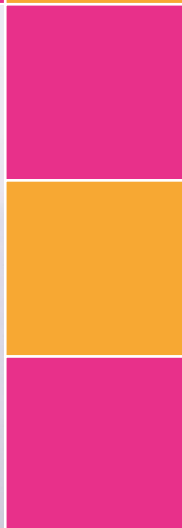
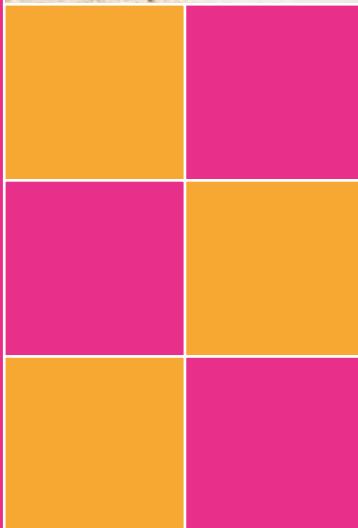
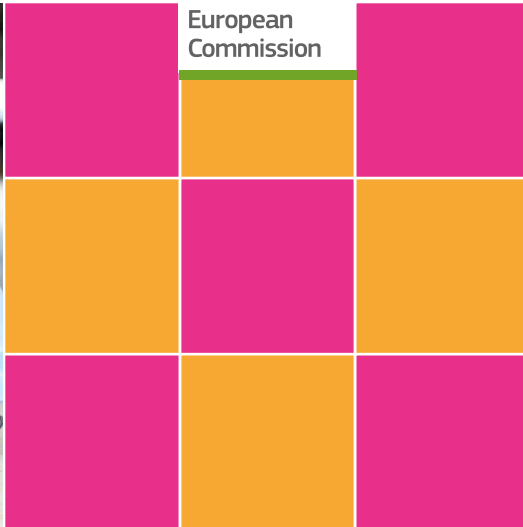




European
Commission



DG Health and
Food Safety

OVERVIEW REPORT

Non-EU Countries' National Policies and Measures on Antimicrobial Resistance

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EUROPEAN COMMISSION
DIRECTORATE-GENERAL FOR HEALTH AND FOOD SAFETY

Health and food audits and analysis

DG(SANTE) 2017-6505

OVERVIEW REPORT OF THE RESPONSES TO A QUESTIONNAIRE SENT TO NON-EU COUNTRIES REGARDING NATIONAL POLICIES AND MEASURES TAKEN TO COMBAT THE DEVELOPMENT OF ANTIMICROBIAL RESISTANCE

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ABBREVIATIONS USED IN THIS REPORT

AMR	Antimicrobial Resistance
EU	European Union
FAO	Food and Agriculture Organization
OIE	World Organisation for Animal Health
WHO	World Health Organization

1. INTRODUCTION AND OBJECTIVES

Antimicrobial resistance (AMR) can be defined as the ability of a micro-organism to withstand antimicrobial treatments¹. Combatting the threat posed by AMR is a priority for the European Commission and for many countries and international organisations around the world. To tackle AMR, steps should be taken at all levels of society, with governments often expected to provide leadership. The World Health Organization (WHO) member countries' national authorities are expected to deliver comprehensive action plans and guidelines, and create them in line with a One Health approach.

The Commission has already gathered information from European Union (EU) Member States on this subject, including by means of questionnaires. In line with the priority given to this subject, the intention of the present questionnaire was to collect similar information from non-EU countries on their national policies regarding AMR. The purpose of the analysis was to obtain a better overview of the international situation and to collect information on the actions already taken or planned in these non-EU countries to tackle AMR.

The WHO, the World Organisation for Animal Health (OIE) and the Food and Agriculture Organization (FAO) have jointly collected information from countries around the world on their progress in implementing the global action plan on AMR and actions to address AMR across all sectors², via a self-assessment questionnaire distributed to countries in November 2016³, a survey which is to be repeated annually. Notwithstanding the existence of this WHO-OIE-FAO initiative, the Commission decided to distribute the present questionnaire with the objective of collecting factual information on issues about which the EU attributes particular importance, considering that it could be difficult to extract such specific information from the results of the WHO-OIE-FAO self-assessment⁴ (e.g. whether prescriptions are legally required, whether antimicrobial growth promoters are authorised for use in animals, etc.).

The European Commission's Action Plan on AMR for the period 2011-2016⁵ already stated that the Commission aimed to join forces with international partners to contain the risks of spreading AMR, including by developing bilateral cooperation against AMR. These ambitions have been further developed in the European One Health Action Plan against AMR issued in June 2017⁶, which included objectives such as promoting a stronger EU global presence on the AMR issue, developing stronger bilateral partnerships for stronger cooperation and cooperating with developing countries.

¹ <https://www.efsa.europa.eu/en/topics/topic/antimicrobial-resistance>

² <http://www.who.int/antimicrobial-resistance/global-action-plan/database/en/>

³ <http://www.who.int/antimicrobial-resistance/global-action-plan/AMR-self-assessment-2016/en/>

⁴ This difficulty derives from the fact that many of the questions in the WHO-OIE-FAO self-assessment questionnaire were formulated in an aggregated way, combining many issues within a specific response option.

⁵ https://ec.europa.eu/health/amr/action_eu_en

⁶ EU One Health Action Plan against Antimicrobial Resistance:
https://ec.europa.eu/health/amr/sites/amr/files/amr_action_plan_2017_en.pdf

The present report aims at supporting the collection of information on AMR policies beyond the EU, which should provide a solid basis for further cooperation on this subject between the Commission, non-EU countries and relevant international organisations to combat the global threat posed by AMR.

2. METHODS

The present report presents an overview and analysis of the responses received from non-EU countries to a questionnaire from the European Commission's Directorate-General for Health and Food Safety on national policies and measures taken in these non-EU countries to combat the development of AMR in the human and animal areas. The questionnaire was sent by the Directorate-General for Health and Food Safety (Health and food audits and analysis Directorate) to the 128 EU Delegations attached to non-EU countries⁷ in December 2016, with a request for the questionnaire to be further distributed to the relevant national human health and veterinary competent authorities for AMR in those countries.

The questionnaire, which concerned eight main topics, was composed of either single choice, closed questions (all the introductory questions and associated sub-questions for each topic) or more targeted questions (all the final questions for each topic). The questionnaire is included in Annex I to this report, and these are the topics touched upon:

- Strategies and policies on combatting AMR.
- Prudent use of antimicrobials in humans.
- Prudent use of antimicrobials in animals.
- Access to antimicrobials without a prescription in humans.
- Access to antimicrobials without a prescription in animals.
- Use of antimicrobials as growth promoters in animals.
- Monitoring of AMR in bacterial isolates from human infections (clinical isolates).
- Monitoring of AMR in bacterial isolates from animals and food of animal origin (commensal bacteria and/or pathogens).

For the purpose of this analysis, the countries responding to this questionnaire have been anonymised and grouped in accordance with the two following criteria:

- i. A geographical criterion. For this purpose, the report uses the World Bank geographic regions of 2017, which lists World Bank member countries and all other economies with populations of more than 30 000 inhabitants.
- ii. A criterion related to the countries' economic development. For this purpose, the report used the World Bank income group classification from 2017, which categorises the world's economies into four income groups (high, upper-middle, lower-middle, and low), based on their gross national income per capita.

⁷ https://ec.europa.eu/headquarters/headquarters-homepage/area/geo_en

It must be noted that the term country, used interchangeably with economy in this report, does not imply political independence but refers to any territory for which authorities report separate social or economic statistics.

3. OVERVIEW OF THE RESPONSES TO THE QUESTIONNAIRE

The European Commission sent out questionnaires to 128 EU delegations and received an answer from 77 countries. It should be noted that some countries did not respond to every question or relevant sub-question in the questionnaire, and so the individual response rates to each question varied accordingly (i.e. there were less than 77 responses to several questions). Responses to the questionnaire were received between January and August 2017. Therefore, it may be possible that there is more updated information in relation to certain questions in comparison with the data cited in this report, given that numerous responding countries stated that they were working actively during 2017 to develop national policies or action plans on AMR in line with relevant WHO guidance⁸. The following table provides an overview of the responses received to the questionnaire.

Table 1. Overview of the responses to the questionnaire

Overview of the responses			
World Bank geographic region	No of answers	World Bank income group	No of answers
East Asia & Pacific	13	High income	12
Europe & Central Asia	13	Low income	14
Latin America & Caribbean	19	Lower middle income	22
Middle East & North Africa	7	Upper middle income	29
North America	1		
South Asia	2		
Sub-Saharan Africa	22		
Total No of answers: 77			

3.1. Topic 1 – Strategies and policies on combatting AMR

Question 1: Has a national action plan or policy/strategy on combatting antimicrobial resistance been developed in your country?

National action plans, strategies, policies and guidelines are usually used to help tackle effectively the development and spread of AMR. Out of 77 respondent countries, 29 stated they had developed a relevant specific national action plan or policy/strategy while 48 stated that they had not.

