African Union

Knowledge, Attitudes, and Practices on Antimicrobial Use, Resistance, and Stewardship in Africa



AU Technical Report
Preliminary Findings - General Population Survey
November 2021

Published by:
African Union Task Force on Antimicrobial Resistance

Authors and Contributors:
African Union Task Force on Antimicrobial Resistance: Yewande Alimi, MPH, DVM; John Oppong-Otoo (MSc); Africa Centers for Disease Control and Prevention (Africa CDC): Chimwemwe Waya BSc; Mohammed Abdulaziz MBBS, MHPM, MPH-FE, FWACP; Center for Disease Dynamics, Economics & Policy (CDDEP): Jessica Craig, MPH; Erta Kalanxhi, PhD; Giridara Gopal, MD; Aditi Sriram, MPH

Acknowledgements:
The authors would like to thank the Members of the African Union Task Force on Antimicrobial Resistance, Drs. Diane Ashiru-Oredope (The Commonwealth Pharmacists Association), Jyoti Joshi (CDDEP), and Geetanjali Kapoor (CDDEP) for providing valuable input during the survey development process. The authors also thank all survey participants.

This technical report reflects work completed with support from the US CDC and Training Programs in Epidemiology and Public Health Interventions Network (TEPHINET).

The findings and conclusions contained within are those of the authors and do not necessarily reflect the positions or policies of the African Union; Africa CDC; CDDEP, TEPHINET, or any other named organisation. Designations, geographical boundaries, and mention of specific countries, companies, or manufactures' products do not imply endorsement or any opinion whatsoever on the part of the authors, contributors, or funding organizations.

Related research and additional information are available at *https://au.int/; https://africacdc.org/; https://www.au-ibar.org/en; and www.cddep.org*.

Suggested Citation: African Union Task Force on Antimicrobial Resistance and Center for Disease Dynamics, Economics & Policy. Knowledge, Attitudes, and Practices on Antimicrobial Use, Resistance, and Stewardship in Africa. 2021. Addis Ababa, Ethiopia.

© African Union Task Force on Antimicrobial Resistance and Center for Disease Dynamics, Economics & Policy (CDDEP), 2021.

Addis Ababa, Ethiopia, November 2021.

Reproduction of the final report is authorized provided the source is acknowledged.

African Union Task Force on Antimicrobial Resistance: African Union Commission
Roosevelt Street, Addis Ababa, Ethiopia

CENTER FOR DISEASE DYNAMICS, ECONOMICS & POLICY
5636 Connecticut Ave NW, PO Box 42735
Washington, DC 20015, USA

Table of Contents

List of Acronyms & Abbreviations ***iv***

Introduction ***1***

Methods ***1***

Results ***2***

Demographics of Survey Participants *2*

Knowledge *5*

Attitudes *7*

Practices *8*

Discussion & Implications for Policy *9*

List of Acronyms & Abbreviations

AMC	Antimicrobial Consumption
AMR	Antimicrobial Resistance
AMS	Antimicrobial Stewardship
AMU	Antimicrobial Use
AU	African Union
CATI	Computer-assisted Telephone Interviewing
CDDEP	Center for Disease Dynamics, Economics & Policy
IBAR	InterAfrican Bureau for Animal Resources
IPC	Infection Prevention and Control
KAP	Knowledge, Attitudes, and Practices
TEPHINET	Training Programs in Epidemiology and Public Health Interventions Network
WASH	Water, Sanitation, and Hygiene

Introduction

Antimicrobial resistance (AMR) is a rapidly emerging challenge in Africa and around the world that threatens the viability of the human, animal, and environmental health sectors and agriculture/food-producing and pharmaceutical industries[1]. Main drivers of AMR include the misuse and overuse of antimicrobials; limited access to high quality, affordable, and clinically appropriate antimicrobial therapies; lack of regulation around antimicrobial use (AMU); poor infection and prevention control (IPC); lack of biosecurity and hygiene measures; and the lack of access to water, sanitation, and hygiene (WASH) infrastructure[2]. Insufficient awareness and knowledge of AMR among key stakeholder groups such as human and animal healthcare providers, pharmacists, farmers and livestock owners, and the general public may also indirectly drive AMR; however, to date, there remains only a weak evidence base assessing the knowledge, attitudes, and practices (KAP) of/towards AMR and its drivers among these stakeholder groups. Furthermore, many national action plans for AMR developed by African Union (AU) member states call for baseline and continuous assessment of KAP among their national populations, but few countries have carried out such activities.

