (100.0%)	(-)	(-)	4 (30.8%)	3 (23.1%)	6 (46.2%)	1	

#: small sample size (<50)

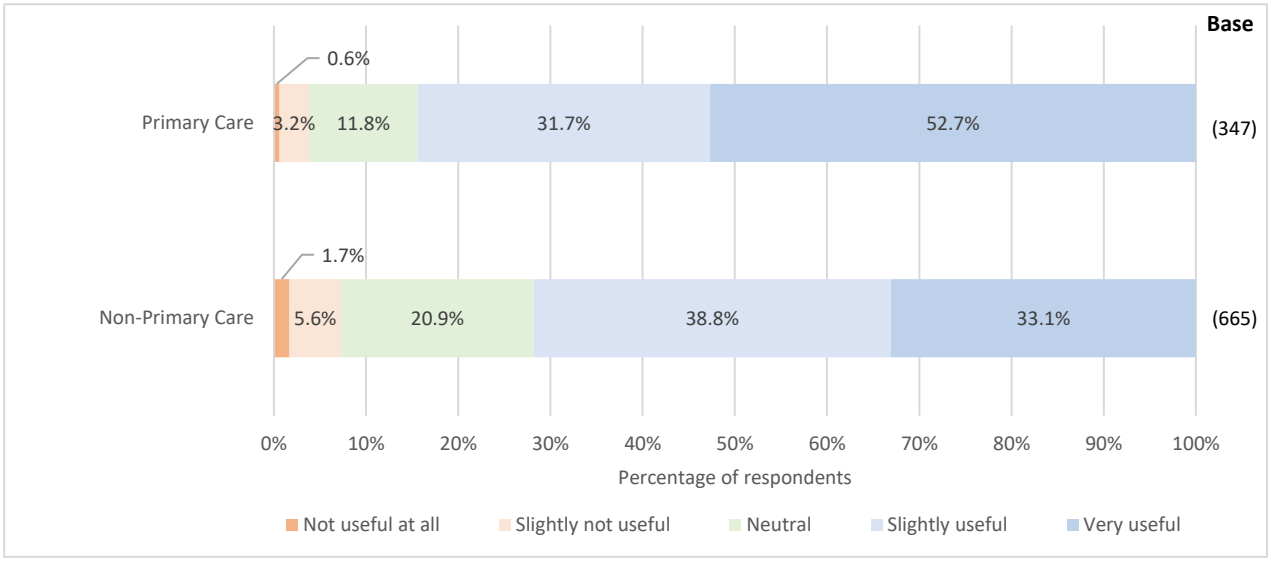
##: very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

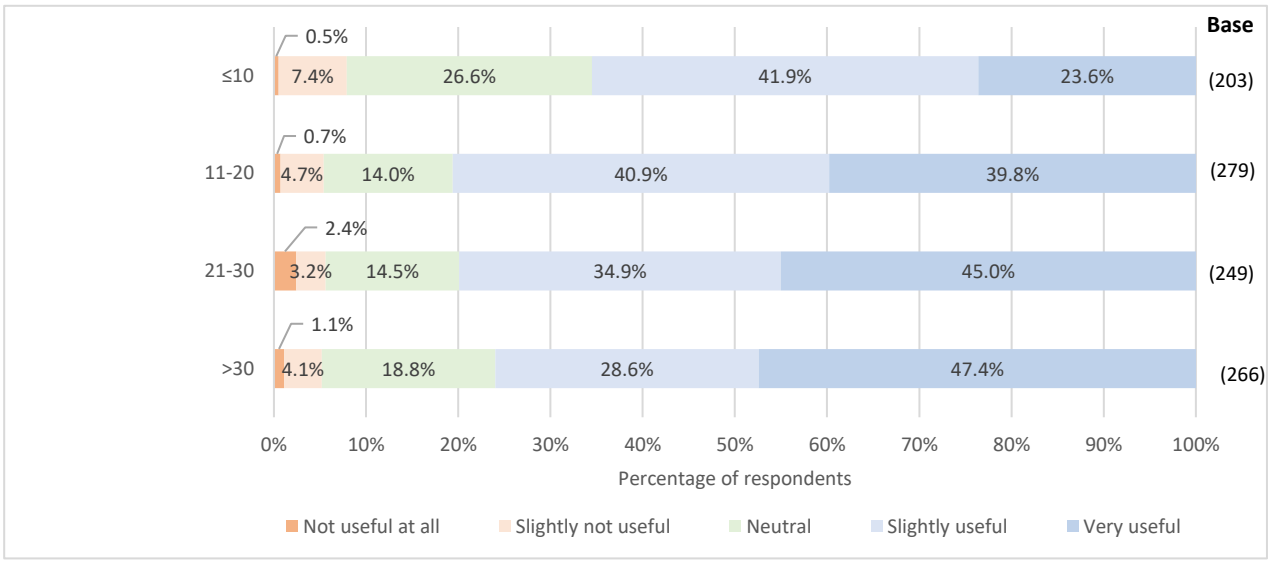
More primary care doctors (84.4%) considered CME accredited formal lectures useful ("very useful"/"slightly useful") to improve doctors' knowledge on proper use of antibiotics, as compared to non-primary care doctors (71.9%). (Chart 117)

Chart 117. Perceived effectiveness of CME accredited formal lecture in improving doctors' knowledge on proper use of antibiotics by type of practice (Q15a)



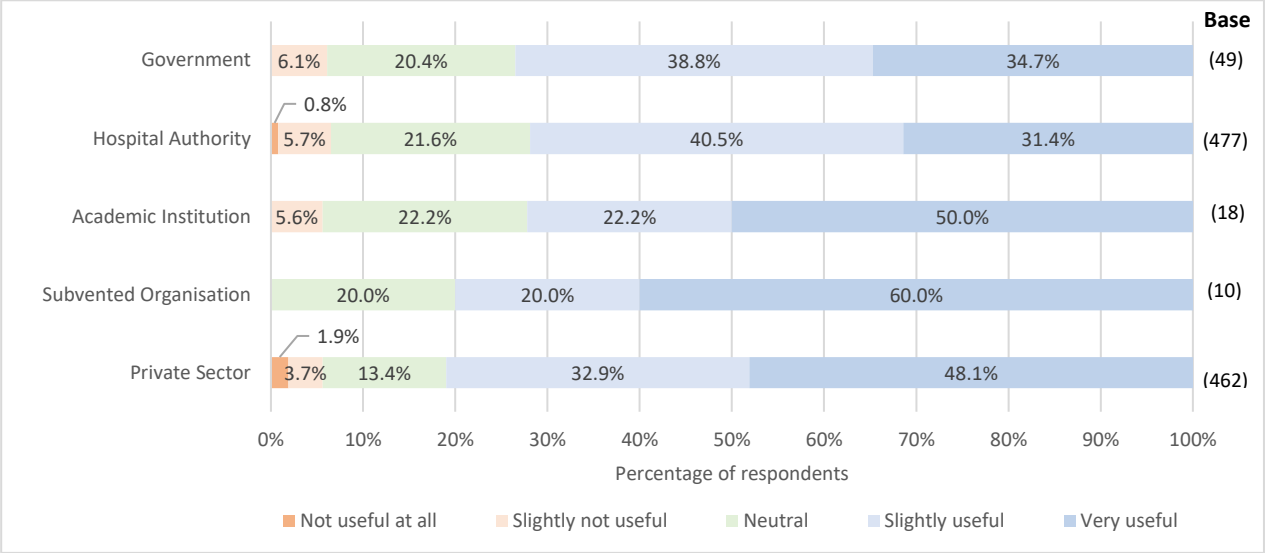
Those who had practised for 11 to 20 years were more likely (80.6%) to consider CME accredited formal lecture useful in improving doctors' knowledge on proper use of antibiotics. (Chart 118)

Chart 118. Perceived effectiveness of CME accredited formal lecture in improving doctors' knowledge on proper use of antibiotics by year of practice (Q15a)



