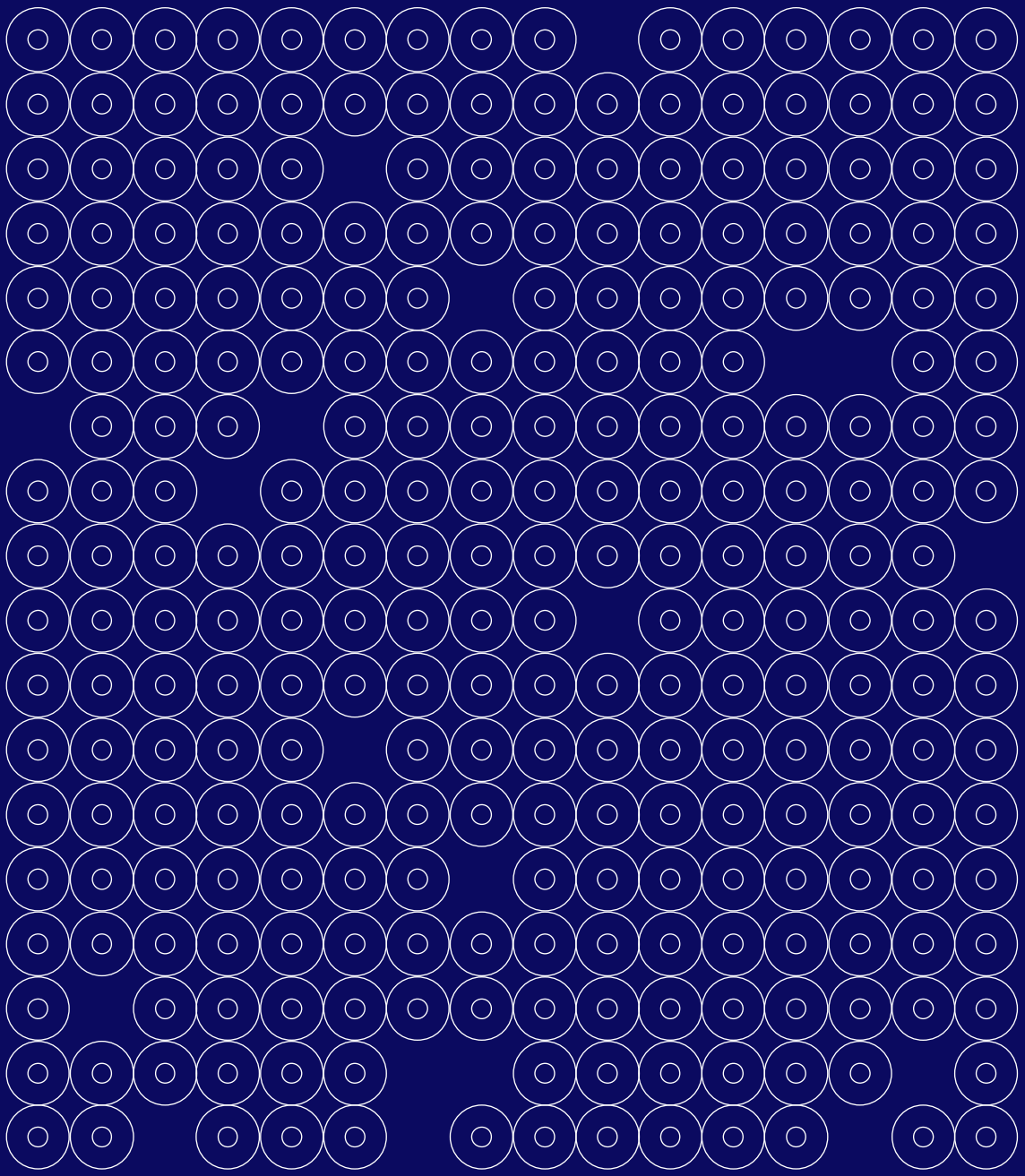
JPIAMR Implementation Plan 2021-2023



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jpiamr
Joint Programming Initiative on Antimicrobial Resistance