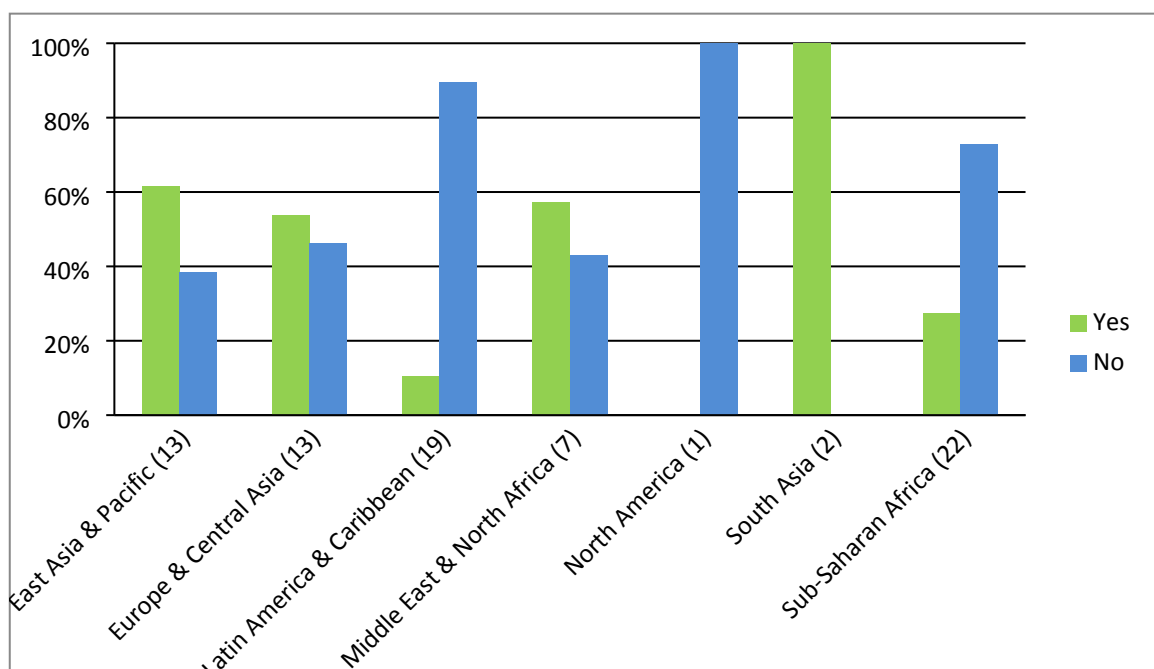
The lowest proportion of respondent countries with established policies comes from Latin America & Caribbean (11 %⁹) and Sub-Saharan Africa (27 %). The relatively high number of respondent countries that have relevant policies comes from East Asia &

⁸ <http://www.who.int/antimicrobial-resistance/en/>

⁹ For ease of readability, the percentages presented in the report have always been rounded up or down.

Pacific (8 out of 13) and Europe & Central Asia (7 out of 13). These data are shown in Figure 1.

Figure 1. National action plans and strategies on AMR – region



Only 21 % of respondent countries from the low income group have policies on combatting AMR. In contrast, a relatively high proportion of countries from the upper middle and higher income groups have relevant strategies in place (41 and 42 %, respectively). These data are summarised in Table 2.

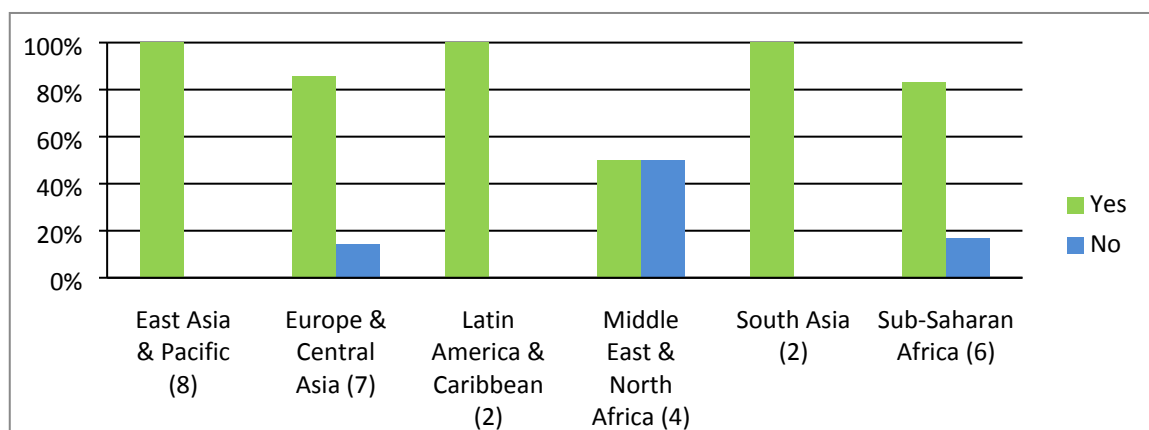
Table 2. National action plans and strategies on AMR – income group

World Bank income group	Yes	No	No of countries
High income	42 %	58 %	12
Low income	21 %	79 %	14
Lower middle income	41 %	59 %	22
Upper middle income	41 %	59 %	29

Sub-question 1.1: If the answer to question 1 is yes, does this action plan or strategy cover aspects related to antimicrobial resistance in: human, animals, or both?

All of the 29 countries with developed national action plans and strategies cover aspects related to AMR in humans, but 4 of these 29 countries stated that aspects related to animals were not covered in their action plan or strategy. Regional differences in relation to AMR strategies in animals are presented in Figure 2.

Figure 2. National policies on AMR in animals – region



Sub-question 1.2: If there is no national action plan or policy/strategy on combatting antimicrobial resistance developed to date, but one is in preparation, will it cover aspects related to antimicrobial resistance in: humans, animals, or both?

Out of the 52 countries responding to this sub-question, 48 declared that they were working currently on the preparation of policies on combatting AMR or planned to have them in the future, while 4 countries responded that such work was not planned or in preparation. Among these 52 countries, 41 and 46 indicated that these policies would address AMR in humans and animals, respectively.

3.2. Topic 2 – Prudent use of antimicrobials in humans

Question 2: Have any national policies or guidelines been developed in your country concerning the prudent use of antimicrobials in humans?

Prudent antimicrobial use aims to benefit the patient while at the same time minimising the probability of adverse effects and the promotion of the emergence or spread of AMR. The incorrect use of antimicrobial agents (e.g. taking antimicrobials inappropriately, low treatment adherence or inappropriate disposal of leftover medication) is linked to the development of resistance. Taking into account cross- and co-resistance, which implies that any exposure of bacteria to antimicrobials increases the occurrence of AMR, following prudent use principles should lead to an overall reduction in the use of antimicrobials, predominantly by limiting their use only to situations where they are necessary. In these situations antimicrobials should be used as a targeted treatment and according to best practices, i.e. based on clinical diagnosis and, whenever possible, on the results of microbiological susceptibility tests, and using an antimicrobial agent of as narrow a spectrum as possible¹⁰. The Commission has recently adopted EU guidelines on

¹⁰ Dellit TH, *et al.* Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America guidelines for developing an institutional program to enhance antimicrobial stewardship. Clin Infect Dis 2007; 44: 159-177. http://www.idsociety.org/uploadedFiles/IDSA/Guidelines-Patient_Care/PDF_Library/Antimicrobial%20Stewardship.pdf

the prudent use of antimicrobials in human health, which aim at reducing inappropriate use and promoting the prudent use of antimicrobials in people ¹¹.

Of the 69 countries responding to this question, 33 stated they have such relevant national policies or guidelines in place, while 36 stated that they do not.

As presented in Figure 3, the situation differs between the various World Bank regions. Only in East Asia & Pacific is there a majority of countries (69 %) with developed national policies and guidelines. In Europe & Central Asia, Middle East & North Africa and Sub-Saharan Africa, the majority of respondent countries have not developed such national policies and guidelines. Additionally, the lowest percentage of countries with established policies and guidelines occurs in Sub-Saharan Africa (33 %). As presented in Table 3, a majority of countries from the high (73 %) and upper middle income (58 %) groups have policies or guidelines in place. In the low income group, only 9 % of countries have developed specific guidelines or policies.