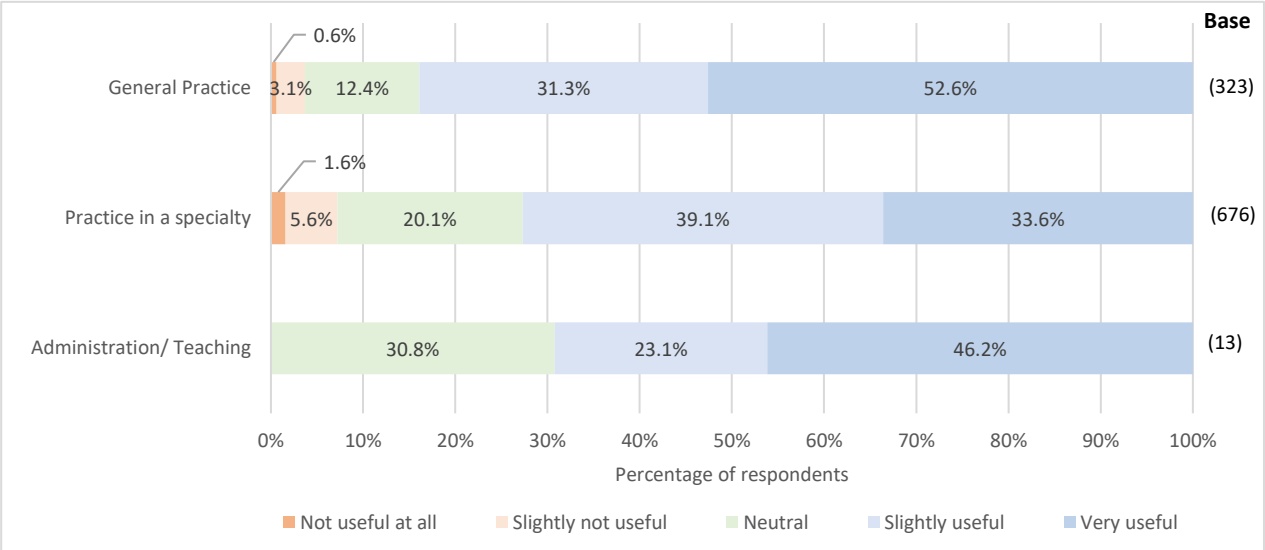
Respondents from the private sector were more likely (81.0%) to consider CME accredited formal lecture useful in improving doctors' knowledge on proper use of antibiotics, followed by subvented organisations (80.0%), and the government (73.5%). (Chart 119)

Chart 119. Perceived effectiveness of CME accredited formal lecture in improving doctors' knowledge on proper use of antibiotics by type of institution (Q15a)



More respondents in general practice (83.9%) considered CME accredited formal lecture useful in improving doctors' knowledge on proper use of antibiotics, as compared to their counterparts in specialty (72.6%), and in administration/teaching areas (69.2%). (Chart 120)

Chart 120. Perceived effectiveness of CME accredited formal lecture in improving doctors' knowledge on proper use of antibiotics by major field of practice (Q15a)



The perceived effectiveness of web/computer-based resources in improving doctors' knowledge on proper use of antibiotics was significantly associated with the respondents' type of practice, type of institution, major field of practice and specialty. (Table 70)

Table 70 Perceived effectiveness of web/computer-based resources in improving doctors' knowledge on proper use of antibiotics (Q15e)

		Respondent count (Row percentage)							
Variable	**Level**	**Base**	**Not useful at all**	**Slightly not useful**	**Neutral**	**Slightly useful**	**Very useful**	**Not applicable**	**p-value**
Type of practice	Primary Care	346 (100.0%)	4 (1.2%)	17 (4.9%)	43 (12.4%)	121 (35.0%)	161 (46.5%)	5	<0.005[a]
	Non-Primary Care	664 (100.0%)	10 (1.5%)	27 (4.1%)	139 (20.9%)	235 (35.4%)	253 (38.1%)	12	
Type of institution	Government	49[#] (100.0%)	(-)	(-)	6 (12.2%)	18 (36.7%)	25 (51.0%)	1	<0.005[b]
	Hospital Authority	483 (100.0%)	6 (1.2%)	20 (4.1%)	100 (20.7%)	191 (39.5%)	166 (34.4%)	5	
	Academic Institution	18[##] (100.0%)	(-)	1 (5.6%)	2 (11.1%)	8 (44.4%)	7 (38.9%)	(-)	
	Subvented Organisation	10[##] (100.0%)	(-)	1 (10.0%)	1 (10.0%)	1 (10.0%)	7 (70.0%)	(-)	
	Private Sector	454 (100.0%)	8 (1.8%)	23 (5.1%)	74 (16.3%)	139 (30.6%)	210 (46.3%)	11	
Major field of practice	General Practice	322 (100.0%)4	4 (1.2%)	15 (4.7%)	40 (12.4%)	110 (34.2%)	153 (47.5%)	5	<0.005[b]
	Practice in a specialty	675 (100.0%)	10 (1.5%)	29 (4.3%)	141 (20.9%)	243 (36.0%)	252 (37.3%)	11	
	Administration/ Teaching	13[##] (100.0%)	(-)	(-)	1 (7.7%)	3 (23.1%)	9 (69.2%)	1	
Specialty	Surgery-related	136 (100.0%)	2 (1.5%)	7 (5.1%)	35 (25.7%)	46 (33.8%)	46 (33.8%)	2	0.03[a]
	Non-surgery-related	681 (100.0%)	9 (1.3%)	28 (4.1%)	117 (17.2%)	250 (36.7%)	277 (40.7%)	12	

#: small sample size (<50)

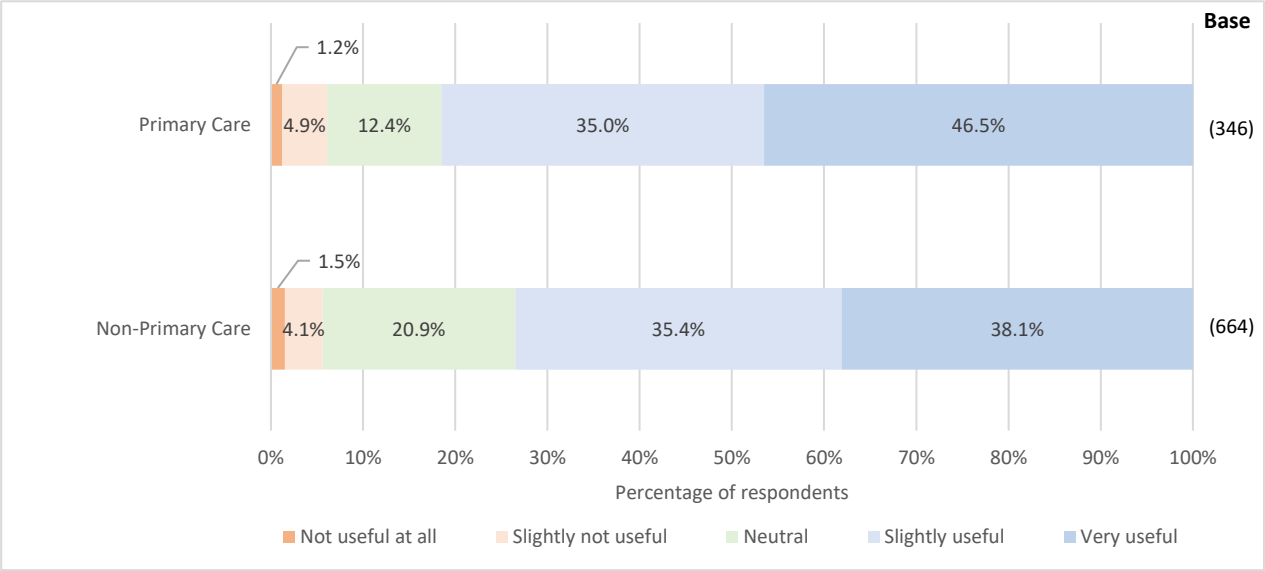
##: very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

