



**ANTIBIOTIC RESISTANCE:  
MULTI-COUNTRY PUBLIC  
AWARENESS SURVEY**



**World Health  
Organization**



# **ANTIBIOTIC RESISTANCE: MULTI-COUNTRY PUBLIC AWARENESS SURVEY**



**World Health  
Organization**

## #AntibioticResistance

WHO Library Cataloguing-in-Publication Data

Antibiotic resistance: Multi-country public awareness survey

I. World Health Organization.

ISBN 978 92 4 150981 7

Subject headings are available from WHO institutional repository

© World Health Organization 2015

All rights reserved. Publications of the World Health Organization are available on [the WHO web site \(www.who.int\)](http://www.who.int) or can be purchased from WHO Press, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland (tel.: +41 22 791 3264; fax: +41 22 791 4857;

e-mail: [bookorders@who.int](mailto:bookorders@who.int)).

Requests for permission to reproduce or translate WHO publications –whether for sale or for non-commercial distribution– should be [addressed to WHO Press through the WHO website \(www.who.int/about/licensing/copyright\\_form/en/index.html\)](http://www.who.int/about/licensing/copyright_form/en/index.html).

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by the World Health Organization to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use.

# CONTENTS

Executive Summary	1
1. Introduction	4
2. Methodology	5
2.1 Country selection	5
2.2 Approach	5
2.3 Limitations	8
3. Results	9
3.1 Use of antibiotics	9
3.2 Knowledge of antibiotics	16
3.3 Knowledge of antibiotic resistance	25
4. Discussion of findings	42
ANNEXES	
Full questionnaire	46
Demographics	51

**#AntibioticResistance**

# EXECUTIVE SUMMARY

Antibiotic resistance is occurring everywhere in the world, compromising the treatment of infectious diseases and undermining many other advances in health and medicine. It represents one of the biggest threats to global health today, and can affect any one, of any age, in any country. It leads to longer hospital stays, higher medical costs and increased mortality. Antibiotic resistance occurs naturally, but misuse of antibiotics in humans and animals is accelerating the process. Tackling antibiotic resistance is a high priority for the World Health Organization (WHO). As part of implementation of objective 1 of the global action plan on antimicrobial resistance, WHO is coordinating a global campaign to raise awareness and encourage best practices among the public, policymakers, health and agriculture professionals. This survey provides a snapshot of current public awareness and common behaviours related to antibiotics in a range of countries.

## KEY FINDINGS

- **Antibiotic use** is widespread: 65% of respondents across the 12 countries included in the survey report having taken antibiotics in the past six months, including more than one third (35%) who took antibiotics within the past month.
  - Reported antibiotic use is higher in the lower income countries included in the survey, where 42% of people say they used antibiotics within the past month compared with 29% of people surveyed in higher income countries.
  - Young people are more likely to have used antibiotics within the past month: 37% of 16 to 24-year-olds, versus 24% of respondents aged 65 years and older.
- In terms of **where people get their antibiotics**, across the countries included in the survey, most people (81%) say they were prescribed or provided by a doctor or nurse (range between countries: 56%-93%), and 93% say they obtained the drugs from a pharmacy or medical store (range between countries: 83%-97%).
- **Levels of knowledge around the appropriate use of antibiotics**—including how and when to use antibiotics and what they should be used for—are mixed.
  - 25% of respondents across the 12 countries included in the survey think it is acceptable to use antibiotics that were given to a friend or family member, as long as they were used to treat the same illness; 43% think it is acceptable to buy the same antibiotics, or request these from a doctor, if they are sick and antibiotics helped them get better when they had the same symptoms before. Both these actions can result in improper use of antibiotics, and therefore contribute to the resistance problem.
  - 32% of respondents think that they should stop taking antibiotics when they feel better, not when they have taken all of them as directed. WHO advises that patients should always take the full prescription, even if they feel better earlier. Respondents in Sudan, Egypt and China were particularly likely to state that they should stop taking antibiotics when they feel better, with 62%, 55% and 53% of survey participants respectively choosing this response.

## #AntibioticResistance

- There is some misunderstanding around which conditions can be treated with antibiotics. The majority of respondents across the 12 countries surveyed correctly identify conditions such as bladder/urinary tract infections (72%) and skin/wound infections (72%) as treatable with antibiotics. However, the majority also incorrectly believe that viruses such as colds and flu (64%) can be treated with antibiotics.
- **Levels of awareness of the issue of antibiotic resistance** and levels of understanding around the issue and how to address it are also mixed, indicating that people recognize the problem but do not fully understand what causes it, or what to do about it.
  - The majority of respondents correctly identify a series of actions that can be taken to address the problem of antibiotic resistance, with 91% of respondents agreeing that regular hand washing would help and 87% agreeing that people should use antibiotics only when prescribed. However, 57% state that there is not much that people like them can do to stop antibiotic resistance, when in fact, everyone can be part of the efforts to address this problem. The general public can help by:
    - preventing infections by regularly washing hands, practicing good food hygiene, avoiding close contact with sick people and keeping vaccinations up to date
    - only using antibiotics when prescribed by a certified health professional
    - always taking the full prescription
    - never using left-over antibiotics
    - never sharing antibiotics with others.
  - There is some misunderstanding around what antibiotic resistance actually is. The majority of respondents across the 12 countries included in the survey correctly believe that many infections are becoming increasingly resistant to treatment by antibiotics (72%). However, a majority also believe, incorrectly, that antibiotic resistance occurs when their body becomes resistant to antibiotics (76%), whereas in fact bacteria, not humans, become antibiotic resistant. These bacteria may then infect humans and the infections they cause are harder to treat than those caused by non-resistant bacteria. Further evidence of misunderstanding is suggested by the fact that 44% of respondents think that antibiotic resistance is only a problem for people who take antibiotics regularly.

## KEY RECOMMENDATIONS

These survey findings point to the following needs:

- to better understand why antibiotics are being used without having been prescribed.
- to increase public education so that people better understand:



- which conditions can be treated with antibiotics and which cannot (e.g. antibiotics are not effective against colds and flu).
- why antibiotics should only be taken when they have been prescribed to a specific individual for a particular episode of illness.
- the importance of taking the full prescription as prescribed.

## **METHODOLOGY**

Fieldwork was carried out between 14 September and 16 October 2015. A total of 9,772 respondents from 12 countries completed the 14 question survey, either online or during face-to-face street interviews, depending on the appropriate methodology to gather a representative sample of adults for that country. The survey was conducted in two Member States from each WHO Region:

<b>African Region:</b>	Nigeria and South Africa
<b>Region of the Americas:</b>	Barbados and Mexico
<b>South-East Asia Region:</b>	India and Indonesia
<b>European Region:</b>	Russian Federation and Serbia
<b>Eastern Mediterranean Region:</b>	Egypt and Sudan
<b>Western Pacific Region:</b>	China and Viet Nam

# 1. INTRODUCTION

Antibiotic resistance is occurring everywhere in the world, compromising the treatment of infectious diseases and undermining many other advances in health and medicine.

A global action plan to tackle the growing problem of resistance to antibiotics and other antimicrobial medicines was endorsed at the World Health Assembly in May 2015. Objective 1 of the plan is to improve awareness and understanding of antimicrobial resistance throughout the world through effective communication, education and training. The plan calls on WHO to assess public awareness and understanding of the problem and develop and implement global communication programmes and campaigns to improve awareness and understanding.

WHO is coordinating a global campaign to raise awareness of antibiotic resistance and encourage best practices among the public, policymakers, health and agriculture professionals to avoid further emergence and spread of antibiotic resistance.

Antibiotic resistance is accelerated by the misuse and overuse of antibiotics, as well as poor infection prevention and control. Steps can be taken at all levels of society to reduce the impact and limit the spread of resistance. The general public can help by taking actions such as preventing infections to avoid the need for antibiotics, only using antibiotics when prescribed by a certified health professional, always taking the full prescription, never using left-over antibiotics and never sharing antibiotics with others. Prescribers also respond to people's expectations and demands, so increasing everyone's understanding of when antibiotics may be of benefit, and when not, should decrease the frequency that they are offered.

At present, relatively little is known about the general public's knowledge of antibiotic resistance at a global level. This aim of this survey was to improve understanding of current public awareness and common behaviours related to antibiotics. It provides a snapshot of the current situation which will assist with efforts to track the impact of awareness-raising efforts across the world. The results reported here will inform future engagement efforts, to ensure campaigns targeting the public address key gaps in knowledge and correct common misunderstandings.

The survey was conducted in 12 WHO Member States, two from each Region, and looks at three key areas: self-reported use of antibiotics, knowledge of antibiotics and knowledge of antibiotic resistance.

## 2. METHODOLOGY

### 2.1 COUNTRY SELECTION

The survey was conducted in the following 12 WHO Member States:

**African Region:** Nigeria and South Africa

**Region of the Americas:** Barbados and Mexico

**South-East Asia Region:** India and Indonesia

**Eastern Mediterranean Region:** Egypt and Sudan

**European Region:** Russian Federation and Serbia

**Western Pacific Region:** China and Viet Nam

Countries included in the survey were selected on the basis that they offered a reasonable spread in terms of level of development (6 higher income and 6 lower income, according to World Bank classifications), population size (a mix of large, medium and small), other characteristics (e.g. geography, language), and whether there was any pre-existing information on public understanding of antibiotic resistance. As only two countries per WHO Region were able to be included within the study, findings cannot be considered to be representative of each Region.

### 2.2 APPROACH

The survey tool and approach were developed by specialized research agency, Good Business, in collaboration with WHO, and fieldwork was carried out by research agency 2CV between 14 September and 16 October 2015. A total of 9 772 respondents in 12 countries completed the 14 question survey either online or during a face-to-face street interview. The language of the survey was translated and localized where necessary, within a consistent framework to ensure overall comparability of results.

The decision regarding which methodology to use (online or face-to-face) was taken on a case by case basis, to ensure a representative sample per country.

Online research has grown rapidly over the past ten years and is now well established in all developed nations as well as a growing number of developing countries. It offers cost and time benefits while delivering similarly robust data sets compared to other methodologies and providing a level of anonymity that can help counter research bias stemming from assumed expectations. Although restricting the sampling to those using the internet results in a different bias, in those countries where this approach was still likely to attain a broadly nationally-representative sample of adults for the survey, the research was conducted through online channels.

In countries where the research was conducted online, an online panel was used to identify respondents, who were then recruited using hard and soft quotas to ensure that the final

## #AntibioticResistance

sample was as representative as possible. A panel management system (PMS) was used to select panellists to participate in the survey on the basis of respondent criteria. Panellists were then invited to participate via an email invitation. Respondents then determine themselves if they wish to participate, considering the subject matter, duration and level of incentive. Those that participate are then recruited via a screening questionnaire. As quotas are fulfilled the PMS adjusts the selection of emails to be sent accordingly to provide for efficient and to-quota completion.

In countries where internet penetration is not widespread enough to recruit a nationally-representative sample using an online methodology, face-to-face surveys were used, and in these cases the interviewers in each country recruited and screened participants. Recruitment was conducted via street-intercepts, with interviewers working in specified locations, based on the agreed quota spread. Interviewers targeted respondents based upon their outstanding quota requirements. Once an interview had been achieved the quota sheet was updated and then next respondent was targeted to fill remaining quotas.

To help minimize methodological bias across countries, participants were asked to self-complete much of the survey.

A closed question methodology was also adopted to ensure consistency and allow for comparability across countries and methodologies.

Regarding sample size, because this survey seeks to capture information for the general population rather than boosting for any specific groups, a sample size of 1000 per country was used where an online methodology was adopted and a sample of 500 per country where it was necessary to use face-to-face (Table 1 below). This sample size was selected to ensure that resulting data is as robust as possible, while also managing resource effectiveness. Similar sample sizes are used to gather data in broadly comparable studies, such as that into antimicrobial resistance conducted by TNS Opinion & Social for the European Commission in 2009<sup>1</sup>.

---

<sup>1</sup> [http://ec.europa.eu/health/antimicrobial\\_resistance/docs/ebs\\_338\\_en.pdf](http://ec.europa.eu/health/antimicrobial_resistance/docs/ebs_338_en.pdf)

Table 1. Number of respondents in each country and method of survey, by region

Region	Country	Methodology	Sample size
African	Nigeria	Face-to-face	664
	South Africa	Online	1002
Americas	Barbados	Face-to-face	507
	Mexico	Online	1001
South-East Asia	India	Online	1023
	Indonesia	Online	1027
European	Russian Federation	Online	1007
	Serbia	Face-to-face	510
Eastern Mediterranean	Egypt	Face-to-face	511
	Sudan	Face-to-face	518
Western Pacific	China	Online	1002
	Viet Nam	Online	1000

A nationally-representative sample of adults aged 16+ in each country completed the survey. For all countries, a quota sampling methodology was employed to ensure that the sample was broadly nationally representative, with hard quotas set for age and gender and soft quotas for region and household income. Other demographic data, such as education level and urbanization, was collected for the purpose of profiling.

This document presents the multi-country average alongside some country-specific data, drawing out differences in findings between countries and socioeconomic differences. Since the data set does not include wide-ranging numeric responses, the mean rather than the median has been used for the overall average.

The demographic factors considered in the analysis are:

- **Gender:** Male or female
- **Age:** 16-24, 25-34, 45-54, 55-64, 65+
- **Education:** None, basic, further, higher
- **Household composition:** With children under 16, without children, other
- **Urbanization:** Urban (within a densely populated city or town), suburban (in a suburb or a city or town), rural (outside of a city or town)
- **Income classification (World Bank classifications)<sup>2</sup>:**
  - Lower income countries (Egypt, India, Indonesia, Nigeria, Sudan and Viet Nam)
  - Higher income countries (Barbados, China, Mexico, Russian Federation, Serbia and South Africa)

---

<sup>2</sup> The World Bank classifies economies based on gross national income per capita (<http://data.worldbank.org/about/country-and-lending-groups>)

### 2.3 LIMITATIONS

The research team considered several factors when setting the research methodology and approach for this survey. These include, though are not limited to: sample size; length of sampling and fieldwork time; the duration of the interview and expectations of the participant; the need to minimize the potential for methodological bias across countries, and the pros and cons of the different research methodologies. Balancing these different considerations, and managing overall budget and cost, result in survey limitation, and for this reason it is important to emphasize that the results reported are a snapshot, and should be considered as estimations, rather than accurate results.

Some of the more notable limitations are listed below:

- The multi-country survey was limited to only two countries per WHO Region and 12 countries overall. Therefore, the data cannot be considered to be representative of each Region, nor of the global situation.
- Closed question quantitative research methodologies limit the extent to which a researcher can probe into respondents' answers to explore levels of understanding and intent.
- Online research methodologies, which were employed in the majority of cases within this multi-country survey, can lead to less considered responses than face-to-face methodologies.
- In all surveys, but particularly those which include questions that respondents may feel have a 'correct' response, a bias may come from respondents giving the answer they feel is 'expected'.

## 3. RESULTS

### 3.1 USE OF ANTIBIOTICS

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

#### When people last took antibiotics

The majority of respondents surveyed report having taken antibiotics within the past six months (65%), including more than one third having taken them within the past month (35%) (Figure 1).

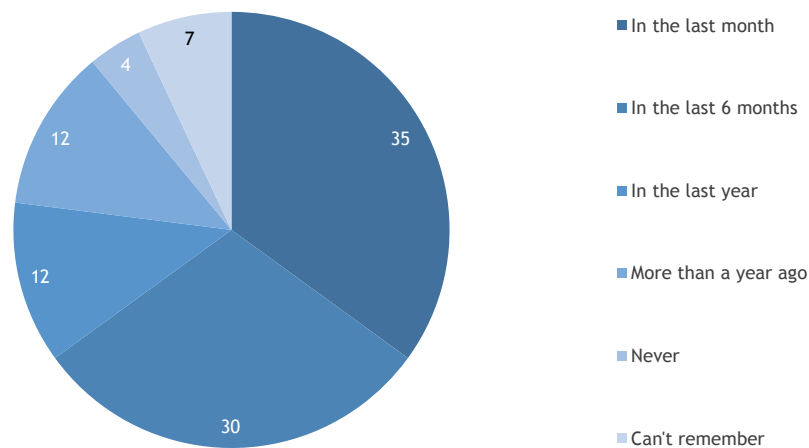


Figure 1. Percentages of responses from all respondents to "When did you last take antibiotics?"

Self-reported antibiotic use **differs considerably between surveyed countries**. More than half of respondents in Egypt reported having taken antibiotics within the past month (54%), and more than three quarters (76%) of respondents in Egypt, Sudan and India took them in the past six months. In contrast, respondents in Barbados and Serbia are noticeably less likely to have taken antibiotics recently, with only 19% reporting having taken them within the past month in both cases. Respondents in Barbados are also the most likely to have never taken antibiotics at 13% (Figure 2).

Figure 2

## #AntibioticResistance

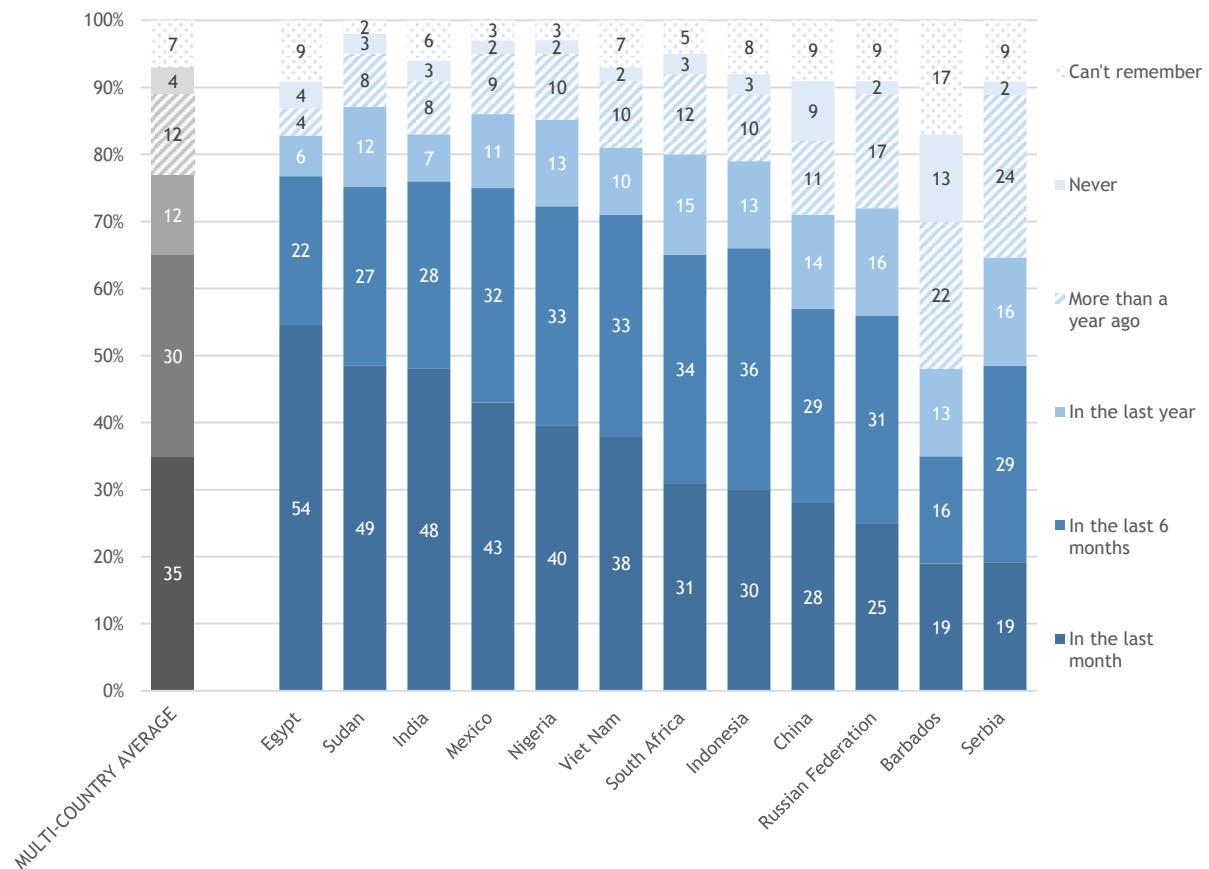


Figure 2. Percentages of responses from all respondents to “When did you last take antibiotics?” by country surveyed

The multi-country survey finds a few notable differences between socio-demographic groups in relation to when they reported having last taken antibiotics.

