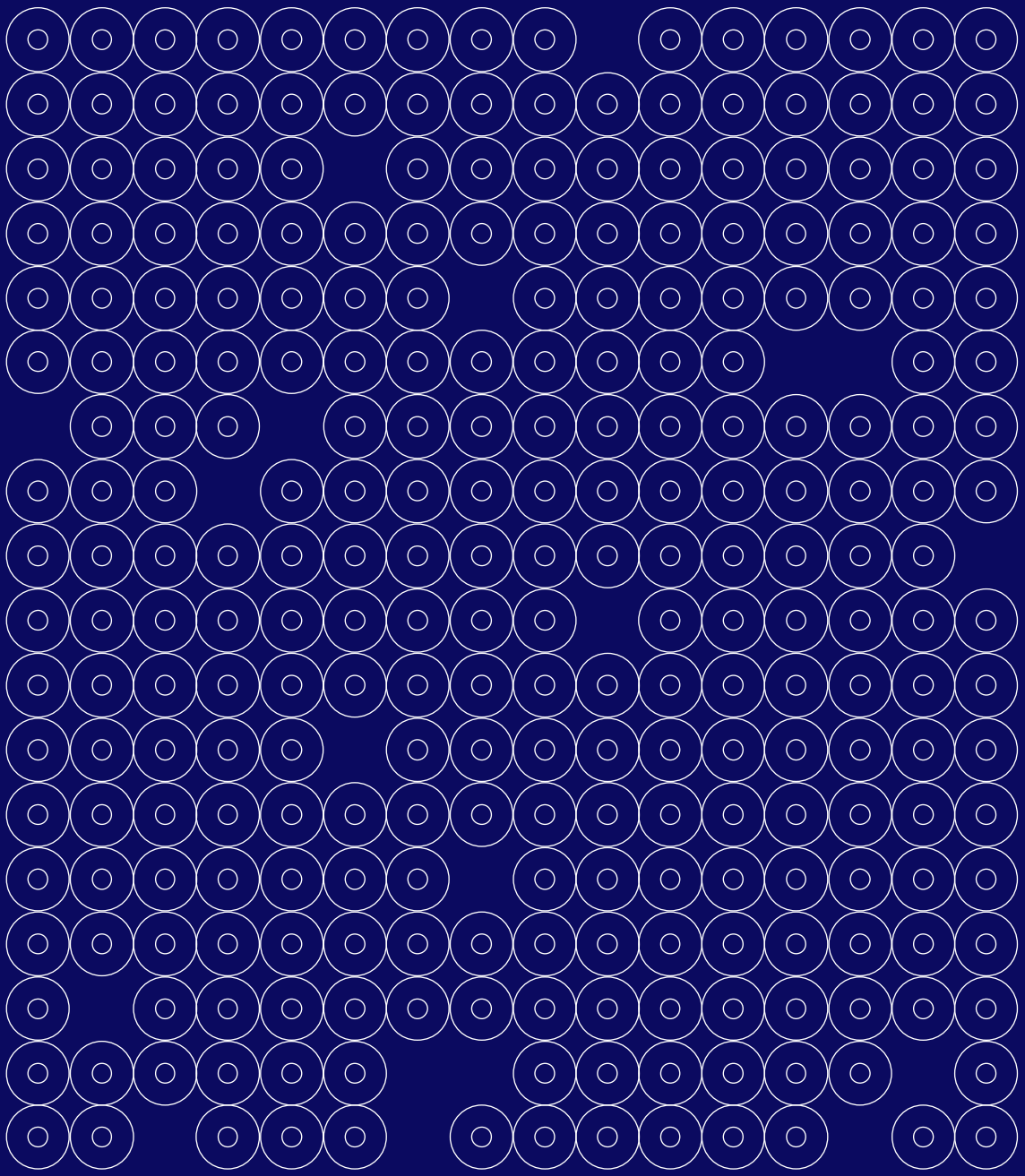
JPIAMR Activity Report 2023



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jpiamr
Joint Programming Initiative on Antimicrobial Resistance

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Foreword

After the culmination of 10 years of JPIAMR as an international initiative to advance science to tackle drug resistant infections mobilising more than 170 M€, over 173 AMR projects and supporting over 1.800 researchers in 82 countries around the work as well as building globally agreed research priorities, 2023 marked the transition to a new phase.

In 2023, JPIAMR has awarded with 20.8 M€, 17 projects involving 93 partners from 23 different countries to develop AMR innovative strategies, tools, technologies, and methods for diagnostics and surveillance. Important for the first time Australia becoming a partner in this endeavour as well as the important contributions from South Africa and development aid agencies that enable us to support groups in Africa and to enable true global outreach.

We also take pride in the first outputs, outcomes and impact generated by the funded projects and networks supported by various JPIAMR calls. Among many impactful findings, it can be highlighted that among JPIAMR Therapeutics projects portfolio already 6 new pre-clinical candidates have been identified and 5 patents have been filed. Other reports regarding JPIAMR Transmission projects and AMU monitoring and AMR emergence and spread in food animals have been published.

Also especial focus has been giving in Early Career Researchers capacity strengthening with a new "JPIAMR Young researchers contest" with 3 cash prizes to encourage young scientists to present their research projects with JPIAMR support through posts on LinkedIn.

The AMR question is taking bigger momentum in the international landscape, as shown in the G20 resolution on AMR as well as in the new EU Council Conclusions and the European Parliament recommendations on AMR. We are excited about what's to come in the new year and believe 2024 will be a landmark year for AMR. The upcoming United Nations General Assembly High-Level Meeting aims to advance political commitment and targets to fight AMR. Together with partners and collaborators, we will work through the participation in 2 Action Groups from the UN AMR Multi-stakeholder Platform to amplify this call for action. Also this year, JPIAMR has been working together with the WHO and the Quadripartite to align the development of AMR global human health and one health research agendas with the future OHAMR research agenda that will substantially contribute to global cooperation and coordination.

The second half of 2024 will also mark the evolution into the One Health AMR Partnership (OHAMR), transitioning the JPIAMR initiative into a new instrument, a joint AMR research programme, through a co-funding instrument within the Horizon Europe programme, that will mobilise funding from the European Commission and member states. Looking forward the expansion in membership, ambition level and outreach. Therefore, major efforts have been undertaking this year in contributing in the preparations of the OHAMR such as the development of the future Strategic Research and Innovation Agenda and the Joint Roadmap of Actions.

We are thankful to our Management Board for their commitment and guidance in these transition times, and to all colleagues in the Secretariat, our call offices, working groups, committees, expert thematic groups and very specially the Scientific Advisory Board, for their strong support and engagement. Let make 2024 a fruitful year that will bring as into a new phase to make substantial advance in tackling AMR; the one health challenge is shared, as well as many of the solutions. Let's tackle them through international collaboration, collective commitment and joint action.

Jan-Ingvar Jönsson, Chair of JPIAMR and Laura Marin, Head of Secretariat

Executive Summary

The Challenge - Lives Are at Stake

Antimicrobials have saved millions of lives throughout the many decades they have been in use as a common drug to treat infection. However, antimicrobial resistance is a current global health security challenge and society needs to respond with concerted actions. Only together can we divert from an anticipated trajectory whereby up to 10 million human lives are lost yearly because of infections caused by antibiotic resistant bacteria by 2050.

The JPIAMR – The key to turn the tide of AMR

The Joint Programming Initiative on Antimicrobial Resistance, JPIAMR, is an international collaborative platform engaging 29 nations and the European Commission to curb antimicrobial resistance (AMR). The JPIAMR coordinates national research funding and supports collaborative action for filling knowledge gaps on AMR with a One Health perspective. Our shared Strategic Research and Innovation Agenda outlines the key areas to be addressed and provides guidance for countries to align their AMR research agendas nationally and internationally. JPIAMR interacts with stakeholders such as United Nations Quadripartite, World Health Organization (WHO), the Global AMR R&D Hub, and countries outside the current membership. The G20 and G7 include activities by JPIAMR in their declarations and resolutions.