Figure 3. Policies and guidelines on prudent use of antimicrobials in humans – region

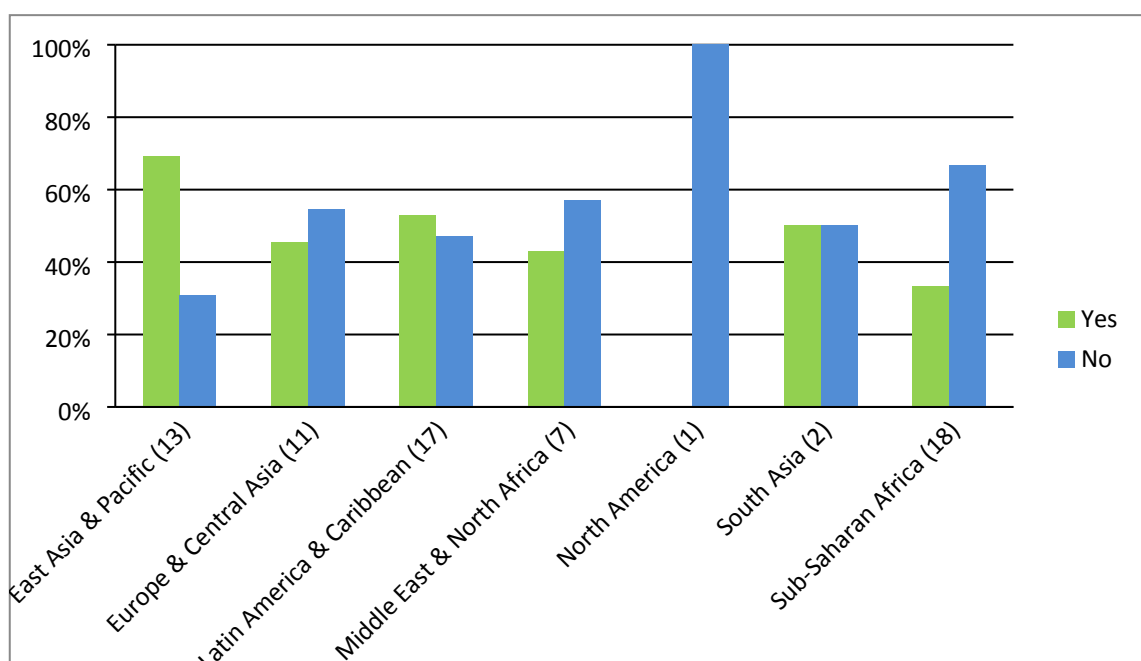


Table 3. Policies and guidelines on prudent use of antimicrobials in humans – income group

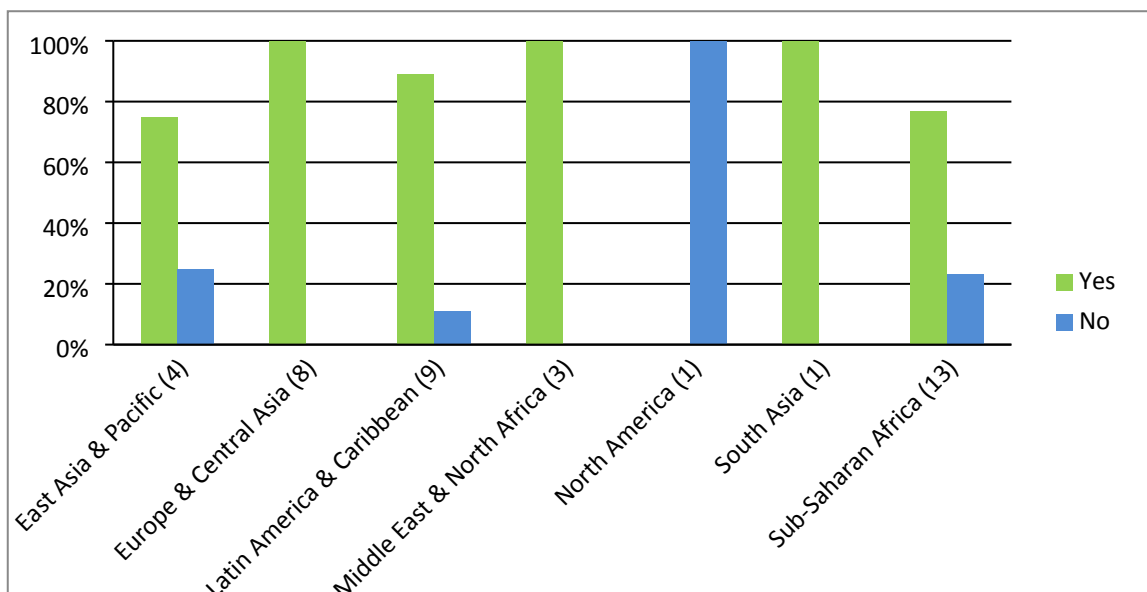
World Bank income group	Yes	No	No of countries
High income	73 %	27 %	11
Low income	9 %	91 %	11
Lower middle income	43 %	57 %	21
Upper middle income	58 %	42 %	26

¹¹ EU Guidelines for the prudent use of antimicrobials in human health. OJ C 212, 1.7.2017, p. 1. [http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017XC0701\(01\)&from=EN](http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017XC0701(01)&from=EN)

Sub-question 2.1. If the answer to question 2 is no, are such policies or guidelines planned or in preparation?

Of the 39 countries responding to this sub-question, 33 are currently working on the preparation of such policies or guidelines or plan to have them in the future, while 6 countries stated that such policies or guidelines are not planned or in preparation. The regional differences are presented in Figure 4. Given that 36 countries stated that they did not have such national policies and guidelines, it is unusual that 39 countries responded to this sub-question.

Figure 4. Plans for developing national policies and guidelines on prudent use of antimicrobials in humans – region



3.3. Topic 3 – Prudent use of antimicrobials in animals

Question 3: Have any national policies or guidelines been developed in your country concerning the prudent use of antimicrobials in animals?

The prudent use of antimicrobials in animals¹² is very important to help reduce the development of AMR since, as in humans, inappropriate use can result in the development of resistant microorganisms, which can be subsequently transmitted from animals to humans (or vice-versa) and to the environment. The use of antimicrobials for mass medication, in sub-therapeutic doses or in other inappropriate manners amplify the aforementioned risk. This is why in September 2015, the Commission published guidelines for the prudent use of antimicrobials in animals¹³ which set out many potential factors to be considered in establishing policies and actions which reflect the multi-faceted, complex issues involved in tackling AMR. They define the prudent use of antimicrobials as leading to more rational and targeted use of antimicrobials, thereby maximising their therapeutic effect and minimising the development of AMR.

Of the 71 countries responding to this question, 48 stated that they have not developed any national policies or guidelines regarding the prudent use of antimicrobials in animals, while 23 countries stated they have such national policies or guidelines in place.

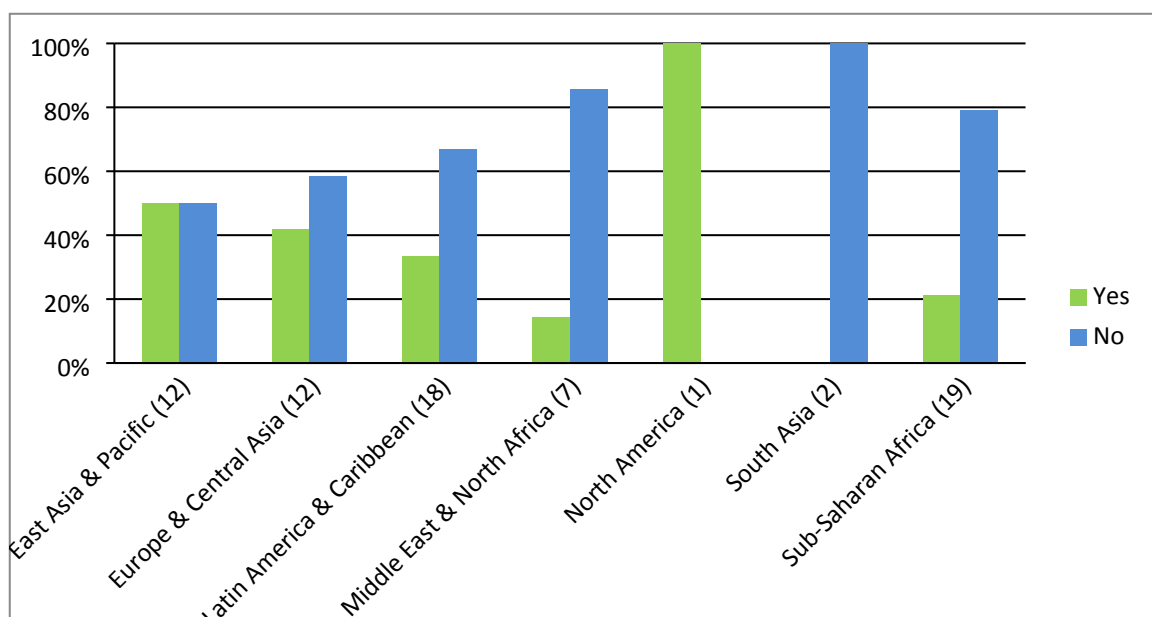
As presented in Figure 5, there are differences between the geographical regions. Aside from the North American region (1 response), the highest percentage of respondent countries that have developed policies on prudent use in animals comes from East Asia & Pacific (50 %). The vast proportion of respondents from Middle East & North Africa (86 %) and Sub-Saharan Africa (79 %) do not have any policies or guidelines on the prudent use of antimicrobials in animals. Additionally, among the respondent countries from South Asia (2), none has developed policies or guidelines on the prudent use of antimicrobials in animals.

