

Consultation on a draft Global action plan to address antimicrobial resistance EUROPEAN COMMISSION and its agencies (EFSA, EMA and ECDC)

The questionnaire is divided into four sections. The questions are broadly framed and intended to give you the opportunity to enter into some depth and explain your organization's viewpoint. While only questions marked with * are mandatory, we would appreciate answers to as many as possible. Where a choice of answer needs to be selected please highlight your answer.

Before answering the questions, please refer to our list of supporting documents.

<http://www.who.int/drugresistance/amr-consultation/en/index.html>

1. Name of individual respondent*

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3. Are you authorised to represent your organization or interest group?* **Yes**

4. Organization Name*

European Commission including its agencies: the EMA (European Medicines Agency), the EFSA (European Food Safety Authority) and the ECDC (European Centre for Disease Prevention and Control)

5. Address of the organization*

B-1049 Brussels, BELGIUM

6. Organization website (if available)

<http://ec.europa.eu/>

7. Country*

Belgium

8. Type of Organization*

- Government department, ministry or agency
- Development or aid agency, foundation, trust or other funding authority
- International developmental organization
- Academic institution
- Civil society
- Private sector
- Other non-governmental organization (NGO)
- Other (please specify): *International Institution*

9. Main sector of interest:

- Human health
- Animal health
- Finance/economics
- Agriculture or food
- Environment
- Communication, education and community
- Other (please specify): *All these sectors, including Research and Innovation, Development and Cooperation*

10. Would you like to be added to our mailing list to receive updates on the development of the global action plan?* **Yes**

General questions

1. From the perspective of your organization, what are the most important areas of concern in AMR?

To contain the rising threat from Antimicrobial Resistance a holistic approach, based on the "One Health" concept, with engagement from all relevant sectors, including human and animal health, agriculture, environment and research, is needed.

Measures in all areas (for example the promotion of the appropriate use of antimicrobial agents in human and veterinary medicine, the prevention of microbial infections and their spread, the development of new antimicrobials and alternatives for treatment or diagnostic tools, the harmonisation of surveillance systems, the establishment of education and training programs and early warning systems and trend watching) need to be implemented in parallel in order to effectively address AMR.

These can only be achieved if a multi-sectorial approach is adopted with involvement and commitment of all governments and concerned stakeholders.

2. Is your organization currently involved in work related to AMR? If Yes, How?

Yes. Over the past decades, the European Commission has developed a series of EU-wide policy and legislative initiatives for the prevention and control of AMR. Some examples are:

*In **human medicine**, the 2001 Community Strategy against AMR called for EU initiatives in the fields of surveillance, research, prevention and international cooperation. This led to the adoption of EU-wide recommendations and guidelines against AMR to be implemented by EU countries. In order to collect data on AMR, EU wide surveillance systems were set up to monitor the spread of AMR and the consumption of antimicrobial agents.*

In 2008, the EU launched the [European Antibiotic Awareness Day](#). This annual event aims at increasing awareness on AMR and promoting the prudent use of antimicrobial agents.

*In **animal husbandry**, a ban on the use of antimicrobials for growth promotion was introduced in 2006.*

*In the **veterinary field**, EU law calls for the harmonised monitoring of zoonotic AMR (resistance transmissible between animals and humans). It also focuses on monitoring the use of antimicrobials in animals.*

***Authorisation** requirements for **human and veterinary medicines**, and other products such as food enzymes, probiotics and decontamination agents, with possible effects on the development of AMR are also kept in focus.*

***EU-funded research:** During the last 16 years, the European Union has awarded nearly €950 million to transnational collaborative projects on antimicrobial resistance, most in the area of human health, but also in the areas of animal health, food and environment. This includes around €155 million for AMR research supported via the Innovative Medicines Initiative (IMI). This is supplemented by a €165 million contribution from the pharmaceutical industry.*

Stronger international cooperation against AMR: the EU has been working actively with international organisations such as Codex Alimentarius, FAO, OIE or WHO. Bilateral contacts have also been set up. In 2009, the EU and the United States of America set up a Transatlantic Task Force against AMR (TATFAR). A [progress report](#) has been published.