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Background

Antibiotics have saved millions of lives throughout the many decades they have been in use. However, antimicrobial resistance (AMR) has become a global health challenge and the World Health Organisation (WHO) now considers AMR to be one of the greatest threats to public health, jeopardising the achievement of the Sustainable Development Goals. Increasing resistance to antibiotics affects human and animal health, food security and the environment. The urgency to act now, with a One Health approach, is highlighted by the estimation that without solutions the annual human deaths due to AMR are projected to be 10 million worldwide by 2050, surpassing casualties resulting from diabetes and cancer combined. The current pandemic has also highlighted that AMR cannot be neglected as it is a global health threat of similar proportion as Covid-19 and that antibiotics are one of the foundations of modern healthcare, including the treatment of co-infections in Covid-19 patients. To address this critical issue society needs to respond with concerted actions across all sectors.

The Joint Programming Initiative on Antimicrobial Resistance

The Joint Programming Initiative on Antimicrobial Resistance (JPIAMR) is a global platform of 28 member nations[1] to curb antibiotic resistance (AMR) with a One Health approach. The initiative funds multi-sectorial AMR research on a global scale and coordinates national research funding.

JPIAMR supports new evidence and innovations that reduce the burden of antimicrobial resistance through coordinated global collaborative research in Europe and around the world with different activities and funding mechanisms. As well as accelerating the discovery of new antibacterial products, JPIAMR also supports research to better understand how resistance develops and spreads in the environment as well as the development of diagnostic tools, improved surveillance and intervention methods, and implementation of smarter strategies for using antibiotics in healthcare and agriculture.

To date JPIAMR has supported 61 projects and over 340 research groups, 31 networks, with funding of approximately 80 million Euro. G7, G20 and the EU recognises JPIAMR as a mechanism enabling global collaboration and coordination of investments and as a key initiative to support. JPIAMR recognises the need for a global approach to address AMR and has actively engaged countries beyond Europe as members and cooperates with key international organisations involved in AMR policy issues as well as international research funders.

The JPIAMR Strategic Research and Innovation Agenda (SRIA)

The AMR Strategic Research and Innovation Agenda (SRIA[2]) published in 2014 and updated in 2019, has guided national and international research priorities to curb AMR, and has provided a research framework for JPIAMR joint actions, as well as outlined key areas of AMR that should be addressed, and provided guidance for countries to align their AMR research agendas nationally and internationally. The WHO Global Action Plan

[1] *Members as of June 2019: Argentina, Belgium, Canada, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Germany, Greece, Ireland, Israel, Italy, India, Japan, Moldova, Netherlands, Norway, Poland, Romania, South Africa, South Korea, Spain, Sweden, Switzerland, Turkey and United Kingdom.*

[2] *www.jpiamr.eu/activities/sria/*

on Antimicrobial Resistance (2015) identified the SRIA as a recommendation for national AMR research programmes.

The JPIAMR SRIA further emphasises the One Health approach to address AMR and outlines six key research priority topics within the AMR field: Therapeutics, Diagnostics, Surveillance, Transmission, Environment and Interventions (Figure 1).

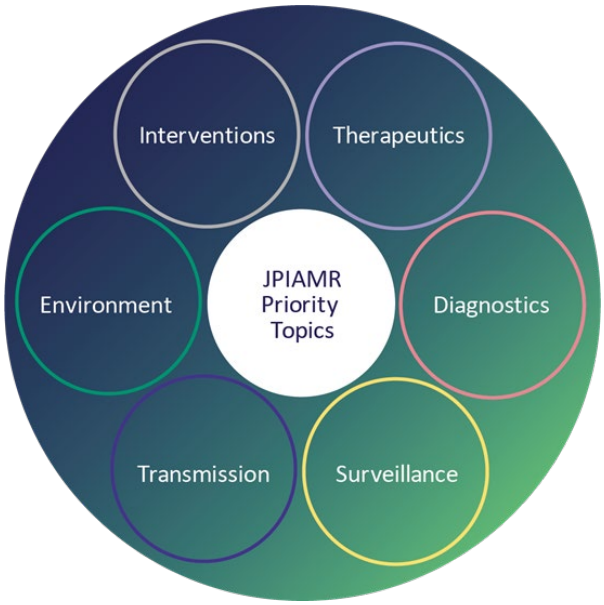

Figure 1. The six priority topics of the JPIAMR SRIA: Therapeutics, Diagnostics, Surveillance, Transmission, Environment and Interventions.

