Open consultation 19 January – 16 February 2024

Consultation report of the Roadmap of Actions

European Partnership on One Health Antimicrobial Resistance

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DESIGN OH AMR

Contents

Background

In response to the urgent threat of antimicrobial resistance, the European Partnership on One Health Antimicrobial Resistance (OHAMR) is one of the key European partnerships that has been identified within the framework of the Horizon Europe Research and Innovation (R&I) programme[1] to contribute to the objectives of the EU One Health Action Plan against AMR[2] and to the recent recommendation on "stepping up EU actions to combat antimicrobial resistance in a One Health approach", adopted by the Council of the European Union (EU)[3], as well as by European Parliament[4] on 1 June 2023. Both documents state the importance of research and innovation for the development, evaluation and implementation of measures against AMR. OHAMR is foreseen to start in 2025 and will deploy a research and innovation (R&I) programme, co-funded by the EC and the OHAMR partners. In order to prepare for the OHAMR partnership, the EC has granted a coordination and support action (CSA), DESIGN OH AMR, lasting from 1 May 2022 to 30 September 2024. A first draft Scientific Research and Innovation Agenda (SRIA) of OHAMR was published in May 2023[5], defining the overall goals, strategy and objectives of OHAMR. The SRIA is currently under revision and a new draft will be subjected to an open consultation during the spring of 2024.

[1] *Horizon Europe Work Programme 2023-2024, Health*
[2] *EU One Health Action Plan against AMR (2017).*
[3] *Council Recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health approach (2023)*
[4] *EP resolution on Prudent use of antibiotics and more research needed to fight AMR (2023)*
[5] *Draft SRIA of the European Partnership on One Health AMR (May 2023)*

The Roadmap of Actions, the development process and the consultations performed to complete the first draft

The OHAMR Roadmap delineates the actions that will be undertaken, during the lifetime of the partnership (2025-2032), to achieve the objectives of the SRIA. The Roadmap of Actions will be implemented through an Annual Work Programme for each year, providing a more detailed description of the planned actions.

The OHAMR Roadmap of Actions is structured around three main Focus Areas, which will be executed through four Programmes.

The following focus areas have been identified:

1. Prevent emergence and spread of AMR
2. Strengthen appropriate use of antimicrobials and infection prevention and control
3. Provide innovative and cost-effective treatment options

The OHAMR actions of these focus areas will be implemented through 4 programmes:

a) The Research and Innovation Funding programme
b) The Capacity Strengthening Programme
c) The Data Exploitation Programme
d) The Impact Programme for Knowledge Mobilisation

This Roadmap has been developed by partners in the CSA DESIGN OH AMR, with the contribution of JPIAMR members, additional funders who have expressed interest to join OHAMR, as well as other experts and relevant stakeholders.

The Focus Areas of the Roadmap is based on the Research and Innovation Objectives of the OHAMR SRIA[6], which were developed by five thematic working groups covering Therapeutics, Diagnostics, Surveillance, Transmission and Evolution, and Interventions for prevention and mitigation. A series of consultations with various stakeholders were performed during the development of the Research and Innovation Objectives. The working groups consisted of the JPIAMR Scientific Advisory Board and additional scientific experts and the members of the working groups also played an important role in the refinement, combination and prioritisation of the objectives into focus areas and potential topics, during a workshop in Berlin 15-16 May 2023. The outcomes of the workshop are detailed in a report[7]. The R&I Funding programme is based on the work by a working group for a portfolio of potential funding instruments, including two workshops and a survey directed to funders and the research community. More details can be found in a published report[8].

[6] *Draft SRIA of the European Partnership on One Health AMR (May 2023)*
[7] *Prioritisation Workshop Report, Berlin 15-16 May 2023*
[8] *Report Portfolio of Funding Instruments for the OHAMR Partnership*

Four working groups were formed in November-December 2023 to further develop the four programmes of the Roadmap. These working groups consisted of representatives from funding organisations that have expressed interest to join OHAMR, JPIAMR members and additional experts nominated by member countries.

In addition, the following consultations and meetings have taken place to obtain feedback on the content of the Roadmap:

Date	Participants	Format
30 Aug 2023	JPIAMR Steering Committee	Meeting
Sept 2023	DESIGN OHAMR consortium	Written feedback and consortium meeting 29 Sept
Sept 2023	JPIAMR Scientific Advisory Board (SAB)	Written feedback and SAB meeting 14 Sept
Sept-Oct 2023	EPHA AMR Stakeholder Network	Meeting 19 Sept and written survey
3 October 2023	EU agencies (EFSA, ECDC, EMA, EEA)	Meeting
13 Oct 2023	JPIAMR Management Board and funders that have expressed interest to join OHAMR	Meeting and break-out room discussions
23 Nov 2023	Innovation agencies	Meeting
Nov-Dec 2023	Other European partnerships	Individual meetings
Nov-Dec 2023	AMR international resource mobilisation organisations in LMICS	Survey
8 Dec 2023	AMR therapeutics international funders	Meeting
19 Jan-16 Feb 2024	Open consultation	Survey

This report contains the feedback received during the open consultation performed 19 Jan-16 Feb 2024. The Roadmap was subsequently revised based on the feedback and published online on 8 March 2024: OHAMR Roadmap of Actions 2025-2032

The Roadmap will feed into the proposal of the OHAMR partnership, which will be submitted in September 2024 and the activities of the programmes will be further developed by the foreseen OHAMR partners. The call topics and activities will be described in more detail in each annual work programme. New topics and activities might be added reflecting scientific and other needs. This version of the Roadmap should be treated as a draft which could potentially be revised during the final preparations of the OHAMR partnership. The final version of the Roadmap will be adopted by the OHAMR partners at the start of the partnership and a revision of the Roadmap is also envisaged approximately three years after the start of the OHAMR partnership.

Open consultation 19 January -16 February 2024

In order to obtain feedback on the draft OHAMR Roadmap of Actions, an open consultation was performed during 19 January to 16 February 2024. Invitations to the consultation were sent to agencies that have expressed interest to join OHAMR, DESIGN OH AMR members, JPIAMR management board and scientific board members and a number of other experts and stakeholders, with the encouragement to spread the information about the consultation in their networks.

Demographic distribution of responders

In total 51 responses were obtained and the demographic distribution of the responders is shown below. The European Commission replied collectively to the survey, but also provided feedback directly on the draft Roadmap document, not included in this report.

Type of responder

The responders could choose if they replied on behalf of their country, organisation or as an individual responder. The majority (64,7 %) replied on behalf of their organisation.

Submitting feedback as	Number of responses
On behalf of my country	6 (11,8%)
On behalf of my organisation	33 (64,7%)
As an individual responder	12 (23,5%)
Total	*51 (100,0%)*

Type of organisation for your affiliation

Most replies were received from funding agencies, followed by universities/research institutes and policy/public agencies.