Major goals of JPIAMR

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

Summary of JPIAMR achievements in 2023

- Governance:
  - Extended/renewed mandate for the current Steering Committee and Scientific Advisory Board until 2025
  - Two Management Board meetings, one virtual; one in Hamilton, Ontario, Canada (hosted by CIHR)
  - Six Steering Committee meetings
  - Three Scientific Advisory Board meetings, two virtual, one informal reception at the ECCMID in Copenhagen
  - Two Core Call Group meetings
- International policy engagement:
  - Partnering in calls with Australia, Latvia and Lithuania
  - Collaboration with UN:
    - » WG of the Quadripartite AMR One Health Research Agenda
    - » Alignment team with the AMR WHO human health agenda

    - » Member Quadripartite Antimicrobial Resistance Multi-Stakeholder Partnership Platform, inauguration meeting in Rome 15-16 November. Member of Cluster 5 on “Resource mobilisation and financing”.
    - » Observer at STAG Committee
  - Collaboration with key AMR initiatives:
    - » Continued collaboration with the Global AMR R&D Hub on the AMR dashboard and discussing platform with other key international stakeholders
    - » ICARS: participating as a partner in the CSA to design the OH AMR partnership
    - » PENTA: participating as a partner in the CSA to design the OH AMR partnership
    - » EPHA: participating as a partner in the CSA to design the OH AMR partnership and connection with their AMR Stakeholder forum
    - » Continuation with MoU Educational Group: JPIAMR, CARB-X, GARDP, Repair Fund, Wellcome Trust, the AMR Action Fund. Co-branded sessions at AMR conference, ECCMID bootcamp and AMS – Organisation of the ECCMID session
    - » Member of the European Partnerships Forum
  - JPIAMR representation in international AMR events, such as the AMR Session at the European Parliament.
- Calls:
  - Approximately 170M€ in mobilised joint research funds, supporting 173 projects and researchers spread across 82 countries
  - Launch of the transnational research call on Diagnostics and Surveillance, awarding 17 new projects resulting in the development of measures to limit the development and spread of AMR and address the urgent need to curb the burden associated with AMR.
  - JPIAMR Core Call Steering Group update of JPIAMR Call Procedures and the template of Memorandum of Understanding, and setup of a Joint Controller Agreement.
- Monitoring and data sharing activities:
  - Mid-term report collection and analyses of the projects funded under the 2021 JPIAMR-ACTION ERA-Net call in the area of Transmission
  - Final-term report collection of the projects funded in 2017 and 2018 calls on preventions and interventions and on therapeutics respectively conducted under the JPI-EC-AMR ERA-Net; analyses ongoing.
  - Update on the outputs, outcome and impact generated by the JPIAMR Therapeutics supported projects
  - Continuous collection of the publications and research resources generated by the funded research projects and networks
  - Analysis and graphical representation of portfolio of JPIAMR funded projects and their outcomes
  - Collection and publication on national members AMR plans and research programmes
  - Data management plan update for JPIAMR-ACTION
  - JPIAMR project dashboard update

- Capacity building activities
  - Launch of a Young Scientist Prize best LinkedIn post contest
- Communications, dissemination and promotion:
  - Promotional communication package on calls and call results
  - Increased impact of social media channels efforts: 276 updates, 285.000 impressions and over 8.000 videos views
  - Standardised guidelines on graphical design, images, templates, newsletter, registration page and promotional campaigns for all the virtual workshops and consultations.
  - Collaboration and alignment of communications with Aquatic Pollutants Secretariat and activities showcasing funded research.
- Workshop and webinar organisation
  - *Social sciences in AMR research and innovation,* webinar 10 January (in collaboration with partners of DESIGN OH AMR)
  - Webinar for applicants in the JPIAMR call *"AMR Diagnostics and Surveillance 2023",* 24 January
  - Therapeutics session at ECCMID, Copenhagen, 16 April
  - JPIAMR Young Scientist Contest Finale, 14 December
- Contributions to the preparations of the future One Health AMR Partnership (OHAMR), lead by the CSA DESIGN OH AMR:
  - Mobilising the JPIAMR SAB members for the drafting of the OHAMR future Strategic Research and Innovation Agenda and the Roadmap of Actions
  - Contribution to the organisation of the OHAMR SRIA Prioritisation workshop in Berlin 15-16 May (hosted by DLR) to identify potential future call topics of the OHAMR partnership.
  - Engagement and brainstorming sessions with members in regards future OHAMR Roadmap of Actions, for example during the Management Board meeting 12-13 October.
  - Participation of JPIAMR members in working groups to develop the programmes of the OHAMR Roadmap of Actions
  - Contribute to alignment efforts between the WHO and Quadripartite AMR global research agenda and the OHAMR SRIA
  - Contribution to the communication and promotion efforts and to disseminate the concept of OHAMR and the evolution of JPIAMR into OHAMR
  - Engagement with stakeholders and member states in facilitating transition towards OHAMR
  - Contribute to the development of design guidelines for the future OHAMR partnership containing templates, colours, logo updates and fonts, to be used in communications.

JPIAMR Governance

The governance and management structure of the JPIAMR is composed of the following bodies according to the JPIAMR Terms of Reference:

- JPIAMR Secretariat
- JPIAMR Management Board
- JPIAMR Steering Committee
- JPIAMR Scientific Advisory Board
- JPIAMR Core Call Steering Group
- JPIAMR Strategic Working Groups

The JPIAMR Secretariat

The JPIAMR Secretariat is responsible for the day-to-day management of JPIAMR. The Secretariat ensures the necessary logistical coordination and communication among all JPIAMR activities and boards as well as manages all administrative and financial matters. The secretariat provides leadership in engaging with key stakeholders and international organisations and prepares the necessary budgetary arrangements to run the management structure. The secretariat coordinates the work of all the partners of the different EU grants and supervises the implementation of all tasks. It also leads the preparations of the OHAMR partnership. The Swedish Research Council hosts the secretariat, and at the end of 2023, the secretariat was comprised of nine full-time or part-time staff (including in-kind contributions) including a Head of Secretariat, three Senior Research Officers, two Senior Analysts, a Communications Officer, a Web Officer/Administrative Officer and a Financial Officer.

JPIAMR Management Board

The JPIAMR Management Board (MB) is the main decision-making body of JPIAMR. Each of the 29 member countries can have two representatives on the MB with a governmental mandate. The European Commission (DG RTD) is a non-voting member. The MB meets formally twice per year, at meetings that are funded by JPIAMR members, and within 2023 the Management Board held two meetings. The first meeting was held online 28-19 March 2023 and the second meeting was a hybrid meeting held in Hamilton, Ontario, Canada/online 12-13 October 2023 (see picture below).

JPIAMR Steering Committee

The JPIAMR Steering Committee (SC) provides steering direction of the JPIAMR and strategic input to undertake the JPIAMR mission. The SC meets regularly to discuss strategic issues, develop proposals for the MB and follows the implementation of activities by the Secretariat. In 2023, the SC Chair was Jan-Ingvar Jönsson (Sweden), the Vice-Chair was Marie-Cécile Ploy (France) and the Steering Committee members were Kathleen D'Hondt (Belgium), Charu Kaushic (Canada), Henning Gädeke, Germany and Gian-Maria Rossolini, Italy. The SC met 6 times in 2023, including, two in Brussels and one in Hamilton. At the MB meeting of October, it was decided to extend the mandates of the SC members until 2025.

JPIAMR Scientific Advisory Board

The MB appoints members of the JPIAMR Scientific Advisory Board (SAB), which consists of top international researchers in the AMR field. The Netherlands Organisation for Health Research and Development (ZonMw) administers the SAB. The members of the 2023 SAB were:

- Till Bachmann, University of Edinburgh, United Kingdom (Chair)
- Luca Guardabassi, University of Copenhagen, Denmark (Vice-Chair)
- Jordi Vila, Hospital Clinic in Barcelona, University of Barcelona and Institute for Global Health, Spain
- Constance Schultsz, University of Amsterdam, Netherlands
- Rafael Cantón, University Hospital Ramón y Cajal and Complutense University, Spain
- Marc Lemonnier, Antabio, France
- Luísa Vieira Peixe, University of Porto, Portugal
- Thomas Harrison, St Georges University of London, United Kingdom
- Ana Alastruey, Instituto de Salud Carlos III, Spain
- Uga Dumpis, Pauls Stradiņš University Hospital, Latvia
- Sabiha Essack, University of KwaZulu Natal, South Africa
- Christian Giske, Karolinska Institute, Sweden
- Geetanjali Kapoor, Center for Disease Dynamics, Economics & Policy, India
- Joakim Larsson, University of Gothenburg, Sweden
- Kornelia Smalla, Julius Kühn Institute, Germany
- Chantal Morel, University of Bern, Switzerland
- Claire Harpet, University Jean Moulin Lyon 3, France
- Tania Dottorini, Nottingham School of Veterinary Medicine and Science, United Kingdom

Just as in 2022, the prime task of the SAB in 2023 has been to support the preparation for the One Health AMR partnership. In the first half of the year, SAB has still been involved in the working groups of the Research and Innovation Objectives. Each group was asked to propose ideas for call topics and activities for potential future activities for the candidate partnership. On 15 and 16 May, the SAB members along with additional experts attended the prioritisation workshop in Berlin to actively discuss, define and prioritise these suggested call topics and activities.

The SAB met three times in 2023 in SAB meetings, of which two online (September and December) and once in person for an informal reception at ECCMID in Copenhagen in

April. In the December meeting, the first outlines for the final JPIAMR scientific conference were discussed. Furthermore, the SAB gave advise for the aim of the 17th JPIAMR call on interventions.

In the MB meeting of October, it has been decided to extend the mandates of the SAB members until December 2024. The reason was to bridge the period until elections for a SAB of the OHAMR partnership early 2025.

Core Call Steering Group

The JPIAMR Core Call Steering Group interacts regularly to develop calls and guidelines to support the activities of Joint Call Steering Groups. Members are representatives from past and present call secretariats. The Core Call Steering Group regularly meets online. This group is supported by in-kind contributions by members.

Sustainability Plan

JPIAMR's activities are based in its Strategic plan for 2020-2025 and Roadmap of Actions 2019-2024.

The central staff of the secretariat 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 in-kind contributions from members (including personnel) and a membership fee for the year to support central operations, combined with support from the European Commission in the form of an ERA-Net co-fund JPIAMR-ACTION to support the management of the joint calls.