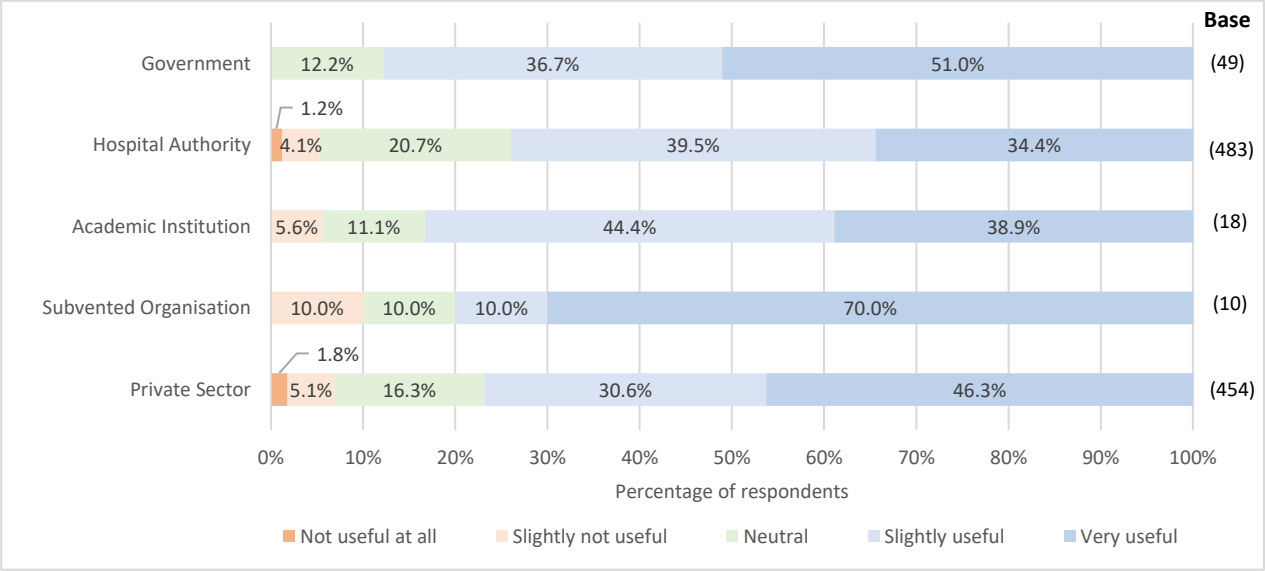
More primary care doctors (81.5%) considered web/computer-based resources useful ("very useful"/"slightly useful") to improve doctors' knowledge on proper use of antibiotics, as compared to non-primary care doctors (73.5%). (0)

Chart 121. Perceived effectiveness of web/computer-based resources in improving doctors' knowledge on proper use of antibiotics by type of practice (Q15e)



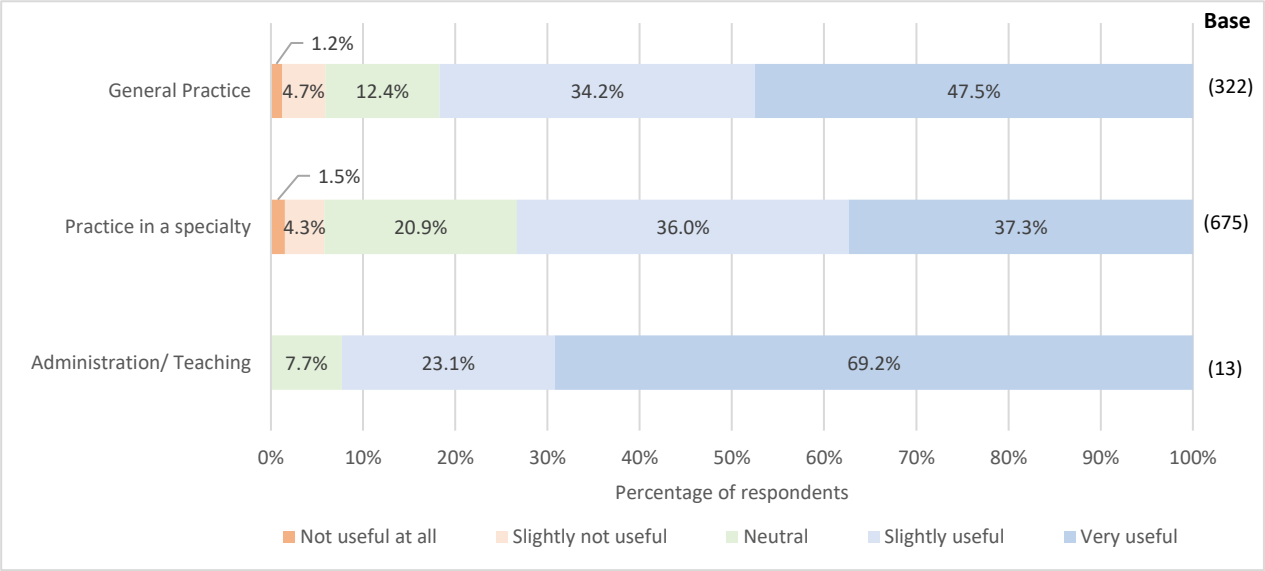
Respondents in the government were more likely (87.8%) to consider web/computer-based resources useful ("very useful"/"useful") in improving doctors' knowledge on proper use of antibiotics, followed by academic institutions (83.3%) and subvented organisations (80.0%). (Chart 122)

Chart 122. Perceived effectiveness of web/computer-based resources in improving doctors' knowledge on proper use of antibiotics by type of institution(Q15e)



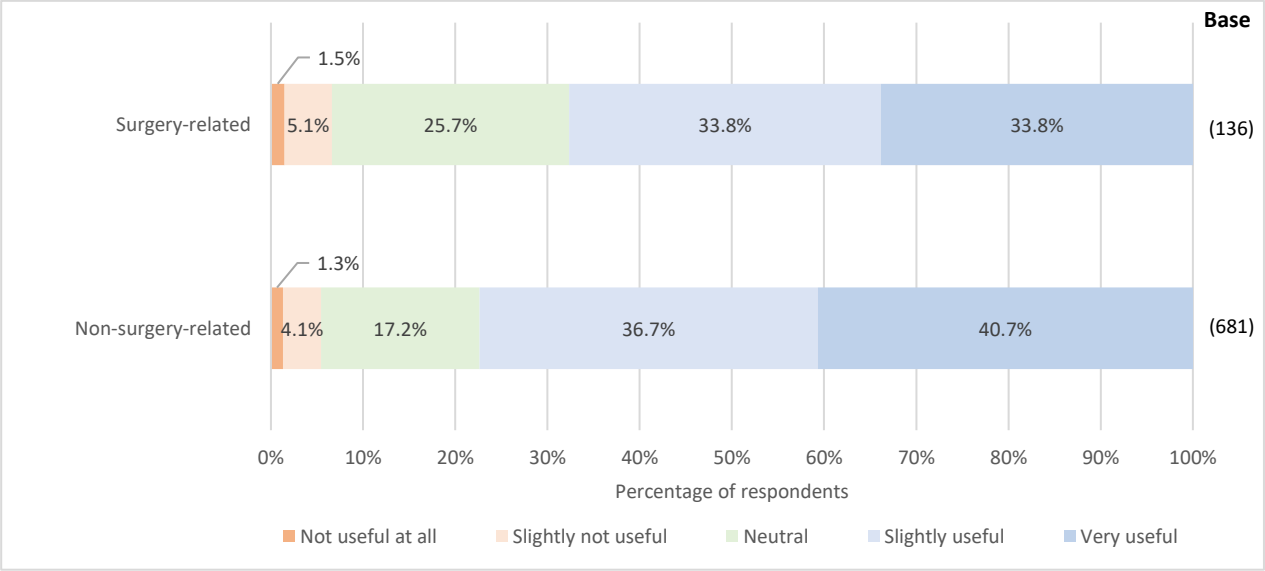
More respondents in administration/teaching areas (92.3%) and in general practice (81.7%) considered web/computer-based resources useful ("very useful"/"useful") to improve doctors' knowledge on proper use of antibiotics, as compared to their counterparts in specialty (73.3%). (Chart 123)

Chart 123. Perceived effectiveness of web/computer-based resources in improving doctors' knowledge on proper use of antibiotics by major field of practice (Q15e)



Respondents from non-surgery-related specialities were more inclined (77.4%) to consider web/computer-based resources useful ("very useful"/"useful") to improve doctors' knowledge on proper use of antibiotics, compared to surgery-related specialities (67.6%). (Chart 124)

Chart 124. Perceived effectiveness of web/computer-based resources in improving doctors' knowledge on proper use of antibiotics by specialty (Q15e)



The perceived effectiveness of infection disease specialist/microbiologist consultation in improving doctors' knowledge on proper use of antibiotics was significantly associated with the respondents' type of practice, gender, year of practice, type of institution, major field of practice and specialty. (Table 71)

Table 71 Perceived effectiveness of infectious disease specialist/microbiologist consultation in improving doctors' knowledge on proper use of antibiotics (Q15f)