- Generally, younger respondents are more likely than older respondents to report having taken antibiotics recently:
  - 37% of 16 to 24-year-olds took antibiotics in the past month, compared to 24% of respondents aged 65 and older (Figure 3).
  - Figure 39% of 16 to 24-year-olds last took antibiotics more than a year ago, compared with 22% of respondents aged 65 and older



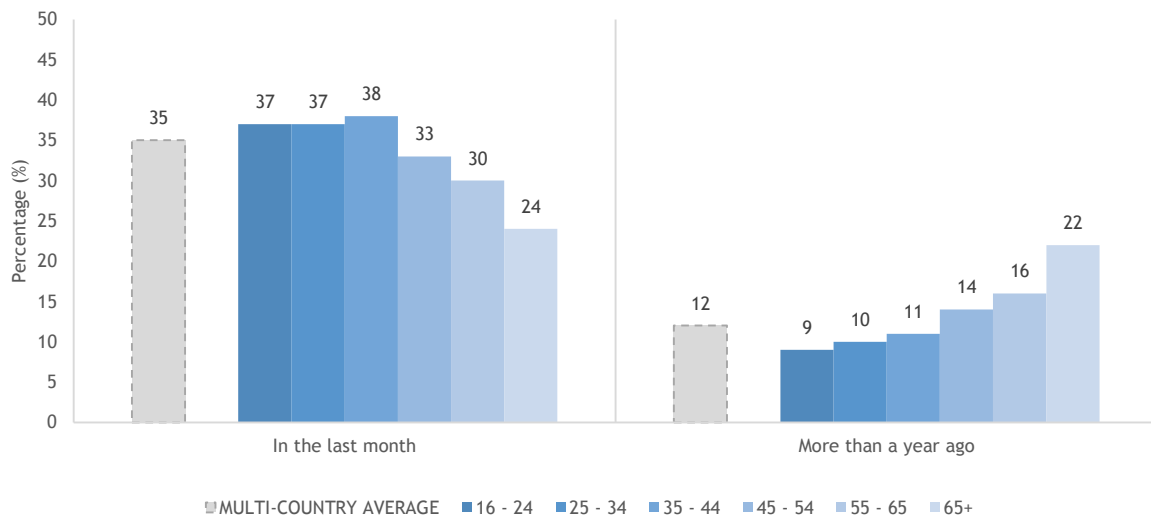


Figure 3. Percentages of responses from all respondents to “When did you last take antibiotics?” by age.

There are also some notable differences between countries of different income levels across the 12 countries surveyed.

- Respondents in lower income countries are more likely to have taken antibiotics in the past month than those in higher income countries, with 42% of respondents in lower income countries reporting having taken antibiotics in the past month compared with 29% of respondents in higher income countries (Figure 4).

Figure 4

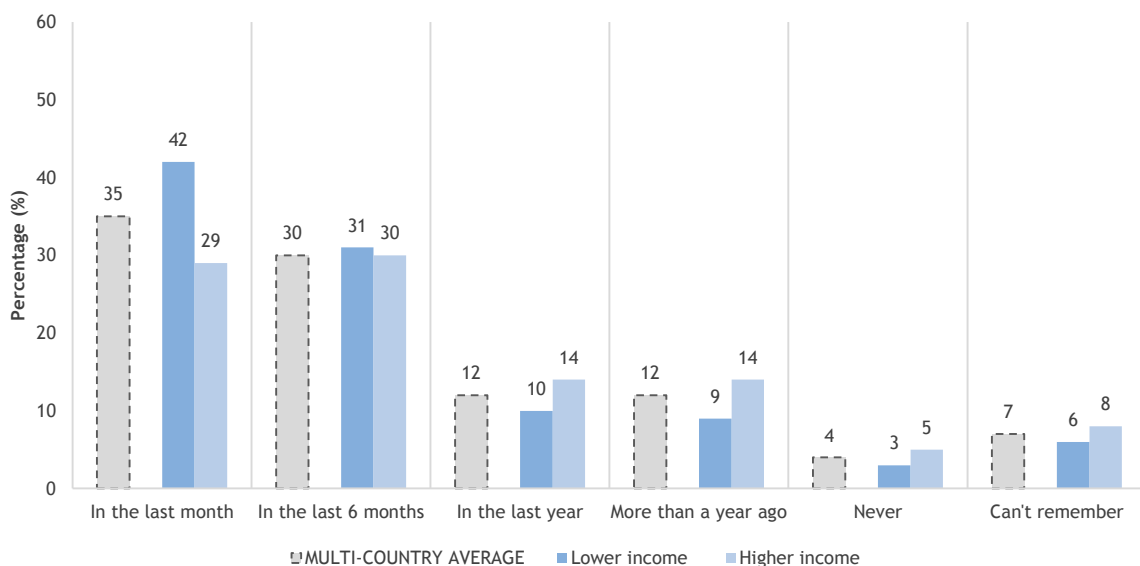


Figure 4. Percentages of responses from all respondents to “When did you last take antibiotics?” by income classification of countries.

## #AntibioticResistance

And finally, there are some **differences by respondents' level of education**, with both the most and least educated being more likely to report having taken antibiotics within the past six months.

- Respondents classified as having no education are more likely to have taken antibiotics in the past six months, with 42% of respondents with no education having taken antibiotics within the past six months compared to 35% of those with basic and 32% of those with further education (Figure 5).

Figure 5

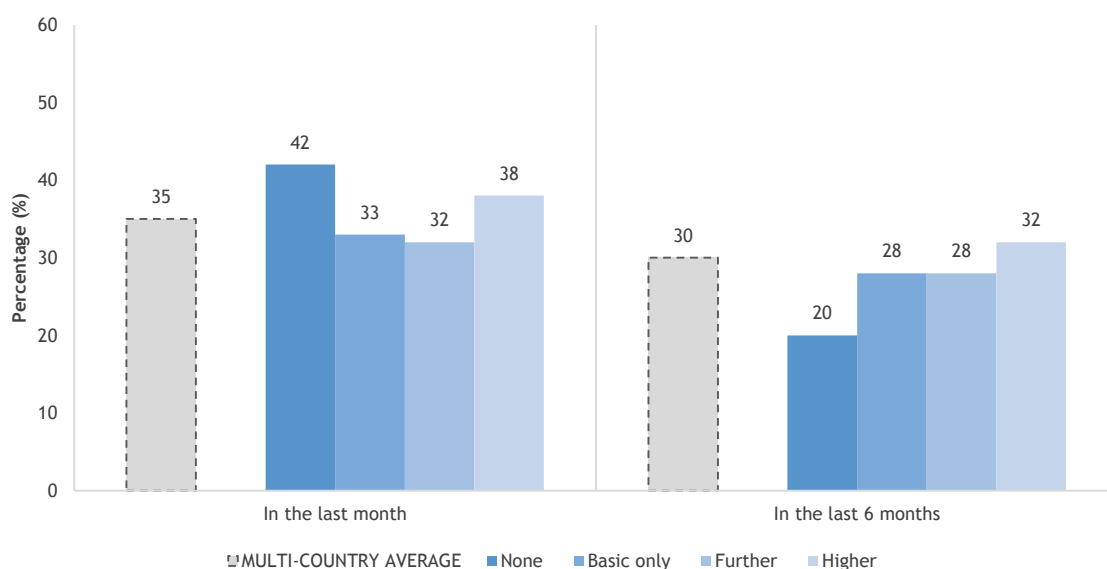


Figure 5. Percentages of responses from all respondents to “When did you last take antibiotics?” by education level of respondents.

### How people obtained antibiotics

Respondents who reported having taken antibiotics were then asked if they had obtained them (or a prescription for them) from a doctor or nurse on the occasion when they last received them.

Overall, the vast majority of respondents (81%) report that they got their antibiotics (or a prescription for them) from a doctor or nurse. This was relatively consistent across the countries surveyed (

Figure 6), though the findings from the Russian Federation were particularly low on this measure, with only 56% of respondents reporting that they got their antibiotics in this way. The proportions of survey participants reporting that they got their antibiotics from a doctor or nurse in South Africa (93%), Mexico (92%), Barbados (91%), Sudan (91%) and India (90%) were all above the overall average, with at least nine out of ten.

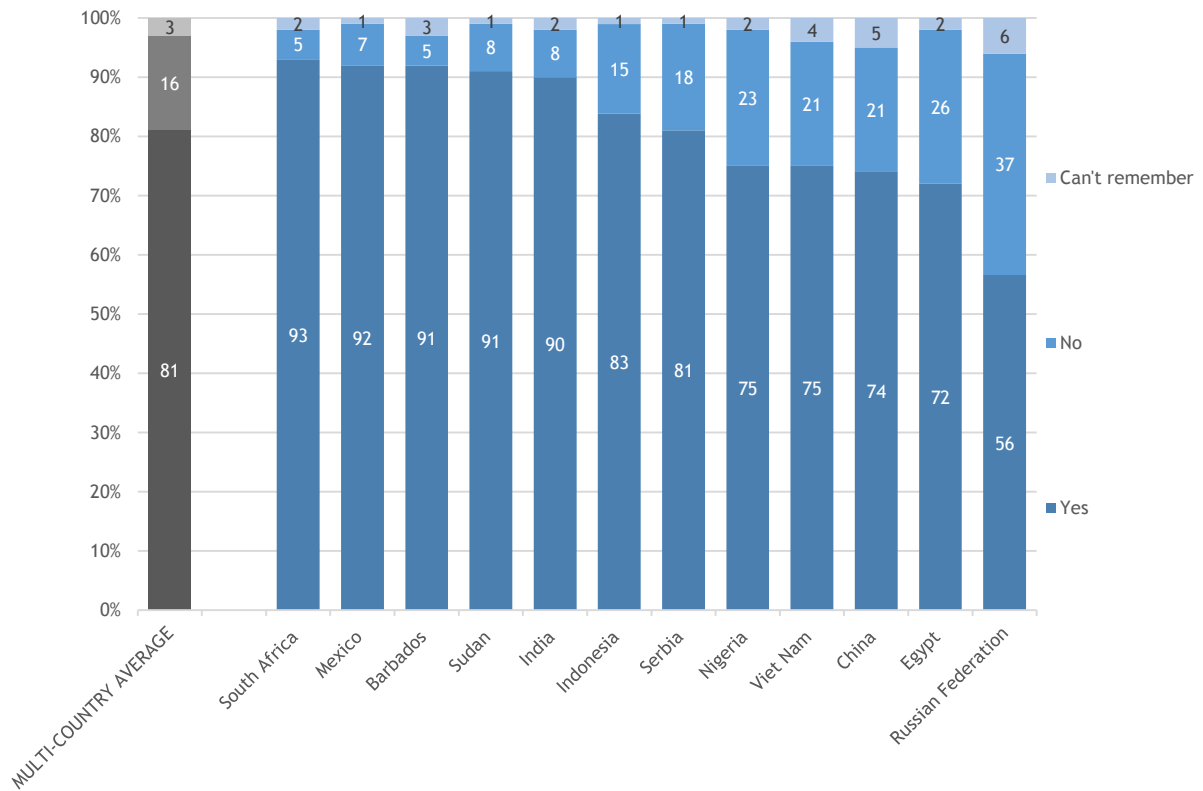


Figure 6. Percentages of responses from all respondents to “On that occasion, did you get the antibiotics (or a prescription for them) from a doctor or nurse?” by country surveyed.

From a **socio-demographic** perspective, the survey finds relatively little variation around how respondents reported getting their antibiotics. Suburban respondents are slightly more likely than those in urban or rural areas to report having gotten antibiotics from a doctor or nurse, with 85% of suburban respondents obtaining antibiotics in this way compared with 80% of those in urban areas and 79% of rural respondents.

**Whether people received advice from a medical professional on how to take them**

The vast majority of respondents in all countries surveyed said they had received advice from a medical professional on how to take the antibiotics they last took (86%) (Figure 7.) There is a relatively continuous spread of answers, ranging from the Russian Federation (69%) to Mexico (95%) and South Africa (95%) at the top end on this measure.

## #AntibioticResistance

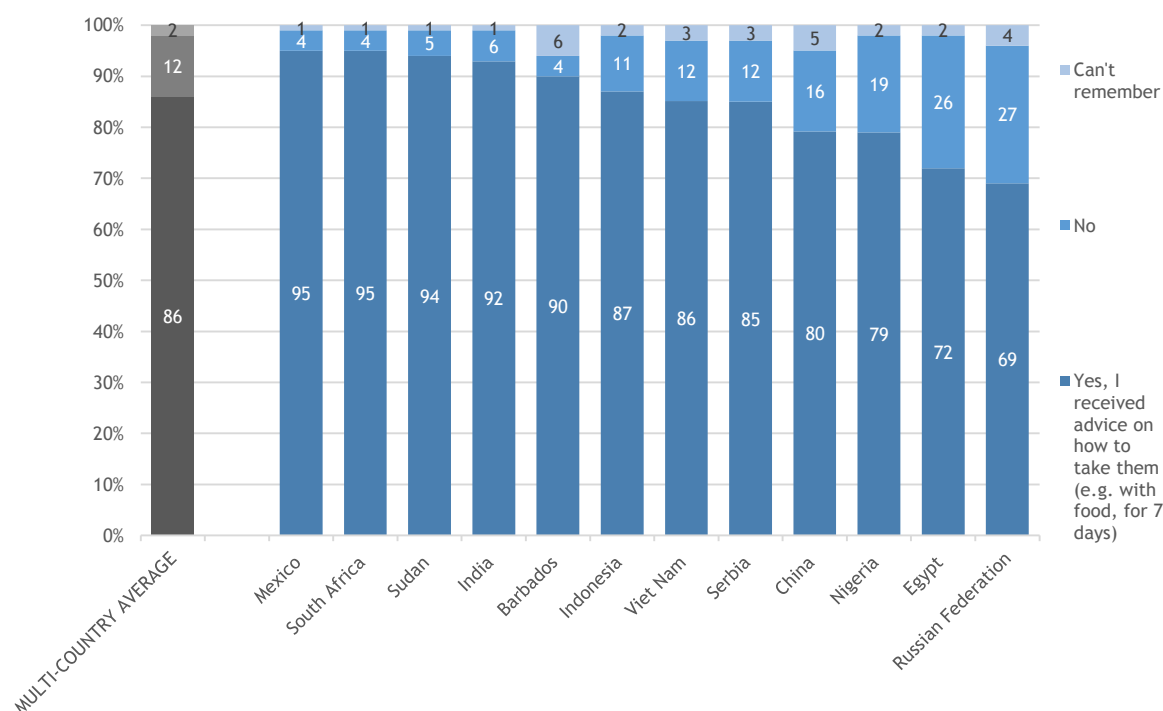


Figure 7. Percentages of responses from all respondents “On that occasion, did you get advice from a doctor, nurse or pharmacist on how to take them?” by country surveyed.

### Where people obtained the antibiotics

Almost all respondents across the 12 countries surveyed report having obtained the antibiotics they last took from a medical stall or pharmacy (93%) (Figure 8.) This figure was above 90% in all surveyed countries other than Nigeria (86%) and China (83%).

China and India are the only countries in which any respondents report having gotten antibiotics online, with 5% and 2% of respondents respectively saying that they got their antibiotics in this way.

China is also the country with the highest number of respondents reporting that they got their antibiotics from a friend or family member, though this response was still low, at 4%.

Nigeria is the country with the highest number of respondents who report getting antibiotics from a stall or hawker, though this response is low too, at 5%.

Antibiotic Resistance: Multi-country public awareness survey

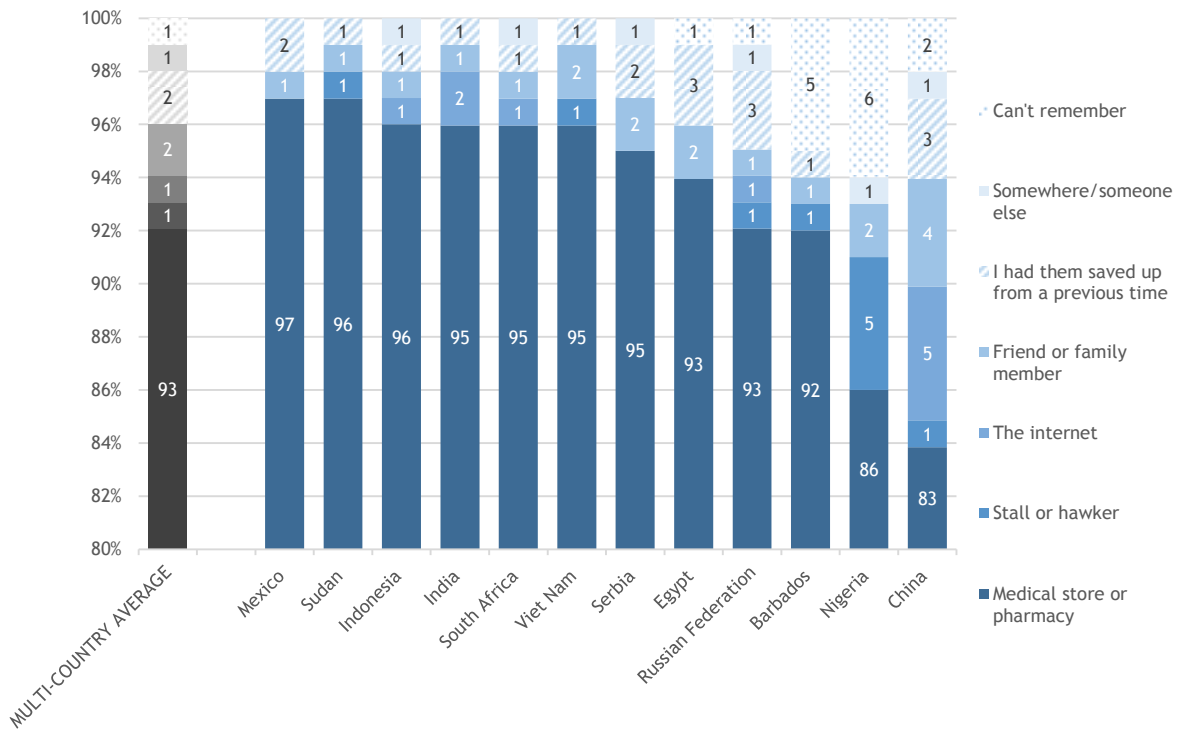


Figure 8. Percentages of responses from all respondents “On that occasion, where did you get the antibiotics?” by country surveyed.