To begin to fill this gap, the AU Taskforce on AMR in partnership with the Center for Disease Dynamics, Economics & Policy (CDDEP) and funded by the Training Programs in Epidemiology and Public Health Interventions Network (TEPHINET), developed a series of standardized surveys to assess KAP among key AMR stakeholder groups involved in the use, prescription, and distribution or sale of antimicrobials for human or animal uses in Africa. Specifically, key stakeholder groups targeted for surveying included:

1. Healthcare workers including physicians, nurses, laboratory technicians, and clinical support staff;
2. Pharmacists, pharmacy technicians, and drug store owners;
3. Farmers and livestock owners;
4. Veterinarians and other animal health providers; and
5. The general public.

Beginning in August 2021, surveys were disseminated across the continent with targeted subnational and national surveying efforts in 15 countries. This interim report describes select, preliminary results from surveying activities among the lay/general population in those 15 countries between 01 August and 30 September 2021. Subnational, national, and continental survey activities across all stakeholder groups will continue through December 2021. An update to this interim report describing full results across all stakeholder groups will be published in March 2022.

Methods

A total of three survey tools were developed: One for the general public, one for human health stakeholders, and one for animal health stakeholders. Skip patterns within each survey tool were utilized to target specific questions to subgroups such as nurses and midwives, physicians, and pharmacists among the human health stakeholder group or farmers, livestock owners, and veterinarians among the animal health

[1] *United Nations Environmnet Program. Antimicrobial resistance: a global threat. 2021. Available from: https://www.unep.org/explore-topics/chemicals-waste/what-we-do/emerging-issues/antimicrobial-resistance-global-threat*

[2] *World Health Organization. Antimicrobial Resistance Fact sheet. 2020. Available from: https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance#:~:text=The%20main%20drivers%20of%20antimicrobial,access%20to%20quality%2C%20affordable%20medicines%2C*

stakeholder group. A scoping literature review was conducted to identify existing KAP surveys utilized in any country and setting; content from these surveys was considered and/or adapted in our survey. Survey tools were reviewed by technical experts at CDDEP, Africa CDC, the AU InterAfrican Bureau for Animal Resources (IBAR), the Commonwealth Pharmacists Association, and several non-governmental organizations and academic institutions. Surveys were then translated into English, French, and Arabic. Each survey and translated version underwent pilot-testing among a focus group of at least four individuals from each target stakeholder group.

Surveys were disseminated via social media; subscriber-based newsletters; targeted e-mails to pre-identified stakeholders; third-party consumer and market survey platforms; by phone via computer-assisted telephone interviewing (CATI) systems; and through stakeholder focal points at international and national government and non-government organizations, agencies, and institutes. Survey activities began in August 2021 and will continue through December 2021.

Data management and analysis were/will be conducted in KoBoToolbox, an open-source tool for field data collection developed by the Harvard Humanitarian Initiative, Microsoft Excel, and RStudio version 4.0.3[3]. Survey data was/will be translated into English prior to cleaning and analysis.

Results

Results presented in this report represent select, preliminary findings from data collected among the general population during national and subnational targeted surveying in 15 countries between 01 August and 30 September 2021. Findings are presented at the continental and regional levels.

Demographics of Survey Participants

The number of survey respondents as of 01 October 2021 is described by country and region in Table 1. Targeted national surveying among the general population occurred in three countries per region, and a total of 4,971 respondents have completed the survey with 1,170; 943; 1,133; 825; and 900 respondents in the northern, southern, western, central, and eastern regions, respectively.

Demographic variables of respondents –gender, age, and educational status – are summarized in Table 2. Overall, more males than females completed the survey across all countries. Most respondents were between the ages of 18 and 34 years and had completed either vocational/technical college, university, or graduate/post-graduate education. Most respondents lived in urban areas with a skew towards those living in capital cities and/or large urban city centers (Table 3).

[3] *Harvard Humanitarian Initiative. KoBo Toolbox. Available from: https://www.kobotoolbox.org/.*

Table 1: *Number of respondents who completed the knowledge, attitudes, and practices survey (as of 01 October 2021) for the general population by region and country*

Region/Country	Sample Size Achieved as of 01 October 2021
Total	**4,971**
Northern	**1,170**
Egypt	400
Morocco	400
Tunisia	370
Southern	**943**
South Africa	400
Zambia	350
Zimbabwe	193
Western	**1,133**
Ghana	425
Niger	354
Nigeria	354
Central	**825**
Cameroon	370
DRC	374
Gabon	81
Eastern	**900**
Ethiopia	121
Kenya	400
Uganda	379

Table 2: *Gender, age, and education status of general population survey respondents by country*