Type of organisation for your affiliation	Number of responses
Ministry	8 (15,7%)
Funding agency	17 (33,3%)
University/ Research institute	12 (23,5%)
SME	1 (2,0%)
NGO/association/foundation	3 (5,9%)
Policy/ public agency	6 (11,8%)
International or European organisation/ initiative	1 (2,0%)
Other	5 (9,8%)
Total	*53 (103,9%)**

* Several answers were possible

Country of the person/organisation that is submitting feedback

Replies were obtained from 25 different countries, whereof 18 were EU countries. Sweden was the country with the highest number of responders.

Country of the person/ organisation that is submitting feedback	**Number of responses**
Austria	2 (3,9%)
Belgium	4 (7,8%)
Bulgaria	1 (2,0%)
Canada	1 (2,0%)
Czech Republic	5 (9,8%)
Estonia	1 (2,0%)
France	3 (5,9%)
Germany	1 (2,0%)
Hungary	1 (2,0%)
India	1 (2,0%)
Ireland	1 (2,0%)
Italy	4 (7,8%)
Kosovo	1 (2,0%)
Lithuania	1 (2,0%)
Moldova	1 (2,0%)
Netherlands	1 (2,0%)
Poland	1 (2,0%)
Portugal	2 (3,9%)
Romania	1 (2,0%)
Spain	3 (5,9%)
Sweden	9 (17,6%)
Switzerland	2 (3,9%)
Turkey	1 (2,0%)
United Kingdom	2 (3,9%)
Vietnam	1 (2,0%)
Total	*51 (100,0%)*

Questions on the Focus Areas

Information text

The OHAMR Roadmap of Actions are structured around three focus areas (described in section 3 of the Roadmap document)

1. Prevent emergence and spread of AMR
2. Strengthen prudent use of antimicrobials and infection prevention and control
3. Provide innovative and cost-effective treatment options

Each year, a joint transnational call will address one of these focus areas (for more information, please see the R&I Funding Programme, section 4.1 of the Roadmap). In addition, a number of supporting activities (coordinated by the Capacity Strengthening Programme, the Data Exploitation Programme and the Impact Programme for knowledge mobilisation) will contribute to ensure maximum impact and efficiency of the implementation of each focus area.

Do these focus areas provide a logical framework for the OHAMR to address the AMR challenge?

The majority of the responders considered that the focus areas provided a logical framework for OHAMR.

Do these focus areas provide a logical framework for the OHAMR to address the AMR challenge?	**Number of responses**
Yes	47 (92,2%)
No	4 (7,8%)
Total	*51 (100,0%)*

If no, please suggest modifications (max 400 characters)

The following free-text answers were obtained:

- In general they do, but water, sanitation and hygiene (WASH) isn't mentioned neither under the focus areas 1 or 2 which in general contains prevention and IPC. WASH is an excellent way to reduce infections and to reduce the over- and misuse of antibiotics. Not least in health care facilities, but also among communities.
- Prioritization and phrasing of focus areas should be done by peer-review.
- The focus areas are missing the economic incentives and translational landscape required for innovation. In addition, it is important to expand the problem of antimicrobial resistance beyond bacteria, and this needs to be explicitly indicated.
- 1) Prevent emergence and spread of AMR with a One Health approach. 2) Strengthen prudent use of antimicrobials and infection prevention and control in both humans and animals. 3) Provide innovative and cost-effective treatment options for both humans and animals.

- Titles of the Focus areas (FA) are not good representations of their objectives. FA1 appears to focus on a gaining a better understanding of AMR mechanisms. This should be better reflected in the title. E.g. Identify drivers and causes of AM and infection prevention and control. Perhaps extend point 2 of FA: strengthen prudent use of antimicrobials and disinfectants and infection prevention and control.
- 2 almost represents means to achieve 1. They should be further differentiated for clarity. Also, the scope is a bit narrow - the entire care chain should be considered, from prevention in society to health seeking, diagnosis, treatment and follow-up.
- Partially yes. Refer to the specific comments submitted on the roadmap of actions (EC)

Would the potential call topics described in section 3.1-3.3 cover the research and innovation needs for these focus areas?

Around two thirds of the responders considered that the potential call topics cover the research and innovation needs.

Would the potential call topics described in section 3.1-3.3 cover the research and innovation needs for these focus areas?	**Number of responses**
Yes	35 (68,6%)
No	16 (31,4%)
Total	*51 (100,0%)*

If no, please specify what is missing (max 400 characters)

The following free-text answers were obtained:

- In general they do, but water, sanitation and hygiene (WASH) isn't mentioned neither under the focus areas 1 or 2 which in general contains prevention and IPC. WASH is an excellent way to reduce infections and to reduce the over- and misuse of antibiotics. Not least in health care facilities, but also among communities.
- Maybe only the need to stress more the relevance of and the need to conduct research about collaboration between different organizations and policymakers to address the various facets of AMR.
- We suggest that "infection prevention and control" is a separated from "Strengthen appropriate use of antimicrobials". We suggest that "Infection prevention and control" is an individual focus area (3.1), "Prevent emergence and spread of AMR" (3.2) and "Strengthen appropriate use of antimicrobials" (3.3).
- Suggest to move "targets for drugs" under 3.1.3-1a) to 3.3.3-3a). Suggest to include the word "procurement" under 3.2.3-2d. Suggest to add the phrase "Development of more efficient solutions" to the title under 3.3.3-3d.
- Prioritization and phrasing of call topics for projects with immediate commercial outputs should be cone by venture capital peer-review. Prioritization and phrasing of call topics for projects without immediate commercial outputs should be done by academic peer-review.
- I think that more details in testing are needed together with an explanation on tests to determine the effect of alternative strategies. This latter can be also an important topic that lack of standardization, at the moment.