From a socio-demographic group perspective, the data show relatively few significant differences, though Figure 9 shows that respondents in rural areas are more likely than those in urban or suburban areas to report having received antibiotics from somewhere other than a medical store or pharmacy, at 14% and 6% respectively.

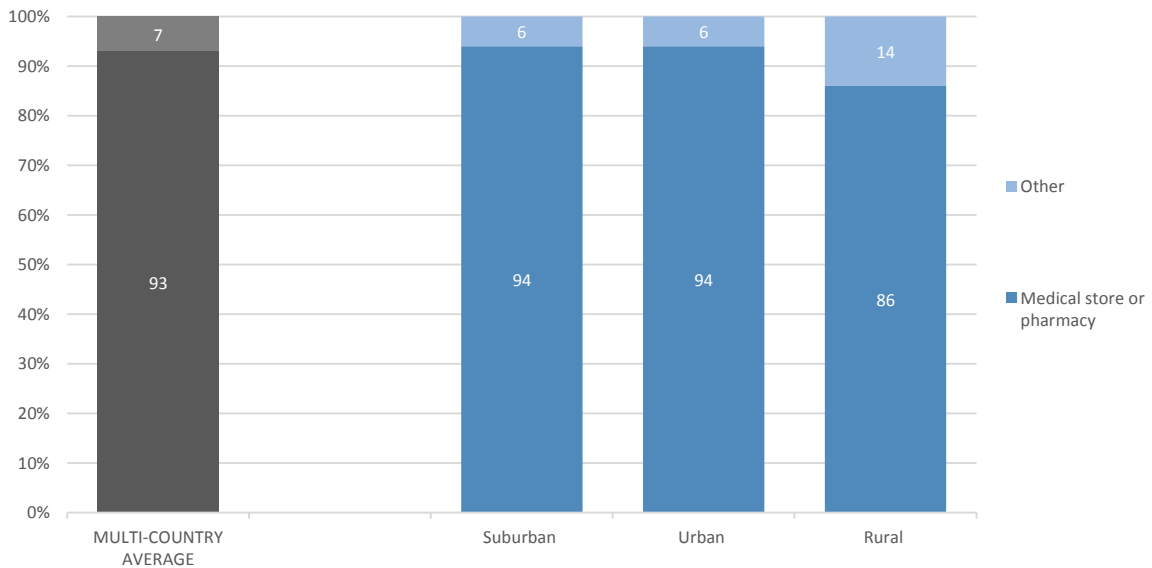


Figure 9. Percentages of responses from all respondents to “On that occasion, where did you get the antibiotics?” by urbanization level

### 3.2 KNOWLEDGE OF ANTIBIOTICS

The next area of survey findings covered in this report is levels of knowledge around the appropriate use of antibiotics including how and when to use antibiotics and what they should be used for.

#### How and when to take antibiotics

Respondents were first asked whether they thought the following statement was true or false: “It’s okay to use antibiotics that were given to a friend or family member, as long as they were used to treat the same illness”

Overall, 25% of the survey respondents think this is true, whereas it is in fact a false statement.

However, the findings show noticeable differences between the countries surveyed (Figure 10.) Respondents in South Africa are most likely to agree that this is a false statement (87%), with only 11% selecting the incorrect "true" response. In comparison, more than one third of respondents in Nigeria (37%) and Egypt (34%) think that this statement is "true".

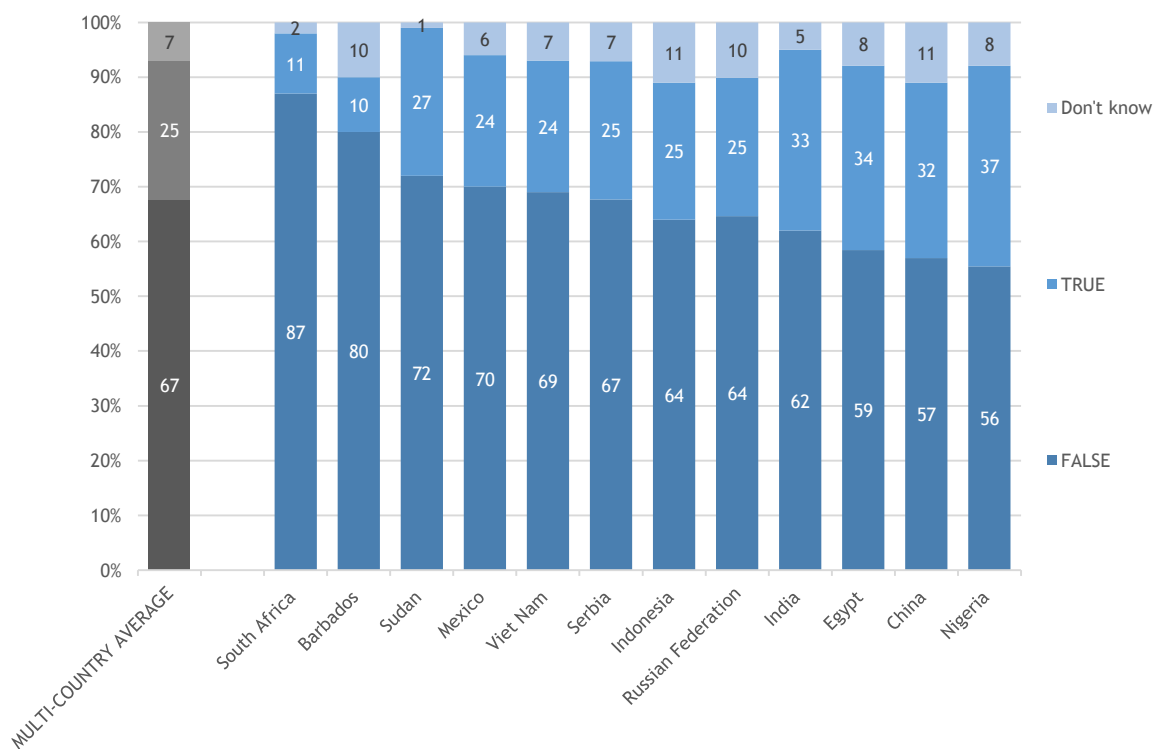


Figure 10. Percentage of responses from all respondents to “It’s okay to use antibiotics that were given to a friend or family member, as long as they were used to treat the same illness” by country surveyed.

The survey findings show a few notable differences between **socio-demographic groups**:

- Respondents in rural areas across the countries surveyed are more likely than those in urban and suburban areas to think that this incorrect statement is true, at 32%, 26% and 20% respectively.
- Respondents in higher income countries are less likely to agree with this incorrect statement (22%), compared to those in lower income countries (29%).
- The more educated a respondent is, the less likely they are to agree with the incorrect statement (Figure 11).

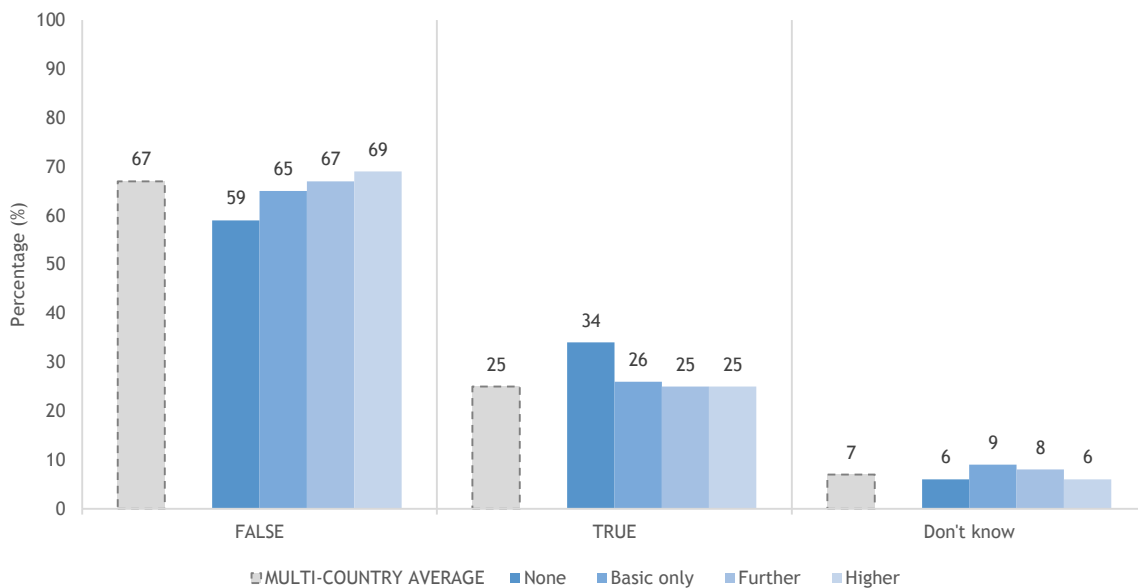


Figure 11. Percentage of responses from all respondents to “It’s okay to use antibiotics that were given to a friend or family member, as long as they were used to treat the same illness” by education level.

Survey respondents were then shown a second statement and again asked whether they thought it was true or false: “It’s okay to buy the same antibiotics, or request these from a doctor, if you’re sick and they helped you get better when you had the same symptoms before”

Across the countries surveyed, 43% of respondents think this is true, whereas it is in fact a false statement.

The findings again show some notable differences between countries surveyed on this statement (Figure 12). Respondents in Mexico and Barbados are most likely to agree that this statement is false, with 67% and 66% respectively selecting this response. In contrast, more than half of respondents in Nigeria (56%), India (52%), Egypt (51%) and Indonesia (51%) think this incorrect statement is true.

## #AntibioticResistance

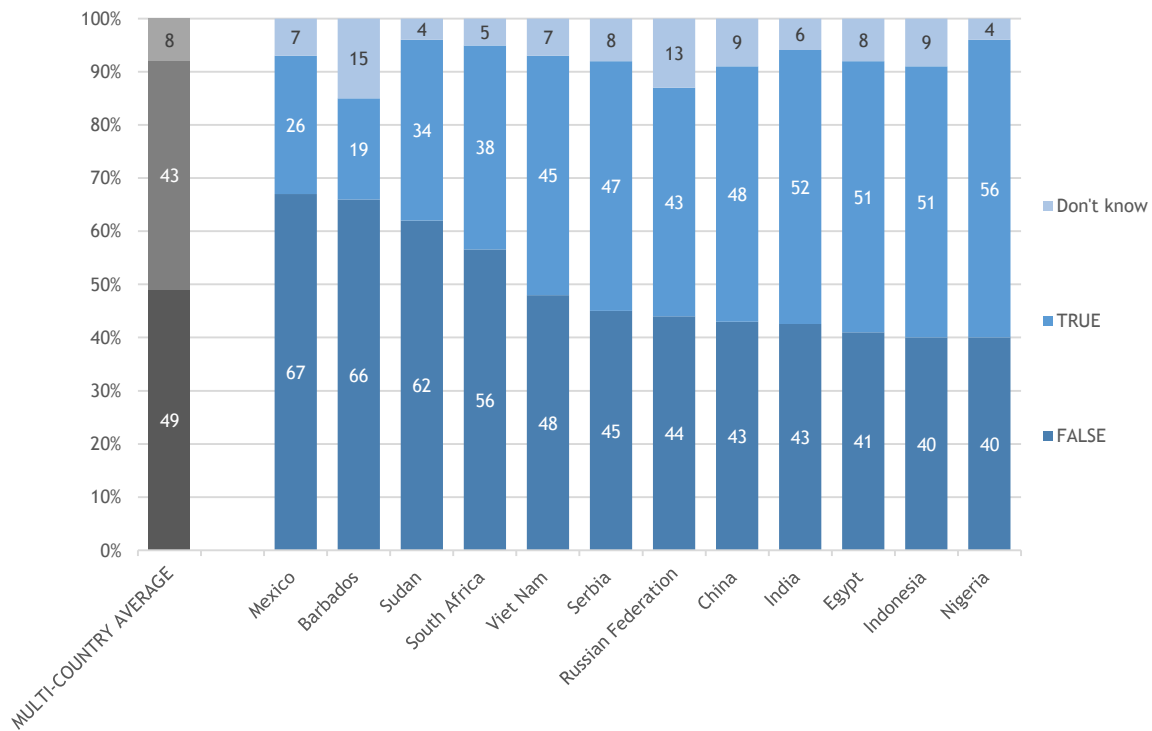


Figure 12. Percentage of responses from all respondents to “It’s okay to buy the same antibiotics, or request these from a doctor, if you’re sick and they helped you get better when you had the same symptoms before” by country surveyed.

The survey findings show a few notable **socio-demographic** differences in relation to this question.

- There is a slight trend towards older respondents being more likely to correctly identify that the statement is false.
- Respondents in higher income countries are more likely to agree that the statement is false (53%), compared to 45% of those in lower income countries.



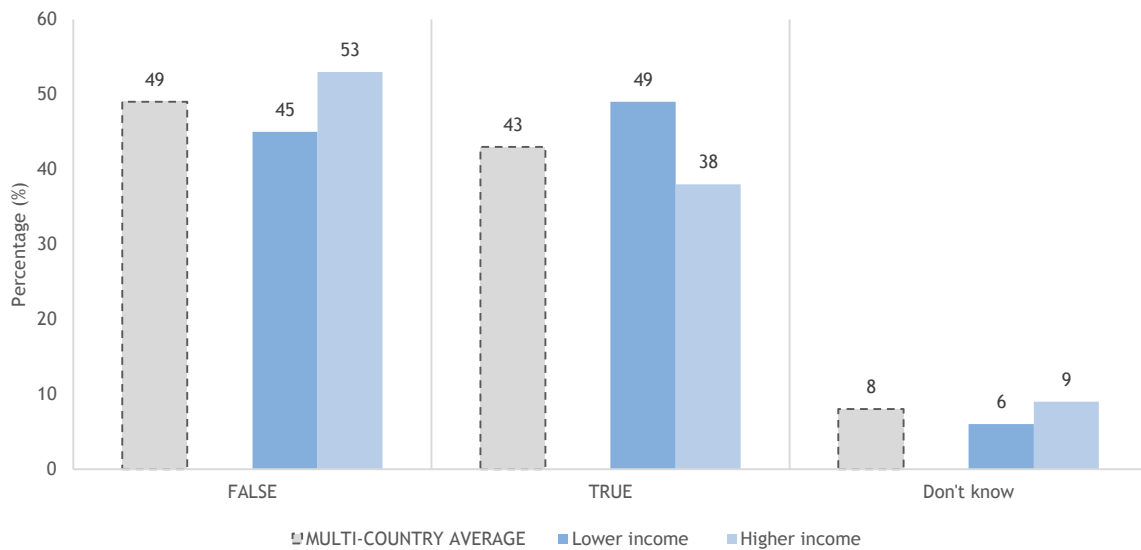


Figure 13. Percentage of responses from all respondents to “It’s okay to buy the same antibiotics, or request these from a doctor, if you’re sick and they helped you get better when you had the same symptoms before” by income classification.

### When to stop taking antibiotics

Survey respondents were then asked when they thought they should stop taking antibiotics once they had begun treatment: when they feel better, or when they have taken all the antibiotics as directed. WHO advises that patients should always take the full prescription, even if they feel better earlier.

The majority of respondents across the countries surveyed answered that the full course of antibiotics should be taken as directed (64%).

Respondents in South Africa are most likely to choose this option, with 87% saying that the full course should be taken as directed. In contrast, more than half of the survey respondents in Sudan (62%), Egypt (55%) and China (53%) choose the other (incorrect) option, saying that they should stop taking antibiotics when they feel better (Figure 14).

Figure 14

## #AntibioticResistance

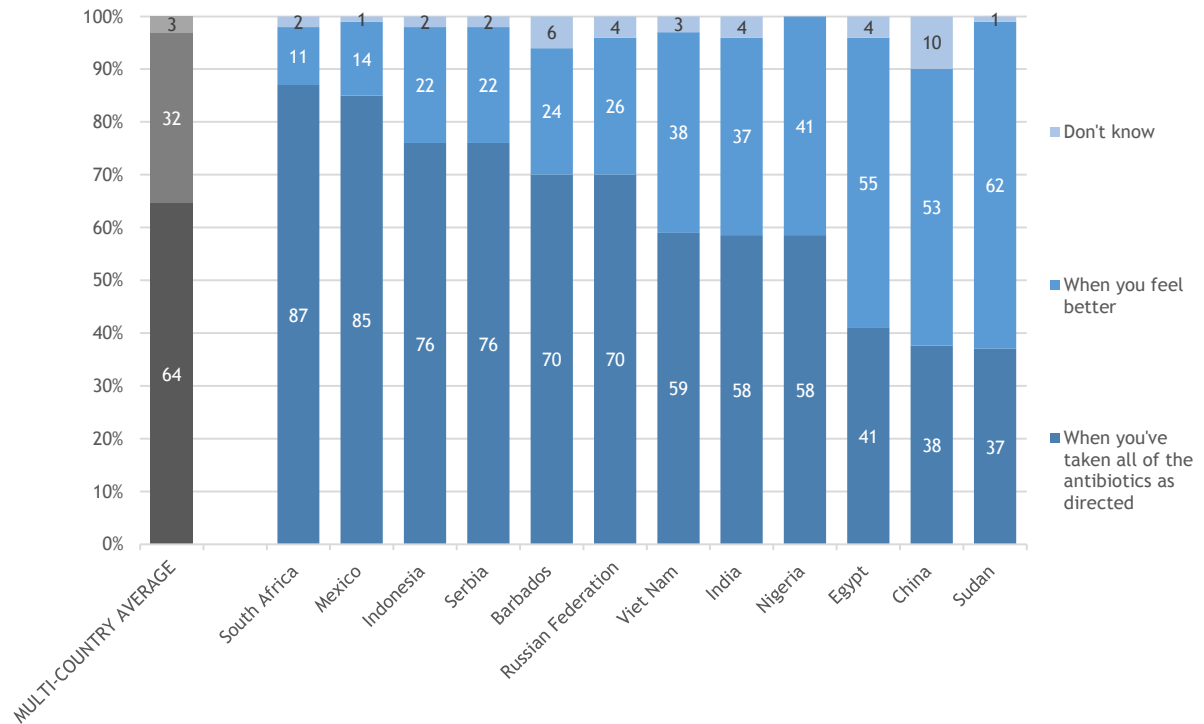


Figure 14. Percentage of responses from all respondents to “When do you think you should stop taking antibiotics once you’ve begun treatment?” by country surveyed.

The survey findings show some notable differences by **socio-demographics**:

- There is a clear pattern in terms of age—the older a respondent is, the more likely they are to say that the full course of antibiotics should be taken as directed (Figure 15).

