## Report on the

Telephone Opinion Survey on General Public's Knowledge, Attitude and Practice on Antibiotic Resistance 2022


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## Executive Summary

1. This survey conducted by the Hong Kong Institute of Asia-Pacific Studies, Chinese University of Hong Kong, was commissioned by the Infection Control Branch of the Centre for Health Protection of the Department of Health, to explore the knowledge, attitude and practice of the general public with respect to antibiotics and their awareness of antibiotic resistance.
2. The target population of this survey were non-institutional Hong Kong residents aged 15 or above who could speak Cantonese, Putonghua or English (excluding foreign domestic helpers). By means of landline and mobile telephone interviews via random sampling, the survey was conducted from 7 September 2022 to 6 October 2022. The sample size of 1,076 successful interviews (493 from landline numbers and 583 from mobile numbers) was achieved with a combined response rate of $32.7 \%$.
3. To make the findings more representative of the Hong Kong general population, the data of this survey was weighted based on the probability of being sampled in the combined landline frame and mobile phone frame, and the relevant age-gender distribution of the population (aged 15 or above excluding foreign domestic helpers) provided by the Census and Statistics Department before data analysis.

## Key Findings

4. In the survey, about a quarter ( $26.1 \%$ ) of the respondents last took antibiotics within the past year. Majority (95.4\%) of those who had ever taken antibiotics reported that their last taken antibiotics were prescribed by doctors, in which $58.1 \%$ of them obtained their antibiotics last taken from private clinics. The major source of antibiotics last taken that
were not or could not remember if prescribed by doctors was from medical store or pharmacy (77.5\%).
5. About a fifth (20.6\%) of respondents whose antibiotics last taken were prescribed by doctors, reported that they had noticed the health advice on antibiotics medicine bags. Among them, $84.9 \%$ considered the advice helped to remind them to maintain personal hygiene.
6. When handling or taking antibiotics in daily life (excluding work) in last medication period, the proportions of respondents whose antibiotics last taken being prescribed by doctors always or seldom practised the following are listed below:
a. Eat or drink only thoroughly cooked or boiled items (98.1\%);
b. Disinfect and cover all wounds (92.5\%);
c. Young children with symptoms of infections should minimise contact with other children (91.9\%);
d. Wear surgical mask if you have respiratory symptoms (87.5\%); and
e. Practise frequent hand hygiene (85.3\%).
7. A majority of the respondents considered that the advice from doctors (78.8\%) and pharmacists (75.8\%) were very useful or slightly useful in facilitating patients to take antibiotics according to instructions and complete the full course of antibiotics.
8. In the past 12 months before enumeration, about a fifth (21.6\%) of respondents had consulted doctor(s) for cold or flu. Among them, $97.2 \%$ did not request antibiotics during that consultation.
9. When doctor's initial assessment indicated that antibiotic was not needed at the moment,
majority ( $96.4 \%$ ) of the respondents would accept the doctor's advice to observe for few more days or to wait for the diagnostic test result before deciding whether to prescribe antibiotics or not. Majority (83.3\%) of the respondents did not prefer consulting doctors who prescribed antibiotic more readily. More than half (66.3\%) of the respondents wanted their doctors to share decision making with them on antibiotics prescription.
10. Majority of the respondents correctly identified the two false statements about antibiotics:
a. "It's okay to use antibiotics that were given by a friend or family member, as long as they were used to treat the same illness" (89.3\%);
b. "It's okay to buy the same antibiotics, or request them from a doctor if you're sick and they helped you get better when you had the same symptoms before" (79.0\%).
11. The percentages of respondents correctly identified which health conditions could or could not be treated with antibiotics are listed below:
a. Headaches (No: 79.5\%);
b. Body aches (No: 78.0\%);
c. Skin or wound infection (Yes: 75.7\%);
d. Diarrhoea (No: 65.3\%);
e. Fever (No: 60.1\%);
f. Bladder infection or urinary tract infection (UTI) (Yes: 59.4\%);
g. Cold and flu (No: 49.7\%); and
h. Sore throat (No: 36.7\%).

Respondents aged 65 or above had the lowest percentages of giving correct answer to 5
out of the above 8 health conditions．

12．Majority of the respondents had heard of the following terms in the language used during enumeration（i．e．Chinese or English）：
a．＂Superbugs＂（超級細菌）（81．4\％）；
b．＂Antibiotic resistance＂（抗生素耐藥性）（76．0\％）；
c．＂Antibiotic－resistant bacteria＂（抗藥性細菌）（75．0\％）；and
d．＂Antimicrobial resistance＂．（抗菌素耐藥性）（40．3\％）．

13．The percentages of respondents who correctly identified the statements about antibiotic resistance as true or false are listed below：
a．Many infections are becoming increasingly resistant to treatment by antibiotics（True：81．2\％）；
b．Antibiotic resistance is an issue in other countries but not in Hong Kong （False：77．4\％）；
c．Antibiotic－resistant infections could make medical procedures like surgery， organ transplants and cancer treatment much more dangerous（True： 76．8\％）；
d．If bacteria are resistant to antibiotics，it can be very difficult or impossible to treat the infections they cause（True：71．4\％）；
e．Antibiotics are anti－inflammatory drugs（False：60．3\％）；
f．Antibiotic resistance is only a problem for people who take antibiotics regularly（False：50．7\％）；and
g．Bacteria which are resistant to antibiotics can be spread from person to person（True：44．1\％）．

Respondents aged 65 or above had the lowest percentages of giving correct answers to
all the above selected statements.
14. The percentages of respondents who strongly agreed or slightly agreed with the following statements are listed below:
a. If high-risk individuals avoid consuming raw or undercooked ready-to-eat food, their risk of being infected by drug-resistant bacteria from food will be reduced (66.8\%);
b. People should not keep antibiotics and use them later for other illnesses (61.7\%);
c. If people taking medicines such as antibiotic and stomach medicines avoid consuming raw or undercooked ready-to-eat food, their risk of being infected by drug-resistant bacteria from food will be reduced (61.3\%);
d. Raw or undercooked ready-to-eat food is more easily to be contaminated by drug-resistant bacteria (42.7\%); and
e. There is not much I can do to stop antibiotic resistance (35.8\%).

Respondents aged 65 or above had the lowest mean score in the statement "People should not keep antibiotics and use them later for other illnesses", whereas the youngest age group of 15 to 24 were least likely to agree that "Raw or undercooked ready-to-eat food (such as salad and sashimi) is more easily to be contaminated by drug-resistant bacteria".

## Recommendations

15. Less than half of the respondents correctly answered that cold and flu, and sore throat could not be treated with antibiotics. As this misconception would make patients misuse antibiotics, more health education on which kinds of common health conditions could be treated with antibiotics should be provided to the public.
16. Only less than half of the respondents knew that bacteria resistant to antibiotics could be spread from person to person. More public education on knowledge and related infection control practices should be provided.
17. Doctors can be reassured that vast majority of the public accept doctor's decision if initial assessment indicated that antibiotics are not needed. Doctors should be informed that majority of the public wished their doctor to share decision making on antibiotics prescription.
18. Only about a fifth of the respondents noticed the health advice on antibiotics medicine bags. More health promotion, better design, in addition to explanation on the health advice by pharmacists while dispensing antibiotics to patients could be considered.
19. The survey revealed that the oldest age group of 65 or above generally had the lowest level of knowledge about AMR and use of antibiotics among all age groups. Tailor made health education and promotion that could be easily access to and understandable by the elders should be enhanced.
20. Young people were less likely to agree that raw or undercooked ready-to-eat food (such as salad and sashimi) was more easily to be contaminated by drug- resistant bacteria. In order to reach and draw the attention of young people, design of health education materials to promote food safety should be attractive to them, and to be disseminated through channels that young people commonly use like social media.

## 1. Introduction

### 1.1 Background

Antibiotic resistance is a burning public health issue. The World Health Organization ("WHO") and WHO Regional Office for the Western Pacific have issued the Global Action Plan on Antimicrobial Resistance ("AMR") and Action Agenda for AMR in Western Pacific Region in 2015 respectively. In recognition of the major threat posed by AMR to public health, the Hong Kong 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.

The Telephone Survey Research Laboratory of the Hong Kong Institute of Asia-Pacific Studies ("HKIAPS") of The Chinese University of Hong Kong was commissioned by the Infection Control Branch of the Centre for Health Protection of the Department of Health to conduct a territory-wide telephone survey in 2022. This survey was designed to explore the knowledge, attitude and practice ("KAP") of the general public with respect to antibiotics and their awareness of antibiotic resistance.

### 1.2 Objectives

The objectives of the survey are as follow:
I. To collect information of KAP of the general public regarding antibiotic resistance, and
II. To assess the effectiveness of health education and promotion on control of antibiotic resistance.

## 2. Research Methodology

### 2.1 Target population

The target population of this survey were non-institutional Hong Kong residents aged 15 or above who could speak Cantonese, Putonghua or English (excluding foreign domestic helpers).

### 2.2 Survey design

Telephone survey is an efficient tool for collecting data from a large random sample within a relatively short period of time, avoiding some of the problems encountered from the approach of conducting face-to-face household interviews, such as difficulties of entering the private estates, the long duration of the fieldwork, and the inability to tightly control the interviewers. Telephone surveys have traditionally covered only households with residential telephone lines (the so-called "landlines"). With the increasing popularity of mobile phones in Hong Kong, there has been a continued rise in the number of households that do not have landline connections. To address this bias, a dual-frame telephone survey design using both landline and mobile phone numbers was employed in this survey, in which a structured bilingual (Chinese and English) questionnaire was used.

### 2.3 Sampling

The survey sample included landlines and mobiles phone numbers. Landlines and mobiles sampling frames were derived by combining the four known prefixes assigned to telecommunication service providers in Hong Kong under the most up-to-date "Numbering Plan" published by the Office of the Communications Authority, with four
suffixes from 0000 to 9999 . Telephone numbers were randomly selected from the frames to produce the final landline survey samples and mobile phone survey samples for the fieldwork.
(a) Selection of Respondents for the landline samples. In each successfully contacted residential unit having at least one landline, only one person aged 15 or above who was available at the moment will be randomly selected for interview by the "Next Birthday Rule" (the person whose birthday comes soonest would be asked to take the phone for the interview).
(b) Selection of Respondents for the mobile phone samples. For each randomly selected mobile phone number, a person aged 15 or above who was a Hong Kong resident and the primary user of that particular number was eligible to be interviewed.

### 2.4 Implementation of the fieldwork

The fieldwork was conducted independently by the Telephone Survey Research Laboratory of HKIAPS in The Chinese University of Hong Kong. The survey was conducted manually by interviewers with the assistance of the Computer Assisted Telephone Interviewing System ("CATI"). With the help of the CATI system, the interviewers read each question that appeared on the monitor and entered the respondents' answers directly into the computer, thereby bypassing the time-consuming process of coding and data entry. This system enhances the efficiency of conducting telephone surveys.

In order to rehearse the interview procedures and examine the feasibility of the
questionnaire, a pilot study was employed before the formal launching of the fieldwork. The pilot study was conducted from 23 to 25 August 2022 and a total of 32 interviews ( 15 of them were from landline sample and the other 17 were from mobile phone sample) were successfully collected. The number of successful interviews conducted in the pilot study were not counted in the formal fieldwork. Based on the pilot study result, the questionnaire was further fine-tuned. For details of the content of the finalised questionnaire, please refer to Appendix I.

The formal fieldwork for this survey was carried out from 7 September 2022 to 6 October 2022. The interviews were mainly conducted from 6:15 p.m. to $10: 15 \mathrm{p} . \mathrm{m}$. However, since some respondents were not available at night, some interviews were scheduled to be conducted during daytime. In order to further ensure that the survey results were not biased due to high non-contact or non-response rates, when there was no response to a call of a particular telephone number, further attempts were made to call that number at different times of the day and on different days of the week.

In the end, a total of 1,076 eligible Hong Kong residents aged 15 or above were successfully interviewed. Among these, 493 were from the landline sample and the other 583 were from the mobile sample. For details about the daily progress that was made on the work of enumeration, please refer to Appendix II.

### 2.5 Response rates

The response rate (RR) in this study is defined as the number of completed case, divided by the sum of the completed cases, refusal cases and drop-out cases (including eligible person not-at-home or not available during the fieldwork period). The basic formula is shown as follow:

$$
R R=\frac{\text { Completed }}{\text { Completed }+ \text { Refused }+ \text { Drop out (e.g.eligibles but not available })}
$$

The response rates for the landline and mobile phone surveys were $27.9 \%$ and $36.8 \%$ respectively. The combined response rate was $32.7 \%$. For details of call dispositions and response rates for landline and mobile phone surveys, please refer to Appendix III.

### 2.6 Quality control

HKIAPS established and implemented quality-control measures to ensure a satisfactory standard of performance throughout the duration of the survey. Such measures included the following: (1) setting up an independent team to carry out quality-control measures and independent checks on at least $15 \%$ of the completed questionnaires; (2) carrying out independent checks on at least $1 \%$ of the "ineligible" telephone numbers; (3) installing an audio recording system with an instant telephone monitoring system to allow the fieldwork supervisor to monitor the interviews and check the quality of the interviews; and (4) checking the consistency of different aspects of the preliminary results.

### 2.7 Weighting of data

Weighting is a technique for correcting or making statistical adjustments to survey data after they have been collected in order to improve the accuracy of the survey estimates. Since there are different probabilities being selected for every eligible respondent (some of them own either landline or mobile phone only but the other may have both), differential propensities to respond (e.g. old females dislike to be interviewed via mobile phone, young people seldom staying at home so that it is difficult to find them through residential landlines and so on), and different sampling frames coverage problems
among various groups in the population, the process of weighting is needed in the analysis of telephone surveys.

Weight adjustments based on two steps. The first step was to compute the design weights by calculating the probability of being sampled in the combined landline frame and mobile phone frame. The next step of weighting is to adjust the samples to the current population structure of Hong Kong which was based on the updated population's agegender distribution (aged 15 or above excluding foreign domestic helpers) provided by the Census and Statistics Department. For details of the process of weighting, please refer to Appendix IV.

### 2.8 Rounding of figures

Since the survey data had been weighted, there might be a slight discrepancy between the sum of the individual responses and the total, as shown in the following tables or charts. These discrepancies were due to rounding.