	Demographic Variable, n (%)*												
	Gender		Age (in years)					Education					
Country	Male	Female	18-24	25-34	35-44	45-54	Older than 54	No formal education	Primary	Secondary	Vocational/ technical college	University	Post-graduate
Region: Northern (n=1,170)													
Egypt (n=400)	224 (56.0)	176 (44.0)	121 (30.3)	153 (38.3)	97 (24.3)	15 (3.8)	14 (3.5)	0	27 (6.8)	73 (18.3)	20 (5.0)	237 (59.3)	43 (10.8)
Morocco (n=400)	236 (59.0)	164 (41.0)	124 (31.0)	153 (38.3)	81 (20.3)	23 (5.8)	19 (4.8)	0	27 (6.8)	98 (24.5)	63 (15.8)	138 (34.5)	74 (18.5)
Tunisia (n=370)	233 (63.0)	137 (37.0)	151 (40.8)	104 (28.1)	87 (23.5)	24 (6.5)	4 (1.1)	0 (0.0)	13 (3.5)	115 (31.1)	34 (9.2)	137 (37.0)	71 (19.2)
Southern (n=943)													
South Africa (n=400)	204 (51.0)	196 (49.0)	80 (20.0)	99 (24.8)	79 (19.8)	70 (17.5)	72 (18.0)	0	13 (3.3)	134 (33.5)	92 (23.0)	109 (27.3)	52 (13.0)
Zambia (n=350)	193 (55.1)	157 (44.9)	121 (34.6)	135 (38.6)	62 (17.7)	18 (5.1)	13 (3.7)	0	2 (2.3)	29 (33.0)	22 (25.0)	26 (29.6)	9 (10.2)
Zimbabwe (n=193)	134 (69.8)	58 (30.2)	111 (57.8)	48 (25.0)	27 (14.1)	6 (3.1)	0	0 (0.0)	1 (2.9)	11 (31.4)	9 (25.7)	13 (37.1)	1 (2.9)
Western (n=1,133)													
Ghana (n=425)	253 (59.5)	172 (40.5)	197 (46.4)	185 (43.5)	35 (8.2)	5 (1.2)	3 (0.7)	3 (0.7)	3 (0.7)	0	41 (9.7)	184 (43.3)	36 (8.5)
Niger (n=354)	183 (51.7)	171 (48.3)	114 (32.2)	91 (25.7)	64 (18.1)	85 (24.0)**		1 (0.3)	1 (0.3)	36 (10.2)	200 (56.5)	68 (19.2)**	49 (13.8)
Nigeria (n=354)	183 (51.7)	171 (48.3)	101 (28.5)	165 (46.6)	68 (19.2)	16 (4.5)	4 (1.1)	2 (0.6)	2 (0.6)	0	33 (9.3)	196 (55.4)**	123 (34.7)

	Demographic Variable, n (%)*												
	Gender		Age (in years)					Education					
Country	Male	Female	18-24	25-34	35-44	45-54	Older than 54	No formal education	Primary	Secondary	Vocational/ technical college	University	Post-graduate
Central (n=825)													
Cameroon (n=370)	237 (64.1)	133 (35.9)	148 (40.0)	164 (44.3)	46 (12.4)	10 (2.7)	2 (0.5)	0	7 (1.9)	79 (21.4)	29 (7.8)	84 (22.7)	30 (8.1)
DRC (n=374)	283 (75.7)	91 (24.3)	132 (35.3)	149 (39.8)	56 (15.0)	37 (9.9)**		4 (1.1)	15 (4.0)	149 (39.8)	93 (24.9)**		113 (30.2)
Gabon (n=81)	57 (70.4)	24 (29.6)	30 (37.0)	30 (37.0)	14 (17.3)	6 (7.4)	1 (1.2)	0	3 (18.8)	3 (18.8)	1 (6.3)	9 (56.3)	0
Eastern (n=900)													
Ethiopia (n=121)	75 (62.0)	46 (38.0)	45 (37.2)	41 (33.9)	32 (26.5)	1 (0.8)	2 (1.7)	0	1 (0.8)	38 (31.4)	6 (5.0)	10 (8.3)	2 (1.7)
Kenya (n=400)	203 (50.8)	197 (49.3)	141 (35.3)	174 (43.5)	64 (16.0)	15 (3.8)	6 (1.5)	0	5 (1.3)	69 (17.3)	84 (21.0)	221 (55.3)	21 (5.3)
Uganda (n=379)	253 (66.8)	126 (33.3)	197 (52.0)	132 (34.8)	42 (11.1)	4 (1.1)	4 (1.1)	0	12 (3.2)	67 (17.7)	14 (3.7)	27 (7.1)	4 (1.1)

*Bold text identifies categories with greater than 50% of responses. Shading added for ease of viewing. *Denominator used in the calculation of proportions was the total number of respondents who completed each question; therefore, there are slight variations due to data missingness. **In Niger, Nigeria, and DRC, education categories grouped university with vocational training/technical college. In Niger and DRC, the 45-54 and older than 54 years age groupings were combined.*