Antibiotic Resistance: Multi-country public awareness survey

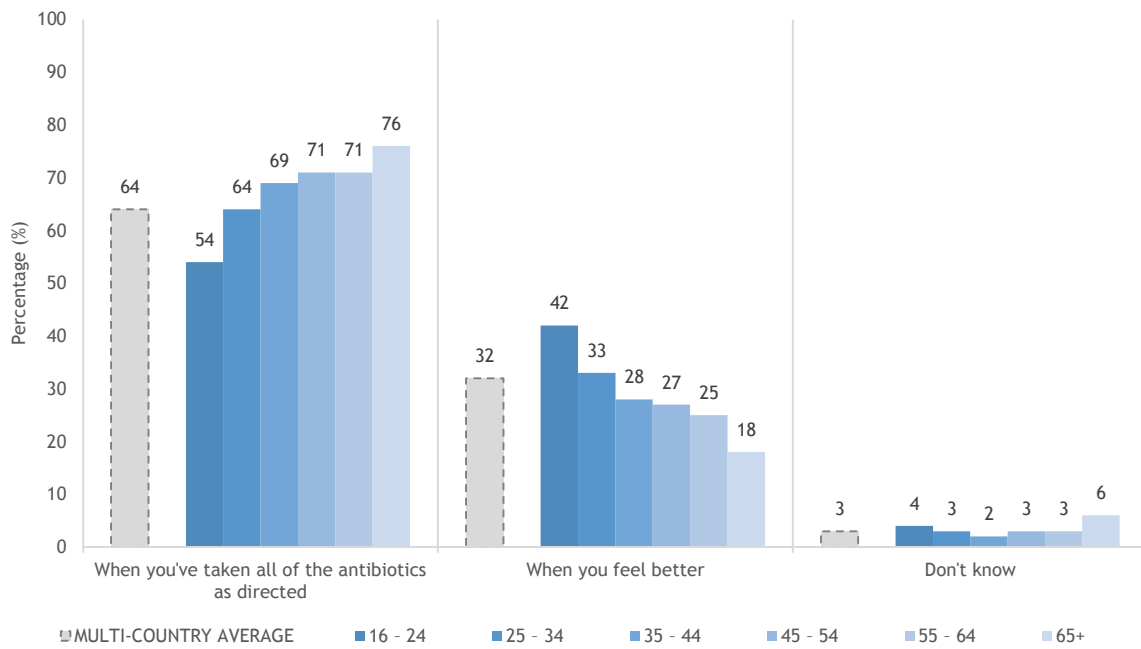


Figure 15. Percentage of responses from all respondents to “When do you think you should stop taking antibiotics once you’ve begun treatment?” by age.

Figure 16 shows that respondents in higher income countries are also notably more likely to know they should only stop taking antibiotics when they have taken all of them as directed (71%), in comparison to lower income countries (58%).

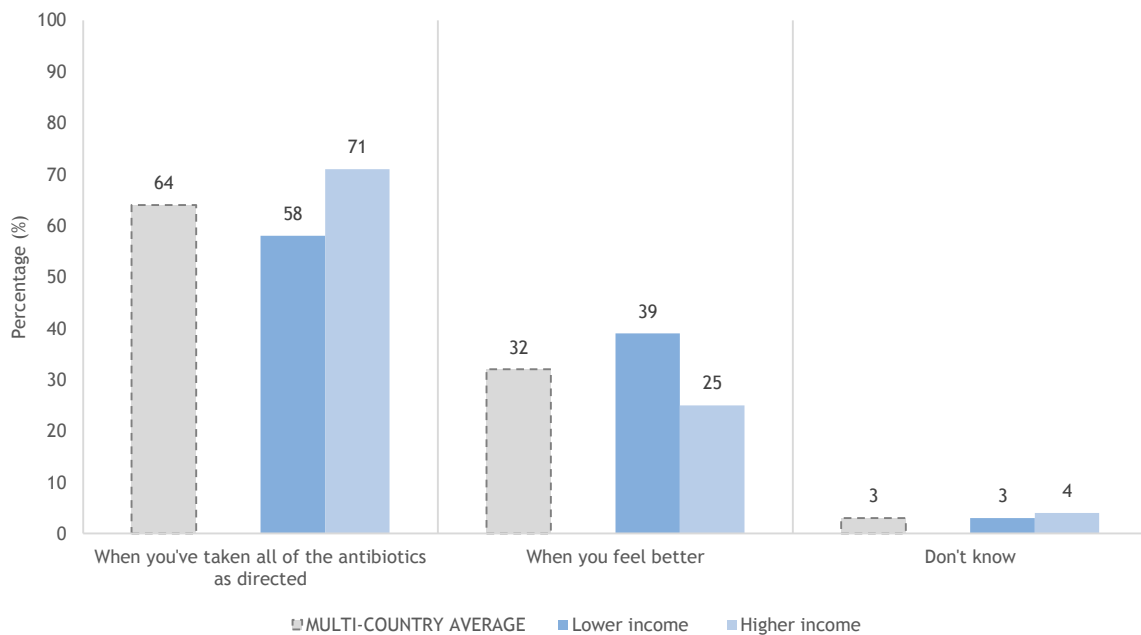


Figure 16. Percentage of responses from all respondents to “When do you think you should stop taking antibiotics once you’ve begun treatment?” by country income classification.

## #AntibioticResistance

Additionally, respondents in rural areas are more likely than respondents in suburban and urban areas to think that they should stop taking antibiotics when they feel better, at 41%, compared to 34% and 33% respectively.

And finally, 56% of respondents with no education say that they should stop taking antibiotics when they feel better compared to 36%, 33% and 29% of respondents with basic, further or higher education respectively.

### Which conditions should antibiotics be used to treat

Respondents were asked which of a list of medical conditions can be treated with antibiotics. The list contained conditions that can be treated with antibiotics (such as bladder/urinary tract infection (UTI), skin/wound infection, and gonorrhoea) as well as those that cannot.

The majority of respondents (72%) correctly identify both bladder/UTI and skin/wound infections as conditions which can be treated with antibiotics (Figure 17).

Figure 17 In contrast, only 51% of respondents correctly identify gonorrhoea as a condition which is treatable by antibiotics.

Large proportions of respondents mistakenly think that conditions which are usually viral, and therefore do not respond to antibiotics, can be treated with these medicines, notably sore throats (70%) and colds and flu (64%).

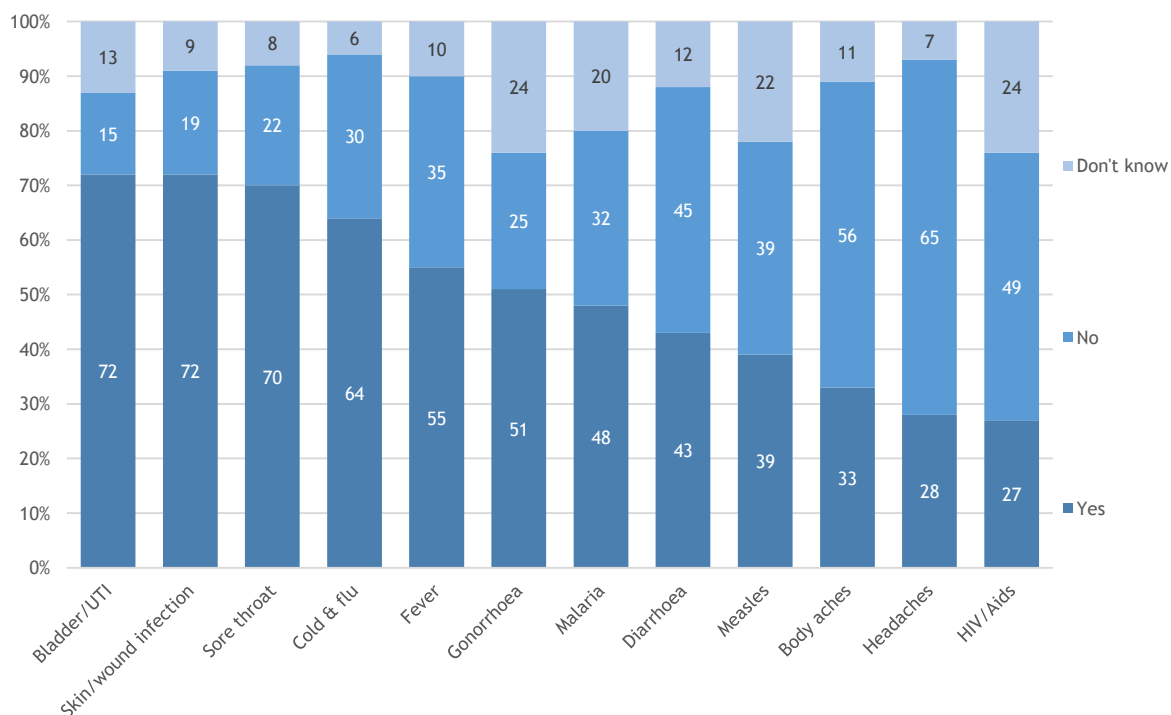


Figure 17. Percentage of responses from all respondents to “Do you think these conditions can be treated with antibiotics?”

There are significant differences between countries surveyed around levels of understanding of which conditions can be treated with antibiotics.

Figure 18 shows the responses for the condition which is most often accurately identified as being treatable with antibiotics (bladder infections/UTIs) according to respondents in all 12 countries surveyed. The vast majority of respondents in Mexico (83%), Serbia (83%) and South Africa (83%) state correctly that the condition is treatable with antibiotics, while only 44% of respondents in Egypt identify this condition as being treatable with antibiotics and 41% state that they are unsure.

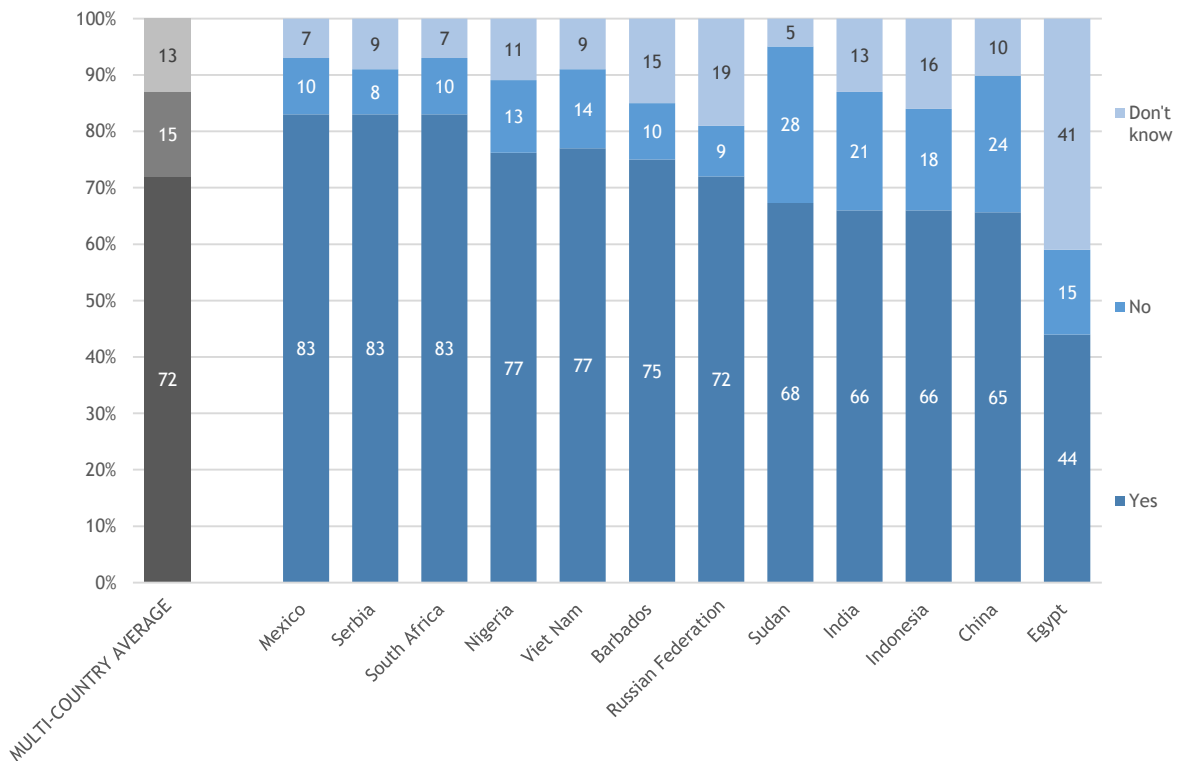


Figure 18. Percentage of responses from all respondents to “Can bladder infections/UTIs be treated with antibiotics?” by country surveyed.

There are also some differences between socio-demographic groups' responses to this question:

- Respondents aged 35 and older are more likely to give the correct answer, with 78% of respondents over 35 answering that UTIs can be treated with antibiotics, compared with 62% of those aged 16-24 and 71% of those aged 25-34.
- Suburban respondents are more likely to respond correctly, with 76% thinking that UTIs can be treated with antibiotics compared to 72% of those in urban areas and 68% of rural respondents.
- Respondents who are more educated are more likely to respond correctly, with 74% of those with higher education identifying UTIs as being treatable with antibiotics, compared to 63% of those with no education.

## #AntibioticResistance

- Respondents in higher income countries are also more likely to respond correctly, with 76% of those surveyed in higher income countries identify UTIs correctly, compared to 68% in lower income countries.

The condition which is most often incorrectly identified as being treatable with antibiotics is colds and flu. In almost all countries surveyed, the majority of respondents believe that colds and flu can be treated with antibiotics (Figure 19). Here too there are some significant differences in findings from different countries. Findings from Nigeria show the highest proportion of correct responses, with more respondents thinking that antibiotics do not work for colds and flu (47%) than those thinking they do (44%). Respondents in Sudan (80%), Egypt (76%) and India (75%) are most likely to state that antibiotics can treat colds and flu.

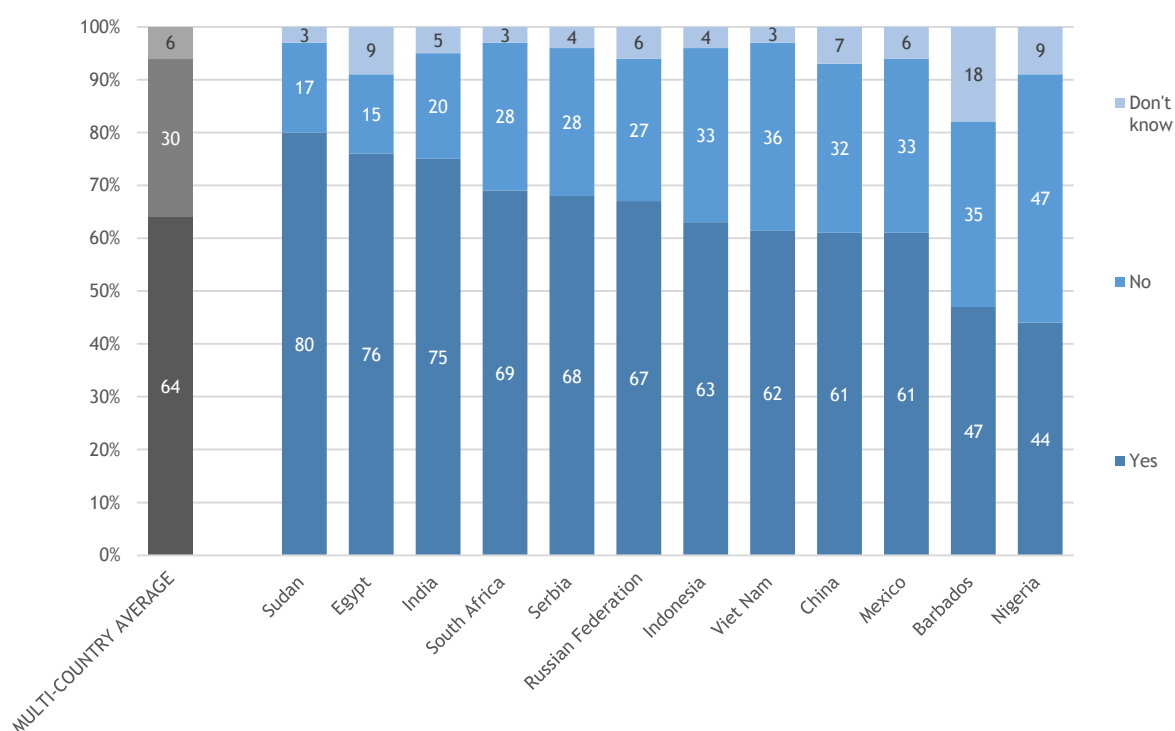


Figure 19. Percentage of responses from all respondents to “Can cold & flu be treated with antibiotics?” by countries surveyed.

The survey findings show some variations by **socio-demographic groups** in response to this question:

- Older respondents are more likely to respond correctly than their younger counterparts
  - 38% of respondents aged 55-64 and 36% of respondents 65 and older state that colds and flu cannot be treated with antibiotics, compared to only 24% of those aged 16-24, 26% of those aged 25-34 and 30% of those aged 35-44.
- Respondents with no education are more likely to think that antibiotics can be used for colds and flu, with 71% answering yes compared to 61% of those with further education and 64% of those with higher education.

### 3.3 KNOWLEDGE OF ANTIBIOTIC RESISTANCE

The final part of this report presents responses to questions exploring levels of awareness of the issue of antibiotic resistance and levels of understanding of the issue and how to address it.

#### Awareness of key terms related to antibiotic resistance and sources of information

Respondents were asked whether they had heard of a series of terms commonly used in relation to the issue of antibiotic resistance. These included:

- antibiotic resistance
- drug resistance
- antibiotic-resistant bacteria
- superbugs
- antimicrobial resistance
- AMR

Overall, the phrase with the highest level of awareness is antibiotic resistance with 70% of respondents in all countries surveyed stating they have heard the term before (Figure 20). This was closely followed by drug resistance (68%) and antibiotic-resistant bacteria (66%). AMR is the least familiar (21%). The proportion of all respondents who have never heard any of the terms is 14%.

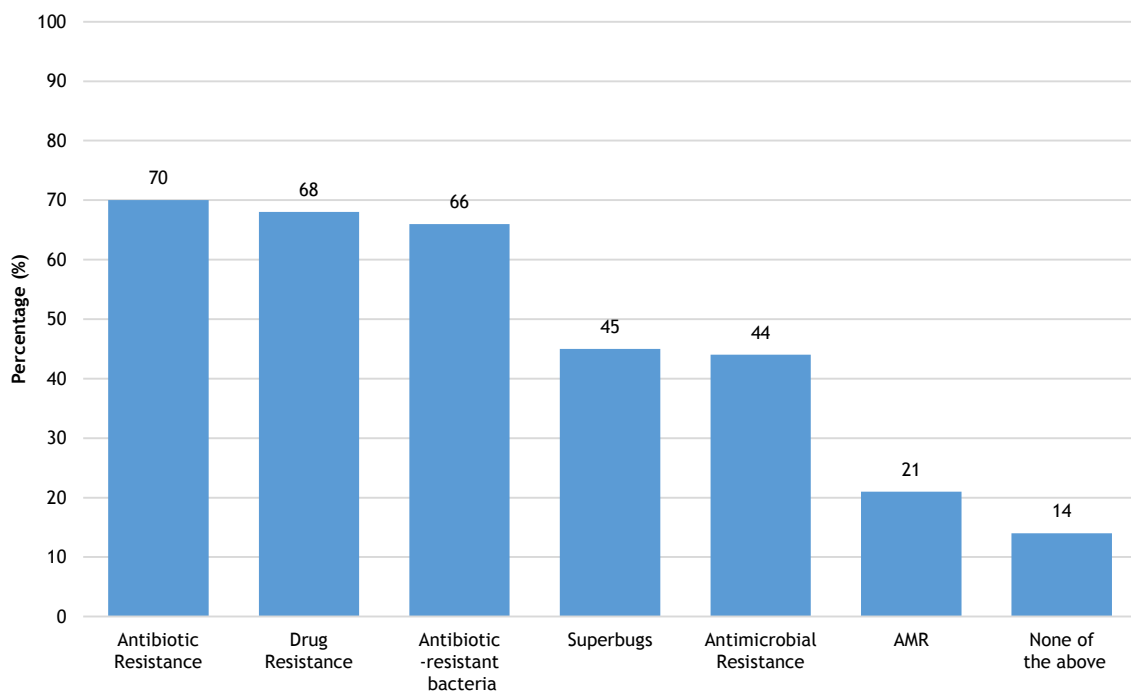


Figure 20. Percentage of all respondents who answered “yes” to “Have you heard of any of the following terms...”