The last call of JPIAMR-ACTION will be launched in 2024, and the plan for the phasing out of JPIAMR transitioning into OHAMR has therefore been initiated. At the JPIAMR Management Board meeting 12-13 October, it was decided to follow a strategy of evolution of JPIAMR into the new partnership on One Health AMR (OHAMR). The terms of reference for the governance bodies will be updated accordingly during 2024. OHAMR will build on the experiences and well-established networks and processes of JPIAMR. Valorisation activities of OHAMR are envisage to include also R&I outcomes from JPIAMR projects, in order to maximise the impact of these projects. A final conference of JPIAMR is planned in early 2025.

JPIAMR Joint Calls

JPIAMR conducts activities in the six key priority topics within the AMR field – Therapeutics, Diagnostics, Surveillance, Transmission, Environment and Interventions – outlined in the JPIAMR Strategic Research and Innovation Agenda (SRIA) and deployed by its Roadmap of Actions 2019-2024. In addition to this, other strategic and policy areas of action have been identified and addressed in the JPIAMR Implementation Plan 2021-2023.

JPIAMR Roadmap of Actions 2019-2024 – investing in AMR research

The JPIAMR SRIA provides a framework for the *JPIAMR Roadmap of Actions 2019-2024* (Figure 1) that guides the joint transnational actions of the JPIAMR, as well as to serves as an information resource for other strategic initiatives to support coordination and synergistic actions.

Figure 1. The JPIAMR Roadmap of Actions 2019-2024.

In the framework of this roadmap the 2023 Joint Transnational Calls on 16th Joint Transnational Call *Development of innovative strategies, tools, technologies, and methods for diagnostics and surveillance of antimicrobial resistance* was launched. A pre-announcement for the last call foreseen in this Roadmap in 2024 in the area of "Interventions" has taken place.

JPIAMR Roadmap will be the finalised. Based on this broad baseline of supported projects and calls in the last years, JPIAMR has been contributing to build a new OHAMR Roadmap of Joint Actions for 2025-2032.

Coordination of JPIAMR Joint Calls

JPIAMR coordinates joint calls through the implementation of the ERA-Net co-funds JPIAMR-ACTION and AquaticPollutants. JPIAMR-ACTION has been running since 2021. In 2023, JPIAMR launched one call under the ERA-Net co-fund, JPIAMR-ACTION. JPIAMR also participates with JPI WATER and JPI OCEANS in a joint ERA-Net co-fund Aquatic Pollutants.

Core Call Steering Group

The JPIAMR Core Call Steering Group consists of Members are representatives from former and present call secretariats and develop calls and guidelines to support the activities of Joint Call Steering Groups. In 2023, the Core Call Group updated the procedures documents for JPIAMR calls and the template for Memorandum of Understanding, and made a template for a Joint Controller Agreement to be used in the 2024 call.

Joint Transnational Calls for Proposals

Since 2014, JPIAMR has held eleven joint transnational project calls and five network calls. To date, JPIAMR has supported 1821 researchers in 129 projects (Figure 2) and 44 networks (Figure 3) with funding approx. 170 million Euro. The goal of the JPIAMR calls is to foster multinational translational research collaborations that can accomplish more than individual countries working independently, leading to improved control of bacterial infections.

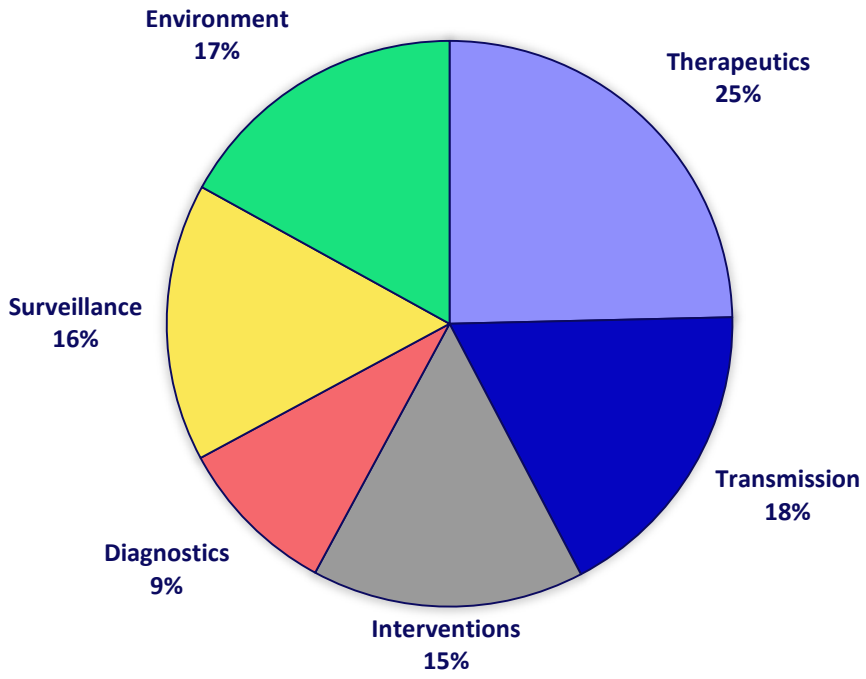

Figure 2. Research projects funded by JPIAMR countries in various calls from 2014-2024, divided according to JPIAMR-SRIA priority areas. To date, 129 research projects have been funded by JPIAMR and the financial contribution to these calls is approximately 167M€.

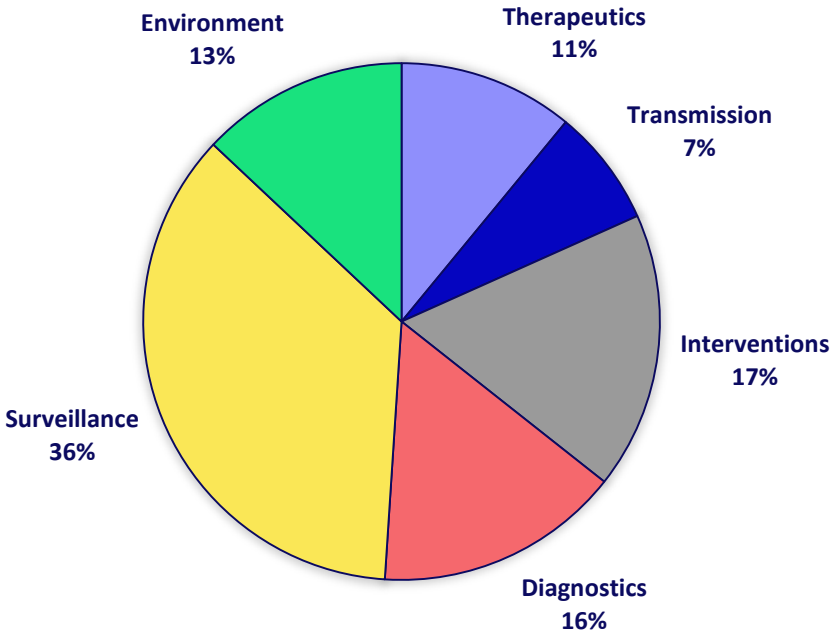

Figure 3. Research networks funded by JPIAMR countries in various calls, divided according to JPIAMR-SRIA priority areas. To date, 44 AMR networks have been funded through JPIAMR network calls. To date, the financial contribution to these calls is 2.7M€.

The Polish National Science Centre (NCN) was the Joint Call Secretariat for the JPIAMR 16th Joint Transnational Call *Development of innovative strategies, tools, technologies, and methods for diagnostics and surveillance of antimicrobial resistance* (Figure 4). The call, included 25 funding organisations from 16 JPIAMR member countries and 3 associated countries. Using a One Health approach, the call aimed to combine the resources, infrastructures, and strengths of multiple countries in order to facilitate research projects supporting the development or improvement of existing strategies, tools, technologies, and methods to support the prudent and rational use of antimicrobials. This could be achieved by focusing on diagnosis of infections caused by resistant microorganisms, on detection of resistant microorganisms, and/or collection, analysis and use of antimicrobial resistance (AMR) and antimicrobial use (AMU) data.