		Respondent count (Row percentage)							
Variable	**Level**	**Base**	**Not useful at all**	**Slightly not useful**	**Neutral**	**Slightly useful**	**Very useful**	**Not applicable**	**p-value**
Type of practice	Primary Care	327 (100.0%)	10 (3.1%)	46 (14.1%)	76 (23.2%)	98 (30.0%)	97 (29.7%)	25	<0.005[a]
	Non-Primary Care	665 (100.0%)	4 (0.6%)	23 (3.5%)	87 (13.1%)	191 (28.7%)	360 (54.1%)	11	
Gender	Male	663 (100.0%)	12 (1.8%)	54 (8.1%)	119 (17.9%)	188 (28.4%)	290 (43.7%)	15	<0.005[a]
	Female	319 (100.0%)	1 (0.3%)	16 (5.0%)	43 (13.5%)	98 (30.7%)	161 (50.5%)	21	
Year of practice	≤10	202 (100.0%)	1 (0.5%)	9 (4.5%)	19 (9.4%)	57 (28.2%)	116 (57.4%)	8	<0.005[b]
	11-20	270 (100.0%)	2 (0.7%)	25 (9.3%)	41 (15.2%)	89 (33.0%)	113 (41.9%)	11	
	21-30	248 (100.0%)	7 (2.8%)	20 (8.1%)	42 (16.9%)	68 (27.4%)	111 (44.8%)	8	
	>30	258 (100.0%)	3 (1.2%)	16 (6.2%)	59 (22.9%)	72 (27.9%)	108 (41.9%)	9	
Type of institution	Government	48[#] (100.0%)	(-)	3 (6.3%)	9 (18.8%)	18 (37.5%)	18 (37.5%)	2	<0.005[b]
	Hospital Authority	481 (100.0%)	3 (0.6%)	23 (4.8%)	47 (9.8%)	145 (30.1%)	263 (54.7%)	8	
	Academic Institution	16[##] (100.0%)	(-)	1 (6.3)	1 (6.3%)	4 (25.0%)	10 (62.5%)	2	
	Subvented Organisation	8[##] (100.0%)	1 (12.5%)	1 (12.5%)	1 (12.5%)	1 (12.5%)	4 (50.0%)	2	
	Private Sector	443 (100.0%)	10 (2.3%)	42 (9.5%)	105 (23.7%)	123 (27.8%)	163 (36.8%)	22	
Major field of practice	General Practice	305 (100.0%)	9 (3.0%)	43 (14.1%)	73 (23.9%)	90 (29.5%)	90 (29.5%)	23	<0.005[b]
	Practice in a specialty	674 (100.0%)	5 (0.7%)	26 (3.9%)	89 (13.2%)	195 (28.9%)	359 (53.3%)	12	
	Administration/ Teaching	13[##] (100.0%)	(-)	(-)	1 (7.7%)	4 (30.8%)	8 (61.5%)	1	
Specialty	Surgery-related	137 (100.0%)	1 (0.7%)	2 (1.5%)	20 (14.6%)	30 (21.9%)	84 (61.3%)	2	<0.005[a]
	Non-surgery-related	675 (100.0%)	7 (1.0%)	45 (6.7%)	103 (15.3%)	204 (30.2%)	316 (46.8%)	17	

#: very small sample size (<50)

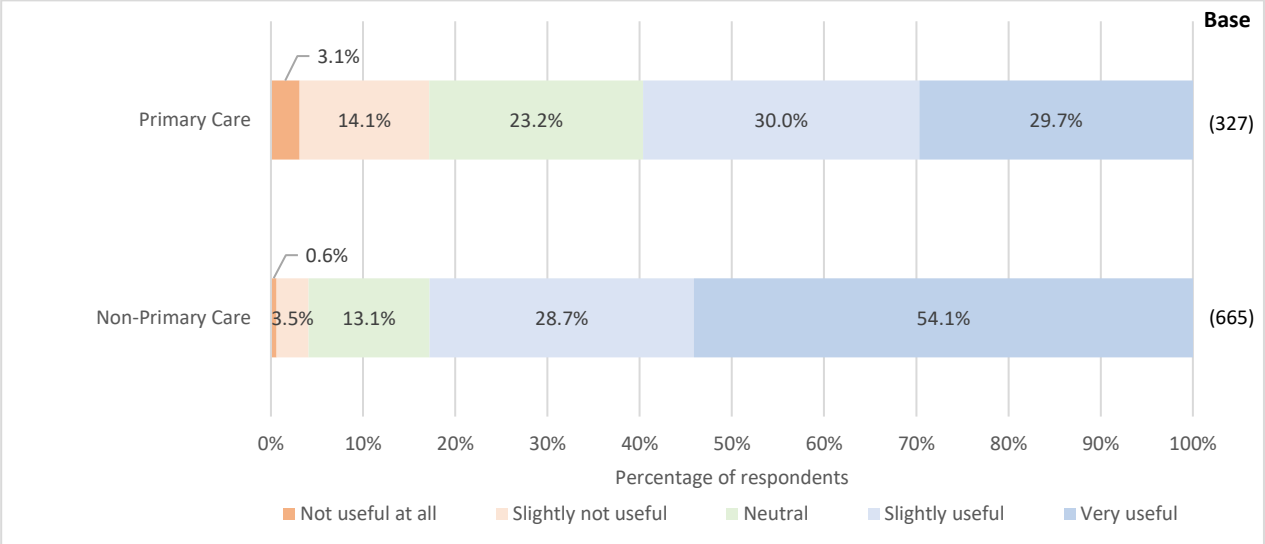
##: very small sample size (<30)

a: Mann-Whitney U Test

b: Kruskal-Wallis Test

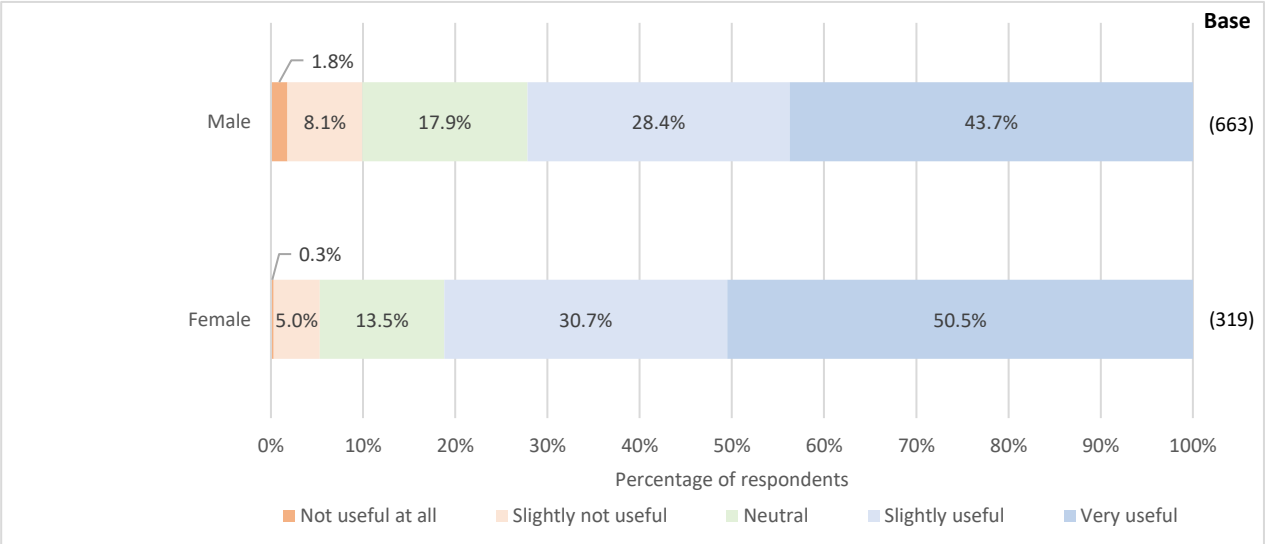
More non-primary care doctors (82.9%) regarded infectious disease specialist/microbiologist consultation useful ("very useful"/"slightly useful") to improve doctors' knowledge on proper use of antibiotics, as compared to primary care doctors (59.6%). (Chart 125)

Chart 125. Perceived effectiveness of infectious disease specialist/microbiologist consultation in improving doctors' knowledge on proper use of antibiotics by type of practice (Q15f)