## #AntibioticResistance

In relation to the term with the highest level of awareness—antibiotic resistance—there are some significant differences in findings between countries surveyed (Figure 21).

More than 8 in 10 respondents in Mexico state that they are familiar with the term (89%), as do those in Indonesia (84%) and the Russian Federation (82%). In contrast, fewer than 5 in 10 respondents are aware of the term in Barbados (43%), Nigeria (38%) and Egypt (22%).

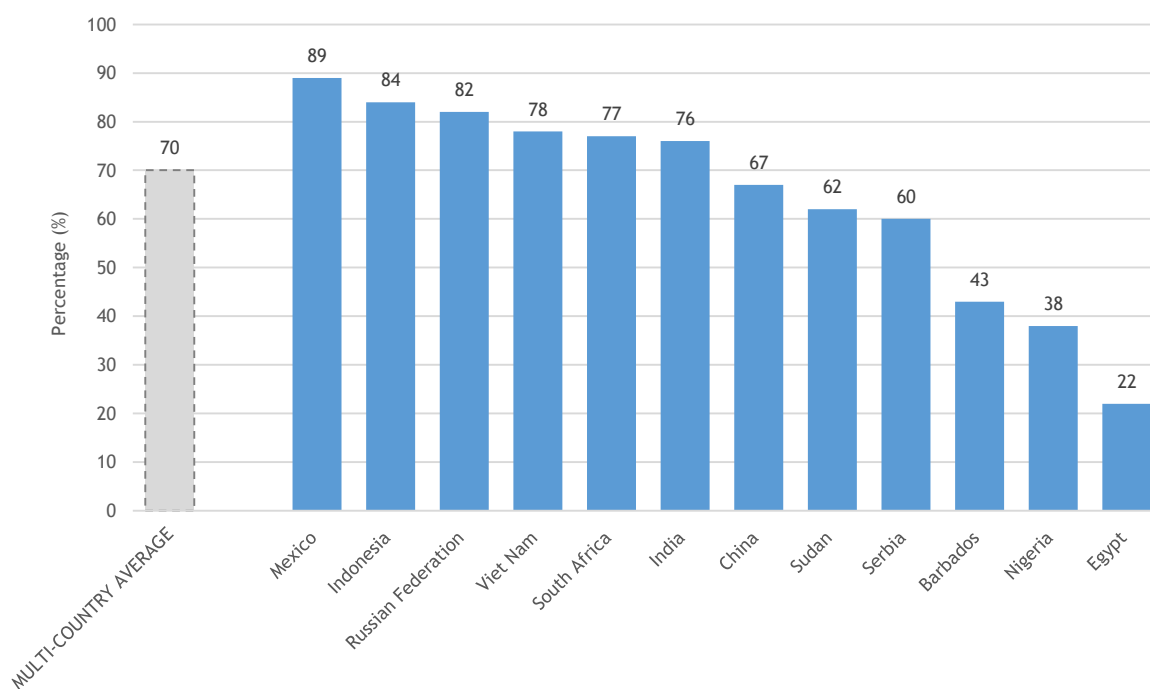


Figure 21. Percentage of all respondents who answered “yes” to “Have you heard of...Antibiotic Resistance?” by country surveyed.

The survey findings show some notable **socio-demographic differences** in relation to awareness of the term antibiotic resistance:

- Respondents with a higher level of education are more likely to have heard of the term antibiotic resistance (77%) compared to those with further (64%), basic (60%) or no education (49%).
- Respondents in rural areas are far less likely to have heard of the term than those in urban or suburban areas, with 55% of rural respondents stating that they know the term, compared to 73% and 70% for their urban and suburban counterparts, respectively.
- Respondents are most likely to have heard of the term if they are aged 55-64, with familiarity at 76%. This is significantly higher than those aged 16-25 (63%) and those aged 65+ (63%).

Those who stated they were aware of the term antibiotic resistance were asked from which sources they had heard about it. The source cited by the largest number of respondents in all 12 countries surveyed is a doctor or nurse (50%), followed by the media (41%), and then a family member or friend (23%).



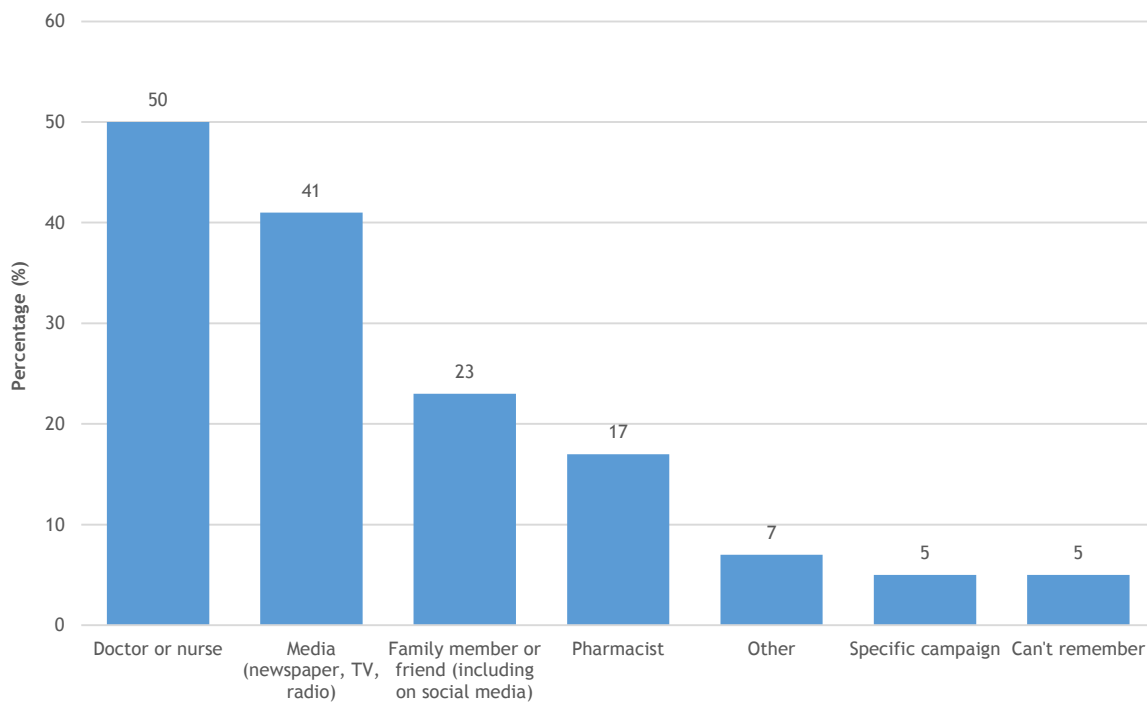


Figure 22. Percentages of responses from all respondents to “Where did you hear about the term antibiotic resistance?”

### Levels of understanding of the issue of antibiotic resistance

In order to explore levels of understanding of the issue of antibiotic resistance, respondents were presented with a list of statements and asked whether they were true or false. These were:

- Antibiotic resistance occurs when your body becomes resistant to antibiotics and they no longer work as well (FALSE)
- Many infections are becoming increasingly resistant to treatment by antibiotics (TRUE)
- If bacteria are resistant to antibiotics, it can be very difficult or impossible to treat the infections they cause (TRUE)
- Antibiotic resistance is an issue that could affect me or my family (TRUE)
- Antibiotic resistance is an issue in other countries but not here (FALSE)
- Antibiotic resistance is only a problem for people who take antibiotics regularly (FALSE)
- Bacteria which are resistant to antibiotics can be spread from person to person (TRUE)
- Antibiotic-resistant infections could make medical procedures like surgery, organ transplants and cancer treatment much more dangerous (TRUE)

Overall, some statements are correctly identified by the majority of respondents whilst others are not (Figure 23), suggesting that there are relatively high levels of misunderstanding about certain aspects of the issue.

## #AntibioticResistance

While 72% of respondents overall correctly identify 'Many infections are becoming increasingly resistant to treatment by antibiotics' as a true statement, an even greater proportion (76%) think that the statement 'Antibiotic resistance occurs when your body becomes resistant to antibiotics and they no longer work as well' is also true, when this is in fact a false statement.

Additionally, only 44% of respondents think that the (accurate) statement 'Bacteria which are resistant to antibiotics can be spread from person to person' is true and only 44% think that that the statement 'Antibiotic resistance is only a problem for people who take antibiotics regularly' is true, whereas in fact it is false.

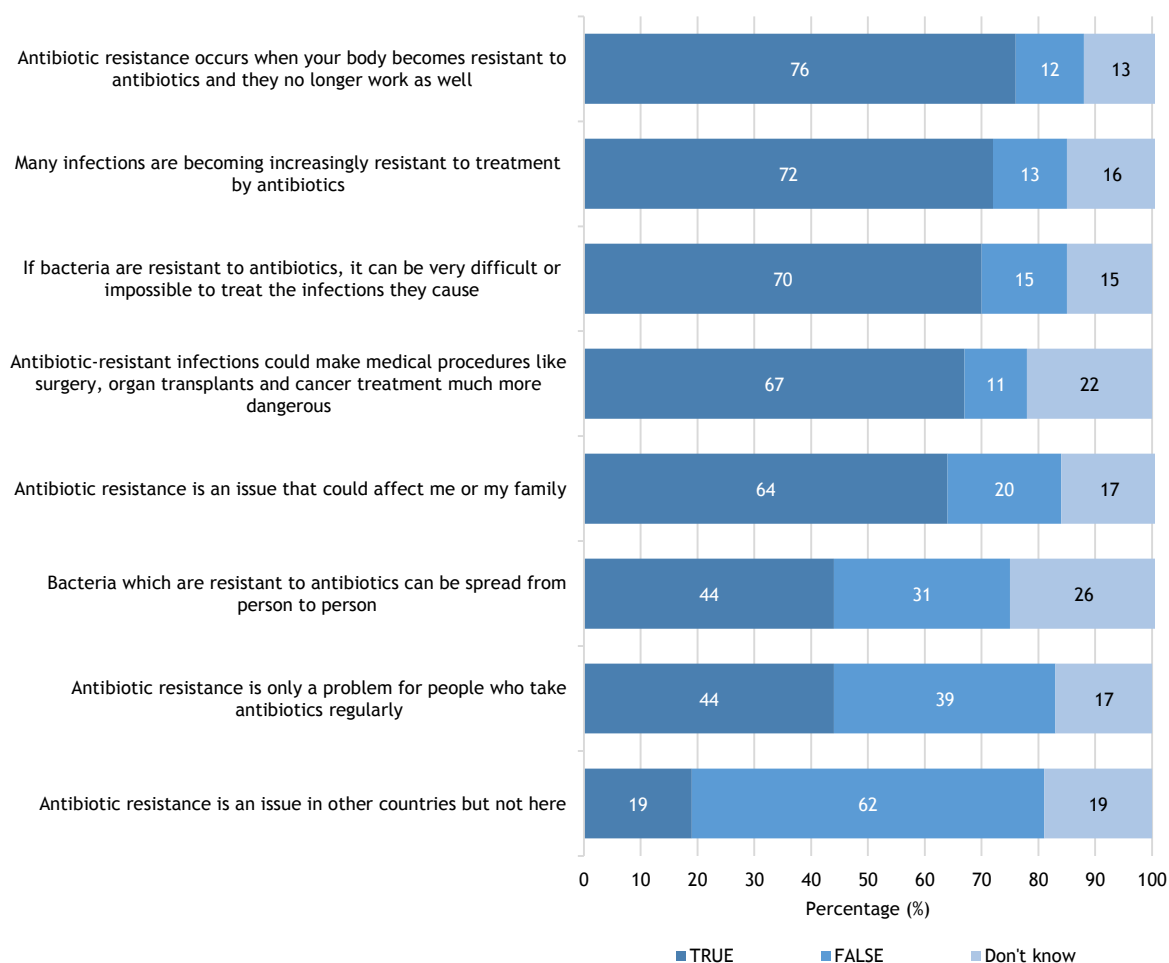


Figure 23. Percentage of responses from all respondents to statements designed to determine knowledge of antibiotic resistance

In relation to the statement which is most commonly misunderstood—'Antibiotic resistance occurs when your body becomes resistant to antibiotics and they no longer work as well'—the findings indicate some significant differences by country (Figure 24), though it is also important to note that the majority of respondents in all countries surveyed think that this statement is true, when in fact it is false.

More than 8 in 10 respondents in Viet Nam (86%), Sudan (84%), South Africa (83%), Indonesia (81%) and Nigeria (81%) think that the statement is true. In contrast, only 55% of respondents in the Russian Federation think that this statement is true, however, almost one quarter (24%) of respondents in the Russian Federation answered "don't know" in response to this question.

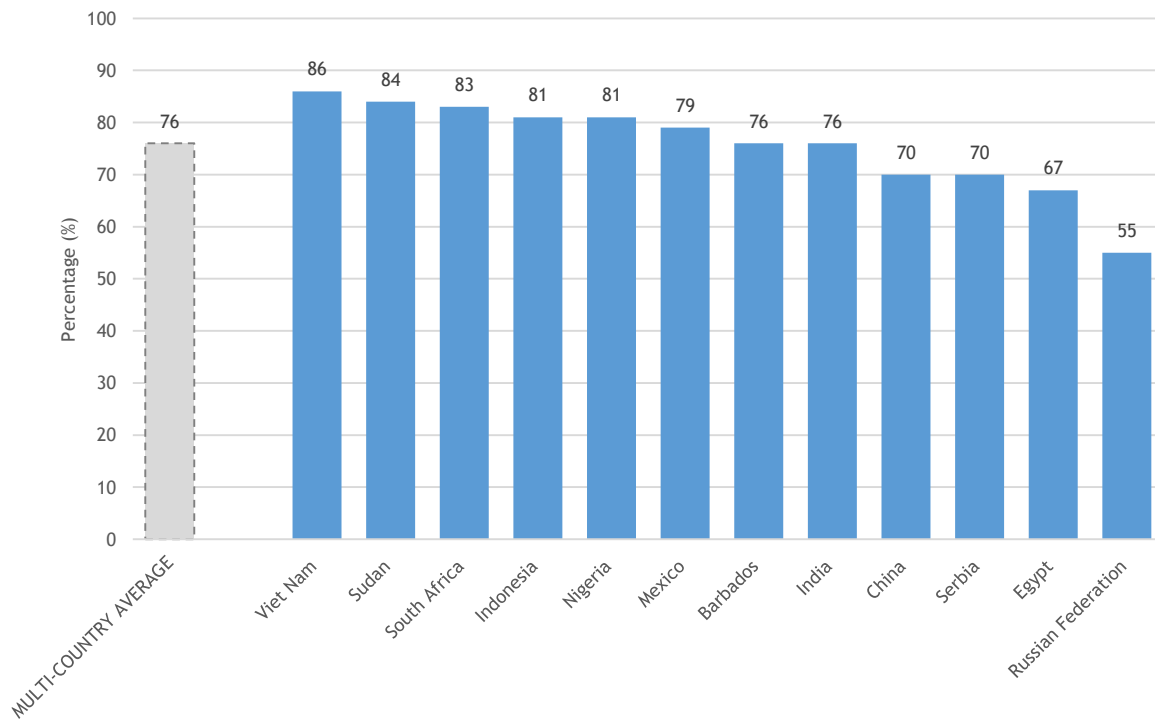


Figure 24. Percentages of all respondents who answered “true” to the question “Antibiotic resistance occurs when your body becomes resistant to antibiotics and they no longer work as well” by country surveyed.

The survey shows some significant differences in findings between countries surveyed in relation to the statement which is best understood—Many infections are becoming increasingly resistant to treatment by antibiotics. Respondents in Mexico (84%), Viet Nam (83%) and the Russian Federation (81%) are the most likely to correctly identify this as a true statement (Figure 25). In contrast, 30% of respondents in Sudan think that this statement is false, while 43% of respondents in Barbados and 30% of respondents in Egypt state they do not know the answer to this question.

## #AntibioticResistance

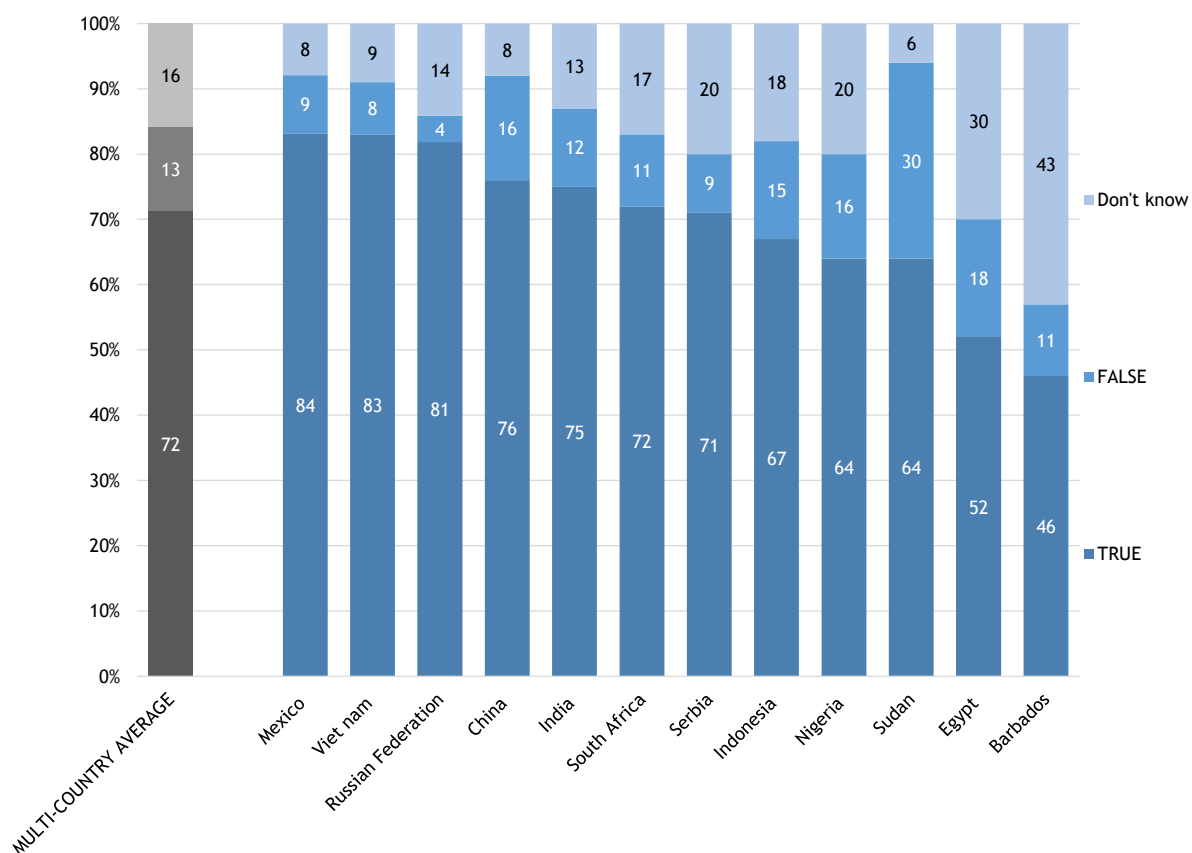


Figure 25. Percentages of responses from all respondents to “Many infections are becoming increasingly resistant to treatment by antibiotics” by country surveyed.