- Provide a framework for collaboration between industry and academia; incorporating economic stimulus for antimicrobials research; innovative translational set-ups and regulatory landscapes.
- In 3a, antifungal resistance could be listed with antiviral and antiparasitic (even thought IMPACT included antifungals as a topic it's likely to remain an important topic in the future). For 3d, only drugs are mentioned. Suggest extending beyond drugs to include new and existing antimicrobials, diagnostics, and alternatives to antimicrobials.
- The term "alternative treatments" is misleading and should be more specific. An explicit mention to phage therapy and the use of enzybiotics should be present, an innovative treatment that circumvents AMR and deserves a strong support - see e.g. the latest concept paper by the European Medicines Agency (http://tinyurl.com/24rs4kj6). Drug repurposing and nanotechnology should also be present here.
- It is important to provide smaller grants for prototypes development for diagnostics and to fund early stage drug discovery. Pharma is not doing this and no-one is providing small seed grants we need lots of scientists trying different paths and target not massive grants for a small number of groups. The large grants only find a few we need early stage seed funding for many researchers.
- There is a lack of acknowledgement of cultural factors as a cause of, and potential mechanism for change, in AMR emergence and infectious disease spread. Further, it is unclear how a truly One Health approach is being considered. Just adding in the phrase 'OH sectors' does not make the call OH, how are factors such as culture, natural environments and economics being considered.
- A topic on the technological issues of system interoperability, common data models, link with EHDS, etc would be much appreciated and highly useful in order to ensure the alignment with the future EHDS and the interoperability of all the stakeholders.
- The One Health approach; this goes beyond OH sectors.
- Consider reassignment of topics to focus areas (FA 1 and 2). In 3.2 strengthening innovation in diagnostic laboratories/national reference centers is missing. In 3.3 innovative approaches (e.g. large molecules and phage therapy), as well as approaches involving the host side is missing. In 3b add studies on the role of disinfectants on enrichment of disinfectant-antibiotic co-or multi-resistance.
- Topic 1: Evaluation of different interventions to increase implementation/uptake of interventions 2c and 2d: Evaluation of incremental efficacy and cost-effectiveness of different IPC and stewardship interventions, including implementation interventions. 3c and 3d: add study of economic/market interventions beyond incentives and regulations.
- It would be useful to promote studies optimizing treatment efficacy of older antimicrobials, e.g by spectrum, dosage or intervals. I also suggest including an ecological perspective among the calls, e.g optimizing antimicrobial treatment with regards to side effects on the patient microbiota, or develop modalities to limit such unwarranted effects.
- Yes, in principle. This question has limitations since the partnership will be implemented with a 7 years programme. The roadmap describes several topics as examples, but during the implementation of the partnership other topics, more relevant than those included in this roadmap, could be identified and selected for actions. Some more specific comments in the roadmap document.

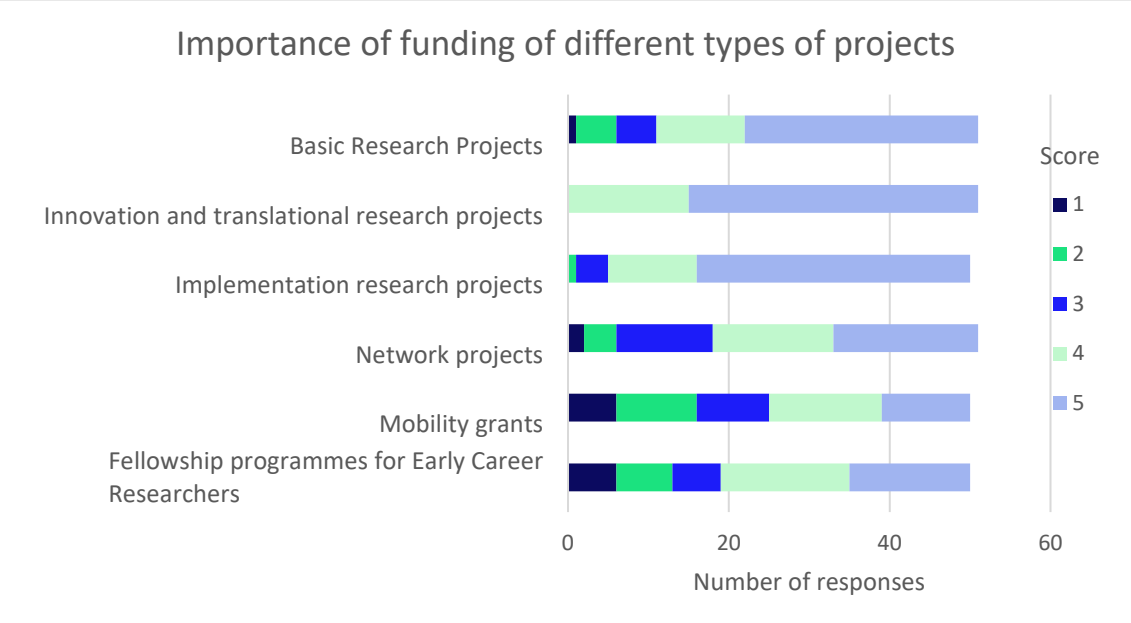
Questions on the Research and Innovation Funding programme

Information text

The R&I Funding programme is described in section 4.1 of the Roadmap document. Joint transnational funding of research and innovation (R&I) activities will be the main action to achieve the objectives of OHAMR. The aim of the R&I funding programme is to develop and implement an annual call for R&I projects and networks covering a combination of topics from one focus area and several funding instruments. In addition to the funding of the research activities, measures to support capacity strengthening, mobility, data/resources sharing, knowledge transfer and valorisation will also be integrated in the calls.

How important do you consider it would be to fund the following types of projects? Please grade from 1 (not so important) to 5 (very important)

The responders were asked to score the importance of the different type of project from 1 to 5. Innovation and translational projects received the most 4 or 5 scores, followed by implementation research projects. Mobility grants and Fellowship programme received the most 1 or 2 scores.



Do you have any suggestion on additional types of grants that OHAMR could support?

- Grants to support involvement of stakeholders and policymakers into permanent network platforms linked to the scientific community
- starting grants to start research group
- Clinical projects covering the needs of patients, which will influence single person, but also whole society - important from the public health point of view. Unless, it is covered in “Innovation and translational research projects”.

- no limitation for eligibility e.g. public and private consortia; university and hospital consortia
- Clinical trials are not considered explicitly and I think this should be a funding area to be considered.
- Interdisciplinary Research Grants: Offering grants to support collaborative research projects that involve multiple disciplines, encouraging cross-disciplinary innovation and problem-solving.
- Seed funding for blue sky research, prototype development and chemoinformatic informed drug discovery projects
- Developing new technologies for One Health support based on AI
- Czech Health Research Council (the Ministry of Health as a funding organization) can support mainly applied research with a combination of basic research.
- Attending the needs of the R&I programme, I think the design is sound.
- sandpit grants;
- Strengthening laboratory infrastructure in LMICs, uptake of quality programs in lab testing for AMR
- (Basic) research projects earmarked for specific topics within the calls (e.g.) focus on implementation or policy evaluation
- A recent report from the AMR Industry Alliance shows a worrying trend of declining AMR R&D workforce. Opportunities for basic research would be an important step to improve these conditions and futureproofing the AMR R&D workforce.
- When developing topics suggestion not to overlap with existing instruments.

Do you have any additional comments on the R&I Funding programme?