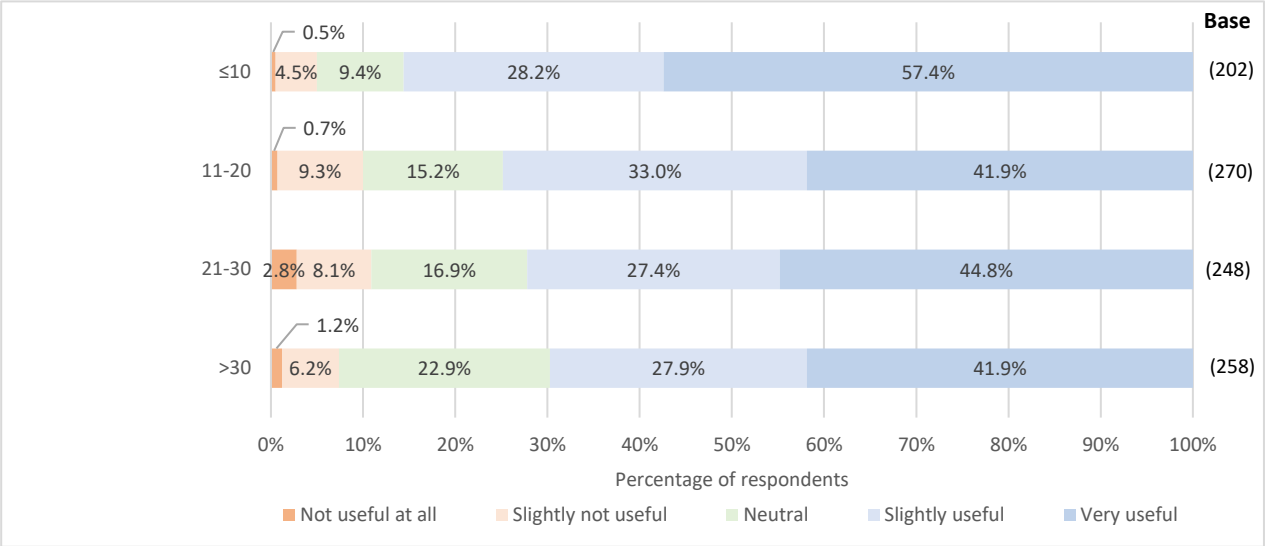
Compared to their male counterparts (72.1%), more female respondents (81.2%) considered infectious disease specialist/microbiologist consultation useful ("very useful"/"slightly useful") to improve doctors' knowledge on proper use of antibiotics. (Chart 126)

Chart 126. Perceived effectiveness of infectious disease specialist/microbiologist consultation in improving doctors' knowledge on proper use of antibiotics by gender (Q15f)



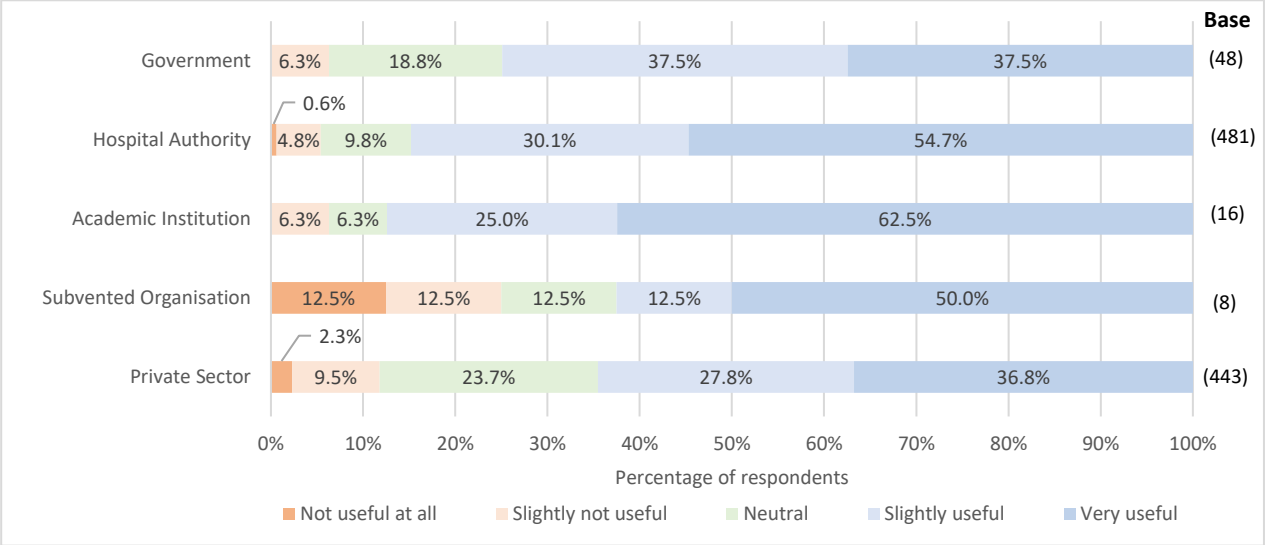
The less experienced, especially those who had practised for ten years or less (85.6%), were more likely to consider infectious disease specialist/microbiologist consultation useful ("very useful"/"slightly useful") to improve doctors' knowledge on proper use of antibiotics. (Chart 127)

Chart 127. Perceived effectiveness of infectious disease specialist/microbiologist consultation in improving doctors' knowledge on proper use of antibiotics by year of practice (Q15f)



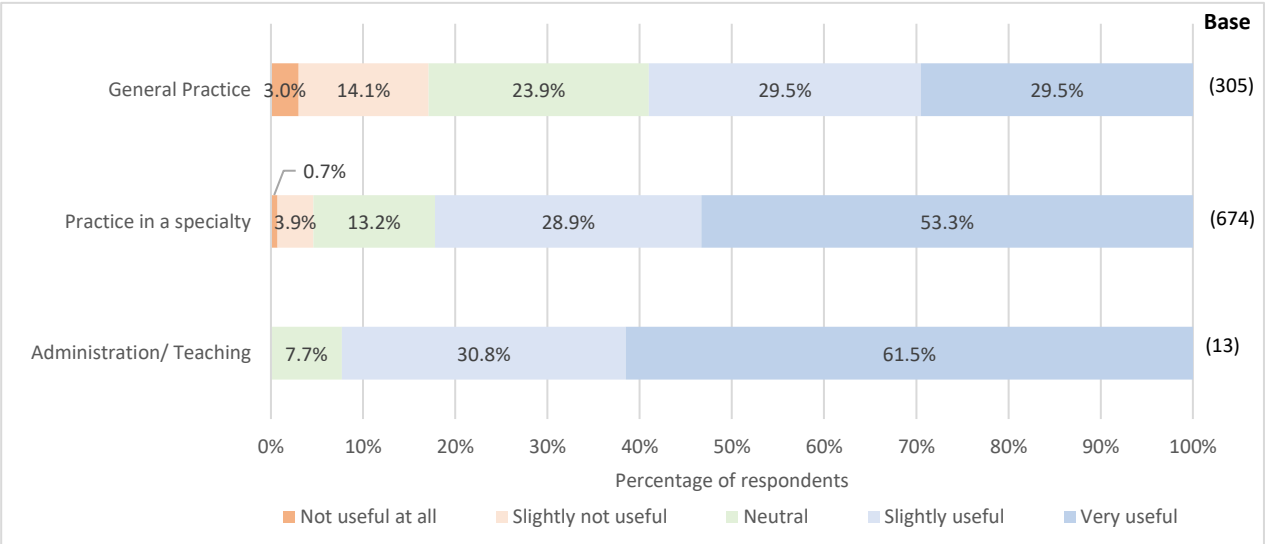
More respondents working in academic institutions (87.5%) regarded infectious disease specialist/microbiologist consultation useful ("very useful"/"slightly useful") to improve doctors' knowledge on proper use of antibiotics, compared to about two-thirds of respondents working in the private sector (64.6%) and in subvented organisations (62.5%). (0)

Chart 128. Perceived effectiveness of infectious disease specialist/microbiologist consultation in improving doctors' knowledge on proper use of antibiotics by type of institution (Q15f)



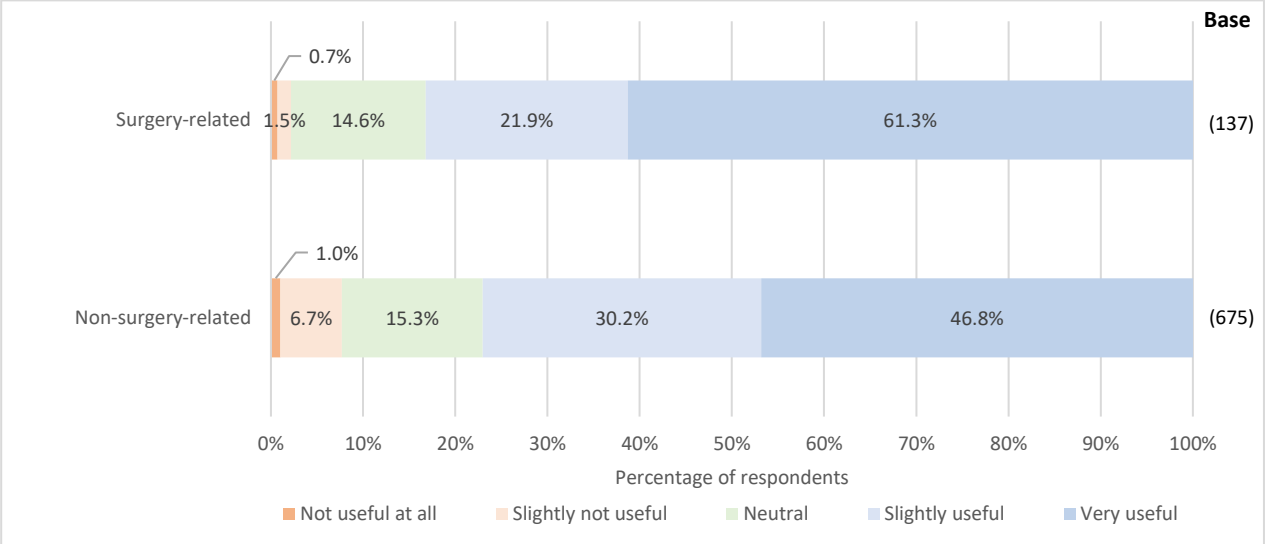
Respondents who were practising in administration/teaching areas were more inclined (92.3%) to consider infectious disease specialist/microbiologist consultation useful ("very useful"/"slightly useful") to improve doctors' knowledge on proper use of antibiotics, as compared to respondents who were in general practice (59.0%). (Chart 129)