To further strengthen its commitment, the European Commission launched in November 2011, a five year [Action Plan against the rising threats from Antimicrobial Resistance](#). The Plan is based on a holistic approach, in line with the "One Health" concept, involving all sectors and aspects of antimicrobial resistance. Prudent use of antibiotics in human and veterinary medicine, enhanced surveillance systems, development of new antimicrobials and prevention of infections are implemented in parallel to effectively address AMR. The Action Plan substantially reinforces the measures already in place and introduces an additional set of rigorous measures to prevent and control the further spread of resistance, preserve the ability of antimicrobial agents to combat microbial infections and securing the availability of new antimicrobial agents.

The plan describes 12 detailed concrete key actions in 7 different attention areas, both in the human and veterinary field.

The actions put forward in the plan aim to:

- Mitigate the risk of developing antimicrobial resistance in humans by ensuring appropriate and prudent use of antimicrobials both in humans and animals;
- Introduce new effective measures to prevent microbial infections and their spread;
- Develop effective antimicrobials or alternatives for treatment of human and animal infections;
- Join forces with international partners to contain the risks of spreading antimicrobial resistance from international trade and travel, and via the environment;
- Harmonise surveillance systems (use of antimicrobials and antimicrobial resistance);
- Reinforce research to develop the scientific basis and innovative means to combat AMR;
- Improve communication, education and training.

The detailed [Action Plan](#) (Communication from the Commission to the European Parliament and the Council, - Action plan against the rising threats from Antimicrobial Resistance; COM(2011)748 which has been [translated](#) into the official languages of the EU) includes the description of the 12 actions. A [Road Map](#) detailing the operational objectives and the concrete activities and deadlines for each of the 12 specific actions described in the plan, as well as other information such as research activities, conferences, legislation, etc. are publicly available at the websites of the European Commission ([DG Research and Innovation](#), [DG Health and Consumers](#)) and its agencies ([EFSA](#), [EMA](#) and [ECDC](#)). In October 2014, the European Commission will publish a progress report on the implementation of the Action Plan.

Questions about the draft global action plan outline document

Before the WHA resolution was adopted, two WHO AMR Strategic Technical Advisory Group (STAG) meetings were held in anticipation, which included members plus a large number of representatives from other organizations. These meetings identified key issues, concerns and led to the development of a draft outline.

As this consultation progresses and stakeholder meetings are held, the secretariat will harvest and incorporate the input into the draft global action plan.

1. How would you rate your understanding of WHO's intention in the development of a global action plan to address AMR?

Very good

Additional comments

2. From the perspective of your organization, are the major issues relating to AMR outlined in the draft global action plan? *Yes*

If No, what additional issues need to be addressed?

Questions on the ‘Building blocks’ described in the draft outline.

You will notice, the global action plan has been constructed around “building blocks” in recognition that different countries will have different starting points. In this situation, countries can choose building blocks to concentrate upon. Each building block specified has been identified as a key area where specific attention, planning and work are needed to achieve progress in addressing AMR. Through questions in this section, we would like to hear your opinions on these building blocks in more detail.

I. Building block-1: Increasing awareness and understanding about AMR and of the actions and changes needed

a) What do you consider to be the main issues under this priority?

Political and societal awareness on the threat of AMR is needed to ensure the implementation of measures to combat antimicrobial resistance, especially the inappropriate use of antibiotics, and to drive research and innovation.

Global estimates are that more than 50% of all medicines are prescribed or dispensed inappropriately, i.e. with a wrong indication, dose, or duration. In addition, about half of all patients do not take their medicines as directed. This has serious health and economic consequences. For example, inappropriate use of medicines increases the risk of adverse medicine events and contributes to the increase in antimicrobial resistance worldwide.

In general, investment by the pharmaceutical industry in promoting their products is much higher than investment by governments in promoting rational use of medicines or providing independent medicines information.

b) What are the main actions that needs to be done -- and who are the main actors/stakeholders who need to take action -- to go beyond the status quo?

Awareness rising is a key element in order to minimize the development of AMR.

In the human field, awareness needs to be increased in public health and healthcare facilities, targeting both consumers and health care professionals.

In the veterinary field, all involved parties (farmers, veterinarians, professionals involved in animal production, universities, pet owners, etc.) need to be correctly informed by regular campaigns. The active involvement and support of the relevant networks and stakeholders associations are essential in order to guarantee the success of such campaigns. The competent authorities should include the campaigns in their national strategies.