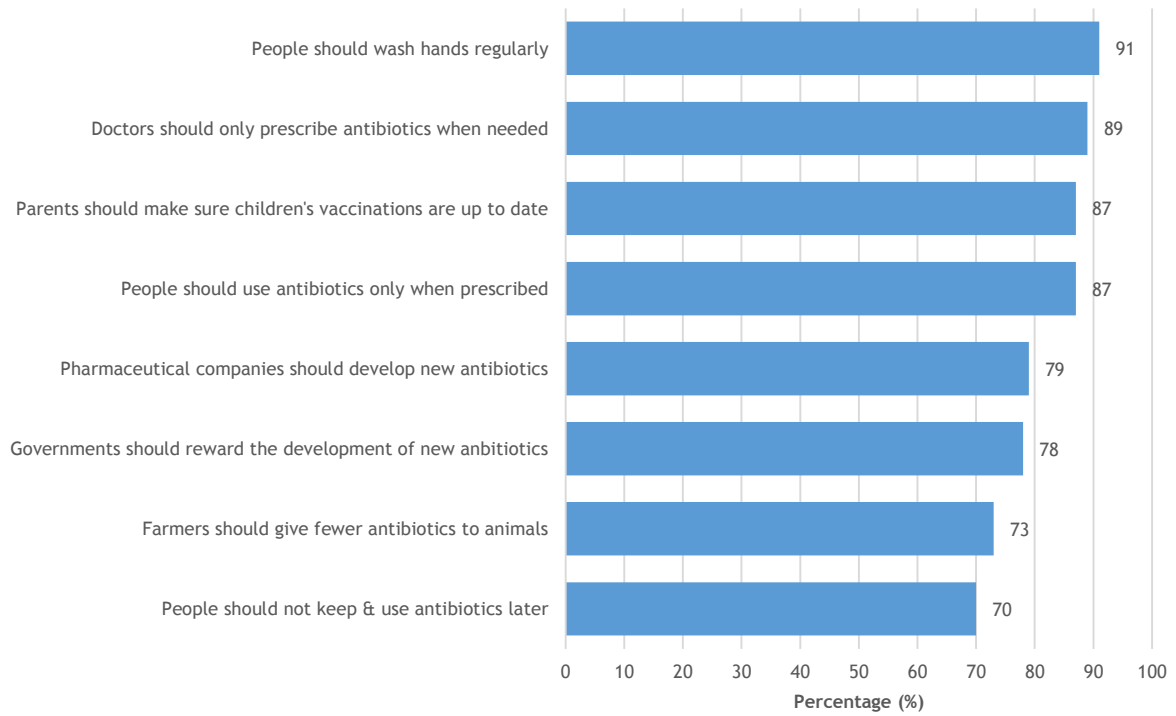
### Levels of awareness and understanding around ways to address antibiotic resistance

In order to explore levels of awareness and understanding around ways to address the problem of antibiotic resistance, respondents were asked whether they felt the following actions would help address the problem:

- People should use antibiotics only when they are prescribed by a doctor or nurse
- Farmers should give fewer antibiotics to food-producing animals
- People should not keep antibiotics and use them later for other illnesses
- Parents should make sure all of their children’s vaccinations are up-to-date
- People should wash their hands regularly
- Doctors should only prescribe antibiotics when they are needed
- Governments should reward the development of new antibiotics
- Pharmaceutical companies should develop new antibiotics

Across the 12 countries included in the survey, the majority of respondents agreed that all of these actions would help address the problem, with People should wash their hands regularly (91%) and Doctors should only prescribe antibiotics when needed (89%) coming out on top (Figure 26). People should not keep and use antibiotics later was the least commonly agreed to, though a significant majority (70%) still thought this has a part to play.

*Antibiotic Resistance: Multi-country public awareness survey*



*Figure 26. Percentages of all respondents who answered “yes” to “Do you think the following actions would help address the problem of antibiotic resistance?”*

There are some significant variations in findings between the countries surveyed and socio-demographic groups in relation to some of these actions, which are explored further below.

## #AntibioticResistance

“ People should use antibiotics only when they are prescribed by a doctor or nurse

In every country surveyed, a majority of respondents agree that this action could help address the problem—in fact, in half of the countries where the survey was undertaken, more than 90% of respondents agree (Figure 27). However in Viet Nam, 13% of respondents disagree with this statement, compared to an overall average of 6%. Additionally, almost one quarter (23%) of survey respondents in China neither agree nor disagree with this statement.

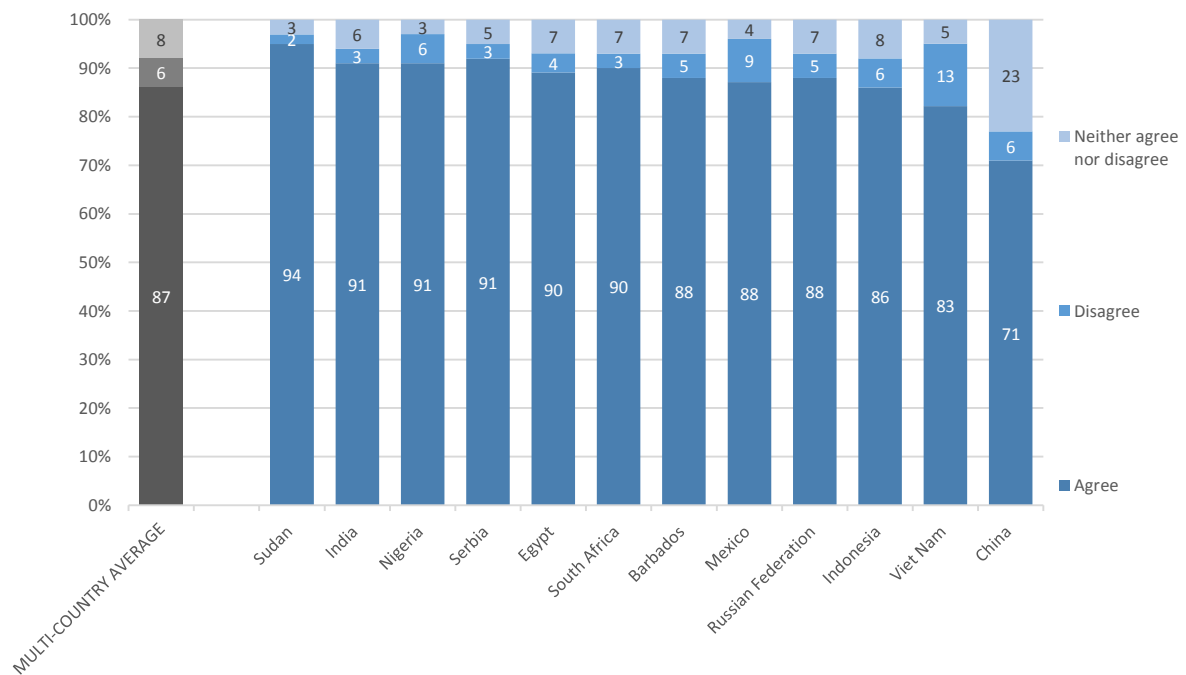


Figure 27. Percentage of responses from all respondents to “People should use antibiotics only when prescribed” by country surveyed.

“ **Farmers should give fewer antibiotics to animals** ”

More than 60% of respondents in all countries surveyed agree that this action could help address the problem (Figure 28).

The multi-country average was 73%, with respondents in China, the Russian Federation and Serbia most likely to agree that this action has a part to play, at 83%, 81% and 81% respectively. Respondents in Indonesia are least likely to agree, at 64%, and the highest proportion of respondents disagreeing with this statement was in Viet Nam at 16%.

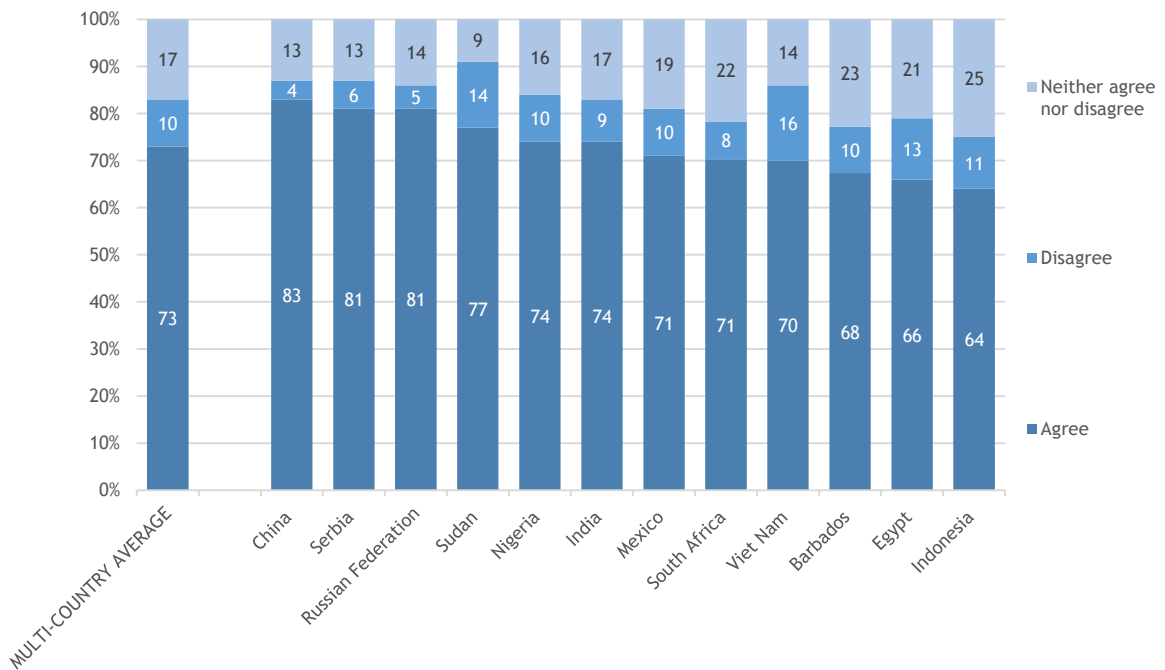


Figure 28. Percentage of responses from all respondents to “Farmers should give fewer antibiotics to animals” by country surveyed.

## #AntibioticResistance



*Governments should reward the development of new antibiotics*

While the majority of respondents in all countries surveyed agree that this action could help address the problem, there are relatively high levels of uncertainty, with one quarter of respondents in Serbia (24%), Barbados (38%) and China (25%) neither agreeing nor disagreeing with the statement (Figure 29).

Figure 29 Respondents in Barbados are the least likely to agree that this action has a part to play, at 50% compared to the multi-country average of 78%, though this is still half of all respondents.

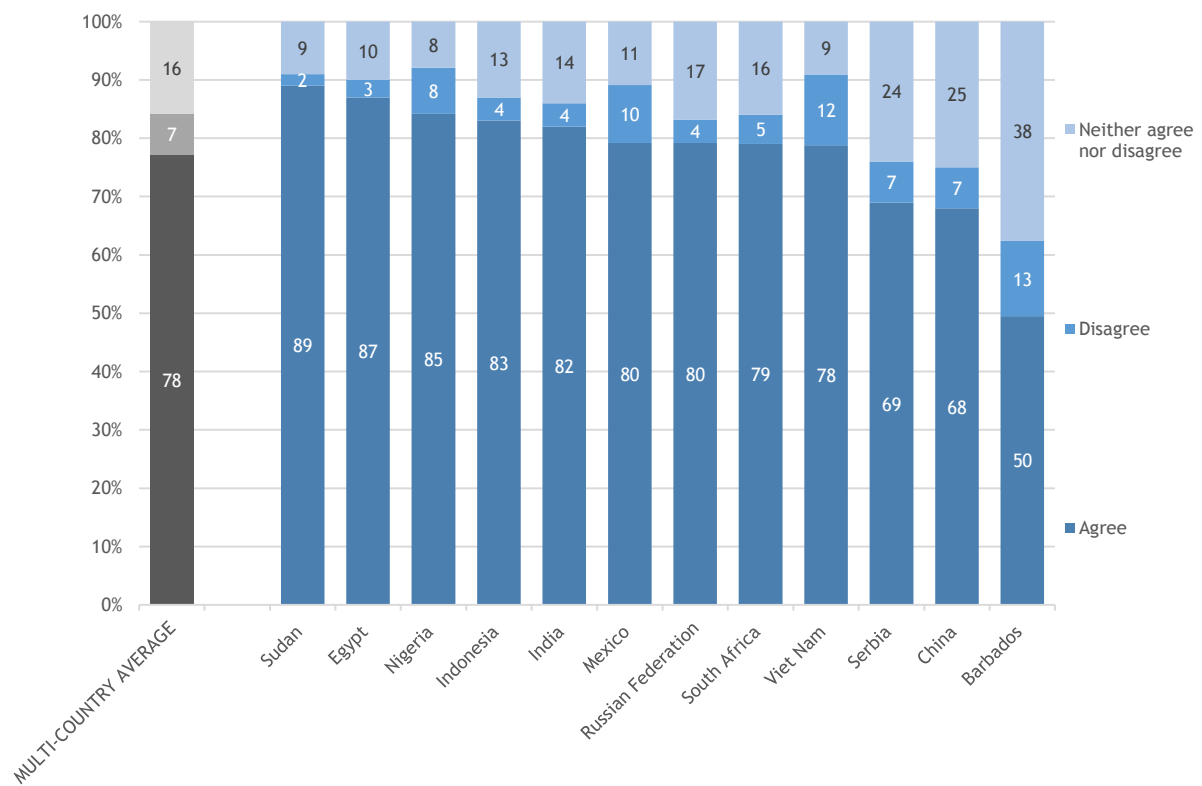


Figure 29. Percentage of responses from all respondents to “Governments should reward the development of new antibiotics” by country surveyed.





**Doctors should only prescribe antibiotics when needed**

The proportion of respondents who agree that this action could help address the problem is above 80% in all countries surveyed (Figure 30). Of note however, is that 14% of respondents in Viet Nam disagree with this statement, compared to the 12-country average of 5%, and 14% of respondents in China neither disagree nor agree, compared to the multi-country average of 6%.

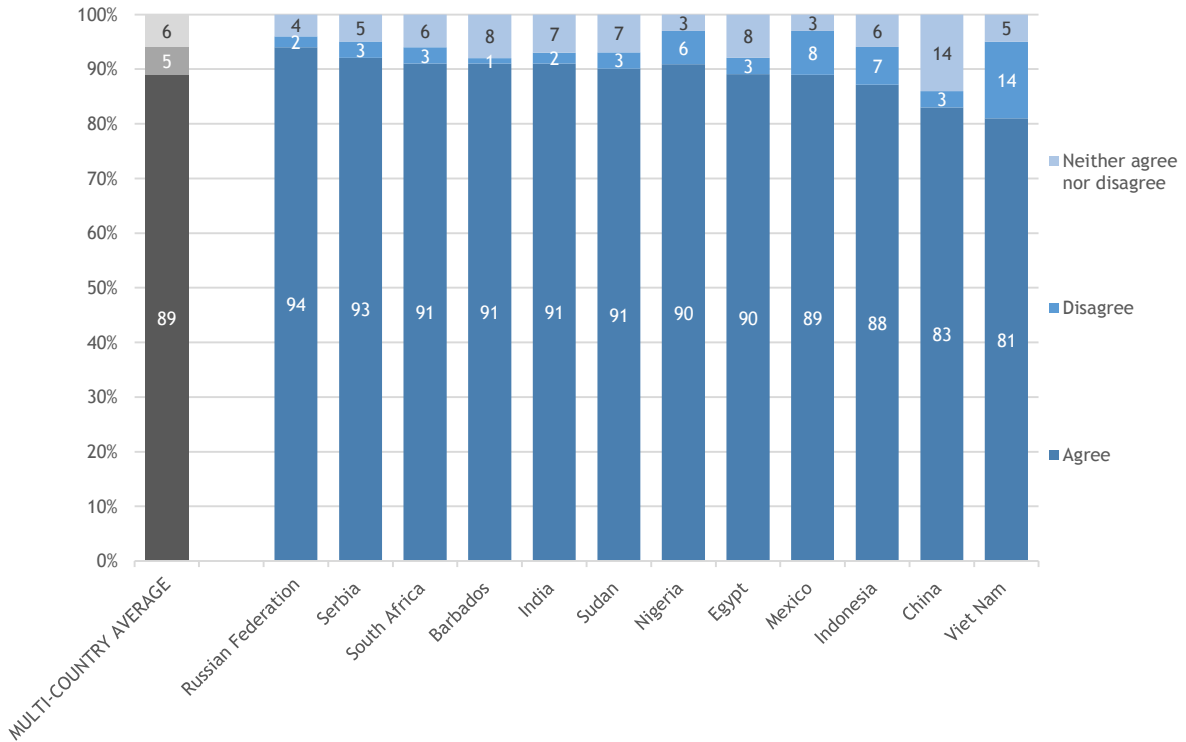


Figure 30. Percentage of responses from all respondents to “Doctors should only prescribe antibiotics when needed” by country surveyed.

“ *Pharmaceutical companies should develop new antibiotics* ”

Figure 31 shows a difference in the survey findings in relation to this statement by income level, with those in lower income countries more likely to agree that this action could help address the problem (82%) than those in higher income countries (76%).

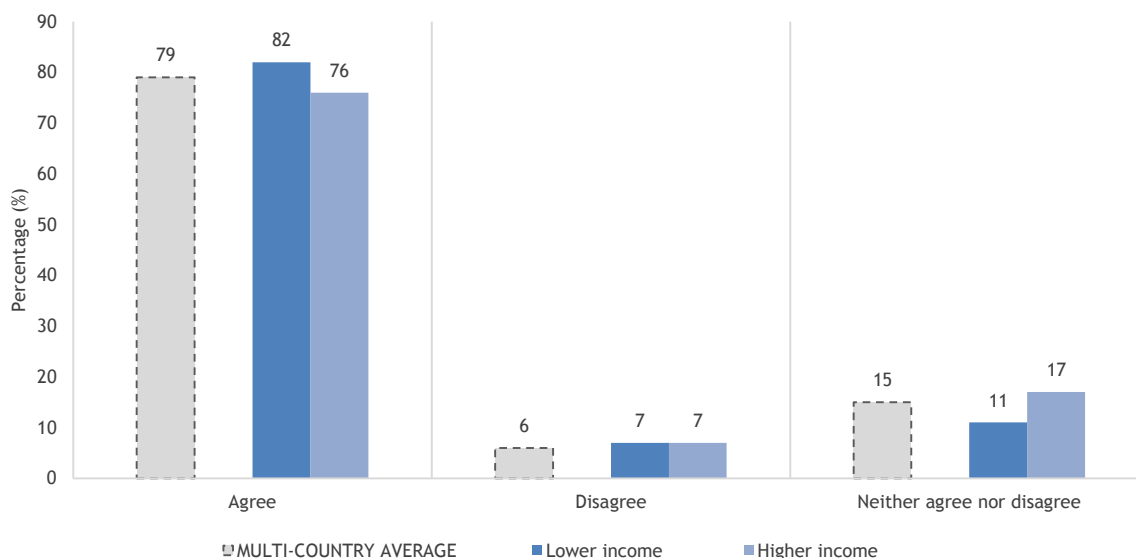


Figure 31. Percentage of responses from all respondents to “Pharmaceutical companies should develop new antibiotics” by country income classification.