The following free-text answers were obtained:

- It is very important that industry are included in the R & I programme.
- Only one bullet point under 4.1.2.3, should there be more?
- The recommended project duration is at least 48 months, taking into account: - duration of doctoral studies; - need of translation and implementation of results.
- Please do consider the inclusion of pathogens other than bacteria. For instance, most programs ignore the risks of resistance in fungi and eukaryotic parasites, but those will become more prevalent and important in the near future (and in the light of climate change).
- There is some variety in the use of different terms for determinants of health and suggest consistency for example, Topic 1a lists molecular, behavioural, ecological, social, societal, economic and environmental factors, whereas Topic 2a lists social, societal, cultural, systemic, economic and behavioural.
- Someone needs to find the drug discovery. Pharma is not doing it. Industry partnership can fund development, but drug discovery for antimicrobials needs to be funded in academia as Pharma aren't doing this.
- SMEs should be also funded in the context of research projects to translate results into products to foster innovation in EU.
- Having one annual call to cover one focus areas seems to silo the Focus areas and keep them apart which goes against the concept of one Health - Would it be better framing to provide support across the Focus areas each year?

- The Czech Republic supports the widening process within the Joint Translational Calls. It means the Widening countries will have a chance to join the successful projects after the first or second stage if they are unsuccessful with their projects (so-called hop on calls).
- Basic research on new candidates for antimicrobial substances is much relevant and one of biggest challenges. Basic research not so specified what it could include. Funding for Network could be specified, and how it relates to actual outputs.
- The quality of the consortium should also be a criterion; 12 months for a 2-stage call is in my opinion not feasible.
- Measures should be taken to avoid over-submission from individual countries, for example to set a minimum of number of funded projects rather than a minimum budget.
- The main interest of most funding organisations is to fund research projects, and their budget was planned accordingly. Please keep this in mind. If the partnership decides to implement several different types of grants each year, with the same budget from the funding organisations, it will spread very thin.
- Important to support also with knowledge, not only money. Also that you can apply as an SME and not huge consortium that requires a lot of management.
- Suggestion to avoid overlaps with efforts done elsewhere (with European and National instruments) and utilise the partnership with a funding programme which is unique and complements other programmes.

Capacity Strengthening Programme

Information text

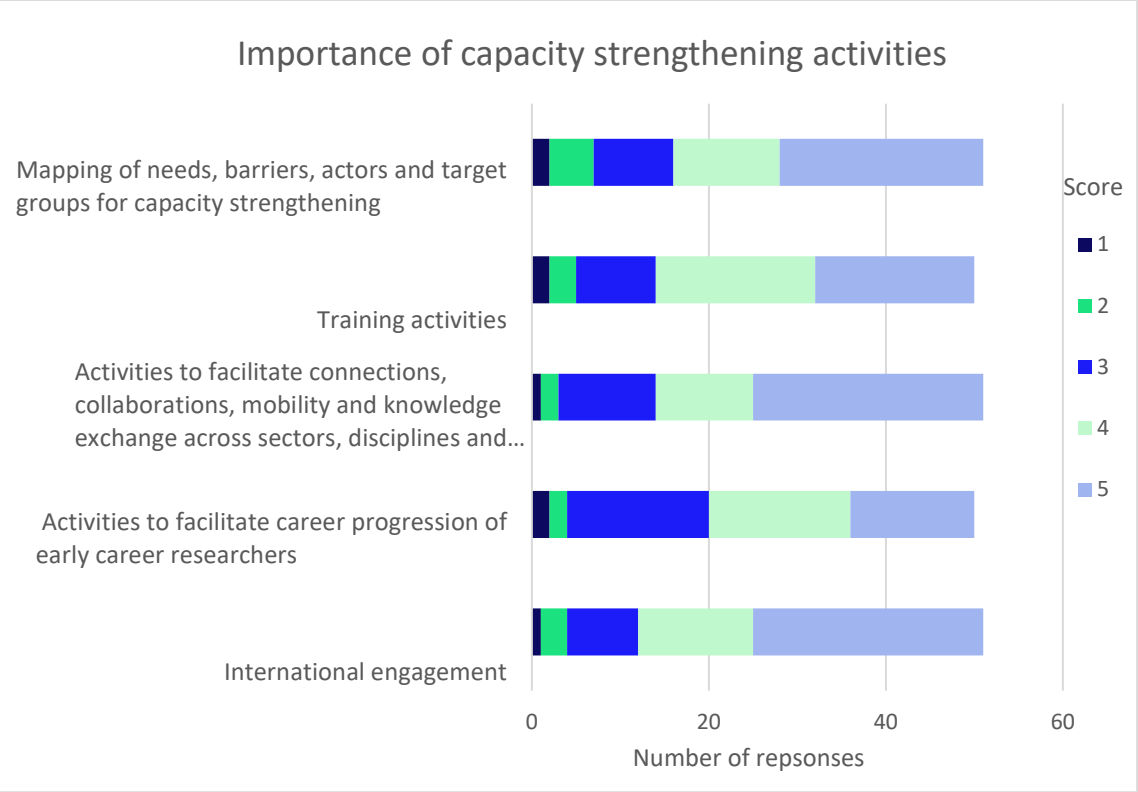
The Capacity Strengthening Programme has the overarching aim to strengthen the European Research Area (ERA) and leverage the capacity of AMR researchers of different career stages and from diverse scientific backgrounds, OH sectors, professional sectors and geographic origins. A special focus will be put on Early Career Researchers and researchers from widening countries and low- and middle-income countries (LMICs).

The objectives of the Capacity Strengthening programme will be:

1. To leverage technical and non-technical skills needed to meet the AMR challenges.
2. To strengthen the collaboration, knowledge exchange and mobility between researchers of different scientific disciplines, OH sectors, professional sectors and countries in EU and beyond.
3. To create a viable and sustainable AMR research community, including the support of ECRs as an important segment of this community.
4. To promote international engagement and research capacity strengthening in under-represented countries (including widening countries) and in LMICs, in order to meet the global challenge of AMR.

How important do you consider that the following activities would be to strengthen research capacity in EU and beyond? Please grade from 1 (not so important) to 5 (very important)

The responders were asked to score the importance of the different capacity strengthening activities from 1 to 5. The scores were quite similar between the different activities, with the highest numbers of score 4 and 5 for international engagement.



Are there any of the activities that are described in more detail in section 4.2.1.1-4.2.1.5 that you consider particularly important?

The following free-text answers were obtained:

- Training activities to increase the understanding of needs and requirements for uptake of research results, including engagement with end-users, policymakers and civil society, as well as exposure to real-world settings (in collaboration with the Impact programme, other partnerships and stakeholders).
- Activities to facilitate connections, collaborations, mobility and knowledge exchange across sectors, disciplines and countries (international collaboration between countries and researchers is crucial for scientific development in this area); - Mapping of needs, barriers, actors and target groups for capacity strengthening; -Training activities (such activities can involve countries with different incomes and do not require large investments (especially if conducted online). Raising and standardizing the qualifications of scientists, as well as unifying research procedures and methods, is crucial to obtaining comparable results and increases the possibility of their reuse)); - Activities to facilitate career progression of Early Career Researchers (very

important due to the need to educate a new generation of researchers in different countries and at the same time establish international cooperation).