The campaigns should not be limited to the distribution of information but should include practical tools to encourage the implementation of all the actions/behaviour aimed at reducing AMR.

The campaigns may include (national) guidelines and education programmes to encourage hygiene practices, infection prevention or transmission, correct treatment, appropriate use of antimicrobials. Examples: treatment guidelines for veterinarians, seminars or post-graduation programs for health professionals, posters, social media, etc.

Campaigns should also be targeted at consumers to strengthen their knowledge and their willingness to demand food produced in systems requiring as low an amount of antimicrobial agents as possible.

In developing countries there is an extensive body of research on strategies to address inappropriate medicine use. The most effective interventions are those with multiple components addressing prescriber and patient education and supervision, and community case management (Holloway K et al: Medicines use in primary care in developing and transitional countries; Results from studies reported between 1990-2009; Presentation at the Third International Conference on Improving Use of Medicines; Turkey 2011).

Advocate for ethical medicines promotion in developing countries by originator and generic companies should be also considered. The use of the results of the Access to Medicines Index ranking in public fora could provide an incentive to industry to improve their ranking.

c) What steps have already been taken to address this priority? (please provide references where possible)

See [Road Map](#) and progress report of the EU Action plan, and the internet sites of DG SANCO, EFSA, EMA and ECDC.

See for example, the results of the [Eurobarometer 2013](#), some conferences or other events on Antimicrobial Resistance organized or supported by the [European Commission](#) and its [agencies](#), the [European Antibiotic Awareness day](#), etc. The EC will publish by the end of 2014 Guidelines for prudent use of antimicrobials in veterinary medicine; this document will include an annex with practical examples of national strategies in the EU Member States to combat antimicrobial resistance in the veterinary sector.

Ethical promotion is included as an indicator in the Access to Medicines Index which scores adherence to the International Federation of Pharmaceutical Manufacturers & Associations' marketing code, extension of this code to sales agents, processes for monitoring and enforcement, and disclosure of enforcement and breaches. Generic companies are not yet included amongst the companies surveyed.

d) What are concrete and measurable indicators of progress for this priority? (Including, for example, global and national goals to be achieved within 2, 5 and 10 years)

- *Number of campaigns per country/sector*
- *Number of countries participating on a Antibiotic Awareness Day/Week (eventually number of social media events organised, participation, etc.).*
- *Regular enquires or surveys showing/comparing the impact of the campaigns, the level of understanding of professionals, the level of understanding of the public, etc..*
- *Publication of prescription rates/data*
- *The Access to Medicines Index ranking could be use to evaluate ethical promotion of medicines.*

II. Building block-2: Identifying the most important approaches for preventing development of infections and the steps needed to move beyond guidance to more effective implementation of such approaches

a) What do you consider to be the main issues under this priority?

The deficit in effective and comprehensive prevention measures to avoid acquisition and transmission of infections in the first place a major issue here.

b) What are the main actions that needs to be done -- and who are the main actors/stakeholders who need to take action -- to go beyond the status quo?

In the veterinary domain, the prevention of infection is also the best way to reach a reduction in the usage of antimicrobials. As a consequence of a reduction in the incidence of animal disease and zoonotic infections, the impact of outbreaks is minimised, thereby minimising also the need for and the consumption of antimicrobials.

Main actions should include:

- *Implementation of hygiene and biosecurity measures including the prevention of the introduction of infections (separate dedicated clothes and boots to be used per unit, limited access, hand washing and hand disinfection facilities including liquid soap, hot and cold water close to the workplace, quick removal and prevention of access to dead animals, all-in/all-out per unit, cleaning, disinfection, verification of disinfection, etc); Clear protocols should be written for infectious disease prevention, infection control and hygiene and these should be available at the farm.*
- *Introduction of herd specific health plans aiming for a consequent stepwise improvement of herd health. Avoid health programmes in which animals are systematically treated with antibiotics in a prophylactic way.*
- *(National control) Programmes to control specific animal diseases (viral and bacterial), including but not limited to vaccination;*
- *Improvement of husbandry systems/farming practices including:*
 - *ensuring proper ventilation and appropriate environmental conditions for the animals,*
 - *appropriate and clean facilities for transport (lairage area, vehicles, etc.),*
 - *integrated production systems which avoid buying and mixing of populations and transport of animals with unknown disease status.*
 - *use of quality feed and water.*
 - *recommend adequate density of animal populations and other zootechnical conditions to decrease antimicrobial consumption.*
- *Incentives for farmers which would lead to measurable improvement in animal health by means of effective preventive measures, improvement of welfare standards (in the broad sense of animal welfare) and monitoring of pathogens and their sensitivity at the herd level with the ultimate objective to ensure evidence based use of antimicrobials in individual herds in line with the prudent use principles.*
- *Introduction of systems to reward a decrease in use of antimicrobials and to penalise an inadequate increase in such use.*
- *Increase of R&D activities (in human and veterinarian field) in infection prevention, such as development of vaccines and other new interventions to prevent infection/acquisition/transmission.*