### 2.9 Statistical analysis plan

All the data collected from the current survey were carefully validated, recoded, and analysed using the statistical software package SPSS version 27.

The statistical presentation of single variable included descriptive statistics such as frequency, percentage and means. But when analysing more than one variable (such as sub-groups analysis of demographic variables), different statistical significance tests would be applied to handle different types of questions and different level of measurement of variables (such as nominal, ordinal or interval data). For example, Chisquare test and Analysis of Variance ("ANOVA") would be employed to detect whether
there was an association between two variables (i.e. whether the variables were independent or related).

The level of statistical significance was often expressed as a $p$-value (calculated probability) between 0 and 1 . The smaller the $p$-value, the stronger the confidence that we should reject the null hypothesis (no relationship between two variables or the observed differences between two variables were just random). There were three levels of significance frequently used in survey reports: $\mathrm{p}<0.05, \mathrm{p}<0.01$ and $\mathrm{p}<0.001$.

## 3. Profiles of the Respondents

In the survey, the respondents were asked about their gender and age (the information on gender was filled in by the interviewers). This information is presented in Figure 3.1. Regarding gender, the proportion of female respondents (52.8\%) was slightly greater than that of male respondents (47.2\%).

Concerning age groups, $8.9 \%$ of the respondents were 15 to 24 years of age, $14.1 \%$ were 25 to $34,16.3 \%$ were 35 to $44,17.2 \%$ were 45 to $54,19.7 \%$ were 55 to 64 , and the remaining $23.7 \%$ were 65 years old or above.

Figure 3.1: Demographic background of the respondents (\%)

Gender


- Male - Female
Age


$$
\begin{array}{ll}
-15 \text { to } 24 & -25 \text { to } 34 \\
-35 \text { to } 44 & -45 \text { to } 54 \\
-55 \text { to } 64 & -65 \text { or above }
\end{array}
$$

The unweighted and weighted distribution of frequency tables of gender and age can be found in Appendix V.

## 4. Survey Results

In this chapter, the descriptive statistics of each question are presented. Besides, subgroup analyses of each question are performed based on the breakdown of respondents' gender and age group. Chi-square test and ANOVA test are used for sub-group analysis. The results of sub-group analyses which are statistically insignificant at the $5 \%$ level are not discussed in the text but reported in the tables. All the following survey findings are based on weighted data.

### 4.1 Use of antibiotics

This section presents when respondents last took antibiotics, and how and where they obtained them.

### 4.1.1 Time of last taken antibiotics

About a quarter (26.1\%) of the respondents reported that they last took antibiotics within the past year, while $58.6 \%$ said that they last took antibiotics more than a year ago (Figure 4.1.1).

Figure 4.1.1: Time of last taken antibiotics (\%)


Base: Persons aged 15 or above $=1076$.
Question: A1 "When did you last take antibiotics?"

Analysed by age, respondents aged between 15 and 24 had a higher proportion of never taking antibiotics when compared with other age groups. There was no statistically significant difference between genders (Table 4.1.1).

Table 4.1.1: Time of last taken antibiotics by gender and age (\%)

|  | GENDER |  | AGE |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | $15-24$ | $25-34$ | $35-44$ | $45-54$ | $55-64$ | $\geq 65$ |
| In the past 30 days | 6.1 | 6.8 | 4.4 | 10.5 | 4.6 | 5.4 | 5.2 | 8.0 |
| In the past 3 months | 5.8 | 5.0 | 3.5 | 7.0 | 3.1 | 6.9 | 5.5 | 5.4 |
| In the past half year | 6.2 | 7.1 | 8.3 | 8.4 | 4.0 | 7.0 | 7.2 | 6.1 |
| In the past year | 7.7 | 7.5 | 10.2 | 6.3 | 10.1 | 9.1 | 5.0 | 6.8 |
| More than a year ago | 57.2 | 59.8 | 53.7 | 53.6 | 65.0 | 60.5 | 61.8 | 54.9 |
| Never | 11.1 | 7.5 | 16.2 | 9.6 | 8.1 | 3.6 | 11.4 | 9.2 |
| Can't remember | 6.0 | 6.4 | 3.6 | 4.6 | 5.1 | 7.6 | 4.0 | 9.6 |
| Sample size | $(508)$ | $(568)$ | $(96)$ | $(152)$ | $(175)$ | $(186)$ | $(212)$ | $(255)$ |
| p-value (Chi-Square) | 0.548 |  |  |  | $0.040 *$ |  |  |  |

*p $<0.05, * * \mathrm{p}<0.01, * * * \mathrm{p}<0.001$
Question: A1 "When did you last take antibiotics?"

### 4.1.2 Whether the last taken antibiotics were prescribed by doctors

Those respondents who had taken antibiotics before were further asked whether the antibiotics last taken were prescribed by doctors, $95.4 \%$ of them said yes and the remaining 4.6\% said no (3.0\%) or could not remember (1.5\%) (Figure 4.1.2).

Figure 4.1.2: Whether the last taken antibiotics were prescribed by doctors and otherwise the source (\%)


Base: Persons aged 15 or above who had taken antibiotic $=911$.

Question: A2 "On that occasion, were the antibiotics prescribed by doctors?"

Base: Persons aged 15 or above whose last taken antibiotics were not prescribed by doctors or who could not remember whether they were prescribed by doctors $=41$.

Question: A3 "On that occasion, where did you get the antibiotics?"

Analysed by age, respondents aged between 25 and 44 had higher rate of having their antibiotics last taken prescribed by doctors than their respective counterparts. There was no statistically significant difference between genders (Table 4.1.2a).

Table 4.1.2a: Whether the last taken antibiotics were prescribed by doctors by gender and age (\%)

|  | GENDER |  | AGE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | 15-24 | 25-34 | 35-44 | 45-54 | 55-64 | $\geq 65$ |
| Yes | 94.7 | 96.1 | 90.8 | 97.0 | 99.5 | 94.3 | 93.9 | 95.4 |
| No | 3.7 | 2.5 | 6.6 | 1.6 | 0.0 | 5.7 | 4.5 | 1.4 |
| Can't remember | 1.7 | 1.4 | 2.6 | 1.4 | 0.5 | 0.0 | 1.6 | 3.1 |
| Sample size | (422) | (489) | (77) | (131) | (152) | (165) | (179) | (207) |
| p-value (Chi-Square) | 0.539 |  | 0.008** |  |  |  |  |  |

Respondents whose last taken antibiotics were not or could not remember if prescribed by doctors were further asked where they obtained their last taken antibiotics. Most of them (77.5\%) reported that they obtained from medical store or pharmacy. No statistically significant difference between the respondents' gender and age was found on the sources of their last taken antibiotics. (Table 4.1.2b).

Table 4.1.2b: Source of last taken antibiotics for those whose last taken antibiotics were not or could not remember if prescribed by doctors by gender and age (\%)

|  | GENDER |  | AGE |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | $15-24$ | $25-34$ | $35-44$ | $45-54$ | $55-64$ | $\geq 65$ |
| Medical store or <br> pharmacy | 90.9 | 61.7 | 90.6 | 100.0 | 0.0 | 90.3 | 65.3 | 66.2 |
| The internet | 4.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.5 | 0.0 |
| Friend or family <br> member | 3.0 | 3.2 | 9.4 | 0.0 | 0.0 | 0.0 | 0.0 | 6.4 |
| Leftover from before | 0.0 | 10.0 | 0.0 | 0.0 | 0.0 | 9.7 | 0.0 | 10.5 |
| Somewhere / someone <br> else | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Can't remember | 2.0 | 25.1 | 0.0 | 0.0 | 100.0 | 0.0 | 26.2 | 16.9 |
| Sample size | $(22)$ | $(19)$ | $(7)$ | $(4)$ | $(1)$ | $(9)$ | $(11)$ | $(9)$ |
| p-value (Chi-Square) | 0.074 |  |  | 0.618 |  |  |  |  |

$* \mathrm{p}<0.05, * * \mathrm{p}<0.01, * * * \mathrm{p}<0.001$
Question: A3 "On that occasion, where did you get the antibiotics?"

### 4.1.3 Type of clinic or hospital respondents got the last taken antibiotics from

Respondents whose last taken antibiotics were prescribed by doctors were further asked which type of clinic or hospital their last taken antibiotics were obtained from, 58.1\% of them replied that they obtained from private clinics (Figure 4.1.3).

Figure 4.1.3: Type of clinic or hospital respondents got the last taken antibiotics from (\%)


Base: Persons aged 15 or above whose last taken antibiotics were prescribed by doctors $=869$.
Question: A4 "On that occasion, from which type of clinic or hospital did you get the antibiotics?"

Analysed by gender and age, a relatively higher proportion of female respondents and those aged between 25 and 54 obtained their antibiotics from private clinics, while a relatively higher proportion of male respondents and other age groups got their antibiotics from hospitals under the Hospital Authority. Moreover, there was a relatively higher proportion of respondents aged 65 or above obtained their antibiotics from clinics under the Hospital Authority or the Department of Health (Table 4.1.3).

Table 4.1.3: Type of clinic or hospital respondents got the last taken antibiotics from by gender and age (\%)

|  | GENDER |  | AGE |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | $15-24$ | $25-34$ | $35-44$ | $45-54$ | $55-64$ | $\geq 65$ |
| Private clinics | 57.1 | 59.0 | 59.7 | 63.8 | 63.5 | 68.8 | 55.7 | 43.6 |
| Clinics under the <br> Hospital Authority | 12.0 | 13.6 | 8.6 | 12.3 | 11.6 | 5.6 | 10.4 | 23.4 |
| Clinics under the <br> Department of Health | 2.6 | 0.9 | 0.0 | 0.0 | 1.4 | 1.5 | 2.6 | 3.0 |
| Other clinics | 3.7 | 1.6 | 1.5 | 3.0 | 3.0 | 2.6 | 3.7 | 1.3 |
| Private hospital | 6.3 | 8.0 | 4.9 | 5.2 | 9.2 | 9.7 | 5.9 | 7.0 |
| Hospital under the <br> Hospital Authority | 16.0 | 12.1 | 17.1 | 12.1 | 10.7 | 9.6 | 17.5 | 16.6 |
| Others <br> (please specify) | 0.3 | 0.5 | 5.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 |
| Can't remember | 1.9 | 4.3 | 3.2 | 3.5 | 0.3 | 2.2 | 4.2 | 5.1 |
| Sample size | $(399)$ | $(470)$ | $(70)$ | $(127)$ | $(151)$ | $(155)$ | $(168)$ | $(198)$ |
| p-value (Chi-Square) | $0.033 *$ |  |  | $0.000 * * *$ |  |  |  |  |

${ }^{*} \mathrm{p}<0.05,{ }^{* *} \mathrm{p}<0.01,{ }^{* * *} \mathrm{p}<0.001$
Question: A4 "On that occasion, from which type of clinic or hospital did you get the antibiotics?"

### 4.2 Instructions on health advice printed on antibiotics medicine bags

### 4.2.1 Whether respondents noticed the health advice on antibiotics medicine bags

Respondents whose last taken antibiotics were prescribed by doctors were further asked whether they noticed the instructions on health advice printed on antibiotics medicine bags, about a fifth of them (20.6\%) reported that they had noticed the instructions. Among this subgroup of respondents, $84.9 \%$ reported that the advice helped to remind them to maintain personal hygiene (Figure 4.2.1).

Figure 4.2.1: Whether respondents noticed the instructions on antibiotics medicine bags (\%)


Base: Persons aged 15 or above whose last taken antibiotics were prescribed by doctors $=869$.
Question: A5 "On that occasion, did you notice there are instructions on personal hygiene on the antibiotics medicine bags?" 【If yes, ask "Did these instructions help to remind you to maintain personal hygiene?"】

No statistically significant difference in awareness of the instructions on antibiotics medicine bags was observed between gender and age groups. (Figure 4.2.1).

Table 4.2.1: Whether respondents noticed the instructions on antibiotics medicine bags by gender and age (\%)

|  | GENDER |  | AGE |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | $15-24$ | $25-34$ | $35-44$ | $45-54$ | $55-64$ | $\geq 65$ |
| Have noticed the <br> instructions before, <br> and were reminded | 17.0 | 17.8 | 12.6 | 13.5 | 17.1 | 14.5 | 16.8 | 24.9 |
| Have noticed the <br> instructions before, <br> but were NOT <br> reminded | 3.9 | 2.5 | 7.5 | 1.7 | 4.1 | 2.9 | 0.7 | 3.9 |
| Have NOT noticed the <br> instructions before | 60.6 | 57.8 | 60.1 | 67.1 | 58.8 | 59.8 | 59.1 | 53.1 |
| Can't remember | 18.5 | 22.0 | 19.8 | 17.7 | 20.1 | 22.9 | 23.3 | 18.1 |
| Sample size | $(399)$ | $(470)$ | $(70)$ | $(127)$ | $(151)$ | $(155)$ | $(168)$ | $(198)$ |
| p-value (Chi-Square) | 0.401 |  |  |  |  | 0.082 |  |  |

*p $<0.05, * * \mathrm{p}<0.01, * * * \mathrm{p}<0.001$
Question: A5 "On that occasion, did you notice there are instructions on personal hygiene on the antibiotics medicine bags?" 【If yes, ask "Did these instructions help to remind you to maintain personal hygiene?"】

### 4.2.2 Frequency of practising the health advice during last medication period

Respondents whose antibiotics last taken being prescribed by doctors were also asked how often they practised the health advice listed on antibiotics medicine bags, when handling or taking antibiotics in daily life (excluding work) during last medication period. The proportions of always or seldom practicing the health advice are listed below:
a. Eat or drink only thoroughly cooked or boiled items (98.1\%);
b. Disinfect and cover all wounds ( $92.5 \%$ );
c. Young children with symptoms of infections should minimise contact with other children (91.9\%);
d. Wear surgical mask if you have respiratory symptoms (87.5\%); and
e. Practise frequent hand hygiene (85.3\%) (Figure 4.2.2).

Figure 4.2.2: Frequency of practising the health advice during last medication period (\%)


Base: Persons aged 15 or above whose antibiotics last taken were prescribed by doctors $=869$.
(^Base: Persons aged 15 or above whose antibiotics last taken were prescribed by doctors excluding those with no young children at home $=519$ )
Question: A6a-e "On that occasion, how often did you practise the following when you handled or took antibiotics in your daily life (excluding work) during the medication period? 'always', 'seldom' or 'never'?"