- Training activities, international engagement.
- Yes, I think that connections and collaborations between research, industry and regulatory authorities is essential.
- 4.2.1.1 Mapping of needs, barriers, actors, and target groups for capacity strengthening; 4.2.1.2 Training activities (Training in advanced technologies that would enable cutting-edge research and innovation to advance the AMR field; Training in interdisciplinary and intersectoral research methodology – especially with regards to conducting research across multiple One Health sectors; Training activities to increase the understanding of needs and requirements for uptake of research results, particularly for basic scientists who typically see peer reviewed publications/conferences as the major route to knowledge translation; Training in data stewardship and FAIR data management); 4.2.1.3 Activities to facilitate connections, collaborations, mobility and knowledge exchange across sectors, disciplines and countries (Activities to promote match-making of researchers of different disciplines, OH sectors and countries, as well as representatives from the private sectors and end-users; Joint start-up, mid-term and final workshops to promote collaboration with projects funded under the same call; Active approach to reach researchers outside the traditional scope of the partnership, such as social scientists, economists and implementation scientists, and to engage end-users to participate in the OHAMR consortia); 4.2.1.4 Activities to facilitate career progression of early career scientists (Establishment of a network of ECRs participating in R&I projects funded under the same call, to connect the researchers of the future. 4.2.1.5. International engagement (incentives and/or financial support for researchers from LMICs and under-represented countries to participate in project consortia, evaluation panels and training and networking activities; bidirectional knowledge exchange, sharing of best practices).
- Partner-search tools; training in communication, dissemination, exploitation; networks of ECRs participating in R&I projects.
- Activities to promote match-making of researchers of different disciplines, OH sectors and countries, as well as representatives from the private sectors and end-users. This activity can be implemented in part with the future pandemic preparedness Partnership.
- 4.2.1.1. (Mapping of needs, barriers, actors and target groups for capacity strengthening).
- Engagement of projects inside of each country.
- Discipline hopping awards- mix disciplines / policy fellowships – experience and make links from research to policy.
- The Training Activities package sounds very good and should be prioritized. Learning new things often also means networking and generating your own ideas to continue working on.
- As the programme is designed, I find International engagement particularly important, with the component of alignment/engagement with other programmes/initiatives being of special interest.
- No
- Training and mentorship programme.

- Training activities are important for building AMR R&I capacity, but perhaps a task more suited to national institutions (universities, sector-specific industries etc.).
- 4.2.1.3 (Activities to facilitate connections, collaborations, mobility and knowledge exchange across sectors, disciplines and countries).
- Actions supporting trans-sectoral mobility (i.e. between research and policy) can enhance both career prospects of academics as well as enhance evidence-based policy making capacity in public policy.
- Early Career progression and networks are important.

Do you have any experience of successful capacity strengthening activities that you would like to recommend?

The following free-text answers were obtained:

- Training activities and activities to facilitate connections are supported in other sectors: we manage some of them: e.g. European Food Risk Assessment (EU-FORA) Fellowship Programme (EFSA); European Innovation Partnership for Agricultural Productivity and Sustainability (national for the Ministry).
- The UK PACE initiative will provide training and support for industry academia as it will provide wrap around support for funded projects.
- Participation in the international courses organized by EMBO or FEBS - enabled to learn state of the art approaches to solve scientific problems and started new collaborations.
- Yes, training in translational medicine and business creation are very effective.
- Capacity strengthening workshops for early career researchers and New Investigators Forums. This Forum aims to support the next generation of researchers to achieve the highest possible level of scientific excellence. It provides opportunities for networking and the professional development activities and discussions are designed to address to the unique challenges faced by ECRs.
- Establishing mentorship programs where experienced professionals provide guidance and support to early-career individuals can be highly effective in building capacity. This one-on-one interaction allows for personalized learning and skill development.
- Networking support - funding to get together for proposal writing.
- Yes, through a joint project with University of Antwerp implemented in Kosovo (2012-2015), long-term collaboration with ECDC and WHO and current project with ICARS about implementation research on antimicrobial stewardship in primary care.
- Sharing resources as a condition for funding and truly open data sharing of result.
- You may want to look (again) at the approach taken by One Health EJP.
- Peer to peer exchange of experience.
- Find the regular ECRAID webinars valuable, as well as the ESCMID courses for researchers. Both of these activities could serve as role models.
- The ECDC/HEARA/2021/024 ECD.12241 grant issued by ECDC and continued through the call EU4H-2022-DGA-MS-IBA-01-02 allowed the creation of the RELECOV Network in Spain, which allowed WGS-based surveillance of SARS-CoV-2 strains at a National level.

- NWO has experience with matchmakings; organizing scientific conferences with workshops and panel discussions regarding ECRs, career perspectives etc.; individual grants from our talent programme and prizes.
- ISO programs on lab quality, lab accreditation programs.

Do you consider that anything essential is missing from the Capacity Strengthening programme?

The following free-text answers were obtained:

- No
- No
- No
- No
- I think that considering "human health" in the larger context of planetary health is important.
- No
- The set-up of a sustainability plan that ensures the benefits of the capacity strengthening program endure beyond its duration. This may involve building local capacity to continue program activities, fostering partnerships, securing resources, and integrating lessons learned into institutional practices.
- No
- Funding that specifically enables interdisciplinary approaches and builds capacity at disciplinary boundaries would be beneficial to AMR research. This could enable integration of technological developments with social science and humanities to ensure interventions are designed in which careful consideration has been given to the target communities and the social and cultural contexts.
- Consider to relate to or include Train of trainers programs.
- I cannot find calls/topics destined to fund transverse facilities which support the activity. If we aim to tackle the already important problem of AMR and its future, we should help build lasting infrastructures and not only researcher networks. HealthCare systems and surveillance oriented public bodies will not engage with no funding oriented for them, and our scope would be seriously shortened.
- No
- @international engagement; looking also beyond under-represented countries, widening countries and LMICs towards other big players in the field of One Health and AMR for exchange of knowledge and sharing best practices.
- It’s important to strengthen capacity of lab staff on AMR testing. In addition, data should get digitized for ease of surveillance. Surveillance should get unified across all domains of One Health.

Do you have any other comments on the Capacity Strengthening programme?

The following free-text answers were obtained:

- Considering lay communication and education must be a part of the program.