¹² The prudent use of antimicrobials can also be referred to as ‘rational’ or ‘responsible’ use.

¹³ Guidelines for the prudent use of antimicrobials in veterinary medicine. OJ C 299, 11.9.2005, p. 7.

http://ec.europa.eu/health/sites/health/files/antimicrobial_resistance/docs/2015_prudent_use_guidelines_en.pdf

Figure 5. Policies and guidelines on prudent use of antimicrobials in animals – region



As shown in Table 4, a relatively high proportion of countries from the high income region (50 %) have national policies or guidelines on the prudent use of antimicrobials in animals in place. The situation looks different among respondents from the low and lower middle income groups, where a smaller percentage of countries have relevant guidelines (15 and 30 %, respectively).

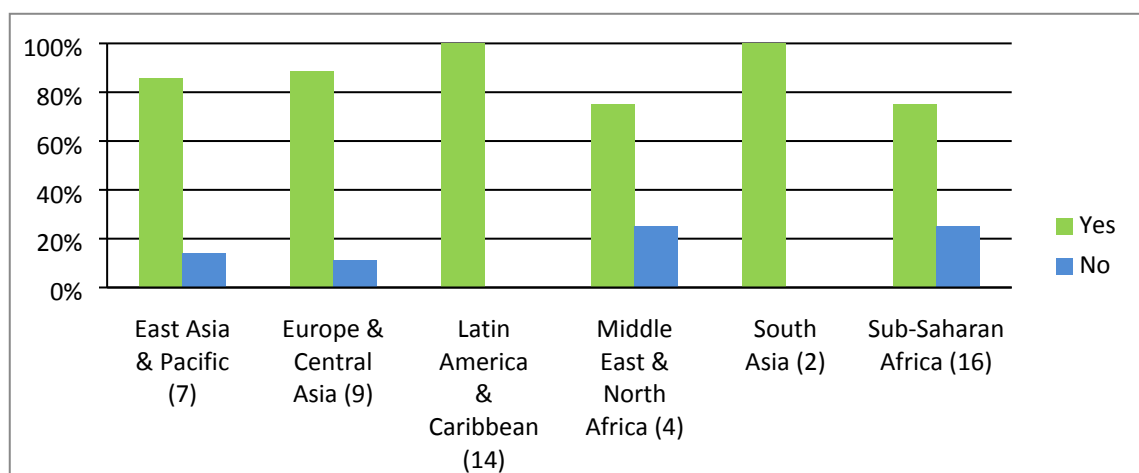
Table 4. Policies and guidelines on prudent use of antimicrobials in animals – income group

World Bank income group	Yes	No	No of countries
High income	50 %	50 %	12
Low income	15 %	85 %	13
Lower middle income	30 %	70 %	20
Upper middle income	35 %	65 %	26

Sub-question 3.1. If the answer to question 3 is no, are such policies or guidelines planned or in preparation?

Out of the 52 countries responding to this sub-question, 45 currently work on such policies or guidelines or plan to have them in the future. As shown in Figure 6, only 7 countries from East Asia & Pacific (1), Europe & Central Asia (1), Middle East & North Africa (1) and Sub-Saharan Africa (4) do not plan to introduce guidelines related to this topic.

Figure 6. Plans for developing national policies and guidelines on prudent use of antimicrobials in animals – region



3.4. Topic 4 – Access to antimicrobials without a prescription in humans

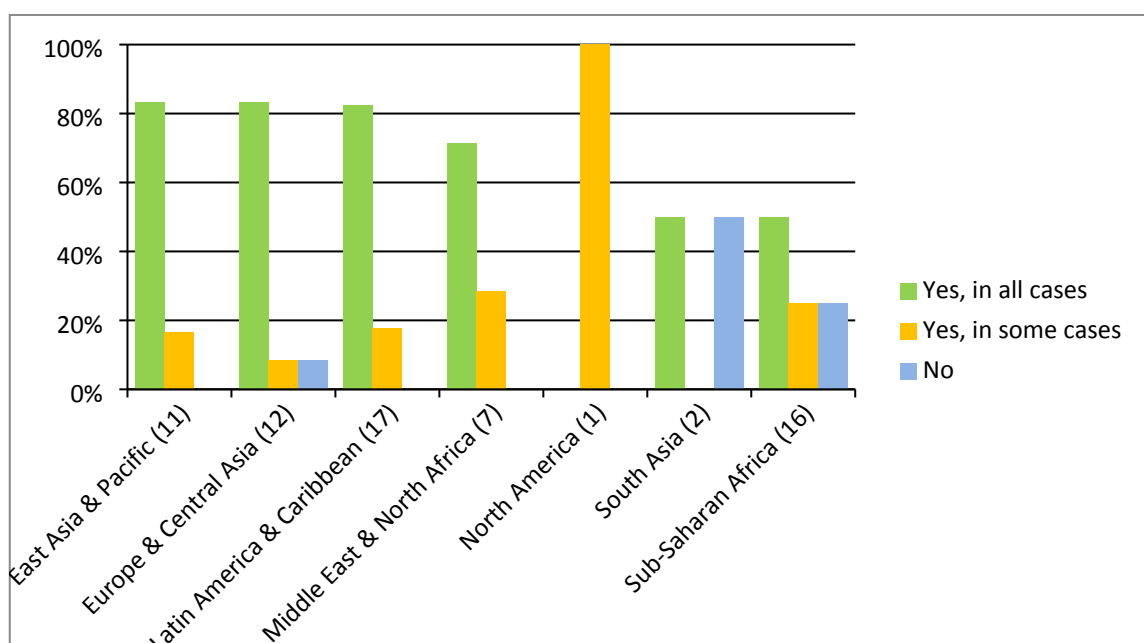
Question 4: In your country, is a prescription required for the use of antimicrobials in humans?

Prescribers are all healthcare professionals qualified to prescribe antimicrobials. In addition to physicians and dental practitioners, the term may refer to prescribing nurses, pharmacists, clinical microbiologists and midwives, depending on local regulations. In some countries, and depending on local circumstances, antimicrobials can be obtained without a prescription.

Out of the 67 countries responding to this question, 48 stated that prescriptions are required in all cases for dispensing antimicrobials to humans, whereas 13 stated that these antimicrobials can be dispensed without prescriptions in some cases. Only 6 countries stated that antimicrobials for humans are available over-the-counter without a prescription in all cases.

As presented in Figure 7, there are slight differences in responses between countries in the various World Bank regions. In 4 out of the 7 regions, most of the respondent countries require prescriptions for dispensing antimicrobials to humans. Only a few responding countries from Sub-Saharan Africa (4), South Asia (1) and Europe & Central Asia (1) do not require a prescription in any case.

Figure 7. Antimicrobial prescriptions in humans – region



As presented in Table 5, the highest proportion of the respondent countries where antimicrobials can be only obtained on prescription comes from the upper middle (81 %) and high (82 %) and income groups. It is possible to obtain antimicrobials over the counter without a prescription in nearly one third of the countries from the low income group.

Table 5. Antimicrobial prescriptions required in humans – income group

World Bank income group	Yes, in all cases	Yes, in some cases	No	No of countries
High income	82 %	18 %	0 %	11
Low income	40 %	30 %	30 %	10
Lower middle income	70 %	15 %	15 %	20
Upper middle income	81 %	19 %	0 %	26

Sub-question 4.1. If prescriptions are not required in any case, are there any plans to introduce such requirements in the future?

Out of the 9 countries responding to this sub-question, 7 countries (1 in Europe & Central Asia, 1 in Latin America & Caribbean, 1 in South Asia and 4 in Sub-Saharan Africa) plan to introduce requirements for prescriptions on antimicrobials for humans in the future. Only 2 countries in Sub-Saharan Africa do not plan to change their current (lack of) requirements.