Table 3: *Description of residence of general population survey respondents by country*

	Demographic Variable, n (%)* unless otherwise noted					
	Residence by Degree of Urbanization			Residence by Subnational Jurisdiction		
Country	Urban	Peri-urban	Rural	Most represented jurisdiction	Major City	Proportion of subnational jurisdictions represented
Region: Northern (n=1,170)						
Egypt (n=400)	280 (70.0)	42 (10.5)	70 (17.5)	Greater Cairo Area	199 (49.8)	7 of 7
Morocco (n=400)	330 (82.5)	25 (6.3)	41 (10.3)	Casablanca	163 (40.8)	12 of 12
Tunisia (n=370)	256 (69.2)	66 (17.8)	45 (12.2)	Tunis	184 (49.7)	24 of 24
Southern (n=943)						
South Africa (n=400)	213 (53.3)	144 (36.0)	43 (10.8)	Gauteng	174 (43.0)	9 of 9
Zambia (n=350)	255 (72.86)	54 (15.43)	41 (11.71)	Lusaka	184 (52.57)	11 of 11
Zimbabwe (n=193)	152 (79.2)	34 (17.7)	6 (3.1)	Harare	84 (43.8)	10 of 10
Western (n=1,133)						
Niger (n=354)	242 (68.4)	15 (4.2)	95 (26.8)	Maradi	66 (18.6)	8 of 8***
Nigeria (n=354)	288 (81.4)	55 (15.5)	11 (3.1)	Lagos	120 (33.9)	34 of 36
Ghana (n=425)	273 (64.2)	124 (29.2)	28 (6.6)	Greater Accra	190 (44.7)	14 of 16
Central (n=825)						
Cameroon (n=370)	283 (76.5)	51 (13.8)	53 (14.3)	Littoral	139 (37.6)	10 of 10
DRC (n=374)	246 (65.8)	19 (5.1)	108 (28.9)	Katanga	68 (18.2)	11 of
Gabon (n=81)	66 (81.5)	10 (12.4)	5 (6.2)	Estuaire	73 (90.1)	6 of 10
Eastern (n=900)						
Ethiopia (n=121)	90 (74.4)	17 (14.1)	14 (11.6)	Addis Ababa	75 (61.2)	9 of 12
Kenya (n=400)	272 (68.0)	78 (19.5)	50 (12.5)	Nairobi	207 (51.8)	8 of 8
Uganda (n=370)	258 (68.1)	80 (21.1)	41 (10.8)	Central	258 (68.1)	5 of 5

*Bold text identifies categories with greater than 50% of responses. Shading added for ease of viewing. *Denominator used in the calculation of proportions was the total number of respondents who completed each question; therefore, there are slight variations due to data missingness. **Per official, national definitions of subnational jurisdictions. ***In Niger, subnational jurisdictions included the 7 administrative regions plus Niamey, the capital district.*

Knowledge

Across all countries and regions where targeted surveying among the general population occurred, respondents were most familiar with the terms "antibiotics," (n=2,466 of 4,971 respondents, 49.6%) and "antibiotic resistance," (n=2,236, 45.0%) (Figure 1). Approximately 10% of respondents had heard of the terms "antimicrobial stewardship" and the "Access, Watch, Reserve (AWaRe) classification for antimicrobials." Only 812 of 4,971 respondents (16.3%) were familiar with World Antimicrobial Awareness Week. About 16% of respondents had not heard of any of these terms.