Compared with their counterpart, female respondents had higher percentages of always or seldom practising frequent hand hygiene, wearing surgical mask if they have respiratory symptoms and requesting their young children with symptoms of infections to minimise contact with other children during last medication period (Table 4.2.2).

When analysed by age, relatively higher proportion of respondents aged between 25 and 54 reported that they always or seldom wore surgical mask if they had respiratory symptoms during last medication period, when compared with their respective counterparts (Table 4.2.2).

Table 4.2.2: Frequency of practising the health advice during last medication period by gender and age (\%)

|  | GENDER |  | AGE |  |  | 45-54 | 55-64 | $\geq 65$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | 15-24 | 25-34 | 35-44 |  |  |  |
| Practise frequent hand hygiene |  |  |  |  |  |  |  |  |
| Always/ Seldom | 82.6 | 87.6 | 83.9 | 87.6 | 87.9 | 86.1 | 81.8 | 84.5 |
| Never | 16.3 | 9.6 | 12.9 | 11.2 | 11.0 | 13.4 | 16.1 | 11.5 |
| Can't remember | 1.1 | 2.8 | 3.2 | 1.1 | 1.2 | 0.6 | 2.0 | 4.0 |
| Sample size | (399) | (470) | (70) | (127) | (151) | (155) | (168) | (198) |
| p-value (Chi-Square) | 0.004** |  | 0.452 |  |  |  |  |  |
| Eat or drink only thoroughly cooked or boiled items |  |  |  |  |  |  |  |  |
| Always/ Seldom | 98.5 | 97.7 | 96.9 | 98.8 | 97.9 | 98.8 | 96.6 | 98.9 |
| Never | 1.5 | 1.9 | 3.1 | 0.7 | 2.1 | 0.6 | 3.4 | 1.1 |
| Can't remember | 0.0 | 0.4 | 0.0 | 0.6 | 0.0 | 0.6 | 0.0 | 0.0 |
| Sample size | (399) | (470) | (70) | (127) | (151) | (155) | (168) | (198) |
| p-value (Chi-Square) | 0.443 |  | 0.473 |  |  |  |  |  |
| Disinfect and cover all wounds |  |  |  |  |  |  |  |  |
| Always/ Seldom | 92.9 | 92.2 | 92.5 | 93.0 | 97.5 | 94.6 | 90.4 | 88.7 |
| Never | 4.5 | 6.1 | 3.6 | 6.2 | 1.9 | 3.0 | 7.0 | 8.4 |
| Can't remember | 2.6 | 1.7 | 3.9 | 0.8 | 0.6 | 2.4 | 2.7 | 2.9 |
| Sample size | (399) | (470) | (70) | (127) | (151) | (155) | (168) | (198) |
| p-value (Chi-Square) | 0.408 |  | 0.125 |  |  |  |  |  |

Table 4.2.2: Frequency of practising the health advice during last medication period from by gender and age (\%) (Continued)

|  | GENDER |  | AGE |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | $15-24$ | $25-34$ | $35-44$ | $45-54$ | $55-64$ | $\geq 65$ |
| Wear surgical mask if you have respiratory symptoms |  |  |  |  |  |  |  |  |
| Always/ Seldom | 84.7 | 89.9 | 89.8 | 94.2 | 91.5 | 90.9 | 84.9 | 79.1 |
| Never | 13.5 | 8.3 | 7.0 | 5.3 | 8.0 | 8.0 | 11.5 | 18.9 |
| Can't remember | 1.8 | 1.8 | 3.2 | 0.6 | 0.5 | 1.2 | 3.6 | 2.0 |
| Sample size | $(399)$ | $(470)$ | $(70)$ | $(127)$ | $(151)$ | $(155)$ | $(168)$ | $(198)$ |
| p-value (Chi-Square) | $0.045^{*}$ |  |  | $0.002 *$ |  |  |  |  |
| Young children with symptoms of infections should minimise contact with other children |  |  |  |  |  |  |  |  |
| Always/ Seldom | 87.6 | 95.6 | 92.9 | 92.7 | 97.5 | 90.8 | 88.6 | 88.7 |
| Never | 9.8 | 3.8 | 7.1 | 7.3 | 1.9 | 6.5 | 9.4 | 8.8 |
| Can't remember | 2.6 | 0.6 | 0.0 | 0.0 | 0.6 | 2.8 | 2.0 | 2.4 |
| Sample size | $(239)$ | $(280)$ | $(46)$ | $(63)$ | $(116)$ | $(109)$ | $(91)$ | $(95)$ |
| p-value (Chi-Square) | $0.003^{*}$ |  |  |  |  | 0.400 |  |  |

*p<0.05, **p<0.01, ***p<0.001
Question: A6a-e "On that occasion, how often did you practise the following when you handled or took antibiotics in your daily life (excluding work) during the medication period? 'always', 'seldom' or 'never'?"

### 4.3 Views on usefulness of instructions given by doctors and pharmacists

All respondents were asked about their perceived usefulness of having doctors giving related advice when prescribing antibiotics to facilitate patients to take antibiotics according to instructions and complete the full course of antibiotics. A similar question on the usefulness of advice of the pharmacists who dispensed antibiotics in hospitals or clinics was also asked. The survey results found that a majority of the respondents considered that the advice from doctors (78.8\%) and pharmacists (75.8\%) were very useful or slightly useful (Figure 4.3.1).

Figure 4.3.1: Perceived usefulness of actions for facilitating patients to take antibiotics according to instructions and complete the full course (\%)


Base: Persons aged 15 or above $=1076$.
Question: 7a-b "How useful do you think the following actions could facilitate patients to take antibiotics according to instructions and complete the full course of antibiotics? Please rate from 1 (very useless) to 5 (very useful)."

Sub-group analyses by gender found that female respondents perceived a higher level of usefulness of doctors and pharmacists' related advice than male respondents. For pharmacists' advice, when compared to younger respondents, elder respondents perceived a higher level of usefulness (Table 4.3.1).

Table 4.3.1: Perceived usefulness of actions for facilitating patients to take antibiotics according to instructions and complete the full course by gender and age

|  | GENDER |  | AGE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | 15-24 | 25-34 | 35-44 | 45-54 | 55-64 | $\geq 65$ |
| Doctors give related advice when prescribing antibiotics |  |  |  |  |  |  |  |  |
| Mean | 4.08 | 4.39 | 4.08 | 4.13 | 4.34 | 4.33 | 4.30 | 4.20 |
| Count | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (ANOVA) | $0.000^{* * *}$ |  | 0.099 |  |  |  |  |  |
| Pharmacists give related advice when dispensing antibiotics in hospitals / clinics |  |  |  |  |  |  |  |  |
| Mean | 4.02 | 4.29 | 3.95 | 3.96 | 4.14 | 4.19 | 4.21 | 4.32 |
| Count | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (ANOVA) | 0.000*** |  | 0.009** |  |  |  |  |  |

Note: $1=$ very useless to $5=$ very useful
*p $<0.05,{ }^{* *} \mathrm{p}<0.01, * * * \mathrm{p}<0.001$
Question: 7a-b "How useful do you think the following actions could facilitate patients to take antibiotics according to instructions and complete the full course of antibiotics? Please rate from 1 (very useless) to 5 (very useful)."

### 4.4 Whether respondents had consulted doctor(s) for cold or flu and requested antibiotics in the past $\mathbf{1 2}$ months

All respondents were asked whether they had consulted doctor(s) for cold or flu in the past 12 months, $77.5 \%$ of the respondents reported that they had not while $21.6 \%$ answered that they had. Respondents who consulted doctor(s) for cold or flu in the past 12 months were further asked whether they had asked for antibiotics during that consultation, $97.2 \%$ of the respondents replied that they did not do so. (Figure 4.4.1).

Figure 4.4.1: Whether respondents had consulted doctor(s) for cold or flu and requested antibiotics in the past 12 months (\%)


Base: Persons aged 15 or above $=1076$.
Question: A8 "In the past 12 months, had you consulted doctor(s) for cold or flu?"

Base: Persons aged 15 or above who had consulted doctor(s) for cold or flu in the past 12 months $=232$.

Question: A9 "Had you asked for antibiotics during that consultation?"

Compared with the other age groups, respondents aged 44 or below had a higher rate of having consulted doctor(s) for cold or flu in the past 12 months (Table 4.4.1).

Table 4.4.1: Whether respondents had consulted doctor(s) for cold or flu and requested antibiotics in the past 12 months by gender and age (\%)

|  | GENDER |  | AGE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | 15-24 | 25-34 | 35-44 | 45-54 | 55-64 | $\geq 65$ |
| In the past 12 months, had you consulted doctor(s) for cold or flu? |  |  |  |  |  |  |  |  |
| Yes | 20.5 | 22.5 | 31.5 | 25.2 | 29.1 | 18.7 | 16.3 | 16.9 |
| No | 79.1 | 76.2 | 67.4 | 73.8 | 70.0 | 80.9 | 82.8 | 82.0 |
| Can't remember | 0.5 | 1.3 | 1.1 | 1.0 | 0.9 | 0.4 | 0.9 | 1.2 |
| Sample size | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (Chi-Square) | 0.253 |  | 0.019* |  |  |  |  |  |
| Had you asked for antibiotics during that consultation? |  |  |  |  |  |  |  |  |
| Yes | 4.0 | 1.4 | 7.9 | 1.6 | 0.0 | 3.1 | 5.4 | 0.0 |
| No | 95.3 | 98.6 | 92.1 | 98.4 | 100.0 | 96.9 | 94.6 | 98.5 |
| Can't remember | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 |
| Sample size | (104) | (128) | (30) | (38) | (51) | (35) | (35) | (43) |
| p-value (Chi-Square) |  |  |  |  |  |  |  |  |

Question: A8 "In the past 12 months, had you consulted doctor(s) for cold or flu?"; A9 "Had you asked for antibiotics during that consultation?"

There was no statistically significant difference in request for antibiotics between gender and age groups (Table 4.4.1).

### 4.5 General views, knowledge and awareness

### 4.5.1 Whether respondents would accept the doctor's advice to observe for few more

 days or to wait for the diagnostic test result before deciding whether to prescribe
## antibiotics or not

All respondents were asked when doctor's initial assessment indicated that antibiotic was not needed at the moment, whether they would accept doctor's advice to observe for few more days or to wait for the diagnostic test result before deciding whether to prescribe antibiotics or not, $96.4 \%$ of the respondents said that they would accept the advice of the doctor (Figure 4.5.1).

Figure 4.5.1: Whether respondents would accept the doctor's advice to observe for few more days or to wait for the diagnostic test result before deciding whether to prescribe antibiotics or not (\%)


- Yes / Accept - No / Not accept - Don’t know

Base: Persons aged 15 or above $=1076$.
Question: A10 "When you consult a doctor and his / her initial assessment for you indicated that antibiotic is not needed at the moment, would you accept if the doctor tells you to observe for few more days or to wait for the diagnostic test's result before deciding whether to prescribe antibiotics or not?"

The survey results found that respondents aged between 35 and 64 were more likely than the other age groups to accept such advice (Table 4.5.1).

Table 4.5.1: Whether respondents would accept the doctor's advice to observe for few more days or to wait for the diagnostic test result before deciding whether to prescribe antibiotics or not by gender and age (\%)

|  | GENDER |  | AGE |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | $15-24$ | $25-34$ | $35-44$ | $45-54$ | $55-64$ | $\geq 65$ |
| Yes / Accept | 95.8 | 96.9 | 94.3 | 95.7 | 97.3 | 97.8 | 98.3 | 94.2 |
| No / Not accept | 3.2 | 1.5 | 3.3 | 4.3 | 2.7 | 1.3 | 1.1 | 2.0 |
| Don't know | 1.0 | 1.7 | 2.3 | 0.0 | 0.0 | 0.8 | 0.6 | 3.7 |
| Sample size | $(508)$ | $(568)$ | $(96)$ | $(152)$ | $(175)$ | $(186)$ | $(212)$ | $(255)$ |
| p-value (Chi-Square) | 0.117 |  |  |  | $0.011^{*}$ |  |  |  |

*p<0.05, **p<0.01, ***p<0.001
Question: A10 "When you consult a doctor and his / her initial assessment for you indicated that antibiotic is not needed at the moment, would you accept if the doctor tells you to observe for few more days or to wait for the diagnostic test's result before deciding whether to prescribe antibiotics or not?"

### 4.5.2 Whether respondents preferred consulting doctors who would prescribe

 antibiotics more readilyRespondents were asked if they preferred consulting doctors who would prescribe antibiotics more readily. Majority (83.3\%) answered that they did not prefer, whereas only $5.7 \%$ expressed that they had such preference (Figure 4.5.2).

Figure 4.5.2: Whether respondents preferred consulting doctors who would prescribe antibiotics more readily (\%)


- Yes - No - Don't know / Depends on the situation

Base: Persons aged 15 or above $=1076$.
Question: A11 "Do you prefer consulting doctors who prescribe antibiotics more readily?"

A comparison of different age groups revealed that respondents aged between 45 and 54 had the highest rate of not preferring to consult doctors who would prescribe antibiotics more readily (Table 4.5.2).

Table 4.5.2: Whether respondents preferred consulting doctors who would prescribe antibiotics more readily by gender and age (\%)

|  | GENDER |  | AGE |  |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | $15-24$ | $25-34$ | $35-44$ | $45-54$ | $55-64$ | $\geq 65$ |  |
| Yes | 6.0 | 5.4 | 5.0 | 6.1 | 6.9 | 6.3 | 4.9 | 5.0 |  |
| No | 81.4 | 84.9 | 80.9 | 84.5 | 83.9 | 89.3 | 84.8 | 77.5 |  |
| Don't know / Depends <br> on the situation | 12.6 | 9.6 | 14.0 | 9.4 | 9.2 | 4.4 | 10.4 | 17.5 |  |
| Sample size | $(508)$ | $(568)$ | $(96)$ | $(152)$ | $(175)$ | $(186)$ | $(212)$ | $(255)$ |  |
| p-value (Chi-Square) | 0.266 |  |  |  | $0.015^{*}$ |  |  |  |  |

*p<0.05, **p<0.01, ***p<0.001
Question: A11 "Do you prefer consulting doctors who prescribe antibiotics more readily?"