- *Improvement of therapeutic approaches and development of new diagnostics.*
- *Research on the effectiveness of prevention strategies and their effective implementation in various settings.*

c) What significant work has already been done to address this? (please provide references where possible)

In the veterinary domain, the principle “prevention is better than cure”, is the basis of the new Commission's proposal for a Regulation on Animal Health (currently undergoing the ordinary legislative procedure in the European Parliament and the Council).

The legislative proposal introduces clear responsibilities for:

- *animal keepers and other operators for the health of the animal under their care, to ensure the required level of biosecurity measures and to have basic knowledge in animal diseases, including interaction between animal health, animal welfare and human health.*
- *veterinarians and other health professionals for appropriate measures to prevent the spread of pathogens and to raise awareness as well as to ensure the early detection of diseases by carrying out proper diagnosis and differential diagnosis to rule out or confirm a disease before symptomatic treatment is commenced.*
- *competent authorities who not only must be capable to protect animal health, human health and the environment through reduction of the risks arising from pathogens but also support operators in acquiring basic knowledge in animal health and inform the general public of the nature of the risk and the measures taken.*

It also provides for an assessment, prioritisation and categorisation of diseases or disease agents, including where appropriate, the capacity to generate resistance to treatment (e.g. antimicrobial resistance) as criterion to decide about appropriate measures. It contains all the possible measures related to pathogens which can be equally applicable to AMR pathogens (e.g. notification, surveillance, eradication, etc.).

All the above mentioned elements alone and in combination have the potential, and are expected to deliver a more proactive and preventive approach in the EU towards better animal health, i.e. for the control of major transmissible animal diseases. Furthermore, they also contribute to a better husbandry, less pathogen pressure and indirectly, to the reduction of infections in animals. As a result this would lead to a possible subsequent reduction of the need for the use of antimicrobials.

The Transatlantic Taskforce on Antimicrobial Resistance (TATFAR) *resulting from the EU-US Summit Declaration of 3 November 2009 with the goal of improving cooperation between the U.S. and the EU has identified three key areas one of which is focussing on the prevention of health care- and community-associated drug-resistant infections.*

See also road map AMR, and the upcoming progress report for more details on the EU policy.

See also block 4 and 5 as regards the health research projects on this field funded by the European Commission under the 7th Framework Programme and included in the scope of the Joint Programming Initiative (JPI).

d) What are concrete and measurable indicators of progress for this priority? (Including, for example, global and national goals to be achieved within 2, 5 and 10 years)

- *Number of member countries /sectors with appropriate guidelines or protocols*
- *Level of implementation of the protocols/guidelines*
- *Decrease of specific infectious diseases*
- *Decrease of antimicrobial consumption*

III. Building block-3: Optimizing the use of existing antimicrobials for human and animal health and in agriculture

a) What do you consider to be the main issues under this priority?

Antibiotics are a precious global source that should be managed on a sustainable basis. Therefore guidance should be put in place for prudent (responsible, appropriate) use, together with appropriate measures to ensure compliance in both the human and veterinary sector. The main challenge will be to establish in all regions in the world packages of measures resulting in a similar 'AMR safety level' (a similar level of risk of development and spread of antimicrobial resistance by the use of antimicrobials).

In the human sector, irresponsible use of antibiotics including over- or under dosing, use of the wrong type of antibiotic, e.g. the use of antibiotic to treat infections that are not caused by bacteria, and poor-quality antibiotics are major issues.