Within each priority topic, a set of research objectives has been defined (Annex I). A shared common research and innovation agenda enhances multidisciplinary collaboration and ensures that knowledge gaps are quickly identified and incorporated in the joint funding activities.

Activities and instruments

This Implementation Plan is based on the principles of:

VARIABLE GEOMETRY – where JPIAMR members and partners engage in selected actions in the portfolio of activities;

FLEXIBILITY - which supports the development of activities responding to the needs and opportunities on national and international level;

RESPONSIVENESS – in that due to changing AMR challenges the JPIAMR will respond through specific and tailored activities.

The JPIAMR Roadmap of Actions 2019-2024

The *JPIAMR Roadmap of Actions 2019-2024*[3] (see Figure 2) guides the joint transnational actions of the JPIAMR as well as to serve as an information resource for other strategic initiatives to support coordination and synergistic actions. The SRIA provides a

[3] https://www.jpiamr.eu/wp-content/uploads/2019/06/JPIAMR-Roadmap_2019-2024.pdf

framework for the joint actions outlined in the roadmap, which is to be regarded as a planning instrument for member states, funding agencies, researchers and other stakeholders and may be updated with additional activities. However, since scientific developments and societal priorities are progressive, the JPIAMR Roadmap of Actions is considered to be a working document and is subject to change at the discretion of the JPIAMR Management Board.

JPIAMR Activity	2021/22	2022/23	2023/24
Research Calls	One Health interventions to prevent or reduce the development and transmission of AMR Priority area: Transmission and Interventions	Optimising existing drugs or drug combinations for the prevention and treatment of infections Priority area: Therapeutics	Development of innovative, digital technologies for collection of microbiological and antibiotic data Priority area: Diagnostics and Surveillance
Network Calls	To be determined	To be determined	Building Bridges between One Health areas to implement interventions Priority area: Interventions
Workshops	Towards the global harmonisation of the analytical and clinical validation of in vitro diagnostic tests Priority area: Diagnostics	Intervention standards and common practice Priority area: Interventions	To be determined
JPIAMR-VRI	Understanding One Health surveillance for students Priority area: Surveillance	Linking drug developers with end users Priority area: Therapeutics	Linking early stage drug discovery Priority area: Therapeutics

Figure 2. The JPIAMR Roadmap of Actions 2019-2024.

In the Roadmap of Actions, JPIAMR use different instruments to support and fund the identified research priorities. Among these are:

Research project grants

The goal of the JPIAMR research calls is to foster and support multi-national translational research collaborations that can accomplish more than individual countries working independently. Research project grants are awarded to consortia of normally 3-6 investigators from a minimum of three different participating countries to carry a joint research project for 36 months.

JPIAMR research projects should have high impact on reducing the burden of AMR providing added value to society as a whole, public health, and economy, by closing knowledge gaps, discovering new drugs, developing diagnostics, and preventing the emergence and transmission of AMR. The funded projects are expected to have high impact on the translation of research into clinical practice, commercialisation of outputs, and policy uptake, in the near future.

JPIAMR research projects should also combine scientific and interdisciplinary competences and data, enabling larger scale projects that use resources and infrastructure not available within a single country, thus in a cost-effective way avoiding duplication and fragmentation of AMR research in the participating countries. Projects should be managed by international consortia building new networks between researchers, enhancing and increasing data sharing, using existing infrastructure, building capacity, and strengthening the European Research Area and the cooperation with non-European countries.