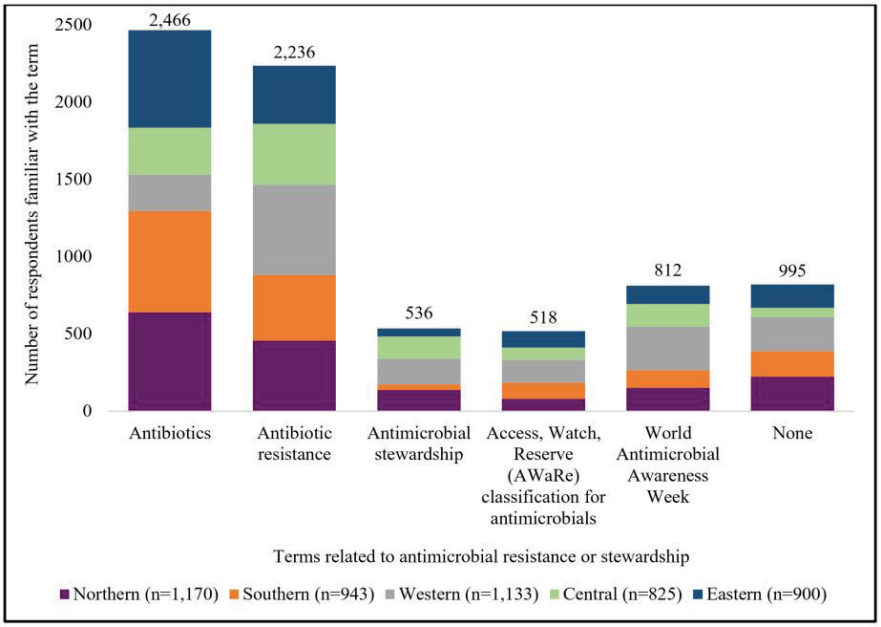


Figure 1: *Number of general population respondents, by region, who were familiar with various terms related to antimicrobial resistance and stewardship*

Respondents were asked to determine if a series of statements regarding AMU and the causes and impacts of AMR were true or false (Figure 2). Across all countries, over 70% of participants correctly identified the following statements as true: "Antibiotics are used to treat infections caused by bacteria," "Antimicrobial resistance can be caused by the overuse and misuse of antimicrobials in humans," "Many bacteria that cause illness are becoming increasingly resistant to treatment by antibiotics," and "Antimicrobial-resistant organisms can transmit between animals, humans, and the environment." About 50% of respondents said that the statement, "Antibiotics are used to treat infections caused by viruses," was true while about 40% of respondents said that the statement, "Taking antimicrobials when you are healthy will prevent you from becoming sick," was also true.

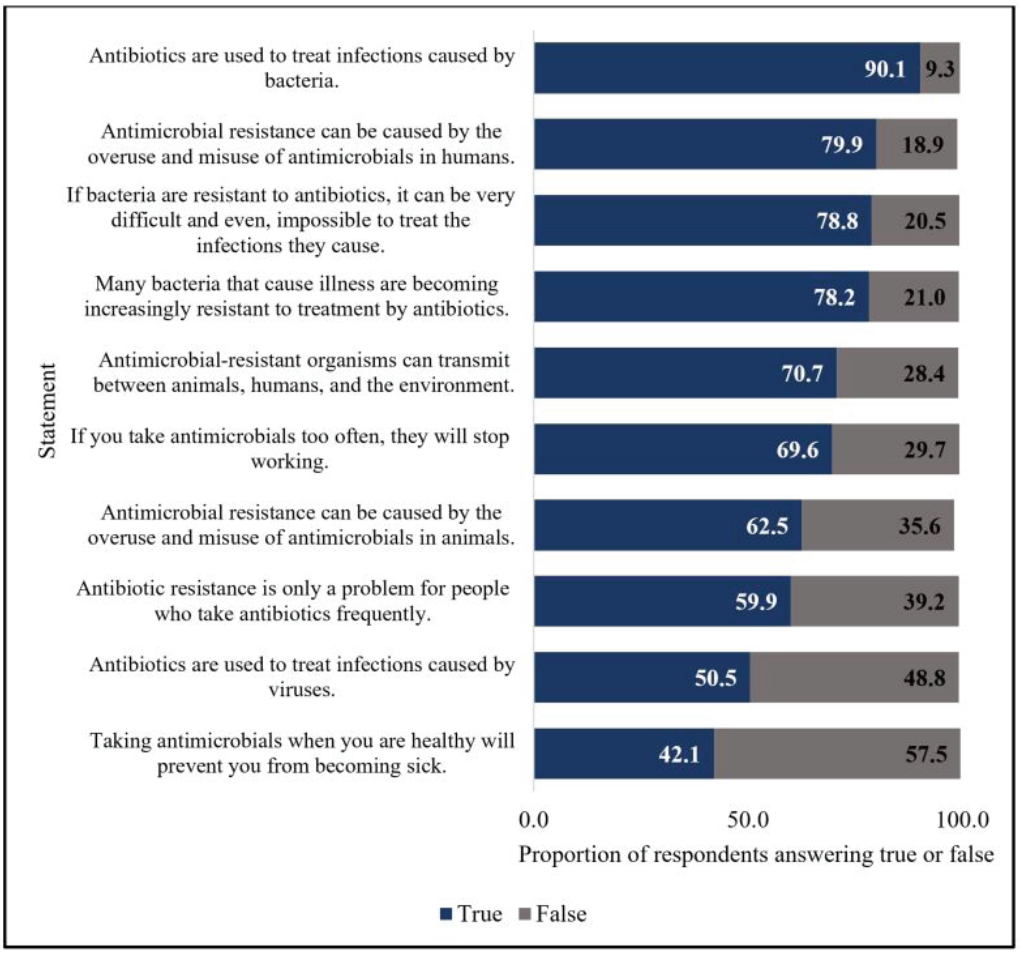


Figure 2: *Knowledge and perceptions of antimicrobial use and causes and impacts of resistance among all general population respondents (n=4,197) assessed through True/False responses to various statements*

A second series of True/False questions asked respondents about the impact of hygiene, sanitation, and vaccination practices on infectious diseases prevalence and AMR (Figure 3). Over 80% of respondents across all 15 countries said that good hygiene and sanitation practices and vaccination could reduce infection or prevent diseases while about 74% said that good sanitation and hygiene could reduce or slow AMR and 73% said that vaccination could reduce or slow AMR.