In the veterinary domain, guidance should balance the need to minimise the risk to man arising as a result of use of antimicrobials in animals with the need to ensure sufficient availability of antimicrobials to treat infectious diseases in animals. Whilst the overall use of antimicrobials in animals should be reduced, care needs to be taken that antimicrobials are still available to treat sick animals as "healthy animals make healthy food".

Main issues in developing countries/LMIC

Existing evidence suggests that low and middle income countries are disproportionately affected by substandard and/or falsified medicines available on the market. Reasons that may influence this growing problem are:

- *Complex international supply chains, including for manufacturing components;*
- *Weak regulatory oversight in some countries (inadequate capacity of National Medicines Regulatory Agencies (NMRAs));*
- *Possible access to affordable medicines in non-formal markets*
- *Lack of public awareness on health risks of AMR*
- *Lack of access to information/information sharing on identified substandard and falsified medicines (including between developed and still developing NMRAs).*

Even if the [2012 MGD Gap Report](#) notes that access to medicines in some regions has hardly improved in the recent years, unavailability of medicines in some developing counties is still a problem. Reasons for unavailability of medicines include:

- *Regulatory barriers (e.g. costs for preparation of registration; lack of incentives for registration, long registration processing times)*
- *Lack of incentives to market (low volume products)*
- *Inefficient public sector procurement & supply management systems*

- *Fragmented supply chains (including the use of different international procurement agencies by different donors; many intermediaries)*
- *Unreliable/delayed release of funding (donors & government)*
- *Difficult to reach areas (geographical, seasonal)*

The role of NMRAs in developing countries: Governments are responsible for protecting the health of their people. Governments therefore establish NMRAs with the mandate to safeguard public health by ensuring that pharmaceutical products available on the market are safe, effective and of assured quality. This also applies to the majority of developing countries, where NMRAs have been set up either as autonomous agencies or within the Ministry of Health institutional set up. However, these authorities tend to suffer from a lack of political and financial support by their governments contributing to the overall capacity constraints impacting fulfilment of their mandate (See e.g. The World Health Organization: Assessment of medicines regulatory systems in sub-Saharan African countries - An overview of findings from 26 assessment reports; WHO, Geneva, 2010).

b) What are the main actions that needs to be done -- and who are the main actors/stakeholders who need to take action -- to go beyond the status quo?

- *Countries should be encouraged to develop and implement global national strategies or action plans for countering AMR and to ensure the prudent use of antimicrobials. The strategy should consist of a comprehensive set of actions including prevention of disease, surveillance programs, risk communication strategies, risk management measures, regulatory measures, research, etc. The strategy/plans should take into account the specific situation in the country (e.g. infectious diseases, prevalence of food borne pathogens, patterns of resistances, etc.).The national strategies may include targets or appropriate indicators to monitor achievements.*
- *Ensure at a global level that antimicrobials are only supplied by professionals with sufficient training in the responsible use of antibiotics; this will require training those actually delivering health products at the point of need (nurses, animal health auxiliaries).*
- *Development of guidance for prudent use of antimicrobials at all levels in the human and veterinary sectors; whilst general guidance can be created at international, regional and national level, specific guidance can only be developed at regional/local level to take into account the characteristics of the health and farming system and local patterns of resistance and availability of antimicrobials.*
- *Put in place harmonised monitoring systems for the sale and use of antimicrobials in both human and veterinary medicine.*
- *Put in place surveillance systems for the harmonised monitoring of antimicrobial resistance in humans, food and animals,*
- *Secure the supply chain for antimicrobials to prevent entry onto the market of poor quality or counterfeit medicines.*
- *Ensure the prudent and appropriate use of antimicrobials for the purpose of treating and preventing infections.*

- *Public information campaigns to educate and inform the public (see also block 1).*
- *Coherent participation in the WHO Substandard/spurious/falsely labelled/ falsified/counterfeit medical products (SSFFC) member states mechanism: Develop a joint Member States position in support of the WHO SSFFC member states mechanism that is based on promotion of public health and de-linkage from intellectual property issues, and recognises capacity constraints of developing countries. Ensure that the final work programme of the SSFFC mechanism will include capacity building of developing countries regulatory authorities.*
- *In the context of budget support use political and policy dialogue to put NMRA capacity strengthening on the agenda (including provision of financial resources and adequate staffing plans). Prioritising NMRAs in national health strategic plans could be made conditional for budget support.*

c) What steps have already been taken to address this priority? (please provide references where possible)

Detailed information on the EU activities is described in the [Road Map](#) and the progress report of the EU AMR Action Plan.