Network grants

Networks calls are a mechanism used by JPIAMR to enhance resource alignment and maximise existing and future efforts to combat AMR. Within network calls, the funded networks may produce white papers, prospective views, guidelines, and/or best practice frameworks in order to identify key questions to be addressed or identify potential solutions to overcome barriers to AMR research studies. Supported networks are guided by a network project plan with a 6-12 month timeframe within which to provide outputs that will be of value to the broader AMR research community.

Network Plus is a new funding instrument being developed by JPIAMR. This funding is for implementation of activities developed by Networks over a 1-2 year period.

Strategic Workshops

JPIAMR identifies and supports future joint actions through the organisation of strategic workshops. By bringing together experts from relevant fields relating to a specific topic, the JPIAMR workshops map the research landscape and identify knowledge gaps. All workshops produce reports and recommendations to JPIAMR.

Strategic Working Groups

The JPIAMR Strategic Working Groups contribute to the different activities of the JPIAMR related to governance, globalisation, policy alignment, the development of the JPIAMR Virtual Research Institute, research infrastructures and industry relations. Each Working Group is made up of JPIAMR Management board representatives of member countries.

The JPIAMR-Virtual Research Institute

To counter the unmet challenges of global coordination of research efforts to combat AMR, JPIAMR is developing the Virtual Research Institute (JPIAMR-VRI). The JPIAMR-VRI supports research networks and research performing organisations to implement AMR One Health research on the Strategic Research Agenda priority topics by increasing knowledge, diversity, collaborations and capability.

Gender dimensions

Gender equality is an important consideration in all JPIAMR activities. Organisers, where relevant, should consider how the gender dimension, i.e. sex and/or gender analysis is taken into account in the implementation and content of research projects and other activities.

Strategic context

The JPIAMR mission for the next years (2020-2025) is:

- *To join forces across nations by leading the alignment, coordination, and support to Antimicrobial Resistance One Health collaborative research and global policy activities.*

JPIAMR's main aim for the next years (2020-2025) is:

- *To provide new evidence and innovations that reduce the burden of antimicrobial resistance through coordinated global collaborative research in Europe and around the world.*

The overarching goals are:

- To align national and international research programmes.
- To support and coordinate transformative research.
- To support and coordinate the JPIAMR Virtual Research Institute.
- To promote innovation and translation of research results.
- To bridge the gap between research and policy.

The goals are addressed by:

- Research and innovation activities
- Alignment activities
- Coordination activities (including general communication, outreach and evaluation activities)

Policy context

Global

Several global agreements provide a socio-political framework for the sectors human and animal health, food production, food security and protection of the environment. In 2015, the WHO announced antimicrobial resistance, including antibiotic resistance, as one of the greatest threats to public health. It endorsed a global action plan to tackle antimicrobial (AMR) that underscores the "one health" approach involving coordination among numerous sectors and actors, including human and veterinary medicine, agriculture, environment, and finance.

On the September 2016, the UN General Assembly (UNGA) convened to discuss on antimicrobial resistance for the first time. Representatives from 193 countries signed a declaration to "Act on AMR" [4], which signals a strong commitment to curb the global overuse of medicines to treat disease. Much of the content in the UN declaration on AMR is consistent with the work already done by JPIAMR. The declaration established a UN coordination body the ad-hoc UN ad-hoc Interagency Coordination Group on Antimicrobial Resistance (IACG), to "provide practical guidance for approaches needed to ensure sustained effective global action to address antimicrobial resistance' while also providing recommendations "on options to improve coordination". It coordinates the activities of relevant UN agencies and other international organisations.

Since then, AMR has shot to the top of the global health agenda with various institutions weighing in: The Council of the European Union conclusions, the G7 communiqué, and the G20 declaration where *JPIAMR was highlighted as a key initiative to combat***.** As a follow up JPIAMR collaborates with the Global AMR R&D Hub launched by the G20 in 2018.