Chart 129. Perceived effectiveness of infectious disease specialist/microbiologist consultation in improving doctors' knowledge on proper use of antibiotics by major field of practice (Q15f)



Respondents from surgery-related specialities were more inclined (83.2%) to consider infectious disease specialist/microbiologist consultation useful ("very useful"/"slightly useful") to improve doctors' knowledge on proper use of antibiotics, compared to non-surgery-related specialities (77.0%). (Chart 130)

Chart 130. Perceived effectiveness of infectious disease specialist/microbiologist consultation in improving doctors' knowledge on proper use of antibiotics by specialty (Q15f)



CHAPTER 5. Conclusions and Recommendations

5.1 Conclusions

This study revealed that

(a) Majority (over 97%) of medical practitioners enumerated were aware that AMR could lead to reduced treatment options, increased treatment cost, increased mortality and increased length of hospital stay. Medical practitioners practised for 30 years or more were comparatively less aware of the increased mortality.

(b) Majority of respondents considered AMR severe worldwide (70.1%) and in Hong Kong (65.1%). However, relatively less respondents in the private sector and with longer year of practice considered it an important problem both worldwide and in Hong Kong.

(c) Majority of respondents considered the following important ("very important"/"slightly important") drivers of AMR:

- patients' self-medication with antibiotics (83.3%), especially among female respondents and those in general practice;
- inappropriate choice of drug (83.0%), especially among doctors with fewer years of practice, working in academic institutions and administration/teaching areas.

(d) Over 80% of respondents were confident in interpreting antibiotic susceptibility test results (85.6%) and knowing when to start antibiotic therapy (81.4%). Around seven in ten respondents were confident in choosing the correct drug and dosage (76.8%), educating patient on the proper use of antibiotics (74.5%), determining the right treatment duration (73.1%), differentiating broad-spectrum antibiotics from narrow-spectrum antibiotics and avoiding their unnecessary use (71.5%) and de-escalating antibiotic therapy according to clinical evaluation and diagnostic test results (68.6%). Comparatively fewer doctors (especially females, those in general practice, and those practising non-surgery related specialties) were confident in de-escalating antibiotic therapy and differentiating broad-spectrum antibiotics.

(e) Nearly half (43.9%) of respondents prescribed antibiotics in less than ten percent of all consultations. Slightly more than half (56.8%) of the medical practitioners prescribed antibiotics for cold/flu/URTI in a frequency of less than five percent. Being female, practising for 11 to 20 years, working in the

government, and practising surgery-related specialties were associated with less frequent prescription of antibiotics for cold/flu/URTI.

(f) More than half (59.4%) of the respondents were “always”/“often”/“sometimes” requested by patients for antibiotics for cold/flu/URTI, especially among male doctors, and those in general practice. Despite this, majority (83.0%) of all respondents "rarely"/"never" prescribed antibiotics whenever patients requested.

(g) “Uncertain clinical diagnosis” was considered by the highest proportion (56.0%) of respondents to be an important (“very important”/“slightly important”) reason for unindicated antibiotic prescription, followed by “expectation or request of antibiotics by patients or carers” (23.8%) and “cannot ensure return of patient for follow up” (17.7%).

(h) The frequency of prescribing antibiotics for uncomplicated URTI whenever patients requested was significantly associated with the perceived importance of reasons for unindicated antibiotic prescription including patients/carers’ expectation or request, being unable to ensure the return of patient for follow up, no time to explain why not indicated and fear of patient’s litigation. Among those reported "always"/"often"/"sometimes" prescribed antibiotics for uncomplicated URTI whenever patient requested, 30.9% and 26.9% considered “expectation/request of antibiotics by patients or carers” and “fear of patient’s litigation” respectively as important reasons accounting for unindicated antibiotic prescription and these proportions were significantly lower among those reported “rarely”/“never” (less than 25% and 15% respectively).

(i) One in five respondents (21.1%) “always”/“often” used Point-of-Care test to guide antibiotic prescription when treating patients with uncomplicated URTI, with relatively more respondents in the private sector (24.5%) adopting such practice.

(j) Majority (86.8%) of respondents “always”/“often” reminded their patients to complete course of the antibiotics as prescribed, especially female doctors, those with longer year of practice, working in the government and the field of general practice. Slightly more than half (58.1%) of respondents “always”/“often” explained to patients that improper use of antibiotics would increase AMR, especially among those with longer year of practice, working in the private sector, and those in general practice.

(k) However, less than four in ten respondents (38.4%) “always”/“often” re-assessed patients’ antibiotic regimen after 48 to 72 hours of starting treatment. Male doctors, those working in academic institutions, those practising in a specialty, especially surgery-related, were more inclined to practice this more frequently.

(l) Majority (71.9%) of respondents considered themselves adequately trained on antibiotic use. Male gender, longer duration of practice and working in academic institutions were found to be factors associated with perceived adequately trained on antibiotic use.

(m) All three selected tools were known by the majority of respondents:

- IMPACT guideline (78.7%), especially among those with fewer years of practice, working in the Hospital Authority, and practising in a specialty.
- Antibiogram for public and private hospitals (68.2%), especially among doctors working in academic institutions and administration/teaching areas.
- ASP in Primary Care/Hospital (64.4%), especially among doctors working in academic institutions.

(n) Most respondents who were aware of the corresponding tools “always”/“often”/“sometimes” used IMPACT guideline (78.2%), followed by antibiogram for public and private hospitals (72.2%), and ASP in Primary Care/Hospital (71.2%). The frequency of use of the tools by relevant respondents was not significantly associated with any of their demographics.

(o) Most respondents who were aware of and had ever used the corresponding tools considered IMPACT guideline (78.5%) useful in improving doctors’ knowledge on proper use of antibiotics, followed by antibiogram for public and private hospitals (78.1%), and ASP in Primary Care/Hospital (72.0%). Effectiveness of the tools perceived by relevant respondents was also not significantly associated with any of their demographics.

(p) Besides using the above tools, respondents “always”/“often” made decision on antibiotic prescription with reference to:

- laboratory test/Point-of-Care test (77.9%) especially among females, those with fewer years of practice, working in subvented organisations, practising in a specialty and surgery related

specialties;

- suggestions from peers of the same specialty (46.8%) especially among female doctors;
- specialist consultation (44.5%), especially among females, those with fewer years of practice, working in the Hospital Authority, administration/teaching areas, and practising surgery related specialties;
- guidelines/recommendations of foreign health authorities/agencies (43.8%) especially among females, and practising non-surgery related specialties.

(q) Sources of information were considered useful in improving doctors' knowledge on proper use of antibiotics by descending proportion of respondents as below.

- CME accredited formal lecture (76.2%), especially among those practised for 11 to 20 years, in private sector, and in general practice;
- web/computer-based resources (76.1%), especially among doctors working in the government, administration/teaching areas, and practising non-surgery-related specialities;
- infectious disease specialist/microbiologist consultation (75.2%), especially among females, those with fewer years of practice, working in academic institutions, administration/teaching areas, and practising surgery-related specialities.

(r) Primary care doctors were relatively less likely to consider AMR led to increased length of hospital stay. They were more inclined to regard patients' non-compliance to antibiotic treatment, self-medication by patients and poor quality of antibiotics important drivers to AMR, while they were less likely to consider the inappropriate choice of drug as an important factor.

(s) In terms of practice, slightly more than half (56.9%) of primary care doctors prescribed antibiotics in less than ten percent of their consultations and they more frequently reported explaining to their patients about the indication of antibiotic prescription, the side effects of antibiotics, the need for complete course of antibiotics as prescribed, and the consequential relationship between improper use of antibiotics and increased AMR.