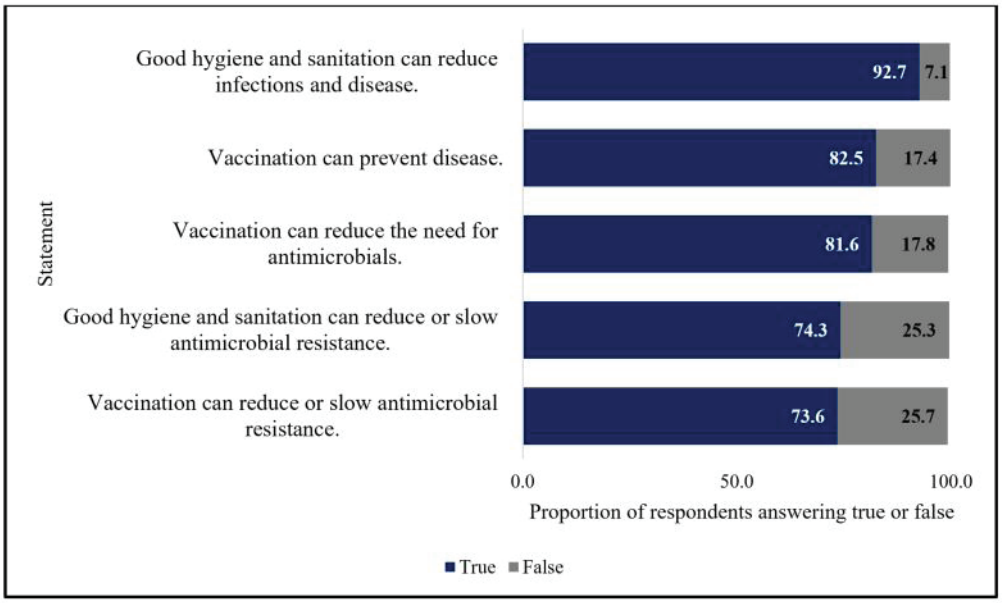


Figure 3: *Knowledge of the relationship between hygiene, sanitation, and vaccination practices on infectious disease prevention and antimicrobial resistance among the general population (n=4,971), assessed through True/False responses to various statements*

Attitudes

Across all survey respondents, over 71% (n=3,544) agreed strongly or agreed slightly that AMR is a serious public health challenge in their country while about 10% (n=486) disagreed slightly or disagreed strongly with the statement (Figure 4). About 65% of respondents (n=3,232 and 3,323, respectively) agreed with the statements that antimicrobials are overused or misused in their country and that many people in their community take antimicrobials without a prescription. The majority of respondents agreed strongly or agreed slightly that there is not much they can do to stop AMR and that they are worried about the impact AMR will have on their health or the health of their families (Figure 5). Seventy-five percent of respondents agreed strongly or agreed slightly with the statement, "If I take antimicrobials correctly, antibiotic resistance is not a problem for me."

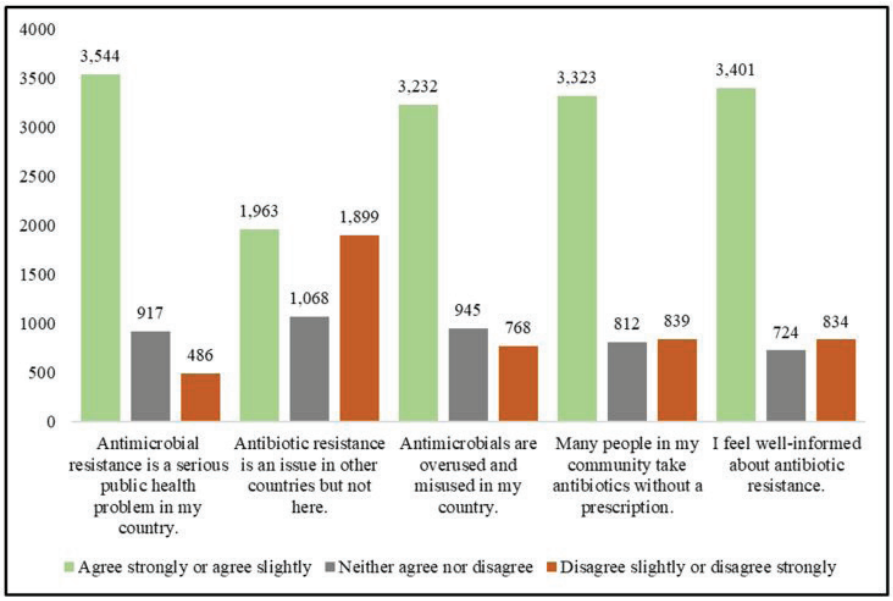


Figure 4: *Attitudes towards antimicrobial resistance and use among all general population survey respondents (n=4,971)*