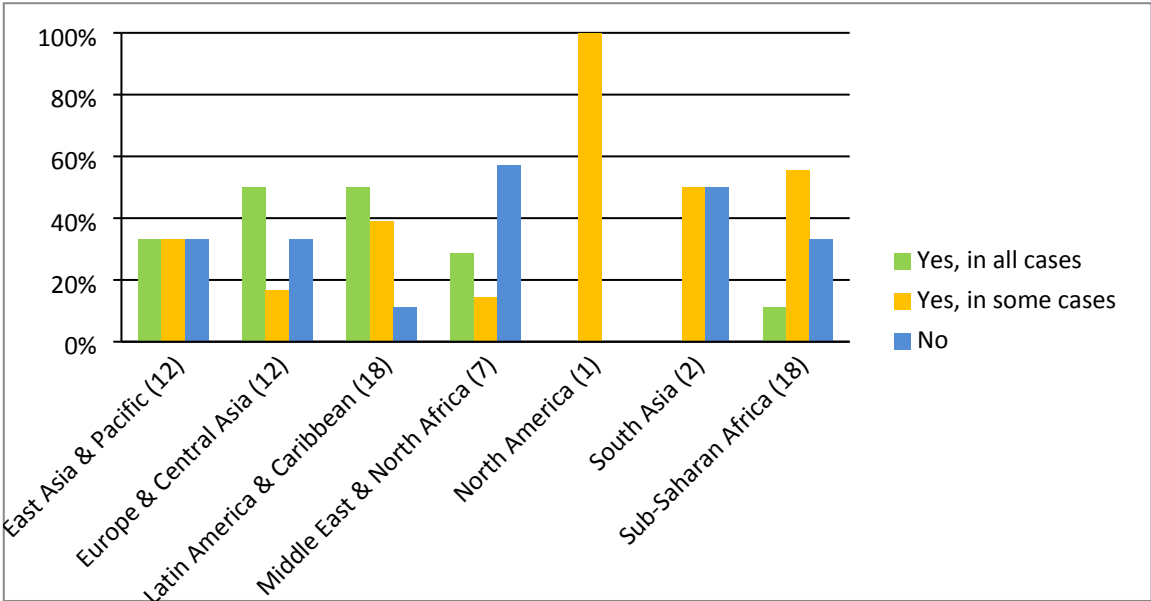
3.5. Topic 5 – Access to antimicrobials without a prescription in animals

Question 5: In your country, is a prescription required for the use of antimicrobials in animals?

Antimicrobials should ideally be prescribed and dispensed based on a clinical diagnosis made by a veterinarian. The history of the herd, flock or animal being treated should be familiar to the prescriber. Off-label use and use of critically important antimicrobials in animals should ideally be justified and limited to cases where no other alternative treatment is available. When farmers and pet owners gain access to antimicrobials without consulting a veterinarian, they might not be instructed in the proper use of these medicines, and may use them even when they are not necessary. It is important that attention is given to the dispensing of antimicrobials as they are not only administered to treat disease, but also may be used for prophylaxis, for metaphylaxis and, in some countries outside the EU, for growth promotion.

Out of the 70 countries responding to this question, 21 stated that antimicrobials for animals can be obtained without a prescription. However, 49 respondents indicated that a prescription to use antimicrobials in animals is either always required (23) or required in some cases (26). As presented in Figure 8, most respondent countries from Middle East & North Africa (57 %) do not require a prescription for antimicrobials in animals. Only 2 respondent countries from Sub-Saharan Africa require a prescription in all cases for the use of antimicrobials in animals. A relatively high proportion of respondents (50 %) from Europe & Central Asia and Latin America & Caribbean always require such a prescription.

Figure 8. Antimicrobial prescriptions in animals – regions



As presented in Table 6, in 45 % of the respondent countries from the low income groups it is possible to obtain antimicrobials for animals over-the-counter without a prescription.

A relatively high proportion of countries from the high (42 %) and upper middle (48 %) income groups only dispense antimicrobials for animals based on prescriptions.

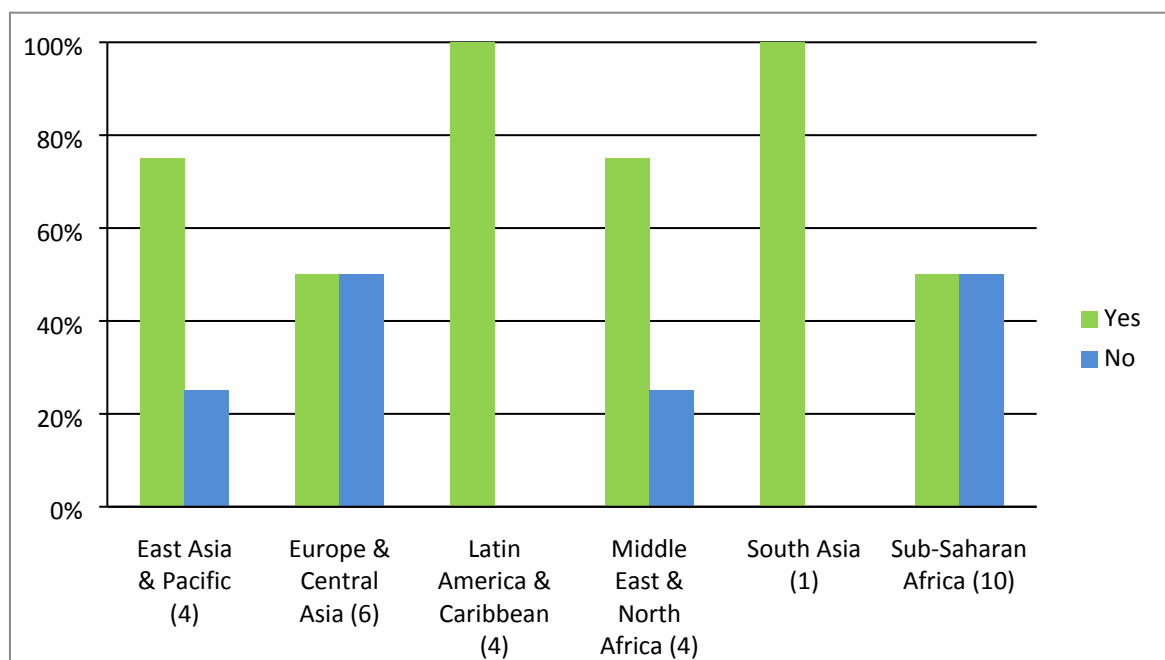
Table 6. Antimicrobial prescriptions required in animals – income group

World Bank income group	Yes, in all cases	Yes, in some cases	No	No of countries
High income	42 %	42 %	17 %	12
Low income	9 %	45 %	45 %	11
Lower middle income	20 %	45 %	35 %	20
Upper middle income	48 %	26 %	26 %	27

Sub-question 5.1. If prescriptions are not required in any case, are there any plans to introduce such requirements in the future?

Out of the 29 countries responding to this sub-question, 19 plan to introduce requirements for the prescription of antimicrobials for animals in the future. A remaining 10 countries do not plan to change the current situation, where such prescriptions are not required. As shown in Figure 9, these 10 countries come from East Asia & Pacific (1), Middle East & North Africa (1), Europe & Central Asia (3) and Sub Saharan Africa (5).

Figure 9. Plans for introducing prescription for antimicrobials in animals – region



3.6. Topic 6 – Use of antimicrobials for growth promotion in animals

Question 6: In your country, is it possible to feed antimicrobials to food producing animals specifically for the purpose of growth promotion (performance enhancement/increased feed conversion efficiency)?

Antimicrobial growth promoters are added to the feed of food producing animals in some countries outside the EU for the purpose of performance enhancement and increased feed conversion efficiency. The routine use of antimicrobial growth promoters in intensive animal production, regardless of the animals' health status or the risk of infection, has increased the overall usage of antibiotics in many countries. As early as in 1968, the United Kingdom Joint Committee on the use of Antibiotics in Animal Husbandry and Veterinary Medicine¹⁴ recommended that antibiotics used as therapeutics in humans or animals or associated with the cross-resistance to antibiotics used in humans should not be used as antimicrobial growth promoters. In 2001 the WHO recommended stopping the use of antimicrobial growth promoters¹⁵ and in the EU, a progressive ban on the use of antimicrobial growth promoters came into full effect in 2006¹⁶.

Out of the 72 countries responding to this question, 40 declared that it is possible to feed antimicrobials to food-producing animals for the purpose of growth promotion, while 32 countries responded that such use was not permitted.

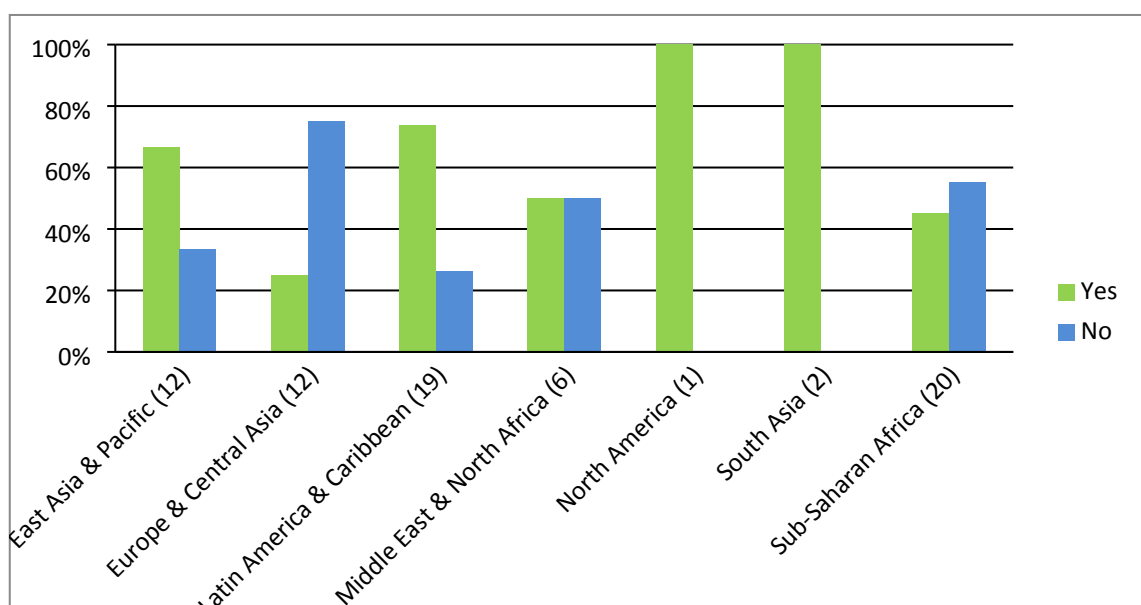
As presented in Figure 10, the situation varies significantly between different World Bank regions. In Europe & Central Asia, Middle East & North Africa, Sub-Saharan Africa, there is a relatively high number of countries that prohibit the use of antimicrobial growth promoters. Conversely, among the 19 respondent countries from Latin America & Caribbean, 14 allow the use of antimicrobial growth promoters.