- Beyond a possible mentorship program for ECRs to support their career progression, a mentorship program to help researchers across career stages to improve the mentorship experience of their trainees (e.g. post-doctoral researchers) would be valuable to support the next generation of scientists.
- Take into consideration also sustainability, impact in policy and implementation, and adaptation.
- The language used in the document at times excludes non-STEM disciplines. For example: 'AMR researchers of different career stages and from diverse scientific backgrounds' should instead say from 'diverse research backgrounds'. 'Engaging with scientific disciplines' should be 'engaging with disciplines' It needs to be clear that social sciences and humanities approaches are to be supported here.
- The first: "mapping" should be a part of any project or activity prior to initiation, not its own – too many mappings done already with little action/implementation, follow up and evaluations. Especially evaluation of effect and impact should be prioritized.
- For Training, many courses are already available in Human Health. Less in veterinary sector (check with FAO) and environment. Overlap risk with Funding Programme for ECRs.
- @4.2.1.2; Training in interdisciplinary and intersectoral research methodology, project management, grant writing as well as equity and ethical perspectives; Please be aware that expensive, commercial consultancy parties will be highly interested to provide training at high costs with poor quality.
- Mapping of available resources and gaps is a prerequisite for the other activities. To streamline resources, consider making use of the mapping that is done by other stakeholders, e.g. in the quadripartite AMR Multi-Stakeholder Partnership Platform.
- Many of these activities already happen, or should happen, during the course of the research projects. Hence, these activities should be encouraged on the scope of the research projects.
- Different actions in this programme will become stronger if they are based or adapted on thorough mapping of the needs of different stakeholders.
- Refer to comments included in the roadmap of actions.

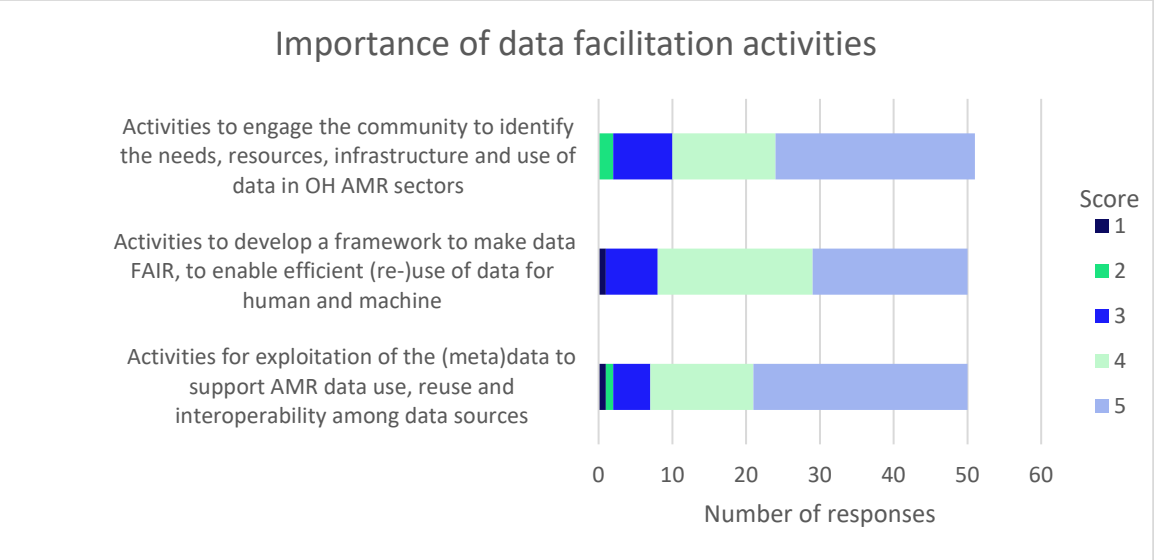
Data exploitation programme

Information text

A data exploitation programme is envisaged to support the AMR community to facilitate sharing and (re)using of data and research infrastructures to foster an effective and efficient control and prevention of AMR. The programme will work towards implementing the FAIR principles, as these guide the steps towards data to become findable, accessible, interoperable and reusable for both people and machines (computers). The ultimate goal would be that funded research and innovation projects produce (or use) FAIR data that remain at their source, that can be visited by algorithms, and be used by computer technology (data science, artificial intelligence).

How important do you consider the following activities to facilitate sharing and (re)using of data and research infrastructures in the field of AMR? Please grade from 1 (not so important) to 5 (very important)

The responders were asked to score the importance of the different data facilitation activities from 1 to 5. The scores were generally high and quite similar between the activities.



Are there any of the activities that are described in more detail in sections 4.3.1.1, 4.3.2.1 and 4.3.3.1, that you consider particularly important?

The following free-text answers were obtained:

- The quality and comparability of data.
- Activities for exploitation of the (meta)data to support AMR data use, reuse and interoperability among data sources; - Activities to engage the community to identify the needs, resources, infrastructure and use of data in OH AMR sectors; - Activities to develop a framework to make data FAIR, to enable efficient (re-)use of data for human and machine - standardizing the description of metadata and the presentation of raw data is crucial for data reuse.
- Mapping existing platform, their improvement, they FAIRness including the use of AI.
- I think the correct exploitation of metadata is very significant.
- 1) Investigate data policy requirements, social, ethical and/or legal barriers or restrictions imposed by the European Commission and within countries that might affect the opportunities to produce and reuse AMR data. 2) Organize activities for mutual learning and good practice sharing across the OH sectors on harmonization of definitions, protocols, data sharing between sources, criteria for analysis and reporting standards in countries with different socioeconomic settings. 3) Engage the AMR community to explore use of AI based approaches including data mining and machine learning for advanced data analytics and insights on accelerating drug dis-

covery, improving infection diagnosis and antibiotic prescription, and AMR surveillance predicting disease outbreaks 4) Establish standards (for instance, vocabularies, metadata schemes, templates, common data models, etc) for integration and interoperability of AMR datasets where domain experts together with data experts identify the requirements and contribute to improving the standardization and harmonization of data collection, analysis and interpretation protocols and workflows to enable data comparison from different OH sectors. 5) Develop a long-term policy for maintaining and capturing FAIR (meta)data. 6) Provide research groups with FAIR data-expertise through data stewardship training with data experts and interactions with other relevant existing initiatives on FAIR data. 7) Foster multidisciplinary efforts, including e.g. clinical, veterinary and agricultural scientists, microbiologists, ecologists, bioinformaticians, mathematical modelers and epidemiologists, to conduct meta-data analysis at national, regional and global levels to facilitate the integration of surveillance data.

- Mutual learning and good practice sharing across the OH sectors.
- 4.3.1.1. (Activities to engage community to identify the needs, resources and use of data in OH AMR sectors).
- Prepare the creation of a world-wide AMR database with FAIR data.
- Access to data and not to forget computer safety.
- Thought 4.3.3 was a good idea, i.e. to pilot test the FAIR model on existing datasets to see what it can provide, before deciding to invest large funds in FAIR.
- As the landscape is currently configured, I find the Activities to engage the community to identify the needs, resources, infrastructure and use of data in OH AMR sectors of particular interest, allowing an extensive definition in order to build the data-space upon them.
- To increase the use of available datasets.
- Activities to facilitate connections collaborations…. Organize a workshop to plan coordination on how to facilitate interactive use of data sets and data banks by encouraging common data structures.
- Interoperability is very important. Patient rights to integrity and privacy are critical to any health data activity. Cost-benefit analyses of health data infrastructure investments would be useful.