See specific activities under Action 1, 2, and 3. See also [GRACE](#) and [APRES](#) research projects funded by the EC.

d) What are concrete and measurable indicators of progress for this priority? (Including, for example, global and national goals to be achieved within 2, 5 and 10 years)

Concrete and measurable indicators of progress for this priority may include:

- *Number of regions and countries with legislation controlling the supply and use of antimicrobials in human and veterinary domains.*
- *Number of countries or regions that have developed and implemented global national strategies for prudent use of antimicrobials in humans and animals.*
- *Number of regions and countries with prudent use guidance in human and veterinary domains.*
- *Number of regions and countries with systems in place for monitoring sales and use of antimicrobials in man and animals.*
- *Number of regions and countries with surveillance systems in place for the harmonised monitoring of antimicrobial resistance in humans, food and animals.*
- *Number of regions and countries not allowing the use of antimicrobials as growth promoters in animals.*

IV. Building block-4: Identifying and closing critical gaps in knowledge needed to address AMR

1) What do you consider to be the main issues under this priority?

2) What are the main actions that need to be done -- and who are the main actors/stakeholders who need to take action -- to go beyond the status quo?

- *An ever-increasing range of drugs to treat infections caused by bacteria, parasites, viruses and fungi are losing their effectiveness. It is crucial to find ways to use these valuable drugs more wisely, understand the mechanisms and transmission of resistance and to develop new drugs and treatments to cure resistant infections*
- *AMR represents a serious threat to global public health, and new resistance mechanisms emerge and spread globally. This implies that global action across all sectors and society is needed.*
- *AMR threatens human health, but also animal health and the environment. A One-health approach is needed since this problem cannot be successfully tackled through isolated sectorial efforts.*
- *Prevention of infectious diseases is key to reducing the use of antimicrobials and to combat AMR. Vaccination and identifying ways to reduce health care associated infections can support prevention.*
- *As regard the use of antimicrobials in veterinary medicine, it is not clear to which extent resistant organisms originating from use of antimicrobials in animals represent a threat to human health. Better understanding of this transmission process should help to identify those links in the chain where interventions can be most effective.*
- *Joint working between human and veterinary sectors to analyse the risk chain and identify critical points and the types of intervention that break transmission.*
- *Reliable and comparable data on AMR and on the use of antimicrobials in human and veterinary medicine is essential for evaluating the trends and sources of AMR, both for the risk assessment process and research purposes and for the evaluation of the effectiveness of the measures in place. For this purpose, the establishment of integrated surveillance systems for the monitoring of AMR in humans, animals and in the food chain, including the creation of an (official) network of laboratories and a database is essential. The results provided by the surveillance systems should be based on internationally standardised methodologies and clear internationally standardised interpretative criteria.*

3) What steps have already been taken to address this priority? (please provide references where possible)

- *EFSA, EMA and ECDC have published in the last years several publications on AMR. The complete list of these publications will be provided in the annexes of the progress report mentioned before, to be published in October 2014.*
- *The Joint Opinion on antimicrobial resistance (AMR) focused on zoonotic infections ([ECDC, EFSA, EMA, SCENIHR, 2009](#)), provides a chapter on the areas where innovation and research should be encouraged in order to address existing problems caused by AMR.*

- *The European Commission has prioritised research to combat antimicrobial resistance over three successive Framework Programmes for Research starting from FP5 in 1999 through to FP7 and Horizon 2020 today. The EU has awarded nearly €950 million to transnational collaborative projects on antimicrobial resistance, most in the area of human health, but also in the areas of animal health, food and the environmental. This includes around €155 million for AMR research supported via the [Innovative Medicines Initiative](#). This is supplemented by a €165 million contribution from the pharmaceutical industry. The research priorities address all pathogens (bacteria, virus, fungal and parasites) and takes a "One Health" approach in addressing the following aspects:*
 - *Understanding the mechanisms and transmission dynamics of resistance;*
 - *Development of diagnostics;*
 - *Development of therapeutics and alternatives including vaccines;*
 - *Improved surveillance systems;*
 - *Understanding the role of the environment, animals and the food chain in the development and spread of AMR;*
 - *Development of interventions to prevent acquisition and transmission of AMR pathogens.*
- *With support from the European Commission a Joint Programming Initiative on AMR (JPIAMR) has been set up, bringing together 17 European countries, Israel and Canada to coordinate their research efforts.*

The first transnational joint call of JPIAMR was launched end of January 2014, and under its research and innovation funding programme, Horizon 2020, the EC plans to support a transnational research call of the JPIAMR via the ERA-NET co-funding scheme. In April 2014 the JPIAMR launched its [strategic research agenda](#) identifying 6 priority topics for research to combat AMR. These could serve well as a model for research priorities for the WHO GAP.