¹⁴ Swann MM, *et al.* Report of the Joint Committee on the use of Antibiotics in Animal Husbandry and Veterinary Medicine. London, Her Majesty's Stationery Office, 1969.

¹⁵ WHO Global Strategy for Containment of Antimicrobial Resistance. Geneva, World Health Organization, 2001. http://www.who.int/drugresistance/WHO_Global_Strategy_English.pdf

¹⁶ Regulation (EC) No 1831/2003 of the European Parliament and of the Council on additives for use in animal nutrition. OJ L 268, 18.10.2003, p. 29. <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32003R1831&rid=1>

Figure 10. Use of growth promoters – region



As shown in Table 7, the highest proportion of the respondent countries where the use of antimicrobial growth promoters is permitted comes from the high, upper middle and lower middle income groups. Only in the low income group do the majority of responding countries (54 %) state that it is not allowed to feed antimicrobials to food producing animals specifically for growth promotion purposes.

Table 7. Use of growth promoters – income group

World Bank income group	Yes	No	No of countries
High income	58 %	42 %	12
Low income	46 %	54 %	13
Lower middle income	57 %	43 %	21
Upper middle income	58 %	42 %	26

As reported by some competent authorities, among antimicrobial agents that are permitted to be used for growth promotion in species such as cattle, sheep, pigs and poultry, the following were mentioned: amoxicillin, amprolium, apramycin, avilamycin, bacitracin, bambarmycin (flavomycin), bicozamycin, carbadox, chlortetracycline, clopidol, colistin, diclazuril, dimetridazole, erythromycin, enramycin, flavofosfolipol (flavomycin), florfenicol, furazolidone, halquinol, ionophores, josamycin, kitasamycin, lasalocid, lincomycin, lincosamide, monensin, narasin, neomycin, nicarbazin, nosiheptide, olaquinox, oxytetracycline, penicillin, robenidine, roxarsone, salinomycin, spectinomycin, spiramycin, streptomycin, sulfamethazine, tetracycline, tiamulin, tilmicosin, tylosin, and virginiamycin.

3.7. Topic 7 – Monitoring the incidence of AMR in bacterial isolates from human infections

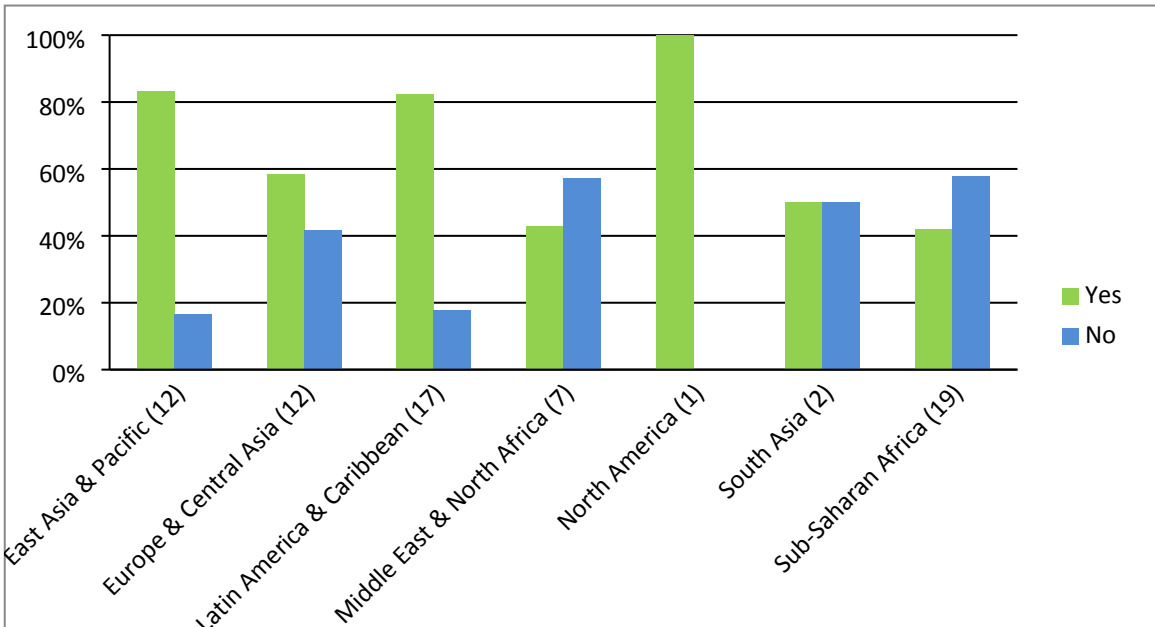
Question 7: Are there any programmes in place in your country monitoring the incidence of antimicrobial resistance in bacterial isolates from human infections (clinical isolates)?

Monitoring the incidence of AMR in isolates obtained from human infections allows the collection of data to support the prevention and control of resistance. Accurate, comparable and representative data provide key information on the occurrence and development of AMR, which play an important role in raising awareness among the public, stakeholders and policy makers.

Out of the 70 countries responding to this question, 44 stated that they have such monitoring programmes in place, while 26 countries stated that they do not monitor AMR incidence from clinical isolates.

As presented in Figure 11, aside from the North American region (1 response), the highest percentage of respondent countries that have monitoring programmes comes from East Asia & Pacific (83 %) and Latin America & Caribbean (82 %). Among respondents from Sub-Saharan Africa, only 8 countries (42 %) monitor AMR incidence in clinical isolates.

Figure 11. Monitoring programmes for AMR in bacterial isolates from human infections – regions



As presented in Table 8, a significant proportion of countries in the high (73 %) and upper middle (78 %) income group stated that they have such monitoring programmes in place. Conversely, only 42 % of the respondent countries in the low income group monitor the incidence of AMR in isolates from human infections.

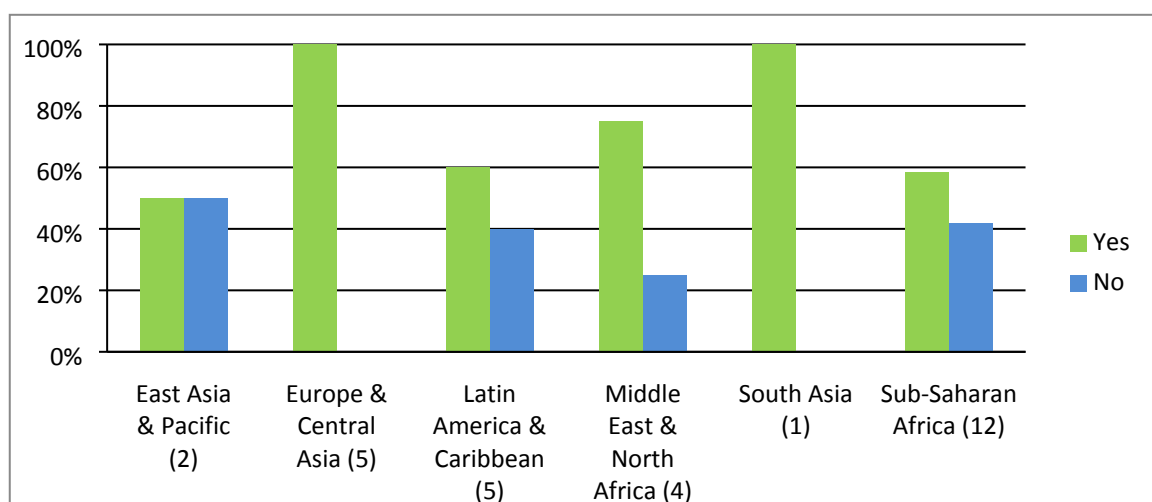
Table 8. Monitoring programmes of AMR in bacterial isolates from human infections – income group

World Bank income group	Yes	No	No of countries
High income	73 %	27 %	11
Low income	42 %	58 %	12
Lower middle income	50 %	50 %	20
Upper middle income	78 %	22 %	27

Sub-question 7.1. If the answer to question 7 is no, are such programmes planned or in preparation?