**People’s opinions on the scale of the problem of antibiotic resistance and whether it will impact them personally**

In order to understand how serious respondents believe the issue of antibiotic resistance is and whether it will have an impact on them, survey participants were asked whether they agree with a series of statements connected to the issue:

- Antibiotic resistance is one of the biggest problems the world faces
- Medical experts will solve the problem of antibiotic resistance before it becomes too serious
- Everyone needs to take responsibility for using antibiotics responsibly
- there is not much people like me can do to stop antibiotic resistance
- I am worried about the impact that antibiotic resistance will have on my health, and that of my family
- I am not at risk of getting an antibiotic-resistant infection, as long as I take my antibiotics correctly

Responses to this question reveal a mix of views around this area, with some slightly paradoxical findings:

- 88% of respondents in all countries included in the survey think that everyone should take responsibility for using antibiotics responsibly, but 64% of respondents also

think that medical experts will solve the problem of antibiotic resistance.

- 63% of respondents believe that they are not at risk of an antibiotic-resistant infection as long as they take their antibiotics correctly, but 63% of respondents also think that it is one of the biggest problems in the world.

It is also important to note that 57% agree that There is not much people like me can do to stop antibiotic resistance with only 18% disagreeing with this statement, and therefore indicating that they believe they do have a part to play.

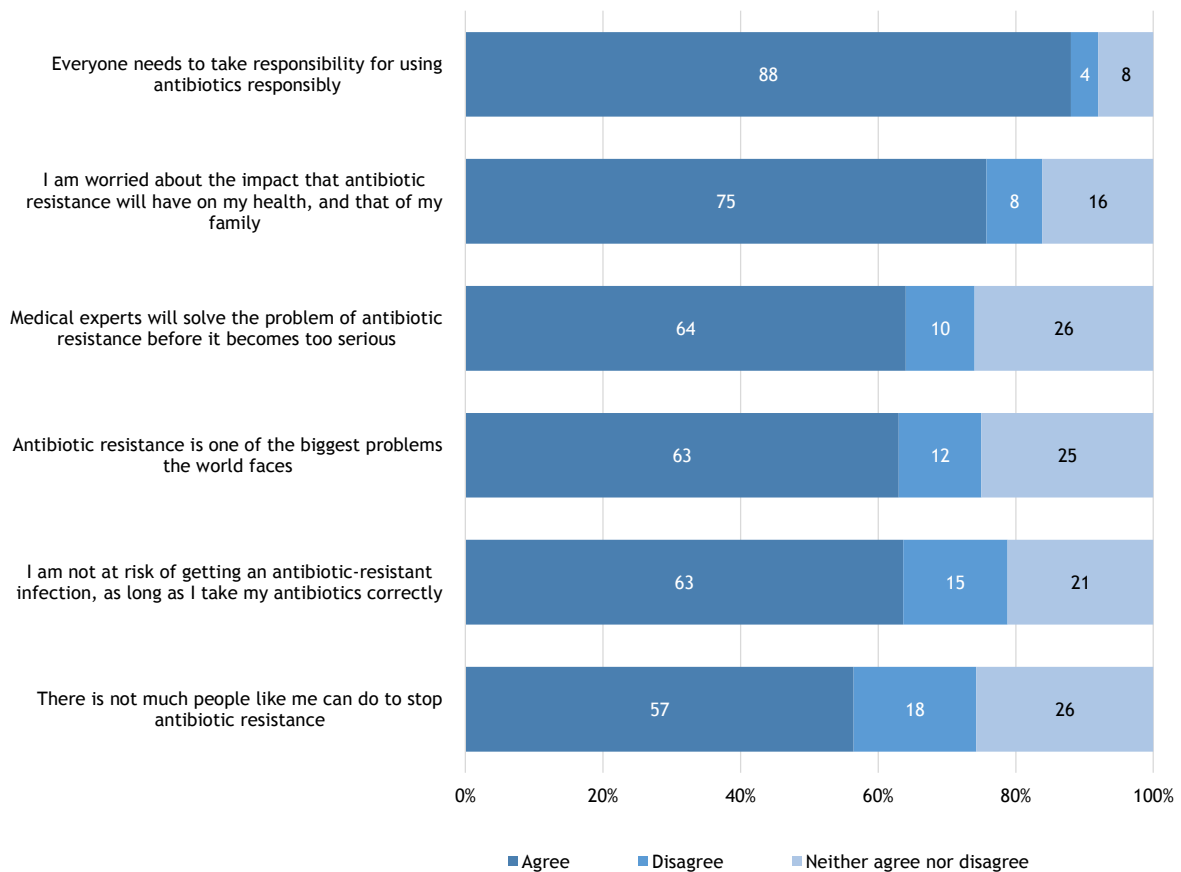


Figure 32. Percentage of responses from all respondents to statements surrounding attitudes towards antibiotic resistance.

There are some significant variations in the findings between the countries surveyed and socio-demographic groups in relation to some of these statements, which are explored further below.

## #AntibioticResistance



*Antibiotic resistance is one of the biggest problems the world faces*

Respondents in a majority of countries included in the survey think that this statement is true, with approximately three quarters of respondents in Sudan (79%), China (75%), India (75%) and Viet Nam (74%) agreeing (Figure 33). In contrast, only 33% of respondents in Serbia and 27% of respondents in Barbados agree that antibiotic resistance is one of the biggest problems in the world, with more than one quarter in each country disagreeing and almost half neither agreeing nor disagreeing with this statement.

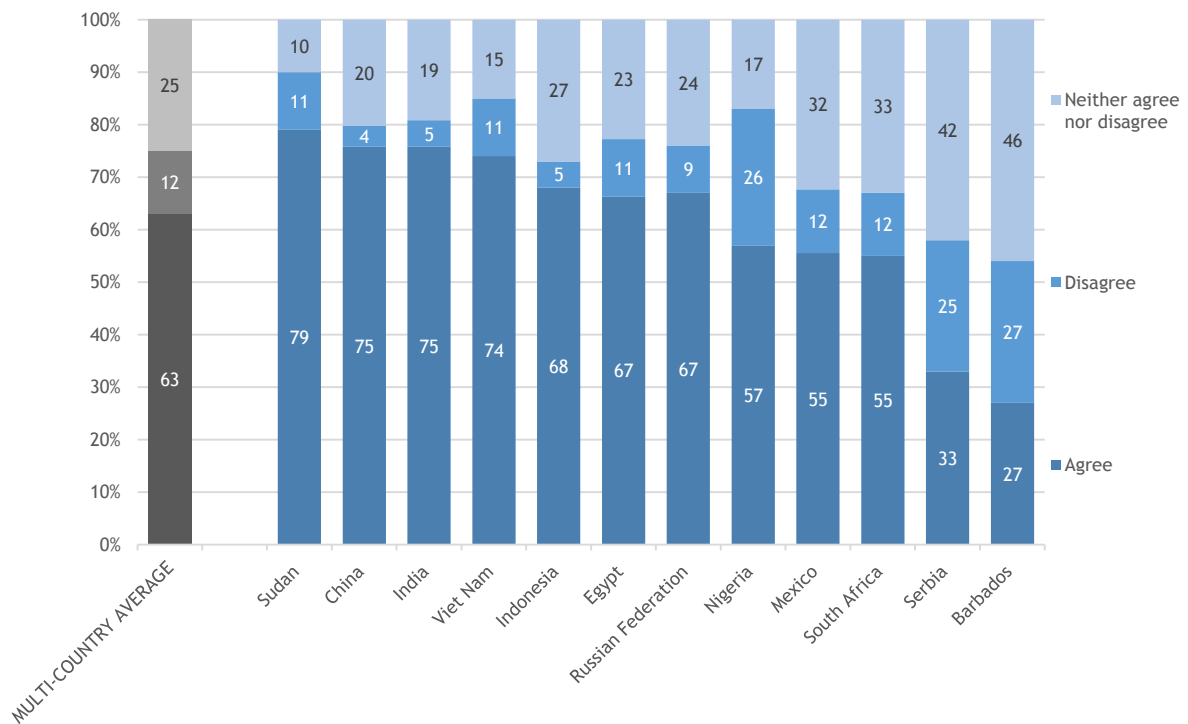


Figure 33. Percentage of responses from all respondents to “Antibiotic resistance is one of the biggest problems the world faces” by country surveyed.



*There is not much that people like me can do*

Generally, respondents with lower levels of education and in lower income countries are more likely to believe that there is little that they can do to stop antibiotic resistance:

63% of respondents with no education agree with this statement compared with 58% of respondents with basic education, 58% of respondents with further education and 56% of those with higher education

61% of respondents in lower income countries agree with this statement compared with 52% of those in higher income countries.

Medical experts will solve the problem of antibiotic resistance before it becomes too serious

Findings suggest that this statement produced a lot of uncertainty from respondents, particularly in Barbados where 56% of respondents neither agree nor disagree with this statement (Figure 34). More than one third of respondents in the Russian Federation (36%), Serbia (35%) and South Africa (36%) are also uncertain. In contrast, 89% of respondents in Sudan agree that experts will solve the problem, as well as 81% of Nigerian respondents.

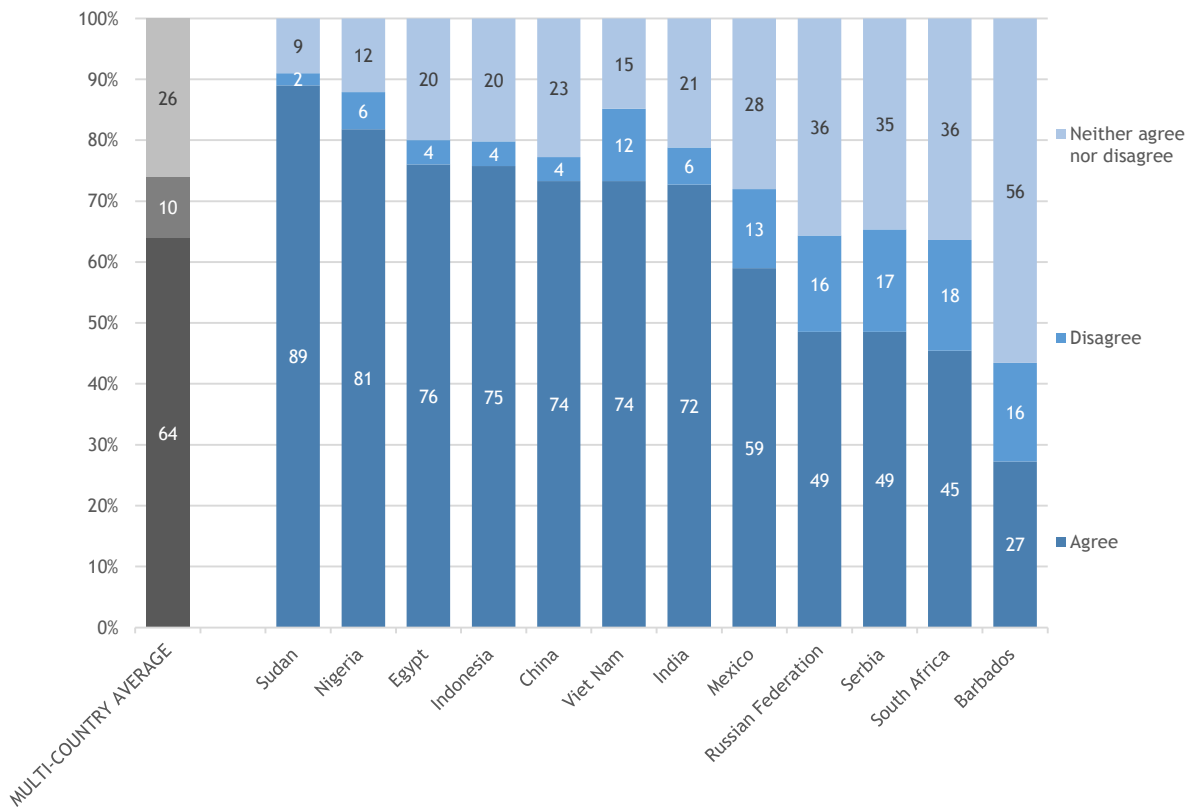


Figure 34. Percentage of responses from all respondents to “Medical experts will solve the problem of antibiotic resistance before it becomes too serious” by country surveyed.

## #AntibioticResistance

“ I am not at risk of getting an antibiotic-resistant infection, as long as I take my antibiotics correctly

Almost two thirds (63%) of all survey respondents believe that they are not at risk if they use antibiotics as prescribed—though this is not in fact the case. Survey findings differ significantly by income level of the respondents’ countries, with 71% of those in lower income countries strongly agreeing to this statement in comparison to 56% of respondents in higher income countries (Figure 35).

Figure 35

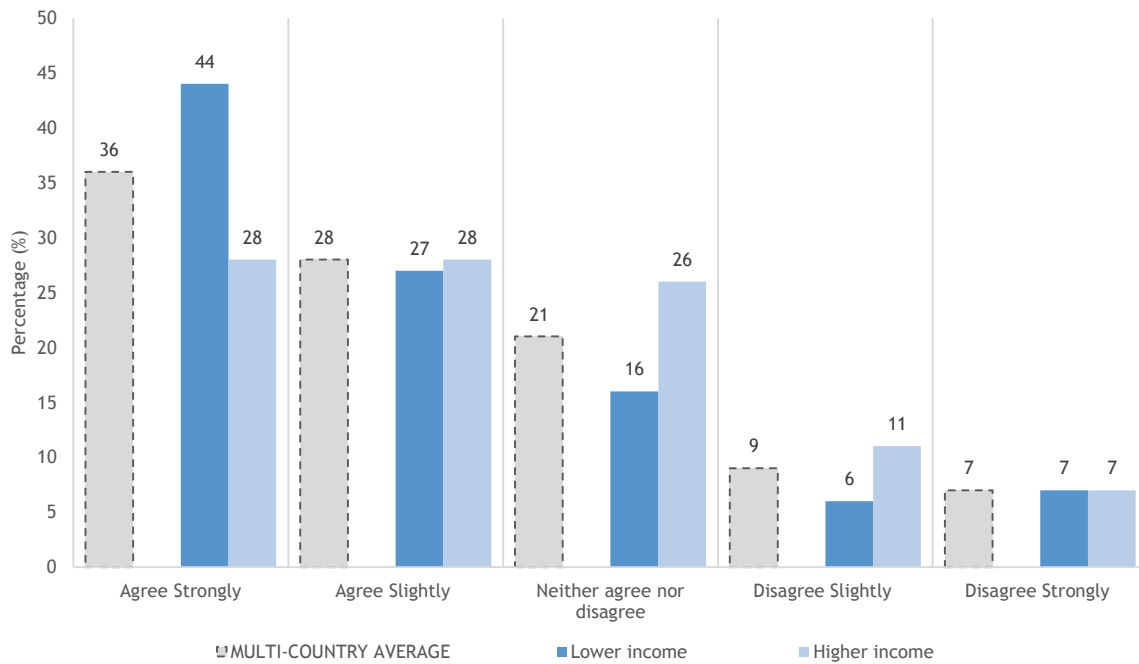


Figure 35. Percentage of responses from all respondents to “I am not at risk of getting an antibiotic-resistant infection, as long as I take my antibiotics correctly” by country income classification.

### Levels of awareness around antibiotic use in agriculture

In order to explore awareness of antibiotic use in agriculture, survey participants were asked whether they thought that antibiotics are widely used in agriculture in their country.

The majority of respondents (62%) think that antibiotics are widely used in agriculture in their country. Respondents in Sudan are most likely to agree with this statement (89%). Respondents in Serbia (53%), Indonesia (52%) and Barbados (40%) are least likely to agree with this statement.

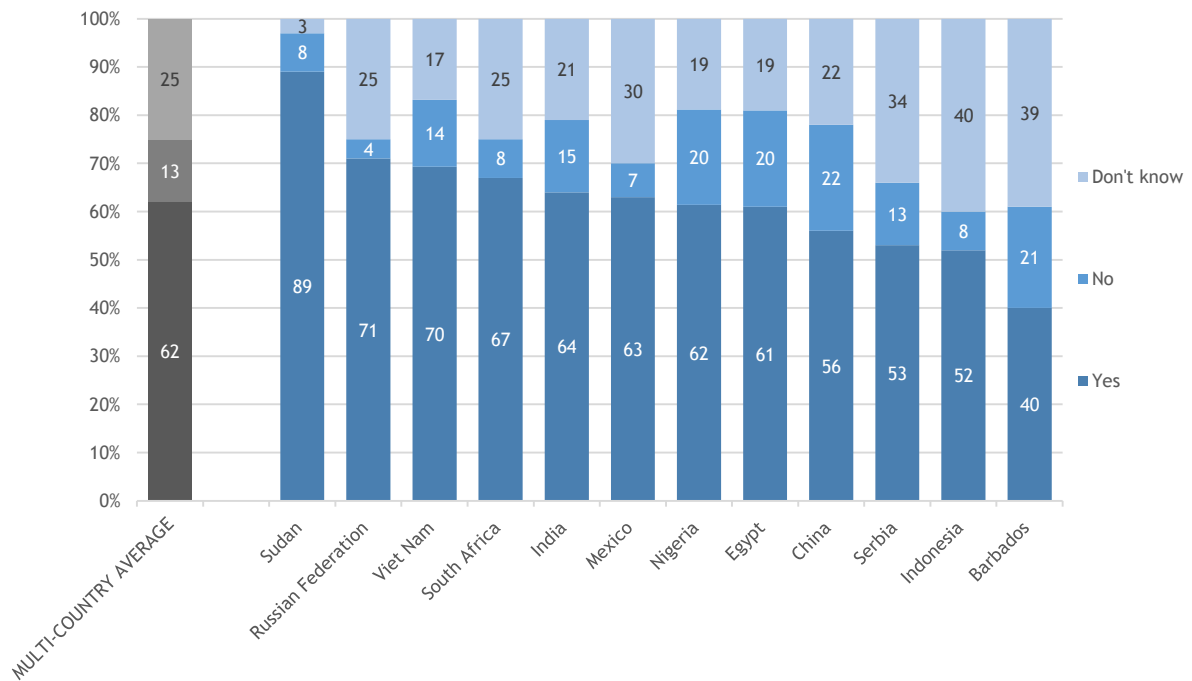


Figure 36. Percentage of responses from all respondents to “Do you think antibiotics are widely used in agriculture in your country?” according to country surveyed.

## 4. DISCUSSION OF FINDINGS

This multi-country survey presents a number of important findings in relation to the use of antibiotics, levels of knowledge about appropriate use, understanding of the problem of antibiotic resistance and what can be done about it across the 12 countries included in the survey. These findings can both help shape future public awareness efforts and aid evaluation of the impact of these efforts.