### 4.5.3 Whether respondents wanted doctors to share decision making with them on antibiotics prescription

When the respondents were asked whether they wanted doctors to share decision making with them on antibiotics prescription, $66.3 \%$ of them said yes (Figure 4.5.3).

Figure 4.5.3: Whether respondents wanted doctors to share decision making with them on antibiotics prescription (\%)


Base: Persons aged 15 or above $=1076$.
Question: A14 "Do you want your doctor to share decision making with you on antibiotics prescription?"

Compared with male and other age groups, female respondents and those aged 64 or below were more inclined to have doctors share decision making with them on antibiotics prescription (Table 4.5.3).

Table 4.5.3: Whether respondents wanted doctors to share decision making with them on antibiotics prescription by gender and age (\%)

|  | GENDER |  | AGE |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | $15-24$ | $25-34$ | $35-44$ | $45-54$ | $55-64$ | $\geq 65$ |
| Yes | 60.7 | 71.2 | 72.9 | 73.2 | 73.6 | 73.1 | 68.3 | 48.0 |
| No | 23.1 | 15.1 | 19.1 | 18.2 | 16.1 | 14.2 | 19.1 | 24.3 |
| Neutral | 16.2 | 13.7 | 8.0 | 8.6 | 10.3 | 12.8 | 12.6 | 27.7 |
| Sample size | $(508)$ | $(568)$ | $(96)$ | $(152)$ | $(175)$ | $(186)$ | $(212)$ | $(255)$ |
| p-value (Chi-Square) | $0.000^{* * *}$ | $0.000^{* * *}$ |  |  |  |  |  |  |


| *p<0.05, **p<0.01, ***p<0.001 |
| :--- |
| Question: A14 "Do you want your doctor to share decision making with you on antibiotics prescription?" |

### 4.5.4 Statements about antibiotics

All respondents were asked if two false statements about antibiotics were true or not. Majority of them could provide the correct answers, in which $89.3 \%$ and $79.0 \%$ of the respondents correctly identified the statements "It's okay to use antibiotics that were given by a friend or family member, as long as they were used to treat the same illness" ; and "It's okay to buy the same antibiotics, or request them from a doctor if you're sick and they helped you get better when you had the same symptoms before" as false respectively (Figure 4.5.4).

Figure 4.5.4: Whether respondents thought the selected statements about antibiotics as true or false (\%)


Base: Persons aged 15 or above $=1076$.
Question: A12a-b "Please indicate whether you think the following statements are "true" or "false"."

Regarding the first statement "It's okay to use antibiotics that were given by a friend or family member, as long as they were used to treat the same illness", the percentage of giving correct answer by female respondents and those aged between 35 and 44 were the highest (Table 4.5.4).

For the second statement "It's okay to buy the same antibiotics, or request them from a doctor if you're sick and they helped you get better when you had the same symptoms before", there was no statistically significant difference between gender and age groups (Table 4.5.4).

Table 4.5.4: Whether respondents thought the selected statements about antibiotics as true or false by gender and age (\%)

|  | GENDER |  | AGE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | 15-24 | 25-34 | 35-44 | 45-54 | 55-64 | $\geq 65$ |
| It's okay to use antibiotics that were given by a friend or family member, as long as they were used to treat the same illness |  |  |  |  |  |  |  |  |
| True | 9.2 | 8.3 | 15.2 | 9.4 | 3.8 | 6.5 | 8.4 | 11.3 |
| False (Correct) | 87.4 | 91.0 | 84.8 | 90.0 | 94.5 | 92.9 | 88.5 | 85.0 |
| Don't know | 3.4 | 0.7 | 0.0 | 0.6 | 1.7 | 0.7 | 3.1 | 3.7 |
| Sample size | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (Chi-Square) | 0.006** |  | 0.007** |  |  |  |  |  |
| It's okay to buy the same antibiotics, or request them from a doctor if you're sick and they helped you get better when you had the same symptoms before |  |  |  |  |  |  |  |  |
| True | 18.1 | 15.4 | 21.0 | 14.8 | 13.4 | 18.3 | 14.3 | 19.2 |
| False (Correct) | 77.8 | 80.2 | 77.6 | 83.5 | 83.1 | 76.9 | 82.0 | 73.2 |
| Don't know | 4.1 | 4.5 | 1.4 | 1.7 | 3.4 | 4.9 | 3.6 | 7.6 |
| Sample size | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (Chi-Square) |  |  |  |  |  |  |  |  |

### 4.5.5 Knowledge of antibiotics

All respondents were asked whether certain health conditions could be treated with antibiotics, including bladder infection or urinary tract infection (UTI), diarrhoea, cold and flu, fever, skin or wound infection, sore throat, body aches and headaches. The percentages of respondents who could correctly indicate which health conditions could or could not be treated with antibiotics are listed below:
a. Headaches (No: 79.5\%);
b. Body aches (No: 78.0\%);
c. Skin or wound infection (Yes: 75.7\%);
d. Diarrhoea (No: 65.3\%);
e. Fever (No: 60.1\%);
f. Bladder infection or urinary tract infection (UTI) (Yes: 59.4\%);
g. Cold and flu (No: 49.7\%); and
h. Sore throat (No: 36.7\%) (Figure 4.5.5a).

Figure 4.5.5a: Whether respondents thought the selected health conditions could be treated with antibiotics (\%)


Base: Persons aged 15 or above $=1076$.
Question: A13a-h "Do you think these conditions can be treated with antibiotics?"

Analysed by gender, female respondents were more likely to give correct answers to certain health conditions including bladder infection or urinary tract infection (UTI), diarrhoea, fever and headaches, when compared with the male respondents. Male respondents had a higher percentage of giving correct answer to sore throat. There was no statistically significant difference in the percentage of giving correct answer to cold and flu, skin or wound infection and body aches between genders (Figure 4.5.5b; Table 4.5.5).

Figure 4.5.5b: Respondents who correctly indicated whether the selected health conditions could be treated with antibiotics by gender (\%)

${ }^{*} \mathrm{p}<0.05,{ }^{* *} \mathrm{p}<0.01,{ }^{* * *} \mathrm{p}<0.001$
Base: Persons aged 15 or above $=1076$.
Question: A13a-h "Do you think these conditions can be treated with antibiotics?"

Analysed by age, respondents aged 65 or above had the lowest percentages of giving correct answer to 5 out of 8 selected health conditions including diarrhoea, skin or wound infection, sore throat, body aches and headaches. The youngest age group of 15 to 24 had the lowest percentage of giving correct answer to bladder infection or urinary tract infection (UTI), cold and flu, and fever (Figure 4.5.5c; Table 4.5.5).

Figure 4.5.5c: Respondents who correctly indicated whether the selected health conditions could be treated with antibiotics by age (\%)


[^0]Table 4.5.5: Whether respondents thought the selected health conditions could be treated with antibiotics by gender and age (\%)

|  | GENDER |  | AGE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | 15-24 | 25-34 | 35-44 | 45-54 | 55-64 | $\geq 65$ |
| Bladder infection or urinary tract infection (UTI) |  |  |  |  |  |  |  |  |
| Yes (Correct) | 50.5 | 67.3 | 55.2 | 62.5 | 61.0 | 64.8 | 57.8 | 55.4 |
| No | 16.7 | 13.5 | 32.9 | 22.5 | 18.2 | 9.6 | 12.8 | 7.3 |
| Don't know | 32.8 | 19.2 | 11.9 | 15.0 | 20.8 | 25.6 | 29.4 | 37.4 |
| Sample size | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (Chi-Square) | 0.000*** |  | 0.000*** |  |  |  |  |  |
| Diarrhoea |  |  |  |  |  |  |  |  |
| Yes | 14.6 | 14.1 | 21.7 | 20.5 | 10.8 | 14.9 | 12.3 | 11.5 |
| No (Correct) | 58.8 | 71.1 | 63.8 | 70.6 | 74.1 | 66.6 | 65.9 | 55.1 |
| Don't know | 26.6 | 14.8 | 14.5 | 8.9 | 15.1 | 18.5 | 21.7 | 33.4 |
| Sample size | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (Chi-Square) | 0.000*** |  | $0.000^{* * *}$ |  |  |  |  |  |

Cold and flu

| Yes | 37.7 | 33.8 | 66.4 | 51.8 | 37.3 | 28.9 | 28.9 | 23.7 |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| No (Correct) | 46.0 | 52.9 | 27.4 | 35.8 | 52.4 | 54.7 | 57.4 | 54.3 |  |  |
| Don't know | 16.3 | 13.3 | 6.2 | 12.4 | 10.3 | 16.3 | 13.7 | 22.0 |  |  |
| Sample size | $(508)$ | $(568)$ | $(96)$ | $(152)$ | $(175)$ | $(186)$ | $(212)$ | $(255)$ |  |  |
| p-value (Chi-Square) | 0.067 |  |  |  | $0.000^{* * *}$ |  |  |  |  |  |
| Fever | 19.5 | 24.8 | 45.5 | 26.7 | 25.3 | 18.2 | 17.6 | 15.6 |  |  |
| Yes | 58.0 | 61.9 | 46.4 | 62.3 | 63.1 | 59.4 | 68.2 | 55.6 |  |  |
| No (Correct) | 22.5 | 13.3 | 8.1 | 11.0 | 11.6 | 22.4 | 14.2 | 28.8 |  |  |
| Don't know | $(508)$ | $(568)$ | $(96)$ | $(152)$ | $(175)$ | $(186)$ | $(212)$ | $(255)$ |  |  |
| Sample size | $0.000^{* * *}$ |  |  | $0.000^{* * *}$ |  |  |  |  |  |  |
| p-value (Chi-Square) |  |  |  |  |  |  |  |  |  |  |

*p<0.05, ** $\mathrm{p}<0.01,{ }^{* * *} \mathrm{p}<0.001$
(To be continued)

Table 4.5.5: Whether respondents thought the selected health conditions could be treated with antibiotics by gender and age (\%) (Continued)

|  | GENDER |  | AGE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | 15-24 | 25-34 | 35-44 | 45-54 | 55-64 | $\geq 65$ |
| Skin or wound infection |  |  |  |  |  |  |  |  |
| Yes (Correct) | 73.7 | 77.4 | 78.4 | 76.9 | 83.9 | 79.6 | 77.3 | 64.2 |
| No | 11.6 | 10.6 | 18.5 | 16.9 | 7.2 | 8.3 | 9.8 | 10.3 |
| Don't know | 14.7 | 12.0 | 3.1 | 6.2 | 8.9 | 12.0 | 12.9 | 25.5 |
| Sample size | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (Chi-Square) | 0.329 |  | $0.000^{* * *}$ |  |  |  |  |  |
| Sore throat |  |  |  |  |  |  |  |  |
| Yes | 40.0 | 47.4 | 47.5 | 48.5 | 47.5 | 47.3 | 38.1 | 39.9 |
| No (Correct) | 38.7 | 35.0 | 42.7 | 41.5 | 39.8 | 30.9 | 43.3 | 28.4 |
| Don't know | 21.3 | 17.5 | 9.8 | 10.0 | 12.8 | 21.7 | 18.6 | 31.7 |
| Sample size | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (Chi-Square) | 0.044* |  | 0.000*** |  |  |  |  |  |
| Body aches |  |  |  |  |  |  |  |  |
| Yes | 6.4 | 5.5 | 4.7 | 6.6 | 6.6 | 7.1 | 6.2 | 4.4 |
| No (Correct) | 75.4 | 80.4 | 90.0 | 80.4 | 82.6 | 78.0 | 75.0 | 71.4 |
| Don't know | 18.3 | 14.1 | 5.3 | 13.0 | 10.7 | 14.9 | 18.7 | 24.1 |
| Sample size | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (Chi-Square) | 0.127 |  | $0.002 * *$ |  |  |  |  |  |
| Headaches |  |  |  |  |  |  |  |  |
| Yes | 8.7 | 5.9 | 11.9 | 10.4 | 7.4 | 5.0 | 7.0 | 5.3 |
| No (Correct) | 74.6 | 83.8 | 82.6 | 82.3 | 83.7 | 81.9 | 76.9 | 74.1 |
| Don't know | 16.7 | 10.3 | 5.5 | 7.3 | 8.9 | 13.2 | 16.1 | 20.7 |
| Sample size | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (Chi-Square) | 0.00 | *** |  |  | 0.00 | *** |  |  |

[^1]Question: A13a-h "Do you think these conditions can be treated with antibiotics?"

## 4．5．6 Whether respondents had heard of the selected terms related to antimicrobial

 resistanceAll respondents were asked according to the language used during enumeration（i．e． Chinese or English），whether they had heard of the following terms including ＂Superbugs＂（超級細菌），＂Antibiotic resistance＂（抗生素耐藥性），＂Antibiotic－ resistant bacteria＂（抗藥性細菌）and＂Antimicrobial resistance＂（抗菌素耐藥性）．The majority of the respondents had heard of＂Superbugs＂（81．4\％），＂Antibiotic resistance＂ （76．0\％）and＂Antibiotic－resistant bacteria＂（75．0\％）．Only 40．3\％of the respondents had heard of＂Antimicrobial resistance＂（Figure 4．5．6a）．

Figure 4．5．6a：Whether respondents had heard of the selected terms related to antimicrobial resistance（\％）


Base：Persons aged 15 or above $=1076$ ．
Question：A15a－d＂Have you heard of any of the following terms？＂

It was noticed that the percentage of male respondents who had heard of "Antibiotic resistance", "Antimicrobial resistance" and "Antibiotic-resistant bacteria" was higher than those of the female respondents (Figure 4.5.6b; Table 4.5.6).

Figure 4.5.6b: Respondents who had heard of the selected terms related to antimicrobial resistance by gender (\%)

${ }^{*} \mathrm{p}<0.05, * * \mathrm{p}<0.01, * * * \mathrm{p}<0.001$
Base: Persons aged 15 or above $=1076$.
Question: A15a-d "Have you heard of any of the following terms?"

Analysed by age, the percentages of having heard of "Superbugs", "Antibiotic resistance" and "Antibiotic-resistant bacteria" among respondents aged 65 or above were the lowest, whereas the youngest age group of 15 to 24 had the lowest percentage of having heard of "Antimicrobial resistance" (Figure 4.5.6c; Table 4.5.6).