Out of the 29 countries responding to this sub-question, 20 are currently working on the preparation of such AMR monitoring programmes or plan to have them in the future, whereas 9 countries (1 in East Asia & Pacific, 3 in Latin America & Caribbean, and 5 in Sub Saharan Africa) stated that they do not plan to monitor AMR in human clinical isolates.

Figure 12. Plans for introducing monitoring of AMR in clinical isolates – regions



3.8. Topic 8 – Monitoring the incidence of AMR in bacterial isolates from animals and food of animal origin

Question 8: Are there any programmes in place in your country monitoring the incidence of antimicrobial resistance in bacterial isolates (commensal bacteria and/or pathogens) from animals and food of animal origin?

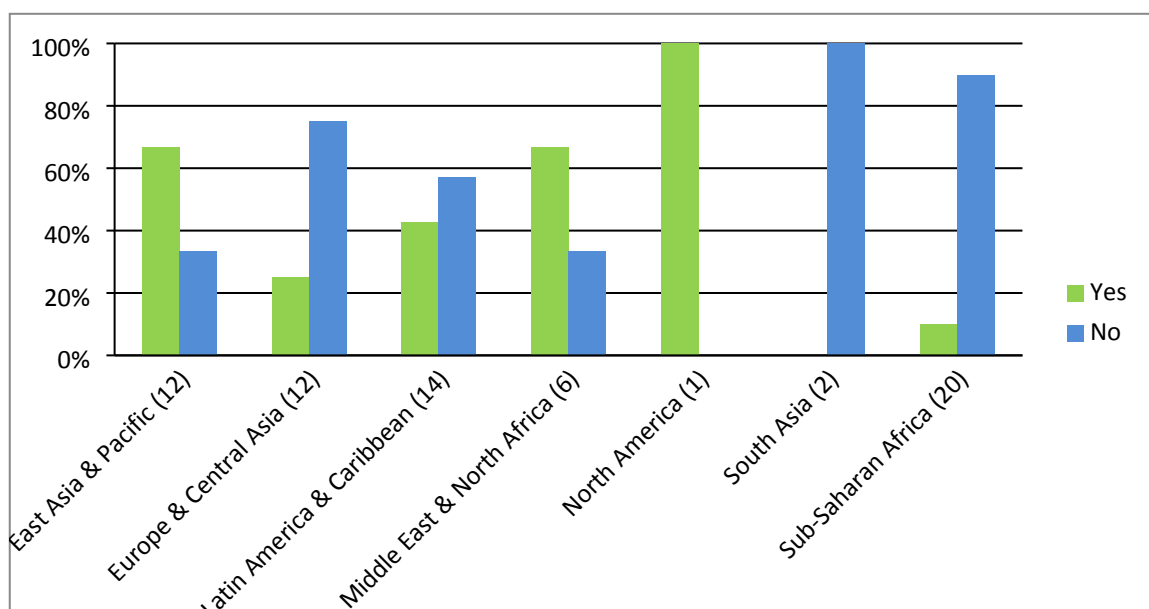
Enterobacteria, such as *Salmonella* and *Escherichia coli* may pose a health risk to humans via direct contact or via the consumption of contaminated food, and resistant isolates may jeopardise the effectiveness of antimicrobial treatment in humans. Monitoring the

incidence of AMR in bacterial isolates obtained from animals and food of animal origin is valuable for evaluating the impact of measures taken to combat AMR.

Out of 67 countries responding to this question, 43 stated there are no programmes in place to monitor AMR incidence in bacterial isolates from animals and food of animal origin, whereas 24 countries stated that such programmes do exist in their territory.

As presented in Figure 13, a majority of respondents from Middle East & North Africa (4) and East Asia & Pacific (8) stated that they monitor AMR in animals and food of animal origin. The lowest proportion of respondent countries with established relevant programmes comes from Sub-Saharan Africa (10 %) and Europe & Central Asia (25 %).

Figure 13. Monitoring programmes of AMR in bacterial isolates from animals and food of animal origin – regions



As shown in Table 9, a majority of respondent countries from the high income group (70 %) stated that they monitor AMR in animals and food of animal origin. The situation is dramatically different in the low income group, where only 8 % of the respondents have such monitoring programmes in place.

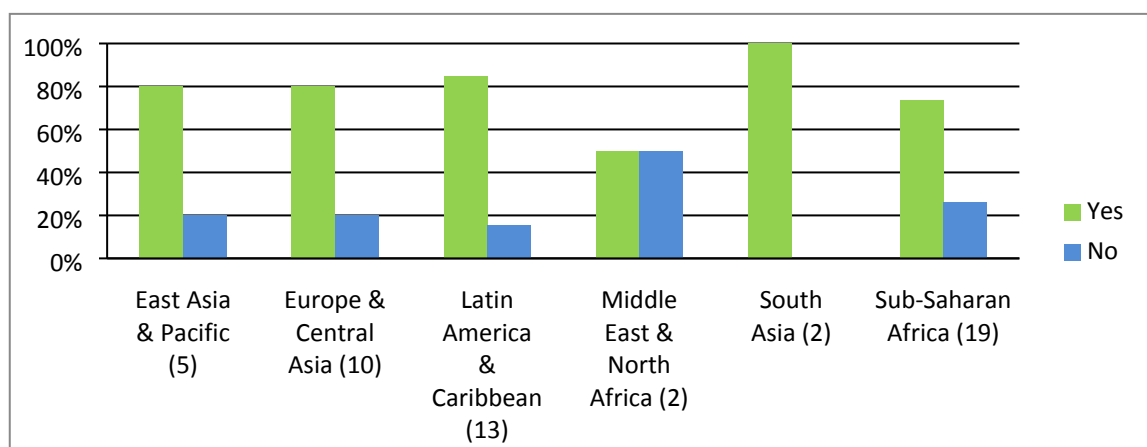
Table 9. Monitoring programmes of AMR in bacterial isolates from animals and food of animal origin – income group

World bank income group	Yes	No	No of countries
High income	70 %	30 %	10
Low income	8 %	92 %	12
Lower middle income	30 %	70 %	20
Upper middle income	40 %	60 %	25

Sub-question 8.1. If the answer to question 8 is no, are such programmes planned or in preparation?

Out of 51 countries responding to this sub-question, 40 are currently working on the preparation of such AMR monitoring programmes or plan to have them in the future. As presented in Figure 14, there are 11 countries in total from East Asia & Pacific (1), Europe & Central Asia (2), Latin America & Caribbean (2), Middle East & North Africa (1) and Sub-Saharan Africa (5) that do not plan to monitor AMR incidence in bacterial isolates from animals and food of animal origin.

Figure 14. Plans for introducing monitoring of AMR in bacterial isolates from animals and food of animal origin – region



4. CONCLUSIONS AND DISCUSSION OF RESULTS

This report provides a broad overview of the actions taken or planned to combat AMR in non-EU countries, categorised according to geographical and economic development criteria. Nevertheless, caution is needed when interpreting these data. Aside from the fact that the source data are based on self-reporting by the countries responding to a questionnaire, there was a large variation in the types of responses received and, in some cases, replies to some of the questions or sub-questions were omitted. In addition, although the response rate to this questionnaire was significant (60 %), many countries did not respond at all. Consequently the data may not be truly representative of the actual situation.

Notwithstanding the above, the data would appear to suggest that, compared to other regions, there has been less progress in the Latin American & Caribbean and Sub-Saharan Africa regions in developing national action plans or policies/strategies to address AMR. Economic development seems to be a relevant factor in this respect, given that 79 % of the responding countries from the low income group stated that they had not yet developed such policies/strategies. It is encouraging that 92 % of the 52 responding countries without a current national action plan or policy/strategy on AMR stated that such initiatives were planned or are in preparation. Presumably this is linked to the expectation that all WHO

member countries should prepare a national AMR action plan by 2017. All countries where there are developed national AMR policies/strategies, stated that these cover human health aspects, whereas animal health aspects are covered only in 86 % of these policies/strategies.

Very few (9 %) of the responding countries from the low income group have yet developed national policies or guidelines on the prudent use of antimicrobials in humans, whereas 73 % of the responding countries from the high income group stated that these policies or guidelines were already in place. A commitment to address this topic is shown by the fact that 85 % of the countries responding to a further sub-question stated that such prudent use policies or guidelines are planned or already in preparation.

In comparison with the number of countries stating that they had already developed prudent use of antimicrobials guidelines or policies in human medicine (48 % of 69 responding countries), a lower proportion of countries stated that they had already developed guidelines for the prudent use of antimicrobials in animals (32 % of 71 responding countries). Again, national income seems to be an important factor in this regard, since approximately 85 % of the 13 responding low income countries do not have national policies or guidelines in place concerning the prudent use of antimicrobials in animals.

A majority of responding countries in the upper middle and higher income groups stated that prescriptions are required for the use of antimicrobials in humans in all cases, whereas 30 % and 15 % of responding countries, respectively, in the low income and lower middle income groups stated that such prescriptions are not required in any case.