Do you consider that anything essential is missing from the Data exploitation programme?

The following free-text answers were obtained:

- No
- No
- The general description of the program mentions collections of biological materials, microbial resources and biobanks. However, the individual points (4.3.2, 4.3.3) lack clear information about which activities would include developing or improving these collections/resources.
- No
- As in the previous section, lay communication and education should be part of the activities considered.

- No
- No
- It is important to have standards to host digital data from One Health initiatives in order to be exploitable by analytical tools and AI to obtain conclusions.
- I miss an essential part which is a pure technological line of work addressing data models, data governance, interoperability requirements and such.
- No
- Not that I can think of
- It is important to interact with other initiatives regarding data and other research infrastructures and resources. It's important to make data FAIR, but the framework should already be in place and not have to be developed within the OHAMR partnership.

Do you have any other comments on the Data exploitation programme?

The following free-text answers were obtained:

- FAIR by putting it all on github/gitlab.
- The programme covers almost all of important issues. Issues that should also be taken into account: - Access to databases (different national regulations limiting access to data, e.g. personal data protection); - Free access to databases; - Databases in which results are deposited must be clearly defined. Free access to databases & guaranteed maintenance after the program end; User-friendly data finders.
- Address ethical considerations related to data exploitation, such as privacy, consent, and confidentiality. Ensure that data is collected and used in accordance with relevant legal and ethical guidelines, and that appropriate safeguards are in place to protect sensitive information.
- For "Activities to engage the community to identify the needs, resources, infrastructure and use of data in OH AMR sectors" it is missing activities on closing the gaps that are already identified.
- Please note that "Facilitate networking of reference centres" is not relevant considering ECDC missions and recent call (4.3.1.1).
- With regards to all activities mentioned, an important aspect for success of the data programme is to seek and maintain broad engagement, e.g. by including countries that are not yet active in this field. Use successful examples of 1) technical solutions for data-sharing and 2) re-use of clinical data for secondary purposes such as research.
- Data digitization is critical for simplifying surveillance work.
- Different actions in this programme will become stronger if they are based or adapted on thorough mapping of the needs of different stakeholders (e.g. researchers, policy makers, ….)

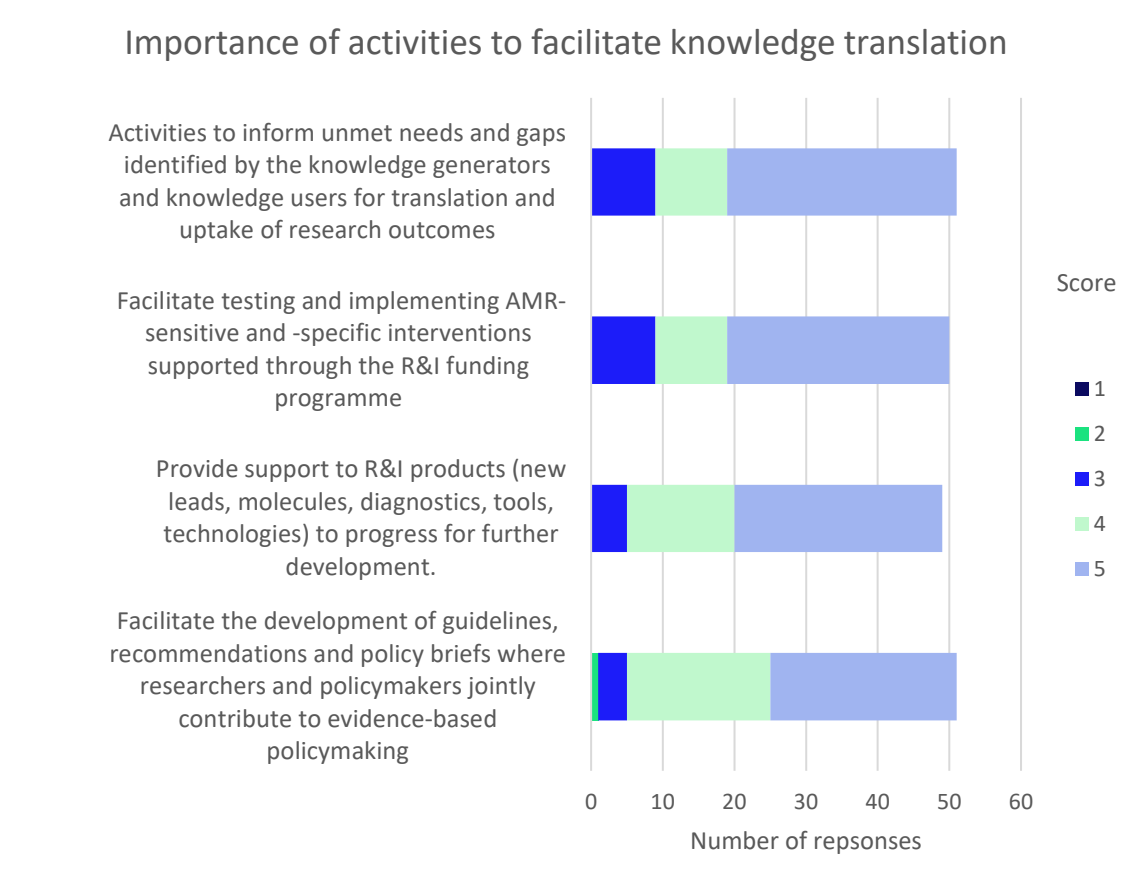
Questions on the Impact Programme for Knowledge Exploitation

Information text

An Impact Programme is envisaged to facilitate the transfer, uptake and valorisation of the knowledge generated from funded research and Innovation projects for maximum societal impact. The programme is proposed to provide a framework for collaboration between the knowledge generators (funded researchers and innovators) and the knowledge-users, including policymakers. It aims to identify unmet needs and prioritisation of research and innovation questions for generating evidence to create maximum impact, as well as accelerate the translation of outcomes from projects, including data, know-how and research results, into products, services, solutions and evidence-based policies.

How important do you consider the following activities to facilitate translation of knowledge generated by funded research into products, services, solutions and evidence-based policies for sustainable impact?

The responders were asked to score the importance of the different translation facilitation activities from 1 to 5. The scores were generally high and quite similar between the activities.



Are there any of the activities that are described in more detail in section 4.4.1 that you consider particularly important?