Figure 4.5.6c: Respondents who had heard of the selected terms related to antimicrobial resistance by age (\%)

${ }^{*} \mathrm{p}<0.05,{ }^{* *} \mathrm{p}<0.01, * * * \mathrm{p}<0.001$
Base: Persons aged 15 or above $=1076$.
Question: A15a-d "Have you heard of any of the following terms?"

Table 4.5.6: Whether respondents had heard of the selected terms related to antimicrobial resistance by gender and age (\%)


| Yes | 77.9 | 72.3 | 78.5 | 79.9 | 79.3 | 80.8 | 72.0 | 65.9 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| No | 21.8 | 26.2 | 20.8 | 18.8 | 20.3 | 18.4 | 26.8 | 33.0 |
| Can't remember | 0.3 | 1.5 | 0.8 | 1.3 | 0.4 | 0.8 | 1.2 | 1.1 |
| Sample size | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (Chi-Square) | 0.031* |  | 0.021* |  |  |  |  |  |

### 4.5.7 Statements about antibiotic resistance

All respondents were asked whether the selected statements about antibiotic resistance were true or false. The percentages of respondents who could provide the correct answers are listed below:
a. Many infections are becoming increasingly resistant to treatment by antibiotics (True: 81.2\%);
b. Antibiotic resistance is an issue in other countries but not in Hong Kong (False: 77.4\%);
c. Antibiotic-resistant infections could make medical procedures like surgery, organ transplants and cancer treatment much more dangerous (True: 76.8\%);
d. If bacteria are resistant to antibiotics, it can be very difficult or impossible to treat the infections they cause (True: 71.4\%);
e. Antibiotics are anti-inflammatory drugs (False: 60.3\%);
f. Antibiotic resistance is only a problem for people who take antibiotics regularly (False: 50.7\%); and
g. Bacteria which are resistant to antibiotics can be spread from person to person (True: 44.1\%) (Figure 4.5.7a).

Figure 4.5.7a: Whether respondents thought the selected statements about antibiotic resistance as true or false (\%)


Base: Persons aged 15 or above $=1076$.
Question: A16a-g "Please indicate whether you think the following statements are "true" or "false"."

Analysed by gender, male respondents were more likely to correctly identify the statement "Bacteria which are resistant to antibiotics can be spread from person to person" as true. Male and female respondents had no statistically significant difference in the other six statements (Figure 4.5.7b; Table 4.5.7).

Figure 4.5.7b: Respondents who correctly indicated whether the selected statements about antibiotic resistance were true or false by gender (\%)


[^2]Compared with other age groups, respondents aged 65 or above had the lowest percentages of giving correct answers to all the selected statements (Figure 4.5.7c; Table 4.5.7).

Figure 4.5.7c: Respondents who correctly indicated whether the selected statements about antibiotic resistance were true or false by age (\%)

*p $<0.05,{ }^{* *} \mathrm{p}<0.01,{ }^{* * *} \mathrm{p}<0.001$
Base: Persons aged 15 or above $=1076$.
Question: A16a-g "Please indicate whether you think the following statements are "true" or "false"."

Table 4.5.7: Whether respondents thought the selected statements about antibiotic resistance as true or false by gender and age (\%)

|  | GENDER |  | AGE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | 15-24 | 25-34 | 35-44 | 45-54 | 55-64 | $\geq 65$ |
| Antibiotics are anti-inflammatory drugs |  |  |  |  |  |  |  |  |
| True | 28.3 | 30.5 | 17.8 | 22.1 | 21.0 | 30.9 | 29.1 | 43.3 |
| False (Correct) | 60.1 | 60.5 | 80.8 | 73.7 | 72.8 | 61.7 | 59.1 | 36.0 |
| Don't know | 11.6 | 9.0 | 1.3 | 4.2 | 6.2 | 7.4 | 11.8 | 20.7 |
| Sample size | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (Chi-Square) | 0.322 |  | $0.000^{* * *}$ |  |  |  |  |  |
| Many infections are becoming increasingly resistant to treatment by antibiotics |  |  |  |  |  |  |  |  |
| True (Correct) | 83.3 | 79.4 | 89.5 | 84.9 | 84.2 | 83.8 | 78.8 | 74.1 |
| False | 6.8 | 8.6 | 9.1 | 7.4 | 9.0 | 5.7 | 9.9 | 6.3 |
| Don't know | 9.9 | 12.0 | 1.4 | 7.7 | 6.8 | 10.4 | 11.3 | 19.6 |
| Sample size | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (Chi-Square) | 0.261 |  | 0.000*** |  |  |  |  |  |
| If bacteria are resistant to antibiotics, it can be very difficult or impossible to treat the infections they cause |  |  |  |  |  |  |  |  |
| True (Correct) | 69.0 | 73.6 | 74.9 | 72.7 | 78.5 | 73.1 | 68.9 | 65.3 |
| False | 18.0 | 15.4 | 23.5 | 22.7 | 16.3 | 14.1 | 21.2 | 8.9 |
| Don't know | 13.0 | 11.0 | 1.6 | 4.6 | 5.2 | 12.9 | 9.9 | 25.8 |
| Sample size | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (Chi-Square) | 0.242 |  | $0.000^{* * *}$ |  |  |  |  |  |
| Antibiotic resistance is an issue in other countries but not in Hong Kong |  |  |  |  |  |  |  |  |
| True | 10.9 | 9.5 | 2.0 | 10.2 | 11.5 | 6.7 | 13.5 | 12.1 |
| False (Correct) | 76.9 | 77.8 | 95.2 | 83.0 | 79.1 | 85.0 | 75.2 | 62.4 |
| Don't know | 12.2 | 12.7 | 2.8 | 6.8 | 9.5 | 8.2 | 11.2 | 25.6 |
| Sample size | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (Chi-Square) | 0.765 |  | $0.000^{* * *}$ |  |  |  |  |  |

[^3](To be continued)

Table 4.5.7: Whether respondents thought the selected statements about antibiotic resistance as true or false by gender and age (\%) (Continued)

|  | GENDER |  | AGE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | 15-24 | 25-34 | 35-44 | 45-54 | 55-64 | $\geq 65$ |
| Antibiotic resistance is only a problem for people who take antibiotics regularly |  |  |  |  |  |  |  |  |
| True | 40.5 | 41.5 | 33.3 | 27.1 | 42.9 | 44.0 | 41.3 | 48.7 |
| False (Correct) | 50.3 | 51.1 | 65.3 | 70.9 | 52.1 | 50.4 | 50.6 | 32.5 |
| Don't know | 9.2 | 7.4 | 1.4 | 2.0 | 5.0 | 5.7 | 8.0 | 18.8 |
| Sample size | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (Chi-Square) | 0.543 |  | 0.000 *** |  |  |  |  |  |
| Bacteria which are resistant to antibiotics can be spread from person to person |  |  |  |  |  |  |  |  |
| True (Correct) | 48.5 | 40.2 | 48.4 | 56.9 | 57.0 | 43.7 | 38.6 | 31.0 |
| False | 31.6 | 43.0 | 50.3 | 34.7 | 33.0 | 39.1 | 40.4 | 34.4 |
| Don't know | 19.9 | 16.8 | 1.3 | 8.4 | 10.0 | 17.2 | 21.0 | 34.6 |
| Sample size | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (Chi-Square) | $0.000^{* * *}$ |  | $0.000^{* * *}$ |  |  |  |  |  |
| Antibiotic-resistant infections could make medical procedures like surgery, organ transplants and cancer treatment much more dangerous |  |  |  |  |  |  |  |  |
| True (Correct) | 78.5 | 75.3 | 85.0 | 85.3 | 84.9 | 79.4 | 69.8 | 66.9 |
| False | 8.4 | 10.1 | 11.4 | 10.1 | 7.5 | 7.5 | 11.5 | 8.7 |
| Don't know | 13.1 | 14.7 | 3.6 | 4.6 | 7.6 | 13.2 | 18.7 | 24.4 |
| Sample size | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (Chi-Square) |  | 39 |  |  | 0.00 | *** |  |  |

*p $<0.05,{ }^{* *} \mathrm{p}<0.01, * * * \mathrm{p}<0.001$
Question: A16a-g "Please indicate whether you think the following statements are "true" or "false"."

### 4.5.8 Knowledge and perception on antibiotic resistance

Lastly, all respondents were asked how much they agreed with five selected statements related to knowledge and perception on antibiotic resistance. The percentages of respondents who strongly agreed or slightly agreed with those statements are listed below:
a. If high-risk individuals (including pregnant women, young children, elderly and people with weakened immune systems) avoid consuming raw or undercooked ready-to-eat food, their risk of being infected by drugresistant bacteria from food will be reduced ( $66.8 \%$ );
b. People should not keep antibiotics and use them later for other illnesses (61.7\%);
c. If people taking medicines such as antibiotics and stomach medicines avoid consuming raw or undercooked ready-to-eat food, their risk of being infected by drug-resistant bacteria from food will be reduced (61.3\%);
d. Raw or undercooked ready-to-eat food (such as salad or sashimi) is more easily to be contaminated by drug-resistant bacteria (42.7\%); and
e. There is not much I can do to stop antibiotic resistance (35.8\%) (Figure 4.5.8).

Figure 4.5.8: Level of agreement of the selected statements (\%)


Base: Persons aged 15 or above $=1076$.
Question: A17a-e "How much do you agree with the following statements? Please rate from 1 (strongly disagree) to 5 (strongly agree)."

Compare with the male respondents, female respondents were more likely to agree that "People should not keep antibiotics and use them later for other illnesses" and "If highrisk individuals avoid consuming raw or undercooked ready-to-eat food, their risk of being infected by drug-resistant bacteria from food will be reduced". There was no statistically significant difference in attitudes of male and female respondents towards the other three statements (Table 4.5.8).

Analysed by age, the respondents aged 65 or above had the lowest mean score in the statement "People should not keep antibiotics and use them later for other illnesses". The youngest age group of 15 to 24 were least likely to agree that "Raw or undercooked ready-to-eat food (such as salad and sashimi) is more easily to be contaminated by drugresistant bacteria". However, no statistically significant difference in the level of agreement of the other three statements was found (Table 4.5.8).

Table 4.5.8: Level of agreement of the selected statements by gender and age

|  | GENDER |  | AGE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male | Female | 15-24 | 25-34 | 35-44 | 45-54 | 55-64 | $\geq 65$ |
| People should not keep antibiotics and use them later for other illnesses |  |  |  |  |  |  |  |  |
| Mean | 3.43 | 3.72 | 3.71 | 3.92 | 3.65 | 3.73 | 3.43 | 3.31 |
| Count | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (ANOVA) | 0.005** |  | $0.008^{* *}$ |  |  |  |  |  |
| There is not much I can do to stop antibiotic resistance |  |  |  |  |  |  |  |  |
| Mean | 3.07 | 3.12 | 3.16 | 2.97 | 3.01 | 3.01 | 3.04 | 3.31 |
| Count | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (ANOVA) | 0.488 |  | 0.076 |  |  |  |  |  |
| R aw or undercooked ready-to-eat food (such as salad and sashimi) is more easily to be contaminated by drug-resistant bacteria |  |  |  |  |  |  |  |  |
| Mean | 3.35 | 3.34 | 3.16 | 3.17 | 3.20 | 3.31 | 3.34 | 3.66 |
| Count | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (ANOVA) | 0.905 |  | $0.000^{* * *}$ |  |  |  |  |  |
| If high-risk individuals avoid consuming raw or undercooked ready-to-eat food, their risk of being infected by drug-resistant bacteria from food will be reduced |  |  |  |  |  |  |  |  |
| Mean | 3.81 | 3.96 | 3.81 | 3.68 | 4.01 | 3.89 | 3.83 | 4.01 |
| Count | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (ANOVA) | 0.046* |  | 0.117 |  |  |  |  |  |
| If people taking medicines such as antibiotics and stomach medicines avoid consuming raw or undercooked ready-to-eat food, their risk of being infected by drug-resistant bacteria from food will be reduced |  |  |  |  |  |  |  |  |
| Mean | 3.65 | 3.80 | 3.63 | 3.67 | 3.74 | 3.81 | 3.76 | 3.71 |
| Count | (508) | (568) | (96) | (152) | (175) | (186) | (212) | (255) |
| p-value (ANOVA) | 0.059 |  | 0.863 |  |  |  |  |  |

Note: $1=$ strongly disagree to $5=$ strongly agree
${ }^{*} \mathrm{p}<0.05,{ }^{* *} \mathrm{p}<0.01,{ }^{* * *} \mathrm{p}<0.001$
Question: A17a-e "How much do you agree with the following statements? Please rate from 1 (strongly disagree) to 5 (strongly agree)."

## 5. Conclusion and Recommendations

### 5.1 Conclusion

### 5.1.1 Use of antibiotics

About a quarter (26.1\%) of the respondents reported that they last took antibiotics within the past year. Majority (95.4\%) of those who had ever taken antibiotics reported that their last taken antibiotics were prescribed by doctors. Among those respondents whose last taken antibiotics were prescribed by doctors, $58.1 \%$ of them obtained the antibiotics last taken from private clinics. The major source of antibiotics last taken that were not or could not remember if prescribed by doctors was from medical store or pharmacy (77.5\%).

### 5.1.2 Awareness of the health advice printed on antibiotics medicine bag

About a fifth (20.6\%) of respondents whose antibiotics last taken were prescribed by doctors had noticed the health advice on antibiotics medicine bags. Among them, 84.9\% considered the advice helped to remind them to maintain personal hygiene.

The proportions of respondents whose antibiotics last taken were prescribed by doctors always or seldom practising the health advice when handling or taking antibiotics in daily life (excluding work) during last medication period are listed below:
a. Eat or drink only thoroughly cooked or boiled items (98.1\%);
b. Disinfect and cover all wounds (92.5\%);
c. Young children with symptoms of infections should minimise contact with other children (91.9\%);
d. Wear surgical mask if you have respiratory symptoms (87.5\%); and
e. Practise frequent hand hygiene (85.3\%).

### 5.1.3 Views on usefulness of instructions given by doctors and pharmacists

A majority of the respondents considered that the advice from doctors (78.8\%) and pharmacists (75.8\%) were very useful or slightly useful in facilitating patients to take antibiotics according to instructions and complete the full course of antibiotics.