- *Surveillance networks of antimicrobial consumption in [humans](#) and [animals](#) have been established in the EU. Annual reports on the results of the surveillance systems provided by the Member States are published by the relevant EU agencies (ECDC and EMA).*
- *Surveillance networks of antimicrobial resistance in [human](#), [animals](#) and in the [food chain](#) have also been established in the EU.*

In order to improve and harmonise the surveillance systems in the veterinary and food sector, the Commission has laid down, based on an [EFSA opinion](#), the legal requirements for the harmonized [monitoring and reporting of AMR](#) in zoonotic and commensal bacteria. Annual reports on the data obtained by the surveillance systems and the harmonized

monitoring provided by the Member States are published by the relevant EU agencies ([EFSA](#) and [ECDC](#)).

- *In the EU, an official network of laboratories for Antimicrobial resistance has been created for the monitoring of AMR in the food chain. The network is composed of the European Reference Laboratory for AMR ([EURL-AR](#)) and the National Reference Laboratories appointed by each Member State.*
- *At international level, the international guidance on risk assessment related to transmission of resistance through foodstuffs of animal origin has already been developed by Codex Alimentarius.*
- *Likewise, guidance on the pre-approval information for registration of new veterinary medicinal products in relation to AMR has been developed by the International Cooperation on Harmonization of Technical Requirements for Registration of Veterinary Medicinal Products (VICH).*

4) What are concrete and measurable indicators of progress for this priority? (Including, for example, global and national goals to be achieved within 2, 5 and 10 years)

See also building block 5:

- *The development and implementation of national research strategies*
- *Further increase in research funding to tackle main priority areas*
- *Number of publications and patents generated*
- *A widening participation and increased investment in the JPIAMR (In this context it is important to note that Australia, Argentina, India, and South Africa have already expressed an interest in participation).*
- *An increase in the number of antimicrobial drugs, vaccines, alternative treatments and diagnostics reaching the market*
- *Development of harmonized surveillance systems able to provide reliable and comparable data on the use of antimicrobials in human and veterinary medicine and on the occurrence of AMR in humans, animals and in the food chain.*
- *Number of countries implementing such surveillance systems, including laboratory capacity.*

V. Building block-5: Developing an innovative and sustainable approach to develop and distribute critical products and technologies needed to address AMR

a) What do you consider to be the main issues under this priority?

b) What are the main actions that needs to be done -- and who are the main actors/stakeholders who need to take action -- to go beyond the status quo?

- *Industrial investment in antimicrobial drug development has declined considerably over the past decades. Public and private partners need to work together to revitalise the drug development pipeline.*
- *Novel business models are needed which incentivise investment in antibiotic R&D while delinking it from sales volumes to promote responsible use.*
- *Clinical trials should be optimised and clinical trial capacity should be increased to support drug development.*
- *Novel and rapid diagnostics are needed to promote a better use of current and new antimicrobials.*
- *Support to translational research is relevant in this context.*

c) What steps have already been taken to address this priority? (please provide references where possible)

A number of partnerships and tools have been implemented by the Commission under the EU Framework Programme for Research and Innovation to stimulate the development of new product and technologies such as;

1. *Public-Private partnerships: The Innovative Medicines Initiative*

- a) The Innovative Medicines Initiative (IMI), a Joint Undertaking between the European Union, represented by the European Commission (DG RTD) and EFPIA is the biggest public–private initiative in Europe. Within the IMI, the New Drugs for Bad Bugs (ND4BB) programme was launched in May 2012 as a rapid response to the launch of the EU Action Plan.*
- b) The [ND4BB](#) is a programme in which academic and other public partners, SME's and the pharmaceutical industry join forces to spur the development of new antibiotics¹. Since the launch of this programme, seven ND4BB projects with a total committed budget of more than € 600 million have either started or are under development.*
- c) ND4BB Topic 4 focuses on the urgent need to develop a new business model for antibiotic development that will reinvigorate investments in this vital area while also addressing the issue of the responsible use of antibiotics. This new project will develop concrete recommendations for new commercial models that provide industry with an incentive to invest in this area while ensuring that new antibiotics are used wisely. The project is under development and will be launched in 2014.*