(t) Compared with those not working in the primary care setting, comparatively fewer primary care doctors reported "always" or "often" requested by

patients for antibiotics to treat URTI, while more of them considered expectation/request by patients or carers an important reason for an unindicated antibiotic prescription. Despite these, they prescribed antibiotics less frequently, and explained to their patients why they were not indicated more frequently. However, less primary care doctors re-assessed their patients' antibiotic regimen frequently, and also fewer primary care doctors made decisions on antibiotic prescription with reference to peers' suggestions, specialist consultation, and laboratory test/Point-of-Care test.

(u) While more primary care doctors were confident in educating their patients on the proper use of antibiotics, less of them were confident in differentiating broad-spectrum antibiotics, and de-escalating antibiotic therapy. Moreover, fewer primary care doctors were aware of the availability of antibiograms, IMPACT guideline and ASP. Nevertheless, more of them considered CME accredited formal lectures, and web/computer-based resources useful to improve doctors' knowledge on proper use of antibiotics, while less of them considered infectious disease specialist/microbiologist consultation useful.

5.2 Recommendations

5.2.1 As relatively less respondents from the private sector considered AMR a severe worldwide and local problem, more AMR awareness-raising activities could be arranged to target medical practitioners working in the private sector.

5.2.2 Since patients' self-medication with antibiotics was considered by most respondents an important driver of AMR, members of the public should be explained more about the disastrous consequences of AMR instead of merely asking them to stop practicing self-medication.

5.2.3 It was revealed that relatively less doctors were confident in de-escalating antibiotic therapy and differentiating broad-spectrum antibiotics. As such, these two areas should be strengthened in continuous professional training, guiding tools and reference materials.

5.2.4 With significantly more respondents who "always"/"often"/"sometimes" prescribed antibiotics for uncomplicated URTI upon patients' requests considered "expectation/request of antibiotics by patients or carers" and "fear of patient's

litigation" as important reasons of unindicated antibiotic prescription. and a significant proportion of respondents were frequently requested by patients for antibiotics for cold/flu/URTI, patient education and expectation management should be enhanced in public promotional campaign.

5.2.5 While more than three quarters of the respondents always/often used either Point-of-Care test or laboratory test, the use of Point-of-Care test to guide antibiotic prescription when treating patients with uncomplicated URTI was found to be relatively infrequent. Consideration might thus be taken for sharing such findings and explore with stakeholders on feasibility of more frequent use of either test to help optimise use of antibiotics in specific settings.

5.2.6 More promotional campaigns could be targeted at primary care doctors to promulgate the antibiograms, IMPACT guideline and ASP. Efforts could be made to explore and remove hindrance to application of the tools, as well as create a feedback mechanism for continuous improvement of these tools. Dissemination of relevant training could be done via CME accredited formal lectures as well as web/computer based resources, which were considered useful by majority of respondents.

5.3 Limitations

5.3.1 Despite various measures had been employed to boost the response rate, including incentives and sending out two rounds of reminder letters, not many medical practitioners had responded to the Survey. The Survey is thus subject to non-response bias. Non-respondents might have different knowledge, attitudes and practices towards AMR from respondents.

5.3.2 The Survey reached 97.8% of the targeted sample size. Despite the relatively small number of responses yet to be collected to reach the target, the chance of committing Type II error might still be higher than expected.

5.3.3 This Survey employed the self-administered questionnaire method.

(a) Despite a pilot study had been carried out to ensure the wording of the questions was easy to understand, there was a slight possibility that some respondents might misunderstand one or more questions and hence report inaccurate data; and

(b) There were missing information for some questions as some respondents

might skip questions that they did not want to answer or did not understand.

5.3.4 Recall bias and recall error were possible as respondents might have memory failure on events that took place in the past.

5.3.5 Some respondents might not be willing to disclose or might under-report those practices that were not commonly considered as ideal practice (e.g. prescribing antibiotics whenever requested). On the other hand, some respondents might over-report those practices that were generally regarded to be desirable.

5.3.6 The sample sizes in some subgroup analysis were relatively small; the results based on such sample sizes should be interpreted with caution.

5.3.7 The Survey is a cross-sectional study. The study results only established correlation but not the causal or time relationship between variables.

Annex A Survey Questionnaire

RESTRICTED WHEN ENTERED WITH DATA

ACCESSIBLE TO AUTHORIZED PERSONS ONLY

Survey url: chp-amrsurvey.csg-worldwide.com/survey/survey.php?u=5db2bbecbd839844832288x36m6e27c7

DEPARTMENT OF HEALTH

2019 KNOWLEDGE, ATTITUDE AND PRACTICE SURVEY OF

MEDICAL PRACTIONERS ON ANTIMICROBIAL RESISTANCE (AMR)

To keep the information collected in strict confidence, please put the completed form in the pre-paid "Restricted" envelope and have it properly sealed before mailing to CSG. As an alternative, you may choose to complete the electronic questionnaire of this survey via the QR code and password above.

Part 1. Knowledge and awareness on antibiotics and antimicrobial resistance

1. Antimicrobial resistance (AMR) could lead to:	Yes	No	Don't know
a. Reduced treatment options	☐1	☐2	☐98
b. Increased length of hospital stay	☐1	☐2	☐98
c. Increased treatment cost	☐1	☐2	☐98
d. Increased mortality	☐1	☐2	☐98

2. Please rate the severity of AMR in the following:	Not severe at all 1	2	3	4	Very severe 5
a. Worldwide	☐1	☐2	☐3	☐4	☐5
b. Hong Kong in general	☐1	☐2	☐3	☐4	☐5
c. Hospital setting	☐1	☐2	☐3	☐4	☐5
d. Community setting	☐1	☐2	☐3	☐4	☐5

3. Please rate the importance of the following factors contributing to AMR:	Not important at all 1	2	3	4	Very important 5
a. Poor infection control	☐1	☐2	☐3	☐4	☐5
b. Inappropriate use of antibiotics in terms of:					
(i) Duration	☐1	☐2	☐3	☐4	☐5
(ii) Choice of drug	☐1	☐2	☐3	☐4	☐5
(iii) Influence of pharmaceutical industry	☐1	☐2	☐3	☐4	☐5
(iv) Patients' non-compliance to antibiotic treatment	☐1	☐2	☐3	☐4	☐5
(v) Self-medication with antibiotics	☐1	☐2	☐3	☐4	☐5
c. Poor quality of antibiotics	☐1	☐2	☐3	☐4	☐5

Part 2. Prescription of antibiotics

4. Are you aware of the following in Hong Kong?	Yes	No
a. Antibiogram for public and private hospitals	☐1	☐2
b. IMPACT guideline (Interhospital Multi-disciplinary Programme on Antimicrobial Chemotherapy)	☐1	☐2
c. Antibiotic Stewardship Programme in Primary Care/ Hospital	☐1	☐2

5. How often do you make decision on antibiotic prescription with reference to the following?	Never	Rarely	Sometimes	Often	Always	Not applicable
a. Antibiogram for public and private hospitals	☐1	☐2	☐3	☐4	☐5	☐9
b. IMPACT guideline (Interhospital Multi-disciplinary Programme on Antimicrobial Chemotherapy)	☐1	☐2	☐3	☐4	☐5	☐9
c. Antibiotic Stewardship Programme in Primary Care/ Hospital	☐1	☐2	☐3	☐4	☐5	☐9
d. Foreign guidelines/ recommendations for health authorities/ agencies (e.g. WHO, CDC)[4]	☐1	☐2	☐3	☐4	☐5	☐9
e. Peers' suggestion (of the same specialty)	☐1	☐2	☐3	☐4	☐5	☐9
f. Specialist consultation (e.g. microbiologist, infectious disease specialist)	☐1	☐2	☐3	☐4	☐5	☐9
g. Laboratory test/ Point-of-Care test	☐1	☐2	☐3	☐4	☐5	☐9

6. Please rate your level of confidence in the following:	Not confident at all 1	2	3	4	Very confident 5
a. I know when to start antibiotic therapy	☐1	☐2	☐3	☐4	☐5
b. I can choose the correct drug and dosage	☐1	☐2	☐3	☐4	☐5
c. I can determine the right treatment duration	☐1	☐2	☐3	☐4	☐5
d. I can differentiate broad-spectrum antibiotics from narrow-spectrum antibiotics, and avoid their unnecessary use	☐1	☐2	☐3	☐4	☐5
e. I can interpret antibiotic susceptibility test result	☐1	☐2	☐3	☐4	☐5
f. I can de-escalate antibiotic therapy according to clinical evaluation and diagnostic test result	☐1	☐2	☐3	☐4	☐5
g. I can educate patient on proper use of antibiotics	☐1	☐2	☐3	☐4	☐5