### 5.1.4 Whether respondents had consulted doctor(s) for cold or flu and requested antibiotics in the past $\mathbf{1 2}$ months

About a fifth (21.6\%) of the respondents had consulted doctor(s) for cold or flu in the past 12 months. Among them, $97.2 \%$ did not request antibiotics during that consultation.

### 5.1.5 General views, knowledge and awareness

When doctor's initial assessment indicated that antibiotic was not needed at the moment, majority ( $96.4 \%$ ) of the respondents would accept the doctor's advice to observe for few more days or to wait for the diagnostic test result before deciding whether to prescribe antibiotics or not.

Majority (83.3\%) of the respondents did not prefer consulting doctors who prescribed antibiotics more readily. More than half ( $66.3 \%$ ) of the respondents wanted their doctor to share decision making with them on antibiotics prescription.

Majority of the respondents correctly identified the two false statements about antibiotics, namely "It's okay to use antibiotics that were given by a friend or family member, as long as they were used to treat the same illness" (89.3\%) and "It's okay to buy the same antibiotics, or request them from a doctor if you're sick and they helped you get better when you had the same symptoms before" (79.0\%).

The percentages of respondents who could correctly indicate which health conditions could or could not be treated with antibiotics are listed below：
a．Headaches（No：79．5\％）；
b．Body aches（No：78．0\％）；
c．Skin or wound infection（Yes：75．7\％）；
d．Diarrhoea（No：65．3\％）；
e．Fever（No：60．1\％）；
f．Bladder infection or urinary tract infection（UTI）（Yes：59．4\％）；
g．Cold and flu（No：49．7\％）；and
h．Sore throat（No：36．7\％）．

Respondents aged 65 or above had the lowest percentages of giving correct answer to 5 out of the above 8 health conditions．

Majority of the respondents had heard of the following terms in the language used during enumeration（i．e．Chinese or English），including＂Superbugs＂（超級細菌）（81．4\％）， ＂Antibiotic resistance＂（抗生素耐藥性）（76．0\％）and＂Antibiotic－resistant bacteria＂（抗藥性細菌）（75．0\％），while only $40.3 \%$ of the respondents had heard of＂Antimicrobial resistance＂（抗菌素耐藥性）

The percentages of the respondents who correctly identified the statements about antibiotic resistance as true or false are listed below：
a．Many infections are becoming increasingly resistant to treatment by antibiotics（True：81．2\％）；
b．Antibiotic resistance is an issue in other countries but not in Hong Kong（False： 77．4\％）；
c. Antibiotic-resistant infections could make medical procedures like surgery, organ transplants and cancer treatment much more dangerous (True: 76.8\%);
d. If bacteria are resistant to antibiotics, it can be very difficult or impossible to treat the infections they cause (True: 71.4\%);
e. Antibiotics are anti-inflammatory drugs (False: 60.3\%);
f. Antibiotic resistance is only a problem for people who take antibiotics regularly (False: 50.7\%); and;
g. Bacteria which are resistant to antibiotics can be spread from person to person (True: 44.1\%).

Respondents aged 65 or above had the lowest percentages of giving correct answers to all the above statements.

Regarding the perception of the issue of antibiotic resistance, the percentages of respondents who strongly agreed or slightly agreed with the 5 selected statements are enlisted below:
a. If high-risk individuals avoid consuming raw or undercooked ready-to-eat food, their risk of being infected by drug-resistant bacteria from food will be reduced (66.8\%);
b. People should not keep antibiotics and use them later for other illnesses (61.7\%);
c. If people taking medicines such as antibiotics and stomach medicines avoid consuming raw or undercooked ready-to-eat food, their risk of being infected by drug-resistant bacteria from food will be reduced (61.3\%);
d. Raw or undercooked ready-to-eat food is more easily to be contaminated by drug-resistant bacteria (42.7\%); and
e. There is not much I can do to stop antibiotic resistance (35.8\%).

Respondents aged 65 or above had the lowest mean score in the statement "People should not keep antibiotics and use them later for other illnesses", whereas the youngest age group of 15 to 24 were least likely to agree that "Raw or undercooked ready-to-eat food (such as salad and sashimi) is more easily to be contaminated by drug-resistant bacteria".

### 5.2 Recommendations

1. Less than half of the respondents correctly answered that cold and flu, and sore throat could not be treated with antibiotics. As this misconception would make patients misuse antibiotics, more health education on which kinds of common health conditions could be treated with antibiotics should be provided to the public.
2. Only less than half of the respondents knew that bacteria resistant to antibiotics could be spread from person to person. More public education on knowledge and related infection control practices should be provided.
3. Doctors can be reassured that vast majority of the public accept doctor's decision if initial assessment indicated that antibiotics are not needed. Doctors should be informed that majority of the public wished their doctor to share decision making on antibiotics prescription.
4. Only about a fifth of the respondents noticed the health advice on antibiotics medicine bags. More health promotion, better design, in addition to explanation on the health advice by pharmacists while dispensing antibiotics to patients could be considered.
5. The survey revealed that the oldest age group of 65 or above generally had the lowest level of knowledge about AMR and use of antibiotics among all age groups. Tailor made health
education and promotion that could be easily access to and understandable by the elders should be enhanced.
6. Young people were less likely to agree that raw or undercooked ready-to-eat food (such as salad and sashimi) was more easily to be contaminated by drug- resistant bacteria. In order to reach and draw the attention of young people, design of health education materials to promote food safety should be attractive to them, and to be disseminated through channels that young people commonly use like social media.

### 5.3 Limitations

1. Landline surveys could not reach households without landline telephone while the number of residential landlines in Hong Kong was decreasing in recent years. In order to reduce over- or under-representation of different groups in population, this project employed the dual-frame telephone sampling and weighted the data by the distribution of age and gender.
2. Selection bias and response bias exist - this study did not account for the views of the following groups:
(a) elderly who resided in residential care homes and did not have mobile phones. Hence, those older people were underrepresented and the findings may not be fully representative to the older population in Hong Kong.
(b) subjects who declined the interview may have different views to those who agreed to be interviewed.
3. The survey was conducted during the COVID-19 pandemic which may affect the health seeking behaviour of people. Comparison of the result of present survey to similar ones
during non-COVID-19 period should be cautious.
4. It was reported by the media during the period of survey that there was a rise of fraudulent phone calls purporting to be made by the Department of Health in Hong Kong. This discouraged the selected individuals to accept our survey invitation and they were more reluctant to answer the questions. Interviewers had to spend extra time on explanation and more difficult to complete interview successfully.
5. Since the survey was conducted by means of telephone interview, it was impracticable to use visual aids. For example, it was not possible to show the sample of antibiotics medicine bags when asking respondents whether they had noticed the health advice printed on it.
6. The data of the survey were self-reported by the respondent and verification of their answers was infeasible.
(END)

## Appendix I：Content of Questionnaire

## 公眾對抗生素耐藥性認知，態度及行為調查 2022

## General Public＇s Knowledge，Attitude and Practice Survey on

Antibiotic Resistance 2022

GENDER 受訪者性別 Respondent＇s gender：
1．男 Male
2．女 Female

AGE「請問你屬於以下邊個年齡組別呢？係15至24，25至34，35至44，45至54，55至64，定係65歲或以上呢？」
＂Which age group are you belong to？ 15 to 24,25 to 34,35 to 44,45 to 54,55 to 64 ，or 65 or above？＂

1．15至24歲［15 to 24］
2．25至34歲［25 to 34］
3．35至44歲［35 to 44］
4． 45 至 54 歲［45 to 54$]$
5．55至64歲［55 to 64］
6．65歲或以上［65 or above］

A1「請問你對上一次使用抗生素係幾時呢？」【讀出1－6】
＂When did you last take antibiotics？＂【Read 1－6】
1．過去30日內［In the past 30 days］【續問A2】【continue with A2】
2．過去三個月內［In the past 3 months］【續問A2】【continue with A2】
3．過去半年內［In the past half year］【續問A2】【continue with A2】
4．過去一年內［In the past year］【續問A2】【continue with A2】
5．超過一年之前［More than a year ago］【續問A2】【continue with A2】
6．從未使用過［Never］【跳問A7】【skip to A7】
9．唔記得［Can＇t remember］【跳問A7】【skip to A7】

【只問有使用過抗生素（A1＝1－5）的受訪者】
【Ask those who had taken antibiotics（A1＝1－5）only】
A2「㧽次使用䀝抗生素係唔係由西醫開架呢？」
＂On that occasion，were the antibiotics prescribed by doctors？＂
1．係［Yes】【跳問A4】【skip to A4】
2．唔係 $[\mathrm{No}]$ 【續問A3】【continue with A3】
9．唔記得［Can＇t remember］【續問 A3】【continue with A3】

【只問抗生素唔係由西醫開／唔記得（ $\mathrm{A} 2=2 / 9$ ）的受訪者】
【Ask those whose last taken antibiotics were not prescribed by doctors or who could not remember whether they were prescribed by doctors（ $\mathrm{A} 2=2 / 9$ ）only】
A3「咁嗰次你喺邊度得到抗生素？」【讀出1－5】
＂On that occasion，where did you get the antibiotics？＂【Read 1－5】
1．藥店或藥房［Medical store or pharmacy］【跳問 A7】【skip to A7】
2．網上［The internet］【跳問 A7】【 skip to A7】
3．朋友或屋企人［Friend or family member］【跳問 A7】【skip to A7】
4．我之前食剩穊［Leftover from before］【跳問 A7】【skip to A7】
5．其他地方或其他人得到漑［Somewhere／someone else］【跳問 A7】【skip to A7】
9．唔記得［Can’t remember］【跳問 A7】【skip to A7】

【只問抗生素由西醫開（A2＝1）的受訪者】
【Ask those whose last taken antibiotics were prescribed by doctors（A2＝1）only】
A4「咁嗰次喺邊類嘅診所或醫院得到抗生素呢？」【讀出1－6】
＂On that occasion，from which type of clinic or hospital did you get the antibiotics？＂【Read 1－6】

1．私家診所（包括西醫診所及牙科診所）
［Private clinics（including western medicine clinics and dental clinics）］
2．醫院管理局轄下診所（包括普通科門診，設於醫管局轄下醫院嘅專科門診，以及醫管局轄下醫院嚊牙科診所）
［Clinics under the Hospital Authority（including general outpatient clinics，specialist outpatient clinics in hospitals under the Hospital Authority，and dental clinics in hospitals under the Hospital Authority）］
3．衞生署轄下診所（包括長者健康中心，公務員診所，胸肺服務診所，皮膚科診所，社會衞生科診所，及牙科診所）
［Clinics under the Department of Health（including Elderly Health Centres，Families
Clinics（for civil servant），Chest Clinics，Dermatological Clinics，Social Hygiene Clinics，and Dental Clinics）］
4．其他診所，包括資助機構或慈善團體轄下診所
［Other clinics（including clinics under subsidised organisations or charities，etc．）］
5．私家醫院［Private hospital］
6．醫院管理局轄下醫院［Hospital under the Hospital Authority］
7．其他（註明）［Others（please specify）］
9．唔記得［Can＇t remember］

【只問抗生素由西醫開（A2＝1）的受訪者】
【Ask those whose last taken antibiotics were prescribed by doctors（A2＝1）only】
A5「咐㧽次你有有見到抗生素藥袋上有叫人注意個人衞生嘅指示呢？」
【如果有的話，再追問：「呢啲指示有有提醒到你注意個人衞生呢？」】
＂On that occasion，did you notice there are instructions on personal hygiene on the antibiotics medicine bags？＂
【If yes，ask＂Did these instructions help to remind you to maintain personal hygiene？＂】
1．有見過，有提醒到［Have noticed the instructions，and were reminded］
2．有見過，有提醒到［Have noticed the instructions，but were not reminded］
3．有見過呢啲指示［Have not noticed the instructions before］
9．唔記得［Can＇t remember］

【只問抗生素由西醫開（A2＝1）的受訪者】
【Ask those whose antibiotics last taken were prescribed by doctors（A2 $=1$ ）only】
A6「咁嗰次你喺日常生活（唔包括工作）處理或使用抗生素嘅整個療程期間，有幾經常做以下嘅行為呢？你可以回答『經常』，『間中』，同『有』三個答案。」
＂On that occasion，how often did you practice the following when you handled or took antibiotics in your daily life（excluding work）during the medication period？＇always＇，＇seldom＇or＇never＇？＂

A6a 「『時刻保持手部衞生 』。係經常，間中，定係右咁做呢？」
＂＇Practice frequent hand hygiene＇＂
1．經常［Always］
9．唔記得［Can＇t remember］
2．間中［Seldom］
3．有［Never］

A6b「『喺飲食時，食水同食物會徹底煮沸同煮熟』。係經常，間中，定係右咁做呢？」 ＂＇Eat or drink only thoroughly cooked or boiled items＂＂
1．經常［Always］
9．唔記得［Can＇t remember］
2．間中［Seldom］
3．有［Never］
$A 6 c 「 『$ 當出現傷 $\square$ 時，會消毒及覆蓋所有傷口』。係經常，間中，定係右咁做呢？」 ＂＇Disinfect and cover all wounds＇＂

1．經常［Always］
9．唔記得［Can＇t remember］
2．間中［Seldom］
3．有［Never］

A6d「『當有呼吸道感染病徵時，戴上外科口罩』。係經常，間中，定係有咁做呢？」 ＂＇Wear surgical mask if you have respiratory symptoms＇＂
1．經常［Always］
9．唔記得［Can＇t remember］
2．間中［Seldom］
3．有［Never］

A6e「『如家中嘅幼童出現傳染病病徵，會盡可能減少接觸其他兒童』。係經常，間中，定係有咁做呢？
＂＇Young children with symptoms of infections should minimise contact with other children＇＂
【幼童指12歲或以下】［Young Children refer to those aged 12 or below］
1．經常［Always］
9．唔記得［Can＇t remember］
2．間中［Seldom］
0．不適用（家中沒有幼童）［No young children at home］
3．有［Never］

A7「如果1分代表『非常有幫助』至5分代表『非常有幫助』。你覺得以下嘅方法，對於促使病人按指示使用抗生素並完成整個療程有幾大幫助呢？」

## 【有需要時讀出1－5，追問程度】

＂How useful do you think the following actions could facilitate patients to take antibiotics according to instructions and complete the full course of antibiotics？Please rate from 1 （very useless）to 5 （very useful）．＂
【Read 1－5 if necessary】