In addition, the United Nations Agenda 2030 provides the most comprehensive and interconnected framework with 17 goals for sustainable environmental, societal and economic development. Sustainable Development Goal (SDG) 3, dedicated to health, and other SDGs, particularly those addressing clean water and sanitation (SDG6), zero hunger (SDG2), and economic growth (SDG8), also depend crucially on inclusion of direct effects or indirect linkages to the ability to treat infections in the future.

European

The European Union is developing and releasing regulatory documents on all central areas relevant to JPIAMR, addressing antibiotic sales and use in human and veterinary medicine, animal health, drug discovery, incentives for antibiotic development and regulatory approvals of new drugs, food security, waste management protection of water resources and the environment, and the organisation of European research and innovation.

The core European legislative piece for JPIAMR is arguably the "EU One Health Action Plan against Antimicrobial Resistance". It sets the EU ambition and provides an integrated approach to protect the ability to treat infections in the future by developing

[4] *https://digitallibrary.un.org/record/842813/*

new antibiotics, better diagnostics and surveillance, and preventing or reducing the emergence and spread of AMR, as well as increased coordination between different policy areas relating to the health of humans and animals, food security and protection of the environment in Europe. Its implementation strategy includes the need to partner with the member states through the establishment of a platform such as JPIAMR and the future One Health AMR Partnership. The EU Council Conclusions on AMR (14 June 2019) indicated that Member States (MS) should be supported in their efforts to combat AMR, but they also need to do more at national level. The Council agrees that the EC and MS should further support JPIAMR efforts.

National

National strategies, national research programmes and agendas and national action plans on AMR are strong drivers of the objectives and activities of JPIAMR. Their origins can vary between countries, e.g. coming from one dedicated national ministry or R&I funder, from an inter-ministerial process or from national coordination by a reference group of the main national actors. When significant convergence between the national priorities of several participating countries is identified, these priorities can be aligned into Joint Actions and pursued in synergistic collaboration across pan-Europe, adding value beyond the limitations of national capacities.

In return, the joint programming process of JPIAMR also holds the potential and ambition to enrich national strategies and coordination by inspiring the national adoption of emerging topics of transnational attention, encouraging the development of integrated national AMR strategies and generally incentivising cross-ministerial and cross-institutional conversation within member countries.

Plan

The implementation activities are grouped by main goals and described in a chronological prioritisation timeline order from the year 2021 to 2023. The deployment of the actions are contingent on available resources.

Proposed activities and instruments for the implementation of the goals and objectives:

Alignment activities

To develop global AMR research strategies and programmes through the alignment of national and international research programmes, JPIAMR will:

- Lead preparation of the "One Health AMR Partnership" by supporting the JPIAMR Task Force in development of a JPIAMR Partnership strategy, consultations with prospective partners and stakeholders, drafting Partnership concept and proposal, and organising a JPIAMR strategic conference during 2021 or 2022 to consider the OH AMR Partnership.
- Use a tool or survey to identify the national priorities and the work/research on going in every country before updating the SRIA.
- Update the SRIA for the OH AMR Partnership with a Plan through 2030 including evaluation of broadening of the scope of the SRIA and updating the Roadmap to reflect changed priorities in the SRIA.
- Collect and disseminate information on MS national activities and international initiatives to all MS and globally, including stakeholders such as WHO by maintaining joint calendar of national and international meetings on the JPIAMR webpage (or JPIAMR-VRI in the long-term)
- Seek complementarity with other initiatives (e.g. EU-JAMRAI, OH EJP, IHI etc.) which have activities related to policy analysis and implementation of One Health strategies.
- Develop tools for the MB/SC to showcase and communicate national activities and ensure JPIAMR participation where possible.