Antibiotic resistance is one of the biggest threats to global health. It can affect anyone, of any age, in any country. Although antibiotic resistance occurs naturally, overuse and misuse of antibiotics in humans and animals is accelerating the process. Steps can be taken at all levels of society to reduce the impact and limit the spread of resistance, including the public, who can help by preventing infection through good hygiene and vaccination, only using antibiotics when prescribed by a certified health professional, taking the full course, and never sharing or using left-over antibiotics.

For this reason, it is critical that people understand the problem, and the way in which they can change their behaviour. In relation to this, the results of this survey show there is much to be done. They show that although people recognize the problem, they do not fully understand what causes it, or what they can do about it.

### Antibiotic use

The results of the survey questions on antibiotic use demonstrate how frequently antibiotics are taken, with a considerable majority of respondents (65%) across the 12 countries reporting having taken them within the past six months. This rises to 76% in Egypt, the country with the highest number of respondents reporting having taken antibiotics in the past six months, including 54% having taken them within the past month. Even in Barbados—the country in which respondents reported the lowest use in the past six months—the number stands at 35%.

This prevalence is highly relevant to public campaigns on antibiotic resistance—both because high levels of use contribute to the problem, and because it demonstrates just how many people it could impact in a short time frame if the antibiotics they are taking become increasingly ineffective. It therefore sets the context for the rest of the findings.

The results of the survey questions on how people obtained antibiotics and whether they got advice on how to take them show that a sizeable majority of respondents across the countries surveyed state that they got their last course of antibiotics, or a prescription for them, from a doctor or nurse (81%), and that they received advice from a medical professional on how to take them (86%). These factors indicate that the antibiotics are more likely to be taken to treat an appropriate condition and in the appropriate fashion, both of which are important in the context of tackling antibiotic resistance. Also notable is the fact that 93% state that they obtained the antibiotics from a medical store or pharmacy, though it is important to note that this is a self-reported survey, and as set out in the limitations section earlier, this can lead to a degree of bias with respondents



providing the answer they believe is 'expected'.

### **Levels of knowledge around the appropriate use of antibiotics**

The results of the survey questions to assess respondents' knowledge of the appropriate use of antibiotics indicate relatively high levels of misunderstanding.

Respondents were asked to indicate whether they thought the statement *It's okay to use antibiotics that were given to a friend or family member, as long as they were used to treat the same illness* was true or false. Although it is in fact a false statement, one quarter (25%) of respondents across the 12 countries included in the survey believe that this statement is true, though there is considerable variation in the findings between countries. While only 10% of respondents in Barbados think the statement is true, this rises to 37% in Nigeria. Across the 12 countries surveyed, respondents in rural areas, those with lower levels of education and those in lower income countries are more likely to think that this statement is true.

Further investigations are needed in order to check if there is a link between broader issues around access to health care and medicine, and the affordability of antibiotics and other drugs for these groups. Taking antibiotics that were prescribed for someone else can contribute to their inappropriate use, because it means that the person they were prescribed to did not finish their course of treatment, and also because the antibiotics may not necessarily be right for the friend or family member's particular illness, or taken in the right dose or for the correct duration.

There is even more evidence of misunderstanding around the second statement shown to respondents: *It's okay to buy the same antibiotics, or request these from a doctor, if you're sick and they helped you get better when you had the same symptoms before*. Across the 12 countries included in the survey, 43% think this false statement is in fact true. This is concerning, because doctors should prescribe antibiotics, ideally after testing to identify whether antibiotics are in fact needed, and, if they are, which particular antibiotics are required.

Another important factor contributing to appropriate antibiotic use is people's understanding of when to stop taking them. WHO advises that patients should always take the full course of antibiotics prescribed to them by a certified health professional because a full course of antibiotics is required to kill all bacteria; stopping early favours those strains that have some resistance naturally. However, close to one third (32%) of respondents surveyed across the 12 countries believe that they should stop taking the antibiotics when they feel better, and this rises to 62% in Sudan. Younger respondents and those in rural areas across the 12 countries, as well as those in lower income countries, are more likely to think they should stop taking antibiotics when they feel better.

Understanding which conditions can be treated with antibiotics is also important, as the use of antibiotics for conditions which are not in fact treatable with these medicines is another contributor to misuse, and therefore to the development of resistance. Respondents were asked to indicate which of a list of medical conditions could be treated with antibiotics—the list included both conditions that can and cannot be treated with antibiotics.

## #AntibioticResistance

The results indicate that misunderstanding around this is widespread. While large numbers correctly identify some conditions which can be treated with antibiotics, such as bladder infections/UTIs (72%), almost as many incorrectly think that other conditions which cannot in fact be treated with antibiotics can be, notably colds and flu (64%). Antibiotics are used to treat bacterial infections, whereas colds and flu are caused by viruses and therefore are not treatable with antibiotics. Further to this, we see that in Sudan, Egypt and India, three quarters or more of respondents think colds and flu can be treated with antibiotics. Younger respondents and those with lower levels of education are also more likely to think antibiotics should be taken for colds and flu.

In combination, these survey findings related to the appropriate use of antibiotics suggest that action which effectively builds understanding of how and when to take antibiotics and what they should be used for—particularly targeting groups among whom misunderstandings seem to be most prevalent—is critical.

### Levels of awareness and understanding of the issue of antibiotic resistance

Given the scale of the problem of antibiotic resistance, and the fact that addressing it will take efforts on everyone's part, it is essential that the public is aware of the importance of the issue of antibiotic resistance, its consequences and what they can do to tackle it, as well as dispelling some of the misconceptions that are prevalent.

The survey explored levels of awareness and understanding by asking respondents whether they had heard of a series of commonly used terms relating to the issue. The results show high levels of familiarity (more than two thirds of respondents) with three of the terms: *antibiotic resistance*, *drug resistance* and *antibiotic-resistant bacteria*. Awareness then drops to fewer than half of respondents for the terms *superbugs* (45%) and *antimicrobial resistance* (44%), with only 21% of respondents stating they are familiar with the term *AMR*. Also notable is that 14% of those surveyed had heard of none of these terms. Levels of awareness of the terms is not uniform across the countries surveyed however—for example, while 89% of respondents in Mexico are aware of the term antibiotic resistance, only 21% of those in Egypt are.

Those who were aware of any or all of the terms were asked where they had heard the term. The source named most commonly was 'doctor or nurse', suggesting that medical professionals have an important part to play in building awareness around this issue, as well as in appropriate prescribing of antibiotics.

It is, of course, important that the public is not only aware of the issue, but also understands it. The survey sought to establish levels of understanding by asking respondents to indicate whether a series of statements around antibiotic use were true or false.

Similarly to the survey findings related to appropriate antibiotic use, the results suggest that there are high levels of misunderstanding in this area. While large proportions of respondents correctly identify some statements, even larger numbers incorrectly identify others. For example, more than three quarters (76%) of respondents believe that antibiotic resistance occurs when their body becomes resistant to antibiotics.

Survey participants were also asked whether they thought some or all of a list of eight possible responses and actions would help address the problem of antibiotic resistance. Encouragingly, the majority of respondents in all cases agreed that the actions could help, with numbers rising to 91% across the 12 countries in relation to ***People should wash their hands regularly.***

However, when respondents were then asked whether or not they agreed with a series of statements on the scale of the problem of antibiotic resistance, the results reveal some misconceptions and misunderstandings. Notable is the fact that 63% of respondents believe they are not at risk of an antibiotic-resistant infection, as long as they take their antibiotics correctly, which is not in fact the case. Antibiotic-resistant bacteria can spread from person to person, with the potential to affect anyone, of any age, in any country. The findings show considerable variation between countries—89% of those surveyed in Sudan and 81% in Nigeria believe that taking antibiotics correctly protects them from risk, compared to 27% in Barbados.

Also notable is the fact that 57% agree with the statement: ***There is not much people like me can do to stop antibiotic resistance.*** This is concerning, as addressing the problem of antibiotic resistance in fact requires action from everyone, from members of the public and policy makers, to health and agricultural professionals.

# ANNEX 1: FULL QUESTIONNAIRE

## DEMOGRAPHICS

- S1 To begin, please record gender  
Single Code  
1. Male  
2. Female
- S2 And what age are you now?  
Single Code  
1. 16-18  
2. 19-24  
3. 25-34  
4. 35-44  
5. 45-54  
6. 55-64  
7. 65+
- S3 In which of these regions do you live?  
Single Code  
*Adapted for relevance on a country by country basis.*
- S4 And which of these best describes where you live?  
Single Code  
1. Urban - within a densely populated city/town  
2. Suburban - in a suburb of a city/town  
3. Rural - outside of a city/town, e.g. village/countryside/farming area
- S5 What is the highest degree or level of school you have completed?  
*If currently enrolled, highest degree received.*  
Single Code  
1. No schooling completed  
2. 12th grade or less, no diploma/qualifications  
3. High school graduate with diploma/qualifications  
4. Some college credit, no degree  
5. Technical/Vocational training or Associate degree  
6. Bachelor's degree  
7. Master's/Professional degree  
8. Doctorate degree
- S6 Which of following best describes your total household income, before tax?  
Single Code  
*Adapted for relevance on a country by country basis.*
- S7 What is your ethnicity?  
Single Code  
*Adapted for relevance on a country by country basis.*
- S8 Which of these best describes your household composition  
Single Code  
1. 1 Single adult only  
2. 1 Single adult and at least 1 child under 16  
3. Married / domestic partnership - adults only  
4. Married / domestic partnership and at least 1 child under 16  
5. Multiple adults aged 16+ only  
6. Multiple adults aged 16+ and at least 1 child under 16

**MAIN QUESTIONNAIRE**

**USE OF ANTIBIOTICS**

1) When did you last take antibiotics?

Single Code

1. In the last month
2. In the last 6 months
3. In the last year
4. More than a year ago
5. Never
99. Can't remember

If 'Never' code 5, go straight to Question 5.

2) On that occasion, did you get the antibiotics (or a prescription for them) from a doctor or nurse?

Single Code

1. Yes
2. No
99. Can't remember

3) On that occasion, did you get advice from a doctor, nurse or pharmacist on how to take them?

Single Code

1. Yes, I received advice on how to take them (e.g. with food, for 7 days)
2. No
99. Can't remember

4) On that occasion, where did you get the antibiotics?

Single Code

1. Medical store or pharmacy
2. Stall or hawker
3. The internet
4. Friend or family member
5. I had them saved up from a previous time
6. Somewhere/someone else
99. Can't remember

**KNOWLEDGE ABOUT ANTIBIOTICS**

5) When do you think you should stop taking antibiotics once you've begun treatment?

Single Code

1. When you feel better
2. When you've taken all of the antibiotics as directed
99. Don't know

6) Do you think this statement is 'true' or 'false'?

Single Code

*"It's okay to use antibiotics that were given to a friend or family member, as long as they were used to treat the same illness"*

1. True
2. False
99. Don't know

7) Do you think this statement is 'true' or 'false'?

Single Code

*"It's okay to buy the same antibiotics, or request these from a doctor, if you're sick and they helped you get better when you had the same symptoms before"*

1. True
2. False
99. Don't know

## #AntibioticResistance

8) Do you think these conditions can be treated with antibiotics?

Single Code per condition

Rotate order asked

1. HIV/AIDS
2. Gonorrhoea
3. Bladder infection or urinary tract infection (UTI)
4. Diarrhoea
5. Cold and flu
6. Fever
7. Malaria
8. Measles
9. Skin or wound infection
10. Sore throat
11. Body aches
12. Headaches

### KNOWLEDGE ABOUT ANTIBIOTIC RESISTANCE

9) Have you heard of any of the following terms

Single Code per term

Rotate order asked

1. Antibiotic resistance
2. Superbugs
3. Antimicrobial resistance
4. AMR
5. Drug resistance
6. Antibiotic-resistant bacteria

10)

10\_1. Ask if answered YES @ 9) to 'Antibiotic Resistance'

Where did you hear about the term: 'Antibiotic Resistance'?

Show list: Code all mentions

1. Doctor or nurse
2. Pharmacist
3. Family member or friend (including on social media)
4. Media (newspaper, TV, radio)
5. Specific campaign
6. Other
99. Can't remember

10\_2. Ask if answered YES @ 9) to 'Superbugs'

Where did you hear about the term: 'Superbugs'?

Show list: Code all mentions

1. Doctor or nurse
2. Pharmacist
3. Family member or friend (including on social media)
4. Media (newspaper, TV, radio)
5. Specific campaign
6. Other
99. Can't remember

10\_3. Ask if answered YES @ 9) to 'Antimicrobial Resistance'

Where did you hear about the term: 'Antimicrobial resistance'?

Show list: Code all mentions

1. Doctor or nurse
2. Pharmacist
3. Family member or friend (including on social media)
4. Media (newspaper, TV, radio)
5. Specific campaign
6. Other

99. Can't remember

**10\_4. Ask if answered YES @ 9) to 'AMR'**

Where did you hear about the term: 'AMR'?

**Show list: Code all mentions**

1. Doctor or nurse
2. Pharmacist
3. Family member or friend (including on social media)
4. Media (newspaper, TV, radio)
5. Specific campaign
6. Other
99. Can't remember

**10\_5. Ask if answered YES @ 9) to 'Drug resistance'**

Where did you hear about the term: 'Drug resistance'?

**Show list: Code all mentions**

1. Doctor or nurse
2. Pharmacist
3. Family member or friend (including on social media)
4. Media (newspaper, TV, radio)
5. Specific campaign
6. Other
99. Can't remember

**10\_6. Ask if answered YES @ 9) to 'Antibiotic-resistant bacteria'**

Where did you hear about the term: 'Antibiotic-resistant bacteria'?

**Show list: Code all mentions**

1. Doctor or nurse
2. Pharmacist
3. Family member or friend (including on social media)
4. Media (newspaper, TV, radio)
5. Specific campaign
6. Other
99. Can't remember

**11) Please indicate whether you think the following statements are 'true' or 'false'**

**Single Code per statement**

**Rotate order asked**

1. Antibiotic resistance occurs when your body becomes resistant to antibiotics and they no longer work as well
2. Many infections are becoming increasingly resistant to treatment by antibiotics
3. If bacteria are resistant to antibiotics, it can be very difficult or impossible to treat the infections they cause
4. Antibiotic resistance is an issue that could affect me or my family
5. Antibiotic resistance is an issue in other countries but not here
6. Antibiotic resistance is only a problem for people who take antibiotics regularly
7. Bacteria which are resistant to antibiotics can be spread from person to person
8. Antibiotic-resistant infections could make medical procedures like surgery, organ transplants and cancer treatment much more dangerous

## #AntibioticResistance

12) On the scale shown, how much do you agree the following actions would help address the problem of antibiotic resistance?

Single Code per statement

Rotate order asked

		Agree Strongly	Agree Slightly	Neither agree nor disagree	Disagree Slightly	Disagree Strongly
1	People should use antibiotics only when they are prescribed by a doctor or nurse	5	4	3	2	1
2	Farmers should give fewer antibiotics to food-producing animals	5	4	3	2	1
3	People should not keep antibiotics and use them later for other illnesses	5	4	3	2	1
4	Parents should make sure all of their children's vaccinations are up-to-date	5	4	3	2	1
5	People should wash their hands regularly	5	4	3	2	1
6	Doctors should only prescribe antibiotics when they are needed	5	4	3	2	1
7	Governments should reward the development of new antibiotics	5	4	3	2	1
8	Pharmaceutical companies should develop new antibiotics	5	4	3	2	1

13) On the scale shown, how much do you agree with following statements?

Single Code per statement

Rotate order asked

		Agree Strongly	Agree Slightly	Neither agree nor disagree	Disagree Slightly	Disagree Strongly
1	Antibiotic resistance is one of the biggest problems the world faces	5	4	3	2	1
2	Medical experts will solve the problem of antibiotic resistance before it becomes too serious	5	4	3	2	1
3	Everyone needs to take responsibility for using antibiotics responsibly	5	4	3	2	1
4	There is not much people like me can do to stop antibiotic resistance	5	4	3	2	1
5	I am worried about the impact that antibiotic resistance will have on my health, and that of my family	5	4	3	2	1
6	I am not at risk of getting an antibiotic-resistant infection, as long as I take my antibiotics correctly.	5	4	3	2	1

## USE OF ANTIBIOTICS IN AGRICULTURE

14) Do you think antibiotics are widely used in agriculture (including in food-producing animals) in your country?

1. Yes
2. No
99. Don't know



## ANNEX 2: DEMOGRAPHICS

Table A2.1 Percentage of respondents in each country surveyed, by gender

Gender	Multi-country average	Barbados	China	Egypt	India	Indonesia	Mexico	Nigeria	Russian Federation	Serbia	South Africa	Sudan	Viet Nam
Male	50	50	50	50	51	50	51	50	49	49	49	54	52
Female	50	50	50	50	49	50	49	50	51	51	51	46	48

Table A2.2 Percentage of respondents in each country surveyed, by age

Age group	Multi-country average	Barbados	China	Egypt	India	Indonesia	Mexico	Nigeria	Russian Federation	Serbia	South Africa	Sudan	Viet Nam
Less than 16	1	0	0	10	0	0	0	0	0	0	0	0	0
16-24	26	16	20	36	24	25	26	48	14	14	23	65	25
25-34	22	17	26	24	24	23	22	22	19	16	28	10	25
35-44	19	19	20	14	22	22	20	17	18	16	19	13	21
45-54	16	18	20	10	16	19	17	8	20	16	16	7	20
55-64	11	14	12	7	13	8	10	5	22	18	12	5	8
65+	4	16	2	0	1	2	4	0	7	20	3	0	1

Table A2.3 Percentage of respondents in each country surveyed, by urbanization level

Urbanization level	Multi-country average	Barbados	China	Egypt	India	Indonesia	Mexico	Nigeria	Russian Federation	Serbia	South Africa	Sudan	Viet Nam
Urban	63	28	67	82	67	69	84	42	88	52	28	47	77
Suburban	21	44	8	11	24	26	14	21	7	12	58	17	11
Rural	16	28	25	8	9	5	2	37	5	36	14	36	12

Table A2.4. Percentage of respondents in each country surveyed, by education level

Education level	Multi-country average	Barbados	China	Egypt	India	Indonesia	Mexico	Nigeria	Russian Federation	Serbia	South Africa	Sudan	Viet Nam
None	3	6	0	1	0	0	1	1	1	3	0	26	2
Basic	22	31	19	14	9	19	16	31	12	29	39	44	17
Further	22	37	35	17	7	11	13	39	23	55	28	13	15
Higher	53	27	45	68	85	69	69	28	64	13	33	16	66

Table A2.5 Percentage of respondents in each country surveyed, by household composition

Household composition	Multi-country average	Barbados	China	Egypt	India	Indonesia	Mexico	Nigeria	Russian Federation	Serbia	South Africa	Sudan	Viet Nam
Without children	29	36	33	46	29	16	22	49	34	30	31	6	14
With children under 16	48	43	49	40	47	52	53	43	42	27	48	53	62
Other	24	21	17	14	24	33	24	7	25	42	22	41	24





**World Health  
Organization**

World Health Organization  
20 avenue Appia  
1211 Geneva 27 – Switzerland  
<http://www.who.int/drugresistance/en/>

**#AntibioticResistance**

ISBN 978 92 4 150981 7