A7a 「『西醫喺開抗生素時解釋』，你覺得有幾大幫助呢？1至5分，你會界幾多分呢？」
＂＂Doctors give related advice when prescribing antibiotics＇＂
1．1分（非常右幫助）［Very useless］
2．2分（稍微有幫助）［Slightly useless］
3．3分（右意見／唔知道）［Neutral／Don＇t know］
4．4分（稍微有幫助）［Slightly useful］
5．5分（非常有幫助）［Very useful］

A7b 「『喺醫院或診所取藥時由藥劑師解釋』，你認為有幾大幫助呢？1至5分，你會畀幾多分呢？」
＂＇Pharmacists give related advice when dispensing antibiotics in hospitals／clinics＂＂

1．1分（非常右幫助）［Very useless］
2． 2 分（稍微有幫助）［Slightly useless］
3．3分（右意見／唔知道）［Neutral／Don＇t know］
4． 4 分（稍微有幫助）［Slightly Useful］
5．5分（非常有幫助）［Very Useful］

A8 「喺過去十二個月內，你有有因為傷風或流行性感冒而睇過西醫？」
＂In the past 12 months，had you consulted doctor（s）for cold or flu？＂
1．有［Yes］【續問A9】【continue with A9】
2．有［No］【跳問 A10】【 skip to A10】
9．唔記得［Can＇t remember］【跳問 A10】【skip to A10】

【只問過去十二個月內有因為傷風／流行性感冒而睇過西醫（A8＝1）的受訪者】
【Ask those who had consulted doctor（s）for cold or flu in the past 12 months（A8＝1）only】
A9「嗰次睇西醫你有有要求醫生開抗生素呢？」
＂Had you asked for antibiotics during that consultation？＂
1．有［Yes］
9．唔記得［Can’t remember］
2．有［No］

A 10 「當你睇西醫嘅時候，如果醫生認為你嘅病暫時唔需要使用抗生素，叫你觀察多一段時間，或者等埋測試結果先決定開唔開抗生素，你接唔接受呢？」
＂When you consult a doctor and his／her initial assessment for you indicated that antibiotic is not needed at the moment，would you accept if the doctor tells you to observe for few more days or to wait for the diagnostic test＇s result before deciding whether to prescribe antibiotics or not？＂
1．會／接受［Yes／Accept］
8．唔知道［Don＇t know］
2．唔會／唔接受［No／Not accept］

A11「你會唔會選擇向較輕易開抗生素兓西醫求醫呢？」
＂Do you prefer consulting doctors who prescribe antibiotics more readily？＂
1．會［Yes］
2．唔會 $[\mathrm{No}]$
8．唔知道／視乎情況而定［Don＇t know／Depends on the situation］

A12「你覺得以下一啲對抗生素噭睇法係『啱』定係『錯』呢？」
＂Please indicate whether you think the following statements are＂true＂or＂false＂＂
$\mathrm{A} 12 \mathrm{a}\ulcorner$ 『只要係醫同樣嘅病，使用朋友或者屋企人甼穊抗生素係右問題嘅』。你覺得係啱定係錯呢？」
＂It＇s okay to use antibiotics that were given by a friend or family member，as long as they were used to treat the same illness．＂
1．啱／對［True］
8．唔知道［Don’t know］

2．錯／不對［False］

A12b「『如果你病咗，之前試過類似嘅病，使用抗生素之後好咗。今次可以買番同樣輒抗生素，或要求西醫開同樣嘅抗生素 』。你覺得係啱定係錯呢？」
＂It＇s okay to buy the same antibiotics，or request them from a doctor if you＇re sick and they helped you get better when you had the same symptoms before＂
1．啱／對［True］
8．唔知道［Don＇t know］
2．錯／不對［False］

A13「你覺得抗生素可唔可以醫以下嘅病呢？」
＂Do you think these conditions can be treated with antibiotics？＂
【A13a至A13h會隨機顯示。】［Questions A13a to A13h will be displayed randomly．］

A13a「『膀胱或泌尿道感染，即係尿道炎』，可唔可以醫到呢？」
＂Bladder infection or urinary tract infection（UTI）＂
1．可以［Yes］
8．唔知道［Don＇t know］
2．唔可以［No］

A13b「『肚痾』，可唔可以醫到呢？」
＂Diarrhoea＂
1．可以［Yes］
8．唔知道［Don＇t know］
2．唔可以［ No ］

A 13 c 「『傷風感冒』，可唔可以醫到呢？ ＂Cold and flu．＂
1．可以［Yes］
8．唔知道［Don＇t know］
2．唔可以［No］

A13d「『發燒』，可唔可以醫到呢？」 ＂Fever＂
1．可以［Yes］
8．唔知道［Don＇t know］
2．唔可以［No］

A13e「『皮膚或傷口感染發炎』，可唔可以醫到呢？」 ＂Skin or wound infection＂
1．可以［Yes］
8．唔知道［Don＇t know］
2．唔可以［No］

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A13f「『喉嚨痛』,可唔可以醫到呢?
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＂Sore throat＂
1．可以［Yes］
8．唔知道［Don＇t know］
2．唔可以［ No ］

A 13 g 「『周身骨痛』，可唔可以醫到呢？」
＂Body aches＂
1．可以［Yes］
8．唔知道［Don＇t know］
2．唔可以 $[\mathrm{No}]$

1

A13h「『頭痛』，可唔可以醫到呢？」
＂Headaches＂
1．可以［Yes］
8．唔知道［Don＇t know］
2．唔可以［No］

A14「西醫開藥之前，你想唔想醫生同你一齊商量使唔使開抗生素呢？」
＂Do you want your doctor to share decision making with you on antibiotics prescription？＂
1．想［Yes］
7．有意見［Neutral］
2．唔想［No］

A15「你有有聽過以下術語呢？
＂Have you heard of any of the following terms？＂
【A15a 至 A15d 會隨機顯示。】［Questions A15a to A15d will be displayed randomly．］
A15a 「『抗生素耐藥性』，你有有聽過呢？」
＂Have you heard of＇Antibiotic resistance＇？＂
1．有［Yes］
9．唔記得［Can＇t remember］
2．有［No］

A15b「『超級細菌』，你有有聽過呢？」 ＂Have you heard of＇Superbugs＇？＂
1．有［Yes］
9．唔記得［Can＇t remember］
2．有 $[\mathrm{No}]$

A15c「『抗菌素耐藥性』，你有有聽過呢？」
＂Have you heard of＇Antimicrobial resistance＇？＂
1．有［Yes］
9．唔記得［Can＇t remember］
2．有 $[\mathrm{No}]$

A15d「『抗藥性細菌』，你有有聽過呢？」
＂Have you heard of＇Antibiotic－resistant bacteria＇？＂
1．有［Yes］
9．唔記得［Can＇t remember］
2．有 $[\mathrm{No}]$

【如受訪者右聽過或唔記得有否聽過抗生素耐藥性／抗菌素耐藥性／抗藥性細菌（A15a／A15c ／A15d＝2／9），讀出以下內容（A16＿In）】
【If never heard of or can＇t remember whether he／she has heard of antibiotic resistance／antimicrobial resistance／antibiotic－resistant bacteria（ $\mathrm{A} 15 \mathrm{a} / \mathrm{A} 15 \mathrm{c} / \mathrm{A} 15 \mathrm{~d}=2 / 9$ ），continue with the instruction（A16＿In）】

A16＿In「以下問題會提及耐藥性或者抗藥性，即係指微生物例如細菌，病毒能夠抵抗藥物。」 ＂Drug resistance means that microorganisms such as bacteria and viruses can resist drugs．＂

A16「你覺得以下一啲對抗生素同抗藥性噆睇法係『啱』定係『錯』呢？」
＂Please indicate whether you think the following statements are＂true＂or＂false＂．＂
【A16a至A16g會隨機顯示】［Questions A16a to A16g will be displayed randomly．］

A16a「『抗生素即係消炎藥』，你覺得係啱定錯呢？」 ＂＂Antibiotics are anti－inflammatory drugs＂＂
1．啱／對［True］
8．唔知道［Don＇t know］
2．錯／不對［False］

A16b「『好多感染對抗生素治療越嚟越有抗藥性』，你覺得係啱定錯呢？」
＂＇Many infections are becoming increasingly resistant to treatment by antibiotics＂＂
1．啱／對［True］
8．唔知道［Don’t know］
2．錯／不對［False］

A16c「『如果細菌產生抗藥性，就好難，甚至有可能用抗生素醫治細菌感染』，你覺得係啱定錯呢？」
＂＇If bacteria are resistant to antibiotics，it can be very difficult or impossible to treat the infections they cause＂＂
1．啱／對［True］
8．唔知道［Don＇t know］
2．錯／不對［False］

A16d「『抗生素耐藥性喺其他國家係問題，但係喺香港唔係問題』，你覺得係啱定錯呢？」 ＂Antibiotic resistance is an issue in other countries but not in Hong Kong＇＂
1．啱／對［True］
8．唔知道［Don＇t know］
2．錯／不對［False］

A16e 「『抗生素耐藥性呢個問題淨係會影響成日使用抗生素嘅人』，你覺得係啱定錯呢？」 ＂＂Antibiotic resistance is only a problem for people who take antibiotics regularly＂＂
1．啱／對［True］
8．唔知道［Don’t know］
2．錯／不對［False］

A16f「『對抗生素具有抗藥性魄細菌會係人同人之間傳播』，你覺得係啱定錯呢？」
＂＇Bacteria which are resistant to antibiotics can be spread from person to person＇＂
1．啱／對［True］
8．唔知道［Don’t know］
2．錯／不對［False］

A16g 「『抗生素耐藥感染會增加醫療（例如外科手術，器官移植和癌症治療等）暨風險』，你覺得係啱定錯呢？」
＂＂Antibiotic－resistant infections could make medical procedures like surgery，organ transplants and cancer treatment much more dangerous＇＂
1．啱／對［True］
8．唔知道［Don’t know］
2．錯／不對［False］

A17「如果1分代表『非常唔同意』至5分代表『非常同意』。你有幾同意以下嘅焍法呢？」
＂How much do you agree with the following statements？Please rate from 1 （strongly disagree）to 5 （strongly agree）．＂
【有需要時讀出 $1-5$ ，追問程度】
【Read 1－5，if necessary】
$\mathrm{A} 17 \mathrm{a}\ulcorner$ 『唔應該留低食剩嘅抗生素，留番下次病哣時候使用』，你有幾同意呢？1至5分，你會界幾多分？」
＂＇People should not keep antibiotics and use them later for other illnesses＇＂
1．1分（非常唔同意）［Strongly disagree］
2．2分（稍微唔同意）［Slightly disagree］
3．3分（友意見／唔知道）［Neutral／Don’t know］
4．4分（稍微同意）［Slightly agree］
5．5分（非常同意）［Strongly agree］

A17b「『對於阻止抗生素耐藥性，我可以做嘅事並唔多』，你有幾同意呢？1至5分，你會界幾多分？」
＂＂There is not much I can do to stop antibiotic resistance＂＂
1．1分（非常唔同意）［Strongly disagree］
2．2分（稍微唔同意）［Slightly disagree］
3．3分（右意見／唔知道）［Neutral／Don’t know］
4．4分（稍微同意）［Slightly agree］
5．5分（非常同意）［Strongly agree］

A17c「『生或未煮熟嘅即食食物（例如沙律，魚生），更容易受耐藥性細菌污染』，你有幾同意呢？1至5分，你會畀幾多分？」
＂＇Raw or undercooked ready－to－eat food（such as salad and sashimi）is more easily to be contaminated by drug－resistant bacteria＂＂

1．1分（非常唔同意）［Strongly disagree］
2．2分（稍微唔同意）［Slightly disagree］
3．3分（右意見／唔知道）［Neutral／Don＇t know］
4．4分（稍微同意）［Slightly agree］
5．5分（非常同意）［Strongly agree］

A17d「『高危人士（包括孕婦，嬰幼兒，長者同埋免疫力較低人士）如避免食生或未煮熟嘅即食食物，可以減低佢哋係食物感染耐藥性細菌暨風險』，你有幾同意呢？1至5分，你會畀幾多分？」
＂＇If high－risk individuals（including pregnant women，young children，elderly and people with weakened immune systems）avoid consuming raw or undercooked ready－to－eat food，their risk of being infected by drug－resistant bacteria from food will be reduced＇＂

1．1分（非常唔同意）［Strongly disagree］
2．2分（稍微唔同意）［Slightly disagree］
3．3分（有意見／唔知道）［Neutral／Don＇t know］
4．4分（稍微同意）［Slightly agree］
5．5分（非常同意）［Strongly agree］

A17e「『正服用藥物如抗生素，胃藥人士如避免食生或未煮熟嘅即食食物，可以減低佢哋喺食物感染耐藥性細菌嘅風險』，你有幾同意呢？1至5分，你會畀幾多分？」
＂＇If people taking medicines such as antibiotics and stomach medicines avoid consuming raw or undercooked ready－to－eat food，their risk of being infected by drug－resistant bacteria from food will be reduced＇＂

1．1分（非常唔同意）［Strongly disagree］
2．2分（稍微唔同意）［Slightly disagree］
3．3分（右意見／唔知道）［Neutral／Don＇t know］
4．4分（稍微同意）［Slightly agree］
5．5分（非常同意）［Strongly agree］