The following seventeen projects involving 93 partners from 23 different countries were recommended for funding, with a total funding amount of 20.8 M€:

- Aerobiome based genomic surveillance of fungicide resistance to track the development and spread of AMR in plant pathogens and the wider environment (AEROBIOMICS-AMR)
- Active one health surveillance in LMICs to monitor and predict Antimicrobial Resistance Using Metagenomics (ALARUM)
- Standardized One Health surveillance of antibiotic residues and antibiotic and heavy metal resistance in Baltic water environments and wild birds (BALTIC-AMR)
- Droplet Digital PCR and PCR-free BIOSensors for the diagnosis of resistance-associated SNPs in Pneumocystis jirovecii (DDBIOS)
- Defining E. coli Diversity in Complex Samples: Methods for Surveillance & Transmission (DECODE)

- Effective RApid DIagnostics and treatment of AntiMicrobial Resistant bacteria (ERADIAMR)
- Novel global One Health surveillance approach to fight AMR using Artificial Intelligence and big data mining (FightAMR)
- Bridging the gap between environment and patient; investigating the risk and transmission of antifungal resistance in Aspergillus fumigatus (GAP-AFR)
- Improving detection and diagnosis of antimicrobial resistance in Aspergillus fumigatus (IMPROVE-ASP)
- One health surveillance approach on marine mammal, marine environmental and human antimicrobial resistance on the North and Baltic Seas (MARRES)
- MEtaGenome-informed Antimicrobial resistance Surveillance: Harnessing long-read sequencing for an analytical, indicator and risk assessment framework (MEGAISurv)
- Informing genomic surveillance by uncovering, phenotyping and prioritising resistance genes to new antibiotics (NewResGenes)
- New, easy to use, low-cost technologies based on DNA origami biosensing to achieve distributed screening for AMR and improved antibiotic prescribing (Origami Sense)
- Development and validation of hospital wastewater and aquatic environment sampling for sentinel surveillance of antimicrobial resistance (RESERVOIR)
- Surveillance for Emerging Antimicrobial Resistance through Characterization of the uncharted Environmental Resistome (SEARCHER)
- Innovative multiplex paper-based electrochemical biosensor and artificial intelligence for smart periprosthetic joint infection and AMR diagnostic (SENSIF)

Towards next-generation AMR surveillance: Assessment of novel technologies with high-throughput and multiplexing potential (TEXAS)More information about the projects can be found on the JPIAMR website.[1]

Figure 4. Communication material for the 16th Joint Transnational Call 2023, *Development of innovative strategies, tools, technologies, and methods for diagnostics and surveillance of antimicrobial resistance.*

[1] www.jpiamr.eu/new-projects-in-the-area-of-diagnostics-and-surveillance/

AquaticPollutants

AquaticPollutants is an ERA-NET by the three Joint Programming Initiatives (JPIs) on Water, Oceans and Antimicrobial Resistance (AMR). The Midterm Meeting of the AquaticPollutants took place in Alcalá de Henares in Spain from 30 May to 1 June 2023. All of the 18 projects were represented including PhD students, young researchers, and members of the transfer project, AquaticPollutantsTransNet, as well as representatives from the funding organisations. During the meeting, each of the 18 projects presented results and progress, followed by ten minutes for questions from the follow-up group. The meeting also included a poster session and a poster competition in which young researchers were able to present their work.

TransNet organised a networking meeting for the projects on cross-cutting issues in research and application of technologies for the removal of CECs, AMR and pathogens from wastewater in July. The Thematic Annual Programming action organized a workshop in Prague 5-6 October 2023. Two additional webinars have been conducted within the PhD Forum during 2023.

Monitoring JPIAMR-funded projects and networks - outputs

Overview of the activities of the research projects funded in the 2021 ERA-NET call and the research outputs generated within the mid-term timeframe

An overview analysis on the mid-term progress of the research projects supported in the co-funded call *"One Health interventions to prevent or reduce the development and transmission of antimicrobial resistance"* has been conducted. The analyses provide an update on the activities of the projects and the results achieved within the timeframe of the reporting period of the research projects. Nineteen projects involving 114 partners from 35 different countries were funded in the call with the total funding amounting to 25.6 M€. The purpose of the call was to support transnational, collaborative research projects aiming to understand the impact of interventions on the development and transmission of antibiotic resistance using a One Health perspective. The primary topics addressed by the call were:

- To understand the impact of interventions on the development and transmission of antibiotic resistance in, and/or between, at least two One Health settings;
- To design, implement, evaluate, and/or compare innovative interventions to control the development and transmission of antibiotic resistance in, and/or between, at least two One Health settings.

The projects funded under the call are multidisciplinary covering diverse aspects of intervention measures ranging from antimicrobial stewardship AMS) based interventions on environmental contamination from hospitals and cleaning of effluents feeding the lake, AMR pollution and pathogens in wastewater streams, hospitals and farms, various on-farm intervention measures including farm-workers and the community, phage-based interventions in breeding pigs, broilers in commercial farm, constructed wetlands, as well as bundle of behavioural interventions targeting diverse

communities utilising information, communication, education and hygiene intervention measures (summarised in figure 5).

Figure 5. Schematic representation of types of intervention studies conducted by the funded projects in the 2021 ERA-NET Call.

The mid-term reports highlighted the different sorts of research outputs already generated by some of the projects in terms of publications (scientific articles – 22, thesis -7, manual/guide -2, technical reports -4, technical standard -1) within the short timeframe as shown in figure 6.

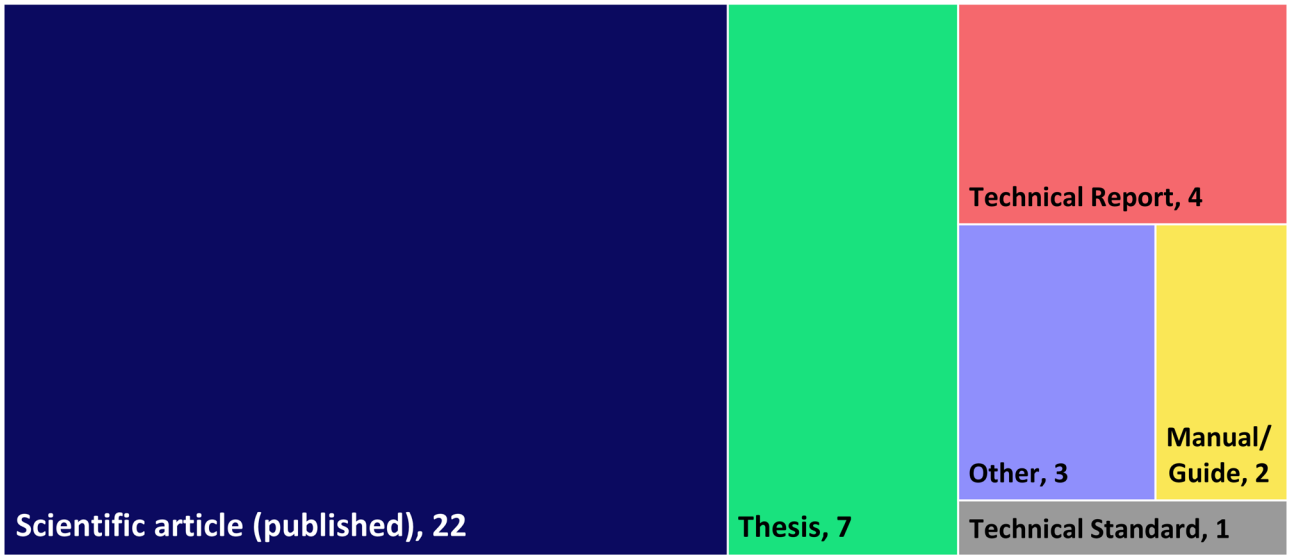

Figure 6. The different types of research outputs generated by the funded projects. The number beside each type of output represents their occurrences.

Dissemination of research findings has also been done not only through scientific publications but also predominantly through participation and presentations in conferences as well as preparation of websites, blogs to reach out to wider audience to promote and communicate the findings and impact of the research. The outreach activities were directed in both regional and national settings but predominantly in international context to different types of audiences (academic audiences – 22%, social

media – 17%, professional practitioners – 14%, students – 13%, policymakers – 13%, general public – 11%) within the community.

More information related to the projects, their publications are available in the website.[2] Some highlights are:

- The project ARPHILAKE is investigating the role of humans, animals, and the environment in spreading antibiotic resistance at Laguna Lake, which is an important body of water in the Philippines for domestic and agricultural use for the community. The project was communicated to Government partners in the Laguna Lake Development Authority (LLDA) and in the academic sector, Food and Agriculture Organization (FAO; United Nations), Laboratory of Sanitary Engineering (Manila).
- COINCIDE consortium is studying the impact of colistin use on resistance in humans and animals in Indonesia. Microbiology protocol for colistin resistance testing of poultry and human isolates has been tailored to local capacities, and published a protocol video on "Determine the method to screen the colistin resistance isolates using phenotypic methods".
- The project COMBAT is studying control the emergence and dissemination of antimicrobial resistance in drain biofilms from three ecological niches: hospitals, pig farms and homes. One of the consortium partners hosted a comprehensive training programme centred on molecular microbiology techniques. The training of early career scientists (ECRs) on metagenomics has been very successful and facilitated data analysis and contributed to the standardisation of results.
- FARM-CARE project is based on two complementary interventions targeting production and biosecurity practices, respectively to mitigate the risk of AMR transmission from pigs to humans. The project developed strategic alliance to facilitate dissemination of the outcomes with a Project Group entitled "ArMoR - fighting Antimicrobial Resistance (AMR) in livestock farming" supported by Horizon Results Booster programme (HRB) that includes 5 EU-funded projects in this field (HealthyLivestock, DISARM, ROADMAP, AVANT and AMRILS).
- HOTMATS aims to design, implement and assess modular advanced solutions primarily targeting AMR pollution and pathogens in wastewater streams directly at AMR hotspots. The consortium has fostered various degrees of collaboration among national organizations such as the Accra Waste Improvement Institute, the Ghana AMR platform, and the Ghana Ministry of Health. The Ghana AMR platform, led by the Ghana Ministry of Health and Ghana Health Service, is a group of AMR implementers from various One-Health disciplines. This has led to an increased focus on AMR in healthcare wastewater in the academic and public community.
- SEFASI in collaboration with another JPIAMR project which aims to collect highly detailed country wide data (SNAP-ONE), has developed the Agriculture-Human-Health-MicroEconomic (AHHME) model for assessing the impact of cross-sectoral interventions. The AHHME model has been developed into an online app for policymakers to use that has been demonstrated at conferences and to the Knowledge Hub members: https://eveemes.shinyapps.io/Model-Code-and-Inputs/ with supporting open access code (https://github.com/Trescovia/AHHME). The

[2] www.jpiamr.eu/projects

transmission model code is also open access on github: https://github.com/rdbooton/SEFASI_model.