2. Specific funding schemes to boosting AMR research in SMEs

- a) Seven of 15 AMR research projects launched last year specifically harness the potential of small and medium enterprises to develop novel antibiotics, vaccines or alternative treatments for drug resistant microbial infections.
- b) The 15 new projects directly support the work of 44 innovative SMEs.

3. Public–public partnerships

- a) Joint Programming Initiative on AMR (JPIAMR). See building block 4. The first call under JPI aims at developing new drugs;
- b) EDCTP
The European & Developing Countries Clinical Trials Partnership (EDCTP) a public –public partnership between the EU, 15 European countries and 9 Sub Saharan Countries aims to accelerate the development of new or improved drugs, vaccines, microbicides and diagnostics against HIV/AIDS, tuberculosis and malaria, with focus on phase II and III clinical trials in sub-Saharan Africa.

4. Inducement Prizes

To foster innovation in the area of research in diagnostics, the Commission will launch at the beginning of 2015 one of the first inducement prizes under Horizon 2020 aimed at boosting the development of a rapid point of care test to identify patients with upper respiratory tract infections that can safely be managed without antibiotics.

4) What are concrete and measurable indicators of progress for this priority? (Including, for example, global and national goals to be achieved within 2, 5 and 10 years)

- The development and implementation of new business models that accommodate for cheaper and faster routes for drug development;
- The development of clinical trial networks to support drug development;
- The increase in the number of pharmaceutical companies which return to this field;
- The increase in the number of SME's which work in this field;
- The increase in the number of antimicrobial drugs, vaccines, alternative treatments and diagnostics reaching the market;
- The increase in the number of countries/regions with global access to life-saving novel antibiotics.

VI. Building block-6: Assessing the long term economic, developmental and social costs and implications of AMR as a basis for sustainable investment and action

Antimicrobial resistance leads to the loss of many advantages in medical care that antimicrobials have enabled (for example cancer therapy). Health services and systems will be substantially impacted if resistance becomes endemic and effective antibiotics are lacking.

Antimicrobial resistance is not solely a public and animal health threat, it has also a global economic impact. Firstly, AMR impacts health systems by increased morbidity and mortality from untreatable or difficult to treat infections, secondly by its impact on human health affecting labour productivity, output and economic growth. Overuse or misuse of antimicrobials (co)-financed by public health systems is also an unnecessary cost.

Insufficient data exist on potential economic and social costs of AMR. Better estimates of AMR's current and estimated economic impact can provide an appropriate base for determining the proper level and balance of required investments and measures to counteract AMR by governments and society; in particular it will help to evaluate the cost/effectiveness of measures to address AMR. The hard data to result will also help galvanize long-term commitment globally.

The establishment of a global agreement on model(s) to estimate the economic and social impact of AMR is one of the main actions to be done in this field and one of the concrete indicators of progress for this priority.

The Commission is assessing the possibilities of having an OECD study on the economic and social impact of AMR in OECD countries.

Data about the cost in Europe of AMR can be found at the [Technical report The bacterial challenge: time to react](#) of ECDC and EMA of 2009.

Concluding questions

3. What contribution would your organization be able to make in implementing the global action plan?

The EU and its 28 Member States have warmly welcomed the Resolution WHA67.25 adopted by the 67th World Health Assembly calling the WHO to lead the process to develop a Global Action Plan (GAP) to address AMR.

As expressed during the WHA of May 2014, the EU will engage actively and constructively in the process of developing the plan, sharing our experiences and supporting capacity building wherever possible. It is the Commission's firm commitment to ensure optimum implementation of the future GAP.

The specific contribution as well as other details of the Commission's participation in the implementation of the GAP could be bilaterally discussed with WHO in order to ensure the best support.

4. Additional input that you feel would facilitate development of the GAP.

See question 3.