Appendix II: Details of Daily Progress of Enumeration

| Date | Number of <br> enumerated cases <br> (Landline) | Number of <br> enumerated cases <br> (Mobile) | Number of <br> enumerated cases <br> (Total) |
| :---: | :---: | :---: | :---: |
| $7 / 9 / 2022$ | 11 | 34 | 45 |
| $8 / 9 / 2022$ | 23 | 46 | 69 |
| $9 / 9 / 2022$ | 20 | 27 | 47 |
| $13 / 9 / 2022$ | 31 | 33 | 64 |
| $14 / 9 / 2022$ | 41 | 38 | 79 |
| $15 / 9 / 2022$ | 23 | 38 | 61 |
| $16 / 9 / 2022$ | 11 | 24 | 35 |
| $19 / 9 / 2022$ | 25 | 46 | 71 |
| $20 / 9 / 2022$ | 28 | 46 | 74 |
| $21 / 9 / 2022$ | 27 | 35 | 62 |
| $22 / 9 / 2022$ | 32 | 38 | 70 |
| $23 / 9 / 2022$ | 15 | 29 | 44 |
| $24 / 9 / 2022$ | 28 | 32 | 60 |
| $26 / 9 / 2022$ | 23 | 44 | 67 |
| $27 / 9 / 2022$ | 19 | 39 | 58 |
| $28 / 9 / 2022$ | 30 | 19 | 49 |
| $29 / 9 / 2022$ | 37 | 2 | 39 |
| $30 / 9 / 2022$ | 32 | 9 | 41 |
| $3 / 10 / 2022$ | 16 | 4 | 20 |
| $5 / 10 / 2022$ | 10 | 0 | 10 |
| $6 / 10 / 2022$ | 11 | 3936 |  |
| Total | 23 | 3076 |  |

## Appendix III: Details of Final Dispositions of Phone Calls and Response Rates

| Final dispositions of phone calls | Number of cases (Landline) | Number of cases (Mobile) |
| :---: | :---: | :---: |
| (A) No. of telephone numbers sampled | 57856 | 47500 |
| (B) No. of ineligible cases |  |  |
| a) Valid telephone numbers |  |  |
| i) Claimed wrong number | 46 | 35 |
| ii) Language problem | 195 | 271 |
| iii) Non-residential line | 1530 | -- |
| iv) No target respondent | 129 | 270 |
| b) Invalid telephone numbers |  |  |
| i) Fax / data line | 2264 | -- |
| ii) Non-working / out of service numbers | 35724 | 20071 |
|  |  |  |
| (C) No. of eligible cases |  |  |
| a) Successfully completed interviews (I) | 493 | 583 |
| b) Unsuccessful cases |  |  |
| i) Mid-way termination cases ( $R$ ) | 37 | 27 |
| ii) Drop out cases such as selected eligible person not-at- home / not available (DO) | 192 | 97 |
| iii) Refusal cases (R) | 1044 | 877 |
|  |  |  |
| (D) No. of cases with unknown eligibility status |  |  |
| a) Answering machine | 1897 | 4647 |
| b) Busy line | 3740 | 2454 |
| c) Call blocking, password needed | 279 | 185 |
| d) Immediate disconnection | 2990 | 4363 |
| e) No answer | 7296 | 13620 |
|  |  |  |
| Landline (RRL) / Mobile (RRm) Survey Response   <br> Rates: <br> $=\frac{\text { Completed (I) }}{\text { Completed (I) + Refused }(R)+\text { Drop Out Cases (DO) }}$ $27.9 \%$ $36.8 \%$ |  |  |
| Combined Response Rate (RR): $=\left(R R_{L} * P_{L}\right)+\left(R R_{m} *\left(1-P_{L}\right)\right)$ <br> where $P_{L}=$ the percentage of the total number of completed interviews coming from the landline survey ( $=$ 493/1076=45.8\%) <br> $R R_{L}=$ landline survey response rate <br> $R R_{m}=$ mobile survey response rate |  |  |

## Appendix IV: Details of Process of Weighting on Survey Data

This survey employed the dual-frame telephone sampling which combines a set of telephone numbers selected randomly from the landline sampling frame with another set of telephone numbers selected randomly from the mobile phone sampling frame, while individuals with both landline and mobile numbers can be sampled from both frames. In order to avoid biased estimates due to a duplication of the population in both frames or from other unknown factors, single-frame estimator method was employed to weight the survey data according to the following steps (Bankier, 1986; Wong, Zheng and Wan, 2022):

## Step 1

Since each respondent has own different numbers of residential landline numbers and mobile phone numbers, their chances of being selected for interview are not equal if we use dual-frame telephone sampling. The first step of weighting procedure is to adjust the unequal chance effects of the dual-frame survey by estimating the probabilities of being selected for each respondent based on the number of landlines and the number of mobile phones owned by each respondent with the estimated totals in the target population. The probability of being sampled in the combined landline and mobile phone sampling frame for $i^{\text {th }}$ sampled individual is derived as follow:

$$
\pi_{i}=\frac{n_{L}}{N_{L}} \times \frac{t_{i}^{L}}{e_{i}^{L}}+\frac{n_{m}}{N_{m}} \times t_{i}^{m}
$$

$$
\text { where } \begin{aligned}
& i=i^{\text {th }} \text { sampled individual in this survey } \\
& n_{L}=\text { the size of landline sample } \\
& N_{L}=\text { the size of the landline sampling frame } \\
& t_{i}^{L}= \text { the number of landline telephones used to receive calls in the household of } i^{\text {th }} \\
& \text { sampled individual } \\
& e_{i}^{L}=\text { the number of eligible persons in the household of } i^{\text {th }} \text { sampled individual } \\
& n_{m}=\text { the size of the mobile phone sample } \\
& N_{m}=\text { the size of the mobile phone sampling frame } \\
& t_{i}^{m}=\text { the number of mobile phones used to receive calls by } i^{\text {th }} \text { sampled individual }
\end{aligned}
$$

Design weights are defined as the inverse of probability of $i^{\text {th }}$ sampled individual being sampled. Hence, the weighting factor 1 (WT1) is: $W T 1_{i}=\pi_{\mathrm{i}}{ }^{-1}$. The calculations are summarised in the following table:

| No. of landline no. | No. of mobile no. | No. of eligible persons in the household | Weighting factor 1 |
| :---: | :---: | :---: | :---: |
| 0 | 1 | N.A. | 13866.385934820 |
| 0 | 2 | N.A. | 6933.192967410 |
| 0 | 3 | N.A. | 4622.128644940 |
| 0 | 4 | N.A. | 3466.596483705 |
| 0 | 6 | N.A. | 2311.064322470 |
| 1 | 0 | 1 | 4155.328600406 |
| 1 | 0 | 2 | 8310.657200811 |
| 1 | 0 | 4 | 16621.314401623 |
| 1 | 1 | 1 | 3197.220217122 |
| 1 | 1 | 2 | 5196.309508606 |
| 1 | 1 | 3 | 6564.474021195 |
| 1 | 1 | 4 | 7559.689897679 |
| 1 | 1 | 5 | 8316.159387255 |
| 1 | 1 | 6 | 8910.592156469 |
| 1 | 2 | 1 | 2598.154754303 |
| 1 | 2 | 2 | 3779.844948840 |
| 1 | 2 | 3 | 4455.296078234 |
| 1 | 2 | 4 | 4892.430069242 |
| 1 | 2 | 5 | 5198.460045268 |
| 1 | 2 | 6 | 5424.675268781 |
| 1 | 3 | 1 | 2188.158007065 |
| 1 | 3 | 2 | 2970.197385490 |
| 1 | 3 | 3 | 3371.898651590 |
| 1 | 3 | 4 | 3616.450179187 |
| 1 | 3 | 5 | 3780.982722321 |
| 1 | 4 | 2 | 2446.215034621 |
| 1 | 4 | 3 | 2712.337634390 |
| 1 | 4 | 4 | 2868.361493046 |
| 1 | 5 | 1 | 1663.231877451 |
| 1 | 7 | 1 | 1341.430625408 |
| 2 | 1 | 2 | 3197.220217122 |
| 2 | 1 | 3 | 4300.087370685 |
| 2 | 1 | 4 | 5196.309508606 |
| 2 | 2 | 2 | 2598.154754303 |
| 2 | 2 | 3 | 3282.237010597 |
| 2 | 3 | 4 | 2970.197385490 |
| 2 | 4 | 4 | 2446.215034621 |
| 2 | 5 | 2 | 1663.231877451 |
| 3 | 1 | 3 | 3197.220217122 |
| 3 | 2 | 3 | 2598.154754303 |
| 3 | 3 | 3 | 2188.158007065 |
| 3 | 4 | 3 | 1889.922474420 |
| 4 | 1 | 4 | 3197.220217122 |
| 4 | 2 | 4 | 2598.154754303 |

Note: According to Office of the Communications Authority's Key Statistics for Telecommunications in HK -Wireless Service (11.10.2022), the total number of residential landlines (size of the landline sampling frame) was $2,048,577$. However, there is still no official statistics available on how many mobile numbers are actually in use by people aged 15 or above. In order to solve this problem, we added a question in this survey to ask the respondents how many mobile numbers they had (as the main user). Then we used the mean of mobile numbers as depicted from the survey result as a reference indicator to calculate the size of mobile phone sampling frame. As the mean of mobile numbers was 1.321839080 and the number of people aged 15 or above in the second quarter of 2022 (based on General Household Survey) was $6,115,800$, the size of mobile phone sampling frame was estimated to be $8,084,103(6,115,800 * 1.321839080=8,084,103)$.

## Step 2

The second weighting procedure is to ensure that the age-gender distribution of survey data is in line with the prevailing distribution of the Hong Kong population. Independent population estimates by gender and age provided by the Census and Statistics Department (based on General Household Survey, $2^{\text {nd }}$ Quarter 2022) are used as control totals and appropriate statistical adjustments are made to account for the inclusion probabilities and the differences in response rates across age groups and gender. The second weighting factor of a particular agegender group is calculated by dividing the population control total of that age-gender group by the estimated number of persons in that age-gender group in the survey weighted by the weighting factor 1 (WT1). The weighting factor 2 of $\mathrm{i}^{\text {th }}$ sampled individual $\left(\mathrm{WT} 2_{\mathrm{i}}\right)$ is derived from:

$$
W T 2_{i}=\frac{N_{k}}{W_{1} k}
$$

where $N_{k}=$ Population size of $\mathrm{k}^{\text {th }}$ age-gender group
$W T_{1} k=$ Estimated size of $\mathrm{k}^{\text {th }}$ age-gender group from the survey weighted by weighting factor 1

The calculation for weighting factor 2 (WT2) of specific age-gender groups are summarised in the following table:

| Age group | Age-gender distribution <br> of the population provided <br> by C\&SD |  | Estimated age-gender <br> distribution from the survey <br> weighted by WT1* |  | Weighting Factor 2 (WT2) |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Male <br> (A) | Female <br> (B) | Male <br> (C) | Female <br> (D) | Male <br> $(\mathrm{A} \div \mathrm{C})$ | Female <br> (B $\div$ D) |
|  | 278787 | 266355 | 510174 | 289914 | 0.546454971 | 0.918738834 |
| $25-34$ | 428471 | 436296 | 590767 | 715069 | 0.725279412 | 0.610145500 |
| $35-44$ | 456280 | 539321 | 638605 | 801299 | 0.714495497 | 0.673058498 |
| $45-54$ | 471444 | 583267 | 643130 | 775871 | 0.733045465 | 0.751757385 |
| $55-64$ | 565861 | 638601 | 702498 | 855797 | 0.805498541 | 0.746205957 |
| 65 or above | 686513 | 764603 | 611000 | 707887 | 1.123589051 | 1.080120535 |

\# Land-based non-institutional population aged 15 or above (excluding foreign domestic helpers) by gender and age in the second quarter of 2022 (General Household Survey)

* The figures on the age-gender distribution from the survey weighted by weighting factor 1 were rounded off to their nearest integers.


## Step 3

The final weighting factor of $i^{\text {th }}$ sampled respondent in this survey is derived from:

$$
W T_{-} F_{i}=W T 1_{i} * W T 2_{i} * B A S E
$$

where $\quad \mathrm{WT}_{-} \mathrm{F}_{i}=$ final weighting factor of $i^{\text {th }}$ sampled individual
$\mathrm{WT} 1_{i}=$ weighting factor 1 of $i^{\text {th }}$ sampled individual
$\mathrm{WT} 2{ }_{i}=$ weighting factor 2 of $i^{\text {th }}$ sampled individual
BASE= sample size adjustment factor= size of total sample/ size of Hong
Kong population aged 15 or above

## Reference:

Bankier, Michael D. (1986). "Estimators based on several stratified samples with applications to multiple frame surveys." Journal of the American Statistical Association 81(396): 1074-1079
Wong, Kevin Tze-wai, Victor Zheng, and Po-san Wan. (2022). "Using a dual-frame design to improve phone surveys on political attitudes: developing a weighting strategy for limited external information in Hong Kong." Quality \& Quantity 56(4): 2387-2414.

## Appendix V: Distribution of Frequency Tables of Gender and Age

【Due to the rounding effect, the total percentage may also not equal to $100 \%$ and the total sample size of weighted results may not equal to 1,076 . 】

GENDER

|  |  | Unweighted |  |  | Weighted |  |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: |
|  |  | Frequency | Percent |  | Frequency | Percent |
| 1. | Male | 506 | 47.0 |  | 508 | 47.2 |
| 2. | Female | 570 | 53.0 |  | 568 | 52.8 |
|  | Total | 1,076 | 100.0 |  | 1,076 | 100.0 |

## AGE

|  |  | Unweighted |  |  | Weighted |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  | Frequency | Percent |  | Frequency | Percent |
| 1. | $15-24$ | 92 | 8.6 |  | 96 | 8.9 |
| 2. | $25-34$ | 154 | 14.3 |  | 152 | 14.1 |
| 3. | $35-44$ | 174 | 16.2 |  | 175 | 16.3 |
| 4. | $45-54$ | 199 | 18.5 |  | 186 | 17.2 |
| 5. | $55-64$ | 231 | 21.5 |  | 212 | 19.7 |
| 6. | 65 or above | 226 | 21.0 |  | 255 | 23.7 |
|  | Total | 1,076 | 100.0 |  | 1,076 | 100.0 |


[^0]:    ${ }^{*} \mathrm{p}<0.05, * * \mathrm{p}<0.01, * * * \mathrm{p}<0.001$
    Base: Persons aged 15 or above $=1076$.
    Question: A13a-h "Do you think these conditions can be treated with antibiotics?"

[^1]:    *p $<0.05, * * p<0.01, * * * p<0.001$

[^2]:    ${ }^{*} \mathrm{p}<0.05,{ }^{* *} \mathrm{p}<0.01, * * * \mathrm{p}<0.001$
    Base: Persons aged 15 or above $=1076$.
    Question: A16a-g "Please indicate whether you think the following statements are "true" or "false"."

[^3]:    *p<0.05, **p<0.01, ***p<0.001