The following free-text answers were obtained:

- Facilitate the development of guidelines, recommendations and policy briefs where researchers and policymakers jointly contribute to evidence-based policymaking
- "Provide support to R&I products (new leads, molecules, diagnostics, tools, technologies) to progress for further development". Important to facilitate increase the TRL of possible solutions.
- 1) Provide support to R&I products to progress for further development; 2) Facilitate the development of guidelines, recommendations and policy briefs; 3) Activities to inform unmet needs and gaps; 4) Facilitate testing and implementing AMR-sensitive and 5) specific interventions supported through the R&I funding programme.
- Diagnostic tools and new molecules.
- Yes, development on diagnostics is key.
- Support knowledge exchange activities through events for interactions with other programs, initiatives HEU partnerships relevant for OHAMR research to share and showcase research outcomes.
- More applicable implementations projects.
- The support for innovators is a strong section that could deliver the knowledge to business in a transformative way.
- Support to Public-private-partnership to push or drive for successful candidates/leads.
- They are all equally important.
- Design thinking with a range of stakeholders to facilitate translation and implementation of evidence to policy programmes and practice taking an OH approach.
- Establish channels for research output from the OHAMR partnership to support evidence-based policy, globally, regionally, and nationally. Support implementation of research output (products and strategies) in the health care sector.
- Providing innovation infrastructure is very important, e.g. sites for testing innovations outside the lab, innovation incubators and scale-up facilities.

Do you consider that anything essential is missing from the Impact programme?

The following free-text answers were obtained:

- I put a "4" on three of the above activities because, even if they are essential, they cannot be the responsibility of JPIAMR, but should be taken over by some other funder...the big question is whom?
- No
- -
- No
- No
- No
- No
- No

- We need to focus more on development of new classes of drugs, not more similar to current structures. We must fund high risk science for novel targets. We also need point of care diagnostics for the right drug for the right patient at the right time.
- Prepare organisations to be able to use evidence based results and use them to create policy documents.
- No
- Not that I can think of
- Develop guidelines of proposals for common regulations on exchange of biological reference material e.g. type strains of microorganisms.
- Implementation should adhere to the same high standards as the primary research. For guidelines, different solutions exist to develop recommendations, including those with very high methodological standards (e.g. AGREE and GRADE). For policy briefs or other implementation tools, quality could be supported by reliance on relevant behavioural change theory, evaluation of tools and their impact, …)
- Refer to the EC comments included in the Roadmap of Actions.

Overarching questions

Do you consider that anything essential is missing from the OHAMR Roadmap of Actions?

The following free-text answers were obtained:

- Water, sanitation and hygiene (WASH) isn't mentioned neither under the focus areas 1 or 2 which in general contains prevention and IPC. WASH is an excellent way to reduce infections and to reduce the over- and misuse of antibiotics. Not least in health care facilities, but also among communities.
- No
- Definition of priority pathogens - Do NOT exclude TB.
- No
- No
- Prevention of overuse of antimicrobials: convincing society on safety & effectiveness of vaccinations (research on safety of using vaccines, incl. existing ones). Side effects of vaccinations should not be ignored, but research should be conducted to indicate groups where risk of their occurrence is the highest. Campaigns on consequences of overuse of antimicrobial compounds should also be carried out.
- No
- No
- I did not find an explicit indication for several elements that need to be consider for the OHAMR roadmap including fungi, protists, lay communication, regulatory affairs.
- The roadmap is very comprehensive and outlines the proposed plan, perhaps an implementation section can be added. Perhaps a draft of an annual work program can be provided in the annex.
- Concreteness of the actions which of the proposed are the most feasible in regard to potential composition and beneficiaries' type in the consortium.
- No. Everything essential is covered.

- Small seed finding for lots of groups we need more people working in this area. People leave when there are very few grants with low odds to work in drug discovery in highly funded areas such as cancer.
- No, good document. Now: make it happen!
- I would like to see more specific activities addressing IPC and how research, implementation and how data generator can reach policymakers.
- The One health approach is not presented strongly on the road map – there is no absolute drive to create a unifying approach integrating and balancing the health of people, animals and the environment in the document and its calls. Even by other definitions of One Health – the collaborative efforts of multiple disciplines to obtain optimal health could be made stronger.
- As stressed before, the technical part allowing the creation of interoperable systems which allow access and reuse of information from trans-national organisations (EFSA, ECDC, WHO, UNEP…) are essential to build an integral system to allow a global approach to the AMR problem. Along with that, the funding of transverse facilities allowing the filling of technical gaps would be of great interest.
- No
- I find the One Health approach not well developed in the Roadmap.
- It is good and comprehensive.

Do you have any other comments on the Roadmap?

The following free-text answers were obtained:

- We would like to raise awareness of the importance of infection prevention and control (IPC) as the fundamental action against spread of infectious diseases and AMR.
- The CABs are positive about the project in general, but it is difficult to suggest activities since the CABs work with overall operative controls.
- No clear separation of parts with or without commercial outputs as part of the project. No focus on comparable infectious paths like antifungal, antiviral, antiparasitic resistance. Short 400 character limits.
- In its current version, the Roadmap of Actions of the European Partnership on One Health Antimicrobial Resistance (OHAMR) 2025-2032, summarizes all the most important elements of the problem of microbial drug resistance from the perspective of developing mitigation and prevention strategies. However, it is very general in nature. It would be beneficial to define the term new antibiotic and methods for their evaluation, taking into account the ability to eradicate the etiological agent (specific targeting) with a limited impact on the host microbiome and low toxicity to host cells. It seems appropriate to include in the program clinical entities that constitute the greatest therapeutic challenge (such as infections caused by strains resistant to carbapenems, VAP, UTI). It is necessary to develop new technologies for assessing the sensitivity of microorganisms to drugs.
- Perhaps the addition of relevant international, outside of Europe, partnerships can be highlighted in the annex.
- Please provide more small seed funding for lots of researchers with a simplified application process for the proof of concept for rapid diagnostics and drug discovery

(not development). Development requires large funding and should be done in collaboration with industry.

- Topics 3.1 – 3.3: Good use of wording "…including, but not limited to, the topics…" Evaluation of impact important. Important to have transmission routes between and within sectors and to assess which are the important pathways. Good to have support for intervention research. Important to support research on the development of new antimicrobials. Note that accessibility relevant also in high-income countries, not only LMIC. Least prioritized: Knowledge exchange activities too general should be least prio among the four in 4.4.1.
- It is not entirely clear how the programmes b), c) and d) are going to be funded. Are they going to be incorporated in a) and the respective activities will be funded on the scope of the projects or is it the aim to have a separate budget for these programmes?
- MnE plan can be included to ensure targets are being met.
- The goal must be clear and include industry and investors.
- Refer to the EC comments included in the roadmap of actions.