To bridge the gap between research and policy, JPIAMR will:

- Include and engage representatives from national governments, ministries and funding agencies (health, innovation, environment, animal health etc.) in the organisation of events, local discussions and JPIAMR meetings, particularly in regions that are not actively involved.
- Expand the communication of results of JPIAMR funded projects and activities to engage new members, policymakers and decision makers and show the added value of transnational collaboration and how the outcomes are different from national research programmes. Ensure MS engagement in process.
- Prioritize funding to topics that fill a policy gap (e.g. innovative teaching, antibiotics shortages, infection prevention and control, primary care, nursing homes, design of indicators of good practice…)

Research and innovation activities

To support and coordinate transformative research, JPIAMR will:

- Fund regular open national and joint transnational competitive calls for proposals in all strategic areas of AMR according to the JPIAMR Roadmap of actions 2019-2024 (see figure 2)
- Support networking and partnership among research communities and organise workshops according to the JPIAMR Roadmap of actions 2019-2024.
- Improve interaction and reduce overlap between funded projects by providing networking platforms and meetings at different time points in project cycle.
- Support and promote the access to, use of, and collaboration between AMR research resources and infrastructure by preparing a concrete plan for interaction with appropriate research infrastructures such as ECRIN including definition of strategic objectives/goals/expectations.
- Conduct an analysis of MS participation, structural barriers (such as budget period differences) and find new strategies and types of instruments such as Twinning programmes which could support increased MS participation in the calls.
- Assess the value of an annual conference vs JPIAMR (online) workshops and smaller conference to improve interactions.
- Maintain the JPIAMR database of AMR research and infrastructures to promote collaboration, use and increased transnational access.
- Asses the possibility to establish a portfolio of joint transnational capacity programme to mobilise researchers to enter the field of AMR research.

To support and coordinate the JPIAMR Virtual Research Institute (JPIAMR-VRI), JPIAMR will:

- Coordinate and support JPIAMR-VRI, a dynamic network of AMR research facilities comprising a platform for scientific interaction between member states, and a joint transnational research capacity in the area of AMR.
- Maintenance, support and utilise JPIAMR-VRI funded networks.
- Implement networking activities (webinars, meetings with Research Centres, yearly hackathons, a few capacity building programs) according to the JPIAMR Roadmap of actions 2019-2024.
- Develop a digital platform.
- Collect and disseminate data/joint calendar on national and international meetings, events and other information of interest to the research community.
- Develop mentorship and observership programmes.

To promote innovation and translation of research results, JPIAMR will:

- Facilitate interaction between pre-clinical science, and clinical practice and commercial developers of new prevention methods, treatments and diagnostics through a permanent dialogue with health care, health policy and animal health policy, industry and their networks (such as the BEAM Alliance), public-private partnerships (such as IMI) and translational stakeholders in agriculture, food production and protection of the environment (see also Alignment activities and Stakeholder engagement)

- Facilitate the development of joint translational projects by funding open national and joint transnational competitive calls for joint public-private projects in areas of identified gaps and opportunities, encouraging multi-disciplinary and translational approaches with a One Health perspective considering support of national innovation agencies.
- Identify barriers and establish collaboration principles on intellectual and data property, data sharing and protection, and privacy together with other funders and international initiatives.
- Establish a Translational Advisory Board (TAB) made up with experts in developing products, business plans, regulation, etc. to help prioritise solutions.

Coordination activities

Governance and administration

- Coordination and management of JPIAMR MB, SC, SAB, Working Groups, and Central Secretariat.
- Member relations.
- Coordination and preparation of documentation for meetings, workshops and other JPIAMR activities, including participation in international events and conferences.
- Supervising joint calls, general peer review procedures and coordination of calls secretariats.
- Overseeing and executing administrative and management aspects , general administration, budgets management, financial reporting, managing contact databases, peer review database, GDRP issues, etc.
- Develop the governance and sustainability models, strategies and policies, to make JPIAMR's operations and Terms of References adapted to changing conditions and membership priorities.
- Define principles defining which non-member countries we would like to bring into JPIAMR and map and target potential new members in Eastern Europe/beyond.
- Add new members.