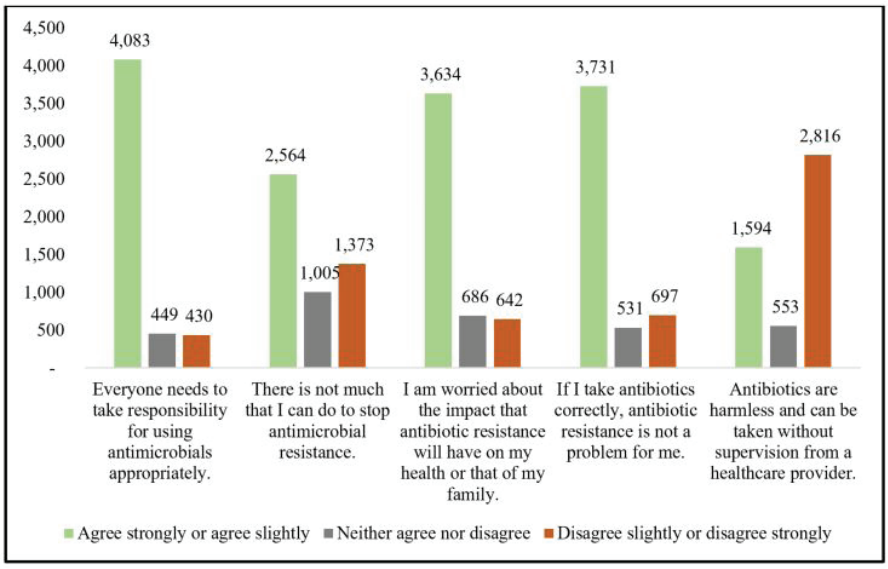


Figure 5: *Attitudes towards antimicrobial resistance and use among all general population survey respondents (n=4,971) continued*

Practices

In the year prior to completing the survey, 75% (n=3,594) of general population survey participants across all countries reported taking an antimicrobial at least once with 3.5% (n=173) reporting taking an antimicrobial daily, 2.4% (n=118) weekly, and 10.3% (n=514) monthly (Figure 6). The remaining 28% reported never taking an antimicrobial in the previous year. When asked about general practices towards antimicrobial consumption (AMC), 69.8% (n=3,470) reported always or sometimes obtaining a prescription for antimicrobials while 30.2% (n=1,491) said they rarely or never obtained a prescription (Figure 7). Nearly half of respondents (n=2,308, 46.4%) reported that always or sometimes stopped taking antibiotics when they felt better even if they hadn't finished the prescribed duration of therapy.