7. In general, what was the percentage of consultations that had led to antibiotic prescription in your usual practice?			
☐1 0 to <5%	☐2 5 to <10%	☐3 10 to <15%	☐4 15 to <20%
☐5 20 to <25%	☐6 25 to <30%	☐97 ≧30% _____% (please specify)	

8. How often do you prescribe antibiotics for cold/ flu/ upper respiratory tract infection (URTI)?			
☐1 0 to <5%	☐2 5 to <10%	☐3 10 to <15%	☐4 15 to <20%
☐5 20 to <25%	☐6 25 to <30%	☐97 ≧30% : _____% (please specify)	

9. How often do your patient request antibiotics for cold/ flu/ URTI?				
☐1 Never	☐2 Rarely	☐3 Sometimes	☐4 Often	☐5 Always

[4] WHO: World Health Organization, CDC: Centers for Disease Control and Prevention

10.	How often do you practise the following for patients with uncomplicated URTI (including common cold and flu)?	Never	Rarely	Sometimes	Often	Always
a.	Prescribe antibiotics whenever patient request	☐1	☐2	☐3	☐4	☐5
b.	Do not prescribe antibiotics and explain to patient why they are not indicated	☐1	☐2	☐3	☐4	☐5
c.	Use Point-of-Care test to guide antibiotic prescription	☐1	☐2	☐3	☐4	☐5

11.	How do you rate the following reasons for unindicated antibiotic prescription?	Not important at all 1	2	3	4	Very important 5
a.	Uncertain clinical diagnosis	☐1	☐2	☐3	☐4	☐5
b.	Expectation/ request of antibiotics by patients or carers	☐1	☐2	☐3	☐4	☐5
c.	Cannot ensure return of patient for follow up	☐1	☐2	☐3	☐4	☐5
d.	No time to explain why not indicated	☐1	☐2	☐3	☐4	☐5
e.	Fear of patient's litigation	☐1	☐2	☐3	☐4	☐5

12.	Upon antibiotic prescription, how often do you explain to patient:	Never	Rarely	Sometimes	Often	Always
a.	Indication of antibiotic prescription	☐1	☐2	☐3	☐4	☐5
b.	Side effects of antibiotics	☐1	☐2	☐3	☐4	☐5
c.	Complete course of antibiotics as prescribed	☐1	☐2	☐3	☐4	☐5
d.	Improper use of antibiotics would increase antimicrobial resistance	☐1	☐2	☐3	☐4	☐5

13.	Do you reassess your patient's antibiotic regimen after 48-72 hours of starting treatment?				
	☐1 Never	☐2 Rarely	☐3 Sometimes	☐4 Often	☐5 Always

14.	Do you consider yourself adequately trained on antibiotic use?	☐1 Yes	☐2 No

15.	How would you rate the effectiveness of the following on improving doctors' knowledge on proper use of antibiotics?	Not useful at all 1	2	3	4	Very useful 5	Not applicable
a.	Formal lecture (CME accredited)	☐1	☐2	☐3	☐4	☐5	☐9
b.	Antibiogram for public and private hospitals	☐1	☐2	☐3	☐4	☐5	☐9
c.	IMPACT guideline (Interhospital Multi-disciplinary Programme on Antimicrobial Chemotherapy)	☐1	☐2	☐3	☐4	☐5	☐9
d.	Antibiotic Stewardship Programme in Primary Care/ Hospital	☐1	☐2	☐3	☐4	☐5	☐9
e.	Web/ computer-based resources	☐1	☐2	☐3	☐4	☐5	☐9
f.	Infectious disease specialist/ microbiologist consultation	☐1	☐2	☐3	☐4	☐5	☐9

Part 3. Demographic

16.	Year of birth						17. Gender	☐$_1$ Male	☐$_2$ Female
18.	In which year did you start clinical practice?: _____								

19. Which of the following best describes your work status as at 30.6.2019?
"Practising in the medical professional" includes the practice of medicine, surgery, midwifery, or any branch of medicine or surgery. This includes research, administration and teaching of the field.

☐$_1$ Practising in the Hong Kong Special Administrative Region in the medical profession
☐$_2$ Practising in the Mainland, Macao, or Taiwan in the medical profession
☐$_3$ Practising overseas in the medical profession
☐$_4$ Not practising in the medical profession

20. Please indicate the type of institution in which you worked in the medical profession as at 30.6.2019 (or last practice if you are no longer practising).
If you have more than one job in the medical profession, please indicate the type of institution of your main job in which you spent most of your working time.

☐$_1$ Government
☐$_2$ Hospital Authority
☐$_3$ Academic institution
☐$_4$ Subvented organisation
☐$_5$ Private - Clinic-based
☐$_6$ Private - Hospital-based
☐$_9$ Private - Others: _____ (Please specify)
☐$_{97}$ Others: _____ (Please specify)

21. Major field of present practice (or last practice if you are no longer practising)

☐$_1$ General practice ☐$_2$ Practice in a specialty ☐$_3$ Administration/ Management
☐$_4$ Teaching/ Education ☐$_{97}$ Others: _____ (Please specify)

22. Level of professional training

☐$_1$ Specialist/ Fellow ☐$_2$ Specialist trainee ☐$_3$ Not under any specialty (Please jump to Q.24)

23. Specialty

☐$_1$ Anaesthesiology	☐$_2$ Obstetrics & Gynaecology	☐$_3$ Pathology
☐$_4$ Community Medicine	☐$_5$ Ophthalmology	☐$_6$ Psychiatry
☐$_7$ Emergency Medicine	☐$_8$ Orthopaedics & Traumatology	☐$_9$ Radiology
☐$_{10}$ Family Medicine	☐$_{11}$ Otorhinolaryngology	☐$_{12}$ Surgery
☐$_{13}$ Internal Medicine	☐$_{14}$ Paediatrics	☐$_{97}$ Others: _____ (Please specify)

24. Other than fellowship qualification(s), please indicate your additional post-graduate qualifications, which is/ are relevant to the medical profession you obtained. (You may ✓ more than one box)

☐$_1$ Diploma ☐$_2$ CME/CPD programme ☐$_3$ Master's Degree ☐$_4$ Doctoral Degree ☐$_9$ Not applicable

If you are interested in receiving an electronic coupon as a token of our appreciation, please fill in a valid email address in the space below:
Email address: _____

---- END OF SURVEY, THANK YOU VERY MUCH ----

Annex B Review Questionnaire

Section A
For both Paper-based and Web-based Respondents

1. How much time was taken to complete the questionnaire?

   _____ minutes

2. Was the length of the questionnaire appropriate?

   ☐ Appropriate

   ☐ Too long

   ☐ Too short

   Comments (if any): _____

3. Did you find any wording or phrase of any question hard to understand/ confusing/ inappropriate?

   ☐ Yes → Which wording/ phrase(s) in which question(s)? And, in your view, how should it/ they be improved?

   Hard to understand: _____

   Confusing: _____

   Inappropriate: _____

   ☐ No

4. Did you think the sequence of some questions should be changed?

   ☐ Yes → Which question(s)? And, in your view, how should the sequence be improved?

   _____

   ☐ No

5. Was there any question you consider too challenging/ sensitive to answer?

   ☐ Yes → Which question(s)? And, in your view, how should the question(s) be improved?

   _____

   ☐ No

6. Were the choices of answers for the questions…..

   (a) enough?

   ☐ Yes

   ☐ No → Which question(s)? And, in your view, how should the answers be improved?

   _____

(b) appropriate?

☐ Yes

☐ No → Which question(s)? And, in your view, how should the answers be improved?

_____

7. Did you find the layout of the questionnaire clear and easy to follow?

☐ Yes

☐ No → In your view, how should the layout be improved?

_____

Section B

For Web-based Respondents Only

8. Were the instructions about completing the web-based questionnaire clear and easy to follow?

☐ Yes

☐ No → Which part was not clear or easy to follow? And, in your view, how should the instructions be improved?

_____

9. Was the time required to load the survey page appropriate?

☐ Appropriate

☐ Too long

Comments (if any): _____

10. If you did not complete the survey in one-go, did you encounter any difficulty when resuming the survey?

☐ Yes → What difficulties?

_____

☐ No

11. Did you find the font size of the survey appropriate?

☐ Appropriate

☐ Too large

☐ Too small

Comments (if any): _____