- Further, some of the work has been presented to the WHO quadripartite and the project results are feeding into that work (e.g. the NAP review data table was sent to them to help collate interventions).

Overview analyses of the JPIAMR funded projects in relevance to the thematic area of AMU monitoring and AMR emergence and spread in food animals

Over the last few years JPIAMR has supported projects under various calls in relevance to the thematic area of AMU monitoring and AMR emergence and spread in food animals. An overview analyses has been performed on the projects related to the three related strategic areas on:

- AMR emergence and spread in food animals: surveillance, molecular epidemiology and transmission dynamics
- AMU monitoring and alternatives to antimicrobials for AMU reduction in food animals
- Bridging innovations and AMR mitigation in food animals

The various projects addressing these strategic areas have been represented graphically in the figure 7.

Figure 7. JPIAMR supported research projects in the thematic area of AMU monitoring and AMR emergence and spread in food animals.

JPIAMR funded projects on AMR emergence and spread in food animals: surveillance, molecular epidemiology and transmission dynamics

- HECTOR: Risk assessment study to estimate contribution of transmission pathways between humans and livestock to minimise the transfer of resistant organisms *E. coli*. (Vietnam); a much higher prevalence of AMR determinants in the strains isolated in Vietnam (both from humans and animals) compared to those isolated from EU countries and the UK. By sharing these results with the provincial authorities and local farmers, HECTOR improved knowledge of the local authorities and farmers on the AMR situation in Vietnam.
- STARCS: performed a One Health study in Hanoi, Vietnam and highlighted the high prevalence of antibiotic resistance in pig and chicken farms and the high risk of environmental contamination in small-scale slaughterhouses. The project provided different policy orientations to tackle antibiotic resistance in healthcare settings and improve agriculture biosecurity in Vietnam.
- ARENA: assessing the contamination levels will be assessed from sources (effluents, river outflows) to end points (aquaculture plants) and final food products (e.g., fish fillets), along with the antibiotic resistome and pathogenic signature in farm surrounding aquatic environments in open (i.e., mariculture) and recirculating aquaculture systems.

JPIAMR funded projects on AMU monitoring and alternatives to antimicrobials for AMU reduction in food animals

- REDUCE AMU: tested interventions aimed to reduce AMU in livestock using the pig production in Thailand as a study case. Substantial use of and resistance to antimicrobials critical to human medicine at the pig farms has been observed, emphasising the need for enhanced interventions to align with the WHO recommendations about how to use these drugs.
- SEFASI: studying farm-level AMU interventions that will be most efficient at the national-level, considering their impact not only in terms of impact on hospitals, communities or farmers, but across all of these groups.
- ENVIRE: different intervention studies to investigate the potential of various on-farm measures: i) Antibiotic-free raising, ii) Phytotherapy as alternative for antibiotics, iii) E. coli vaccination, iv) Application of bacteriophages, v) Treatment or storage of manure, vi) Depollution of farm effluents to remove antibiotics and their residues to contribute to the reduction of the selection and the spread of antimicrobial resistance in broiler chickens and from chicken farms to the environment, and ultimately to humans.

JPIAMR funded projects on Bridging innovations and AMR mitigation in food animals

- INART: studying different cost-effective ways to treat animal manures and to minimise the levels of AMR and infection causing bacteria in the manure and their impact on the soil and plants that is used to fertilise the fields. Recommendations have been put forward to various agricultural departments for decision making in relation to several treatments of manure and identifying the variations across these treatments, their impacts on different land types and the importance of analysing bacteria.

- FARM-CARE: investigating the impact of these two farm interventions: AMR spread can be controlled by limiting the common practice of co-mingling, which is a recognized cause of stress and AMR transmission between pigs, and by applying biosecurity measures to prevent AMR transmission to farm workers and the community.
- ICONIC: investigating ionophore resistance in Enterococci and *S. aureus* from a One Health perspective, analysing geographically diverse populations originating from poultry, retail meat, environment and human isolates; exploring the consequences of ionophore use, and to assess the effect of alternatives to ionophores on the dissemination of clinically relevant AMR.

The research publications and the research resources generated from the projects and the networks are provided on the JPIAMR website.[3]

Detailed analysis and graphical representation of the outcomes of the entire portfolio of JPIAMR funded projects and networks were presented in various consortia meetings and networks.

[3] *https://www.jpiamr.eu/resources/project-resources/*

JPIAMR Webinars

JPIAMR webinars have become an important tool to include AMR researchers and stakeholders. They are creating valuable dialogues around important themes and topics that contribute to JPIAMR's aims and goals. In 2023, JPIAMR held one webinar and one was arranged by DESIGN OHAMR. The webinars were recorded and the videos later published on the JPIAMR YouTube channel.

16th JPIAMR Joint Call webinar for applicants

In alignment with the launch of the 16th JPIAMR call "Development of innovative strategies, tools, technologies and methods for diagnostics and surveillance of antimicrobial resistance"", a webinar was held on 24 January 2023. During the webinar, the call and the partner search tool were presented and the joint call secretariat and national funding agencies answered questions from potential applicants. The presentations were recorded and published on the JPIAMR YouTube channel. 375 people participated and the recorded presentations have been viewed approx. 1000 times.

DESIGN OHAMR webinar: Social Sciences in AMR research and Innovation

A webinar on Social sciences was held on 10 January 2023 in collaboration with DESIGN OH AMR. This webinar provided an overview of the OHAMR partnership and how social sciences and humanities are integrated with the research and innovation objectives. We shared examples of how social sciences have contributed to projects previously funded by JPIAMR. The presentations were recorded and published on the JPIAMR YouTube channel. 175 people participated, and the recorded presentations have been viewed approx. 170 times.

Young Scientist Contest Finale

A closed webinar was held on 14 December 2023, hosting the three finalists in the JPIAMR Young Scientist Best Linkedin Post Contest. At this event, the three finalists presented the research projects that they have been or are active in and the winners were acknowledged and celebrated. The video from the event was shared in social media and has been viewed some 60 times to date.

Capacity Building Activities

JPIAMR Young Researchers Best LinkedIn Post Contest

From 20 October until 20 November 2023, JPIAMR launched a contest for a cash prize to encourage young scientists to present their research projects with JPIAMR support through posts on LinkedIn.

Eligible participants: Young scientists in the early stages of his or her scientific career and currently supervised by PIs with projects supported by JPIAMR in the years 2019-2022.

Guidelines: Young scientists were required to present their lab's project (supported by JPIAMR) in a maximum of 3 updates, with a maximum of 120 words for each post. Posts could include text, figures, images and videos. All entries should be tagged with the JPIAMR page on LinkedIn. On the day of the end of the contest the contestants had to take a screenshot of each post with the "stats" visible and send to JPIAMR secretariat. The evaluation criteria were each contestant's (combined) number of views and engagement rates of LinkedIn posts, published in accordance with the guidelines.

Results: 16 contestants from 10 projects registered, whereof 12 sent in statistics and 11 were eligible.
Project acronyms and total number of impressions:
• STARS-TAP: 7 191, • SULTAN: 2 642, • PHAGE-EX 1: 18 544, • PHAGE EX 2: 3 205,
• DESIGN: 2 353, • ACOMa: 1 189, • MURYXIN: 324, • COINCIDE: 5 054,
• CycleDrug: 18 627, • SNAP-ONE 2: 2 951, • CoEvalAMR: 3 926

Winners: An award ceremony was held online on 18 December. Each one of the 3 winners gave a short presentation of their project and afterwards the order of the winners was announced:

- Place 1: CycleDrug, Hans Carolus (cash prize 1000 EUR, 2nd place: 600 EUR, 3rd place: 400 EUR
- Place 2: PHAGE-EX 1, Anna-Delia Knipper (cash prize 600 EUR)
- Place 3: STARS-TAP, Elisabeth Derollez (cash prize 400 EUR)

Figure 8. Young Scientist best Linkedin post contest image.

JPIAMR Strategy and Collaborations

International collaboration and stakeholder relations

JPIAMR through its Steering Committee and Secretariat continue to engage and collaborate with other AMR funding agencies, international initiatives and relevant stakeholders. International cooperation activities within JPIAMR aim to:

1. Build the critical mass needed to provide an effective response to the AMR challenge;
2. Coordinate global AMR research funding and,
3. Participate more effectively in agenda setting in international AMR policy and research policy fora.

JPIAMR has continued to strengthen the following collaborations at the global level:

In 2023 AMR is been very high up on the global political agenda, as shown in the G20 resolution on AMR as well as in the new EU Council Conclusions and the European Parliament recommendations on AMR.