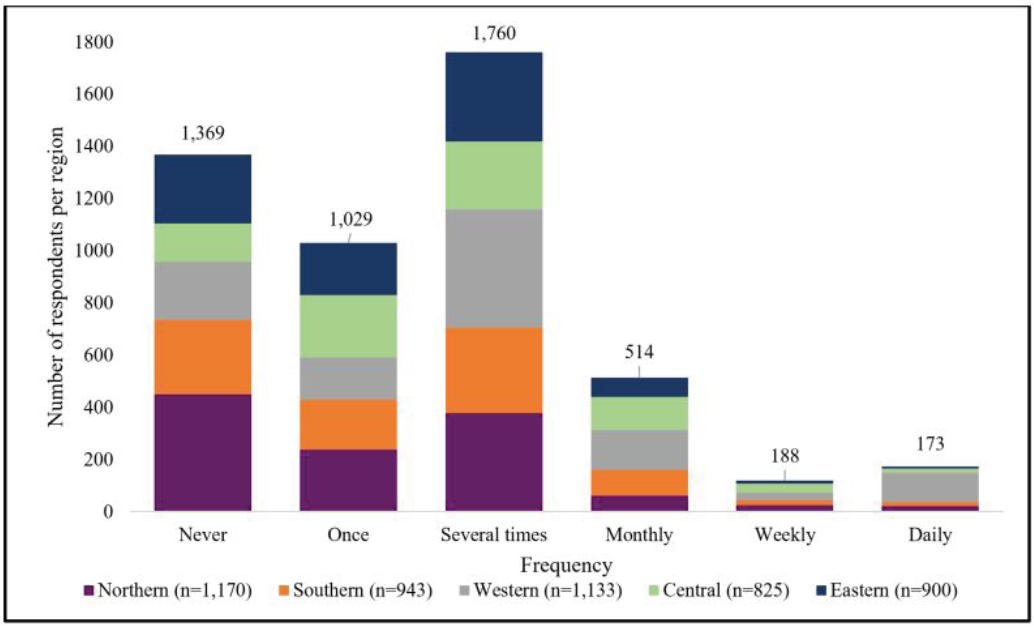


Figure 6: *Number of times all respondents (n=4,971) took antimicrobials in the past year*

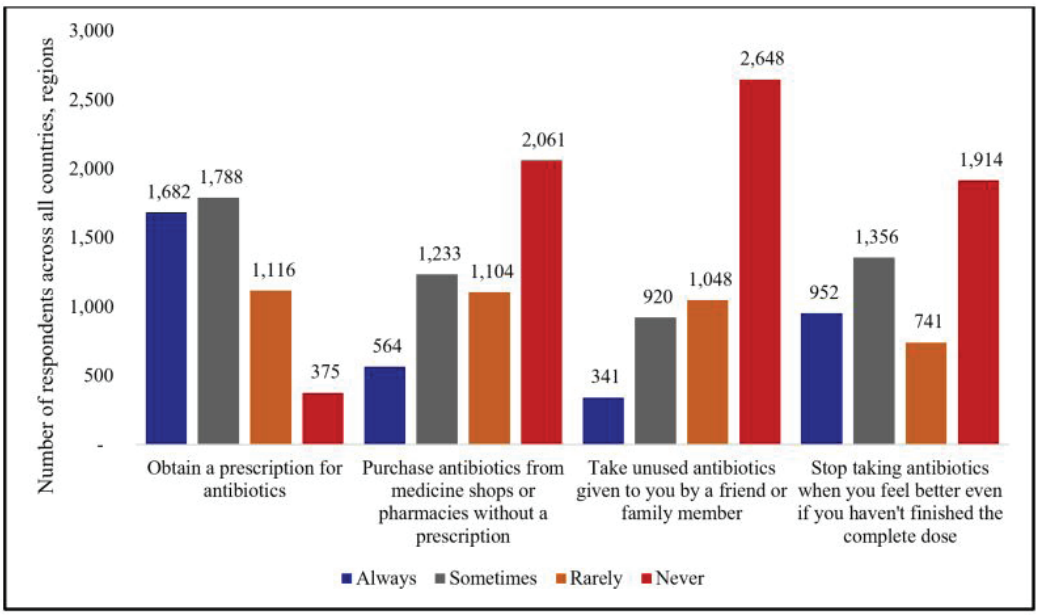


Figure 7: *Self-reported practices regarding antimicrobial consumption among all general population survey participants (n=4,971)*

Discussion & Implications for Policy

To date, this is the largest KAP survey activity related to AMR, AMU, and AMS among the general public in Africa. However, data presented in this interim report should be interpreted with caution as the current survey sample captures primarily well-educated, urban-dwelling respondents in only 15 of 54 AU member states which may not be an accurate representation of national, regional, or continental populations. Further surveying activities are ongoing to reach communities of all socioeconomic classes across geographic regions in Africa. Future updates to this report will include larger sample sizes across the various stakeholder groups and additional analyses to better identify KAP gaps and targets for future intervention and policy at the national, regional, and continental levels.

To summarize, nearly half of the survey respondents reported being familiar with terms such as "antibiotics" and "antibiotic resistance" (Figure 1). However, only about 10% of respondents had heard of terms or concepts such as "antimicrobial stewardship" and the "Access, Watch, Reserve (AWaRe) classification for antimicrobials." Notably, only a minority of respondents (16.3%) were familiar with World Antibiotic Awareness Week while 16% of respondents were not familiar with any of these terms[4]. Most survey respondents correctly identified true statements about the causes, impacts, and current status of AMR (Figures 2,3). Survey responses indicated a high level of concern about AMR. Over 70% of survey respondents agreed that AMR is a serious public health threat in their country, and most respondents indicated that everyone has a role to play in mitigating the emergence and spread of AMR, that they are worried about the impact of AMR on their health or that of their families, but that AMR is only a problem for those who take antimicrobials often (Figure 5). As expected, survey responses indicated that antimicrobial overuse, misuse, and non-prescription use may be high and should be considered a priority target for education, intervention, and policy (Figures 6,7).

[4] *World Health Organization. World Antimicrobial Awareness Week. Available from: https://www.who.int/campaigns/world-antimicrobial-awareness-week*