Stakeholder Engagement

- Representation of JPIAMR at international events, meetings and stakeholders boards.
- Management of key stakeholders relations: regular bilateral meetings, regular consultation, attendance to joint meetings and stakeholders boards (e.g. EC, UN, WHO, ECDC, Global Hub) and international AMR funders (e.g. CarbX, Wellcome, Repair Fund, Gardp, NIH, ICARS).
- Coordination and collaboration with relevant international initiatives and patients' networks/groups.
- Conduct a stakeholder mapping analysis and engage key cross stakeholder groups including industry.
- Enlarge stakeholders' engagement, more One Health, in view of the OH AMR Partnership preparations.
- Organise specific stakeholders' consultations by priority area.

- Alignment of communication with MS for interaction with AMR research community, the EC and national and international stakeholders.
- Support showcasing of JPIAMR and the way JPIAMR is working.

Communication activities

- Management of JPIAMR communication strategy, website, social channels, promotional materials, distribution channels and branding.
- Dissemination JPIAMR information on social media channels, online tools and channels, including the JPIAMR website to relevant groups, including press releases, website "news" items, Twitter feeds, newsletters, videos, podcasts, webinars, as well as group emails forwarded via the JPIAMR stakeholder database.
- Provide information materials, online and offline resources and infrastructure for dissemination of information and ensure increased awareness of the JPIAMR activities.
- Communication of JPIAMR calls and JPIAMR funded projects outputs.
- Advocacy on AMR message.

Monitoring and evaluation activities

- Update existing JPIAMR Monitoring and Evaluation Framework to be more harmonised with the overall Horizon Europe monitoring framework.
- Identify and assign appropriate evaluation indicators/criteria that can track progress towards objectives, impacts and key performance indicators relevant across Horizon Europe partnerships and between the partnerships.
- Implement evaluations, surveys, systematic reviews, meta-analyses, and mapping activities.
- Monitoring and evaluation of JPIAMR activities: Define evaluation indicators/criteria to monitor actions, progress and achievement of JPIAMR to benchmark with other initiatives, and develop processes to identify and involve representatives/ stakeholders from different sectors.
- Monitoring and evaluation of results from JPIAMR funded projects.
- Advance dedicated reporting on quantitative levels and qualitative impact at the level of the individual projects funded, the data on proposals, selected projects, their activities, outputs, outcomes and results in line with Horizon Europe impact pathways.
- Implement a common data platform for all data on proposals, evaluations and projects funded, outputs and results to support open, transparent and broad knowledge transfer.
- Support openness and sustainability following FAIR principles, link, and facilitate use of data platforms or research infrastructure that aims at reusability of existing and future databases, research networks, patient cohorts, microbial strain collections, biospecimens and other research resources generated by funded projects through interactive dashboards to improve findability.

Governance/implementation structure

(According to JPIAMR Terms of Reference 2020)

JPIAMR Management Board

The JPIAMR Management Board (MB) is the decision making body of the JPIAMR. It is composed of a Chair, Vice-Chair and a maximum two members from each participating country. They hold a governmental mandate. The tasks of the MB are to specify the objectives of the JPIAMR and its instruments of action, as well as to ensure the implementation of the JPIAMR SRIA through research and network calls and additional activities. The MB will seek advice regarding its activities from the JPIAMR Scientific Advisory board and JPIAMR Stakeholders.

JPIAMR Steering Committee

The JPIAMR Steering Committee (SC) assists the Management Board in all aspects concerning the preparation and implementation of decisions and provides steering direction of the JPIAMR and strategic input to deliver the JPIAMR mission. It is also responsible to oversee the work of the JPIAMR Secretariat and mandate work to the SAB. It also represents the JPIAMR at strategic meetings. T SC consists of the Chair, Vice-Chair and four elected members of the MB.

JPIAMR Scientific Advisory Board

The JPIAMR Scientific Advisory Board (SAB) is composed of 15 renowned scientists representing expertise in medical, veterinary, environmental and behavioural sciences related to AMR. The SAB will assist the MB with advice on scientific objectives for the implementation of its actions.