The existence of requirements for prescriptions for the use of antimicrobials in animals varies significantly across countries in different income groups, being less commonly reported by the countries from the low income and lower middle income groups. Out of 29 countries responding to the relevant sub-question, 10 stated that they did not plan to introduce such prescription requirements in the future.

It is worth noting that a significant number of responding countries (40) permit the use of antimicrobial growth promoters in animals, a matter which has received attention from the WHO, OIE, the FAO and, of course the EU. The use of antimicrobial growth promoters in animals is permitted in a significant proportion of responding countries across all income groups, namely in 46 % of the countries from the low income region and in 58 % of the countries from the high and upper middle income groups, which seems to suggest that the economic development of the country is not a decisive factor in using antimicrobials for that purpose. Interestingly, the data would suggest that countries from the high and upper middle income groups, which tend to have more developed AMR policies in other respects, are more likely to permit the use of antimicrobial growth promoters in food-producing animals.

There appears to be an association between the economic development of the country and the presence of AMR monitoring programmes in humans and in animals/food, since 73 % of the responding countries from the high income group have such programmes in place, whereas 58 % of the responding countries from the low income group do not. In particular, the fact that 92 % of the responding countries from the low income group do not have AMR monitoring programmes in place for animals/food suggests that these programmes are attributed a lower priority in comparison to AMR monitoring in humans.

There is a broad international consensus that the problem of AMR, if left unchecked, could have devastating consequences for our society. To illustrate the point, and only in monetary terms, the European One Health Action Plan against AMR ⁶ estimates that AMR costs € 1.5 billion annually in healthcare costs and productivity losses, in the EU alone. In addition, "The investment needed to take action is dwarfed by the human and financial cost of inaction which is mounting already" ¹⁷. Nevertheless, the fact remains that effectively dealing with the AMR issue requires substantial resources ¹⁸.

While recognising that there are complex interactions between socioeconomic factors and the patterns and levels of AMR and antimicrobial use ¹⁹, the picture emerging from this report is that countries in the low and middle-income groups are still in the process of implementing all the necessary measures designed to tackle the problem of AMR. This picture is coherent with research showing that low-income countries are unlikely to have the resources or capacity to implement all of the components in the global AMR surveillance system ²⁰.

It is expected that the data collected via this questionnaire will help to promote a better understanding of the situation in various non-EU countries and serve as a basis for targeted initiatives in the future, which is consistent with the proposal that particular strategies have to be developed for the control of AMR in developing countries ²¹. This is particularly important in the context of the new EU One Health Action Plan against AMR, one of the objectives of which is intensifying EU efforts worldwide to shape the global agenda on AMR and the related risks, including a stronger EU global presence, bilateral partnerships, cooperation and cooperating with developing countries.

¹⁷ O'Neill J (chair). Tackling Drug-Resistant Infections Globally: Final Report and Recommendations. The Review on Antimicrobial Resistance. May 2016.

https://amr-review.org/sites/default/files/160518_Final%20paper_with%20cover.pdf

¹⁸ The above-referenced O'Neill Review broadly estimates that the cost of taking global action on AMR is up to 40 billion USD over a decade.

¹⁹ Miller-Petrie M and Gelband H. Socioeconomics, antimicrobial use and antimicrobial resistance. AMR Control. 2017, Economics and Innovation. <http://resistancecontrol.info/2017/socioeconomics-antimicrobial-use-and-antimicrobial-resistance/>

²⁰ Seale AC, *et al.* AMR Surveillance in low and middle-income settings - A roadmap for participation in the Global Antimicrobial Surveillance System (GLASS), Wellcome Open Res. 2017; 2:92. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5645727/>

²¹ Ayukekbong JA, *et al.* The threat of antimicrobial resistance in developing countries: causes and control strategies. Antimicrob Resist Infect Control. (2017) 6:47. <https://aricjournal.biomedcentral.com/track/pdf/10.1186/s13756-017-0208-x?site=aricjournal.biomedcentral.com>

ANNEX I – QUESTIONNAIRE

Question 1

Has a national action plan or policy/strategy on combatting antimicrobial resistance been developed in your country?		Tick Yes <input type="checkbox"/> No <input type="checkbox"/>
If yes , please provide an electronic copy or website link to the relevant document(s)		
Does this action plan or strategy cover aspects related to antimicrobial resistance in:	Humans	Animals
	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
If there is no national action plan or policy/strategy on combatting antimicrobial resistance developed to date, is one planned or in preparation?		Tick Yes <input type="checkbox"/> No <input type="checkbox"/>
If currently planned or in preparation, please indicate if there is a target date for its finalisation and implementation and please provide any website link where further information is available.		
If there is no national action plan or policy/strategy on combatting antimicrobial resistance developed to date, but one is in preparation, will it cover aspects related to antimicrobial resistance in:	Humans	Animals
	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>

Question 2

Have any national policies or guidelines been developed in your country concerning the prudent use of antimicrobials in humans ?		Tick Yes <input type="checkbox"/> No <input type="checkbox"/>
If yes , please provide an electronic copy or website link to the relevant document(s)		
If no , are such policies or guidelines planned or in preparation?		Tick Yes <input type="checkbox"/> No <input type="checkbox"/>

If such policies or guidelines are planned or are in preparation, please indicate if there is/are target date(s) for their finalisation and implementation and please provide any website link where further information is available.

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Question 3

Have any national policies or guidelines been developed in your country concerning the prudent use of antimicrobials in animals ?	Tick Yes <input type="checkbox"/> No <input type="checkbox"/>
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If yes, please provide an electronic copy or website link to the relevant document(s)

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If no , are such policies or guidelines planned or in preparation?	Tick Yes <input type="checkbox"/> No <input type="checkbox"/>
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If such policies or guidelines are planned or are in preparation, please indicate if there is/are target date(s) for their finalisation and implementation and please provide any website link where further information is available.

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Question 4

In your country, is a **prescription** required for the use of antimicrobials in **humans**?

Yes, required in all cases <input type="checkbox"/>	Yes, required in some cases <input type="checkbox"/>	No, not required in any case <input type="checkbox"/>
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If a prescription is required in **all** cases, please provide an electronic copy of any official applicable rules or regulations on this aspect.

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If a prescription is required in **some** cases, please provide information on when prescriptions are required and when they are not required and please provide an electronic copy of any official applicable rules in this regard.

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If prescriptions are not required in any case, are there any plans to introduce such requirements in the future?	Tick Yes <input type="checkbox"/> No <input type="checkbox"/>
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If yes, please indicate if there is a target date for the introduction of such requirements and, if applicable, please provide any website link where further information is available.

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Question 5

In your country, is a **prescription** required for the use of antimicrobials in **animals**?

Yes, required in all cases <input type="checkbox"/>	Yes, required in some cases <input type="checkbox"/>	No, not required in any case <input type="checkbox"/>
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If a prescription is required in **all** cases, please provide an electronic copy of any official applicable rules or regulations on this aspect.

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If a prescription is required in **some** cases, please provide information on when prescriptions are required and when they are not required and please provide an electronic copy of any official applicable rules in this regard.

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If prescriptions are not required in any case, are there any plans to introduce such requirements in the future?	Tick Yes <input type="checkbox"/> No <input type="checkbox"/>
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If yes, please indicate if there is a target date for the introduction of such requirements, whether the requirements will apply to all animals or some/all food-producing species and, if applicable, please provide any website link where further information is available.

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Question 6

In your country, is it possible to feed antimicrobials to food producing animals specifically for the purpose of growth promotion (performance enhancement/increased feed conversion efficiency) ?	Tick Yes <input type="checkbox"/> No <input type="checkbox"/>
If yes , please provide a list of the antimicrobial substances which are permitted to be used for growth promotion and the relevant farmed animal species where such use is permitted.	
If no , please provide (a) an electronic copy or website link to the relevant document(s)/legislation prohibiting such use and (b) the list of antimicrobial substances which are prohibited from such use and (c) the relevant farmed animal species to which the prohibition applies.	

Question 7

Are there any programmes in place in your country monitoring the incidence of antimicrobial resistance in bacterial isolates from human infections (clinical isolates)?	Tick Yes <input type="checkbox"/> No <input type="checkbox"/>
If yes , please provide a brief description and, if possible, a website link to the relevant programme(s)	
If no , are such programmes planned or in preparation?	Tick Yes <input type="checkbox"/> No <input type="checkbox"/>
If such programmes are planned or are in preparation, please indicate when they will be operational and, if possible, provide a website link to the relevant information.	

Question 8

Are there any programmes in place in your country monitoring the incidence of antimicrobial resistance in bacterial isolates (commensal bacteria and/or pathogens) from animals and food of animal origin ?	Tick Yes <input type="checkbox"/> No <input type="checkbox"/>
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If **yes**, please provide a brief description and, if possible, a website link to the relevant programme(s)

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If **no**, are such programmes planned or in preparation?

Tick
Yes No

If such programmes are planned or are in preparation, please indicate when they will be operational and, if possible, provide a website link to the relevant information.

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