At JPIAMR we have worked together with WHO and the Quadripartite and given input on their research agendas, which were published this summer. JPIAMR have also joined the Quadripartite AMR Multi-Stakeholder Partnership Platform and cluster 5 for international funders. Next year there will be an important UN General Assembly high level meeting, which will set a new resolution on AMR, JPIAMR is already taking part in the formulation activities.

JPIAMR also collaborate with several international initiatives. For example, we organised a session on the ECCMID meeting and we are working with CARB-X to align our funding portfolios. We are also in close contact with the EU Parliament MEP Interest Group on AMR.

We are now moving into the phasing out of JPIAMR and transition into the OHAMR partnership and it will be important to make use of the outcomes from JPIAMR.

UN

- Launch of the ***One Health Priority Research Agenda for Antimicrobial resistance,*** developed by the UN Quadripartite organisation (WHO, FAO, WOAH and UNEP). The Quadripartite and JPIAMR has been in constant contact during the development of the agenda, and JPIAMR has contributed significantly to the discussions.
- Launch of the ***WHO Global research agenda for AMR in human in*** collaboration with JPIAMR.

Both global agendas are aligned with the future OHAMR Strategic Research and Innovation Agenda.

Also JPIAMR is an observer at the WHO STAG Committee and has been member of the consultation of the draft “WHO regional European AMR Roadmap”.

AMR Multi-Stakeholder Partnership Platform

JPIAMR is a member of cluster 5 on resource mobilization and financing and participates in the following Action Groups:

- Action Group on Addressing the Antibacterial Pipeline and Access Crisis
- Action Group on Advocacy for Impact – Strengthening Sustainable Resource Mobilization in Low and Middle-Income Country
- UN General Assembly high-level meeting on AMR in September 2024, increasing expectations for how it will deliver on global commitment, architecture and financing for AMR

MoU on Educational Activities with Carb-X, Wellcome Trust, GARDP, Novo Repair, Action Fund

- Co-branded sessions at the AMR conference and AMS
- Exchange of information on funding
- Organised a session in ECCMID

Global AMR R&D Hub

JPIAMR is part of the Global AMR R&D Hub Stakeholder Group. JPIAMR has a continued collaboration for the further development of the global research investment dashboard. Global AMR R&D Hub – Pull Incentives WG; Stakeholder Board

Other collaborations

- *ICARS* is a valuable partner in the CSA DESIGN OH AMR providing advice and support in the AMR prevention and intervention area.
- *PENTA* is also participating as a partner in CSA DESIGN OH AMR providing input in the social economics aspects of AMR.
- *EPHA* is also a partner in CSA DESIGN OH AMR and hosts an AMR Stakeholder Network

European Union and the European Commission

Several meetings have taken place with European Commission officers with a main focus on the design of the future One Health AMR Partnership.

The Council of the European Union and the European Parliament adopted a new AMR resolution on 1 June 2023, which included “the establishment of and significant investment in a European partnership on One Health AMR to allow coordination, alignment and funding of cross-sectorial research and innovation”, strongly supporting our efforts.

We also spoke at the European MEP Interest Group on AMR annual event at the EU Parliament on “Ensuring a One Health approach to tackle AMR at the EU level”.

International Events with JPIAMR Participation in 2023

The following table outlines the international events in which JPIAMR has been represented, through either participation or attendance.

Table 1. International events with JPIAMR Representation 2023.

Meeting or Event	Location	Date
Meeting ICARS - JPIAMR - OHAMR	Copenhagen	10/01/2023
AMR Stakeholder Network meeting (EPHA)	Online	12/01/2023
Meeting Wellcome - JPIAMR - OHAMR	Online	12/01/2023
Meeting with FAO on the Multi-Stakeholder Partnership Platform	Online	25/01/2023
EFSA -JPIAMR/ OHAMR meeting	Online	27/01/2023
EUP AH&W SRIA webinar	Online	15/02/2023
JPIs meeting on strategic orientations	Online	23/02/2023
Technical consultation of draft WHO regional roadmap on AMR	Online	27/02/2023
High level meeting on AMR under the Swedish EU presidency	Stockholm	06-07/03/2023
Global Health EDCTP3 - JPIAMR/ OHAMR meeting	Online	20/03/2023
WHO AMR Human Research Agenda alignment meeting	Online	22/03/2023
WHO -JPIAMR update	Online	03/04/2023
JPI Monitoring & Evaluation TF meeting	Online	13/04/2023
CARBX-JPIAMR OHAMR meeting	Copenhagen	13/04/2023
GLG event on AMR	Copenhagen	14/04/2023
JPIAMR ECCMID Session	Copenhagen	16/04/2023
WHO–JPIAMR/OHAMR meeting on SRIAs	Copenhagen	17/04/2023
ICARS - JPIAMR session on projects portfolio	Copenhagen	17/04/2023
Global AMR R&D Hub and stakeholders Pull Incentive Working Group Sessions	Online	27/04/2023
1st International Annual Workshop for the search of Synergies of the Partnership ERA4Health	Online	09/06/2023
WHO STAG-AMR meeting	Online	13-15/06/2023
WHO Global Webinar WHO Human Health AMR Research Agenda	Online	22/06/2023
OHAMR Roadmap prioritisation workshop	Berlin	15-16/05/2023
WHO STAG-AMR meeting	Online	13-15/06/2023
WHO Global Webinar Launch WHO Human Health AMR Research Agenda	Online	22/06/2023
Kick-off Conference for the EU-WB Policy Dialogue Stakeholder Platform	Sarajevo	13/09/2023

Meeting or Event	Location	Date
One Health EJP Final Meeting	Paris	11-12/09/2023
EPHA AMR Stakeholder Network Meeting	Online	19/09/2023
Workshop on phasing out strategies for European Partnerships	Brussels	21/09/2023
EHFG Gastein	Gastein	26-28/09/2023
AMR Multi-Stakeholder Partnership Platform- 5th Cluster Kick-off meeting	Online	29/09/2023
ICARS' Annual Partners Meeting	Online	03/10/2023
Gallup -JPIAMR *AMR Initiative introduction	Online	05/10/2023
One Health AMR Science & Research Symposium, Pan-Canadian action plan	Hamilton	11/10/2023
HLM AMR Spanish Presidency meeting	Pamplona	17-18/10/2023
Global AMR R&D Hub's Annual Stakeholder Group meeting	Berlin	18-19/10/2023
MEP AMR group workshop at the European Parliament	Brussels	24/10/2023
PPAMR/Financial institutions cluster 2nd meeting	Online	25/10/2023
Pandemic preparedness-OHAMR meeting	Online	07/11/2023
AMR Multi-Stakeholder Partnership Platform action group proposal meeting	Online	08/11/2023
Inaugural Plenary Assembly of the AMR Multi-Stakeholder Partnership Platform	Rome	15-16/11/2023
JPIAMR/OHAMR future antimicrobial treatments portfolio consultation with international funders	Online	08/12/2023
MSPP Action Group meeting	Online	13/12/2023

Update of national AMR research programs/calls from the member countries

JPIAMR has collected updates of all the activities and action plans on AMR that are taking place in member countries at national levels in the year 2022-2023. Updated member fiche can be found on the JPIAMR website.[4] Below is a description of selected actions and activities of JPIAMR members:

- **Belgium:** A National One Health AMR action plan 2020-2024 is being validated and is coordinated by the FPS Health, Food Chain Safety and Environment. 10 strategic axes including Research & Innovation and research funding will be allocated by the federal and federated entities according to their priorities. BELMAP report published on One Health report on antibiotic use and resistance (2011–2021).
- **Canada:** The Pan-Canadian Action Plan on AMR was released in June 2023. CIHR is co-leading the development of a National One Health AMR Research Strategy, in collaboration with Agriculture and Agri-Food Canada, in support of the Action Plan's Research and Innovation Pillar. CIHR will also support the leadership pillar, primarily though supporting LMICs by advancing equitable access, stewardship and IPC, AMR/AMU surveillance data.
  National calls on "AMR: Point of Care Diagnostics in Human Health – Phase 2" and "Network for Global Governance Research on Infectious Diseases".
- **Finland**: One Health Finland is a project conducted for raising awareness on One Health/Planetary Health. The HOH – Helsinki One Health network to coordinate various research activities (researcher forum, panel discussion, webinars).
- **France**: The French Ministry of Health and INSERM will coordinate EU-JAMRAI-2 with numerous entities from 30 countries. The programme will kick-off in the beginning of 2024. Preparation of the EcoAntibio3 (the French national plan for the reduction of the risks of antimicrobial resistance in veterinary medicine) roadmap is in progress. Preparation of the intersectoral roadmap against AMR is also in progress. In addition, in the framework of the Research Priority Plan for AMR, France also recently organised a call for junior and senior scientists (re)establishing in France.
- **Germany**: Germany has adopted a new National Action Plan (NAP) on AMR and is working on a new national AMR strategy, which will have a broad spectrum on One Health, prevention and antibiotic stewardship in different outpatient settings. The IMAG AMR (national mirror group) brings together the ministries involved in Antimicrobial Resistance Strategy (DART) 2030 responsible for the overall coordination, adaptation and expansion of the national AMR strategy. The future AMR strategy would also take into account the development of an outpatient antibiotic stewardship strategy based on the specificities and needs of primary care, paediatric care, outpatient specialist care and dental care.
- **Ireland**: Meeting of the Animal Health Implementation Committee for iNAP2 (Second One Health National Action Plan on AMR) took place in June 2023 highlighting the Progress on iNAP2 projects in the animal health and environment sectors. The AMR One Health Thematic Network, (including the OneHealth government, funding, and research communities, health services, policy makers and other actors) conducted an AMR One Health Research Gap Analysis in 2023. The

[4] www.jpiamr.eu/about/jpiamr-members/

Government of Ireland also hosted a “One Health Event- From Policy to Practice” to mark world antimicrobial resistance awareness week and target One Health policymakers in Ireland.