JPIAMR Secretariat

The JPIAMR Secretariat is responsible for the day to day management of the JPIAMR. It ensures the necessary coordination and communication among the different JPIAMR governance bodies and other relevant international bodies. Coordinates the implementation of JPIAMR's strategy and executes its implementation plan. Thus, the Secretariat assists the Management Board, the Steering Committee, the Scientific Advisory Board, the different Working Groups, Task Forces and Call Secretariats with the preparation of documents, reviews and reports. Manages relationships with international partners and stakeholders. Oversight of key scientific AMR initiatives and research efforts. Monitors JPIAMR research funded projects. Manages communication of JPIAMR activities. Provides logistical support. It also prepares the necessary budgetary arrangements to run the management structure.

The Secretariat, which shall remain independent, is hosted by the Swedish Research Council.

The central staff of 5,7 FTEs (in 2020) and activities of task-specific working groups, led by different member countries in a *Distributed Secretariat/Coordination Model*, are funded in a mixed model with membership fees and contributions in kind from members (including personnel), combined with EC support in the form of a Coordination and Support Action and an Eranet co-fund.

Annex I. JPIAMR SRIA priority topics and research and innovation objectives

Priority topic	Focus	Research and innovation objectives
Therapeutics	Discovery of new antibiotics and therapeutic alternatives, and the improvement of current antibiotics and treatment regimens	• Find new antibiotics and targets • Develop new chemical entities and scaffolds • Improve pharmacokinetics and pharmacodynamics of antibiotics, including neglected antibiotics • Use personalised medicine and artificial intelligence to improve therapies • Develop alternatives for antibiotics • Develop treatment protocols based on combination therapy using existing and new antibiotics • Develop policy measures and economic stimuli to minimise barriers for the development, availability and introduction of new therapies and alternatives • Assess how regulation modifies and influences production and use of antibiotics
Diagnostics	Development and improvement of diagnostics to improve the use of antibiotics and alternatives to antibiotics	• Improve the efficacy of new and existing diagnostic tools to more effectively distinguish between bacterial and non-bacterial infections, and/or detect antibiotic susceptibility • Create support for the implementation of innovative technologies and linkage to data platforms promoting the use of narrow-spectrum antibiotics • Improve the use of rapid diagnostics in appropriate One Health settings • Improve understanding and explore ways to overcome behavioural and socio-economic barriers limiting the adoption and use of rapid diagnostics
Surveillance	Optimisation of surveillance systems to understand the drivers and burden of antimicrobial resistance in a One Health perspective	• Improve and standardise AMR surveillance systems, from sampling to data analysis including sampling frame, tools, methodology and reporting • Strengthen the use of surveillance data to identify human and non-human reservoirs of AMR • Optimise the use of surveillance data to estimate burden and to assess the impact of interventions • Develop novel techniques to supplement and promote the exchange of surveillance data • Improve and standardise the surveillance of antibiotic use

Priority topic	Focus	Research and innovation objectives
Transmission	Understanding and preventing the transmission of antimicrobial resistance	• Unravel the complex dynamics of selection and transmission of antimicrobial resistance • Identify factors responsible for the persistence and spread of resistant organisms and resistance elements • Determine the impact on AMR of different systems of healthcare, animal production, global trade and environmental pollution and contamination
Environment	The role of the environment in the selection and spread of antimicrobial resistance	• Determine and model the contribution of contamination sources, environmental reservoirs and exposure routes on the emergence and spread of AMR • Evaluate the relationship between AMR and the environment, climate change, and pollution • Assess the potential impact of industrial systems on AMR in the environment • Develop innovative technological, policy, social, economic and regulatory approaches to mitigate AMR in the environment
Interventions	Investigation and improvement of infection prevention and control measures in One Health settings	• Develop innovative interventions aimed to prevent and control the spread of AMR in a One Health perspective • Investigate the effectiveness of AMR prevention and control strategies to increase uptake and acceptance in One Health settings • Assess the effectiveness and cost-effectiveness of specific AMR prevention and control practices, considering different geographic and socio-economic settings • Optimise implementation strategies, including drivers for and barriers to behavioural change, to reduce AMR • Understand the prescription behaviours contributing to the responsible and prudent use of antimicrobials • Assess educational and training programmes to enhance antibiotic stewardship