- **Japan:** National Action Plan on AMR (2023-2027) has been published in April, 2023 to outline items to be implemented over the next five years to further promote measures on AMR. Several national calls that include AMR as a research area have been conducted.
- **Moldova:** The National Program for Surveillance and Combating Antimicrobial Resistance for the years 2023-2027 has been approved in September 2023 - the Plan takes a One Health approach, aiming to strengthen healthcare, public health, veterinary medicine, agriculture, food safety, and research. National survey has been conducted on Knowledge, Attitudes, Behaviour on antimicrobial Resistance in the WHO European Region was carried out in Republic of Moldova, as part of the "Special Eurobarometer 478". Standardization of the AMR diagnostic methodology and determining the consumption of antimicrobial preparations have been developed.
- **Netherlands:** A new national AMR action plan is under development but due to upcoming elections, the plan will be presented late 2023 or early 2024. A new ZonMw research programme started in 2023, which includes national funding and international collaborations, such as the new partnership under the HE framework. The Dutch Global Health Strategy 2023-2030: “Working together for health worldwide” aims to contribute in a coordinated and targeted way to improving public health around the world has been renewed in which AMR has a prominent role. A call for implementation in the clinic is ongoing. .
- **Poland:** Poland has integrated the AMR action plan into the National Health Programme (2021-2025), including environmental health and preventing communicable diseases and national drugs strategy. Educational and capacity-building efforts are also a part of the programme (Infectious Diseases Spring School 2023, post-graduate programme on infection control, antibiotics and antimicrobial drug stewardship)
- **South Korea**: “One health AMR research program” in Korea spans from 2019 – 2033 and includes three phases: Phase I – To construct research infrastructures including soft and hard structures; Phase II – To vitalize basic and translational researches by taking advantage of the collaborative and multisectoral research platforms that have been built during the stage 1; and Phase III – To expand the breadth and depth of researches in all areas of the one health AMR and pursue further advancement of the one health AMR research.
- **Sweden:** The intersectoral national action plan on AMR, which is developed by 26 national authorities and organisations, has been updated with activities for the years 2021-2024. The national research programme is in the process of updating its research agenda and funding instruments, based on input from the Swedish research community and stakeholders in the human health, animal health, food production, environmental protection, and international aid sectors. The Public Health Agency of Sweden has developed and tested a reimbursement model aiming to increase access to certain antibiotics of particular medical value. During Sweden’s term of Presidency of the Council of the EU a new council recommendation on “stepping up EU actions to combat antimicrobial resistance in a One Health approach” has been negotiated and decided (2023/C 220/01). ReAct and Uppsala University also hosted

a dialogue meeting on “The Global Need for Effective Antibiotics - Unlocking Barriers for Collective Action” on May, 2023.

- **Switzerland:** The One Health Action Plan 2024-27 of the Strategy Antibiotic Resistance Switzerland (StAR) is being developed with various partners and stakeholders from research, politics and industry. The National Center of Competence in Research (NCCR) AntiResist is a Swiss-wide research consortium funded by the Swiss National Science Foundation (SNSF) working on antibiotic resistance.
- **United Kingdom:** The UK’s first NAP, “Tackling antimicrobial resistance” was published in 2019 and runs until 2024. This underpins to a 20-year strategic vision to see AMR contained and controlled. The NAP for AMR is in the process of updating co-ordinated by the Department for Health and Social Care (DHSC) in consultation with a broad range of stakeholders across different sectors and will be informed by the findings from the AMR Call for Evidence. Public Health Wales has created an online portal that will enable healthcare professionals in Wales to have more localised and timely data on the AMR position in the communities in which they work and published a set of prescribing guidelines to support safe and optimised prescribing of various medications, including antimicrobials.

JPIAMR Communications

The JPIAMR's communication strategy is centred around a 'digital first' approach, with social media and digital tools playing a crucial role. The JPIAMR website serves as the central hub for communication, with social media platforms and tools, such as newsletters, serving as spokes. This model remains the primary communication strategy.

During the year we have seen the importance and impact of X (formerly Twitter) declining, which is a reflection of the platform's global loss of users. A survey conducted by Nature in August 2023[5] shows that around 50% of the approx. 9 000 scientist that responded had either left the platform or reduced their usage to some extent. This have had a negative impact on stakeholders who use the platform to reach their target audience. For JPIAMR, this have resulted in a sharp decline in the number of views for our updates.

Although LinkedIn is experiencing a rapid growth in terms of followers it does not match the decline seen on X. These changes are important to take into account when developing future communication strategies.

Communication activities and events

In 2023, JPIAMR carried out a limited number of activities, with most of the focus being on the DESIGN OHAMR project. Calls, news and events were treated with the same level of quality and thoroughness as usual. Collaborations and communications were shared with the funders involved in each event, including the launch of the 16th call and the pre-announcement of the upcoming 17th call. During the Swedish Presidency of the Council of the EU, JPIAMR was presented at a high-level meeting on AMR. A contest engaging young researchers was launched with much enthusiasm.

Calls

On 16 January 2023 the 16th JPIAMR joint transnational call for the development of innovative strategies, tools, technologies, and methods for diagnostics and surveillance of antimicrobial resistance was launched as planned. The call was promoted using a custom image (figure 9), social media outreach activities, newsletters, and news updates on the JPIAMR website. On 24th January 2023, participating funders held a joint webinar presenting the 16th call and the partner search tool to researchers, including a Q&A session.

[5] https://www.nature.com/articles/d41586-023-02554-0

Figure 9. Call image for the 16th JPIAMR call "AMR Diagnostics and Surveillance".

To facilitate the promotion of the 16th call, a comprehensive communications package was shared with funders well in advance of the launch. The package included suggested social media messages, news text and a tailored image. This allowed funders to promote the call more easily on a national level and align their promotion with a global context. The webinar was recorded, and videos of presentations were uploaded to the JPIAMR Youtube channel. This has become a standard practice and is highly appreciated by applicants. As is often the case, the number of views of videos exceeds the number of participants in the online webinar.

Presenting funded research projects in the 14th call

In accordance with our mission to communicate funded research objectively, we contacted the coordinators of the 15 funded projects in the call. We requested that they created short videos presenting their projects using a provided template as guidance. In total, we received ten videos, which were shared on JPIAMR's social media platform (figure 10). The impact of these videos was positive for the projects, funders, and JPIAMR.

Figure 10. Title images for three of the projects presented with video in the 14th call.

European Antibiotic Awareness Day (EAAD) and World Antibiotic Awareness Week

The European Antibiotic Awareness Day took place on 18 November 2023, coinciding with the start of the World Antibiotics Awareness Week. JPIAMR communicated the results of the 16th joint transnational call during this period of intense focus on AMR. Communications were launched on the following Monday, 20 November, as the EAAD occurred on a Saturday. Additionally, the 17th call for AMR interventions in 2024 was pre-announced (figure 11). The funders participating in this call received a communication package to promote it and ensure clear and consistent messaging in

their respective national contexts. Social media was the primary communication channel, as digital activities mainly represent the EAAD and WAAW.

Figure 11. Call image for the 17th JPIAMR call "AMR Interventions 2024" pre-announced at the EAAD / WAAW 2023.

Overview of JPIAMR events and activities

- In February, videos were published on the JPIAMR YouTube channel and shared on social media, presenting research projects funded in the 2022 call for 'Diagnostics and Surveillance Networks'.
- On 6 March, JPIAMR was presented alongside SRC at an exhibition during the high-level meeting on antimicrobial resistance hosted in Stockholm by the Swedish Presidency of the Council of the EU (figure 12).
- JPIAMR co-organised an event at ECCMID 2023 on developing funding applications from drug discovery to drug development. The event was promoted on social media.
- On World TB Day (24 March), the importance of global research collaboration on AMR was highlighted and updates were shared on social media.
- The AquaticPollutants newsletter was also promoted following collaboration within AquaticPollutants. The progress of the 18 projects funded in the call via JPIOCEANS, WATERJPI and JPIAMR in July was communicated. Updates were shared on social media.
- Ten videos presenting the research projects funded in the 2022 call 'Disrupting drug resistance using innovative design' were posted on the JPIAMR YouTube channel and shared on social media from July to October.
- The JPIAMR Young Scientist Best LinkedIn Posts Contest was promoted. Young scientists were encouraged to present their research projects with JPIAMR support on LinkedIn. Updates were made on social media.
- Communication activities were carried out during this year's EAAD and WAAW from 17-24 November (see separate section above).
- JPIAMR, as a partner of the AquaticPollutants TransNet, shared and communicated updates throughout 2023.
- Seven newsletters were published, reaching approximately 1640 contacts with news on JPIAMR activities and events.
- Ten news posts and articles about events were posted on the JPIAMR website.

Figure 12. JPIAMR at the high-level meeting on AMR (6 March 2023).

Overview of the total measured impact made by JPIAMR communications:

JPIAMR Communications Activity Overview: 1 January – 18 December, 2023

Type	Updates*	Impressions*	Engagement*	Views of Video*
Twitter @JPIAMR	61	153200	2896	2237
LinkedIn/JPIAMR	37	23082	5908	6826
YouTube/JPIAMR	16	-	-	2579
TOTALS	**276**	**285 328**	**8 894**	**8 229**
Newsletters *(1640 contacts)*	**7**			
		Unique Pageviews*		
www.jpiamr.eu	**10**	107 500		

* *Ongoing measures.*

www.jpiamr.eu twitter.com/JPIAMR facebook.com/JPIAMR

jpiamr

Figure 13. Measured communications and impact by JPIAMR communications.

Communication tools

Newsletter

The JPIAMR newsletter is vital for sharing important updates, information and news. Currently, the newsletter reaches over 1 640 subscribers.

YouTube channel

The JPIAMR YouTube channel contains videos from workshops and webinars and supports projects and networks. The number of subscribers and viewers is continuously increasing. As of December 2023, the channel has 370 (331 in 2022) followers and in total 57 811 views (55 232 in 2022).

Canva

During 2023 JPIAMR communications have increasingly used Canva to develop infographics for social media messages and presentations.

Social media

Social media continues to be a key channel for JPIAMR communications, however the major change during 2023 is the declining in use and importance of X, formerly known as Twitter, as highlighted earlier.

- X (Twitter): This service is not JPIAMR's most important social media platform anymore! JPIAMR has gained more followers and reached 5 133 followers in 2023 (compared to 4 618 followers in 2022), but the pace was lower and stalled at the end of the year.
- LinkedIn/JPIAMR: This service has become JPIAMR's most important social media platform for sharing news, events, funded research results and activities with the AMR-research community. We now have 1430 followers which is a significant increase since the year before (944).
- Facebook/JPIAMR: We have decided to discontinue our updates on Facebook since our audience is not active there to a level that matches efforts to stay up to date.

JPIAMR website

The website jpiamr.eu is the hub for communications and is the container for information about JPIAMR and its activities across time.

In 2023, a project to connect the JPIAMR project and network webpages to the JPIAMR project database was completed. This ensures rapid transfer and update of data with minimal manual involvement and efficient dissemination of information on the outputs and outcomes of the projects and networks supported under various JPIAMR calls, (figure 14).

Also the pages containing overviews of resources generated by JPIAMR supported research, such as research publications and tools, as well as AMR data and research infrastructure platforms are now connected to the database.

In 2023, the website has been continuously updated and 10 news and event posts have been published. It has had more than 107 500 unique page views during the period 1 January to 7 September. Since Google discontinued its Analytics tool we have no more data after 8 September 2023. Via the Swedish Research Council, a new tool for web analytics is about to be implemented as of December 2023.

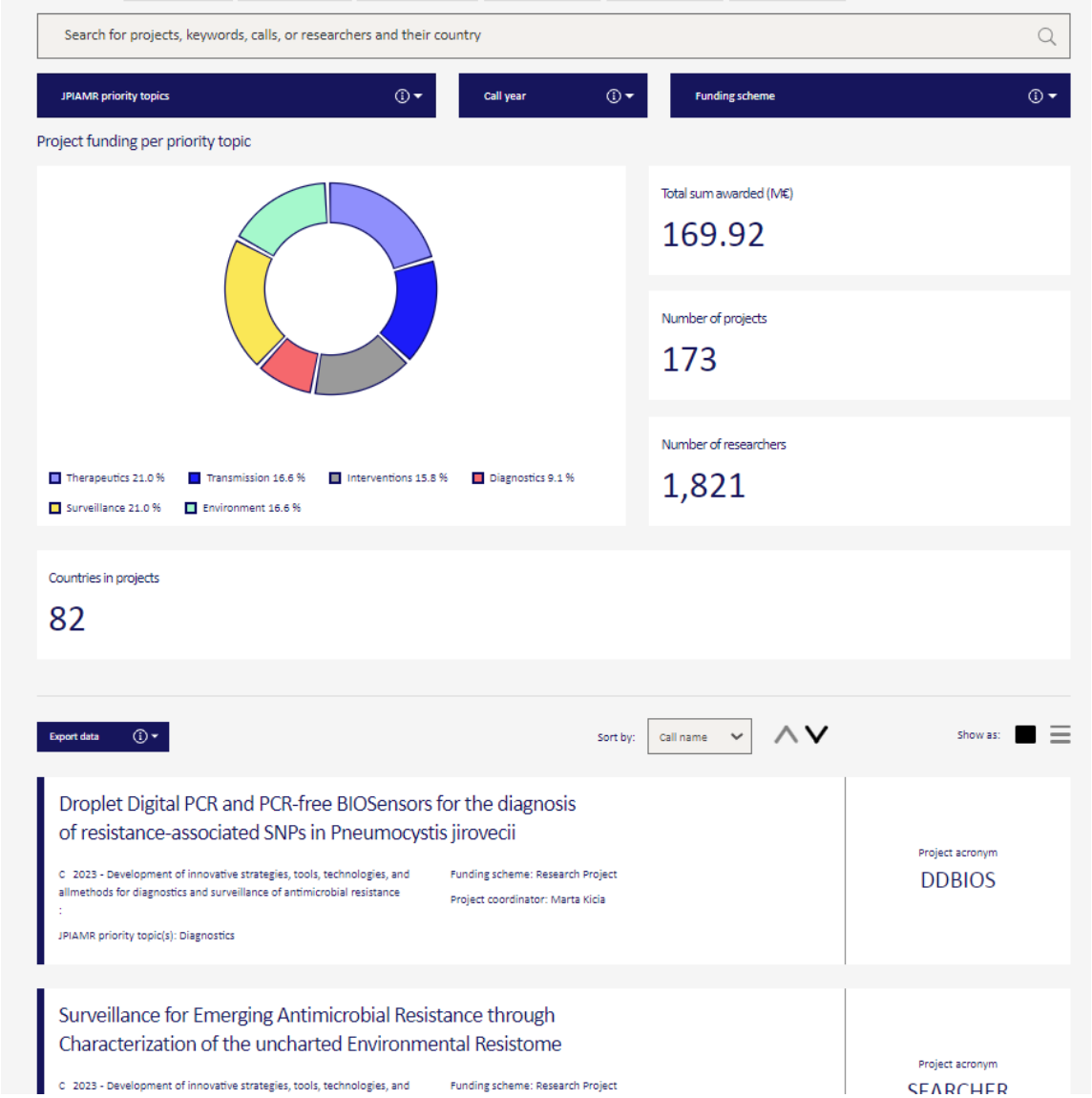

Figure 14. The JPIAMR projects webpage with interactive dashboard and listing of projects and networks.

Contributions to the preparation of the One Health AMR Partnership

During 2023, JPIAMR members, its Management Board, its Scientific Advisory Board (SAB) and its Secretariat have contributed significantly to the preparation of the future European co-funded partnership on One Health AMR (OHAMR) in close collaboration with the Coordination and Support Action (CSA), DESIGNing the European Partnership on One Health AMR (DESIGN OH AMR, project number 101057036) granted by the European Health and Digital Executive Agency (HADEA).

OHAMT will build on, be complementary to and go beyond JPIAMR with the aim to close the current gaps and break existing silos on AMR in accordance with the European One Health Action Plan against AMR. The partnership will encompass the field of human, veterinary and environmental disciplines, a broad spectrum of pathogens and include socio-economic aspects. It will strengthen the EU as an internationally recognised actor for OH AMR by expanding globally. OHAMR will boost research, development and innovation and foster the generation of novel solutions to prevent and treat infectious and improved surveillance, diagnosis and control of resistant microorganisms and to facilitate the uptake and implementation of such solutions in order to reduce the burden of AMR. The partnership will pool the necessary financial resources from the participating national research programmes with a view to implementing joint calls for transnational proposals.

The proposal of OHAMR is planned to be submitted in September 2024 and the first calls are expected to be launched 2025.

During 2023, the JPIAMR Scientific Advisory Board contributed to finalise the draft OHAMR Strategic Research and Innovation Agenda (SRIA, figure 15), which was published on 22 May.

Figure 15. The OHAMR draft SRIA.

The JPIAMR SAB and other experts and stakeholders also participated in a prioritisation workshop in Berlin 15-16 May (figure 16), which resulted in a number of potential topics that was included in the draft OHAMR Roadmap of Actions, which was developed during 2023 (to be completed during 2024).

Figure 16. The JPIAMR SAB and other experts and stakeholders at the Prioritisation workshop in Berlin 15-16 May

The JPIAMR Management Board provided input on the draft SRIA at the Management Board meeting (online) 28-29 March and on the draft Roadmap of Actions at the Management Board meeting in Hamilton, Canada 12-13 October.

JPIAMR central infrastructures and resources (e.g. communication channels, social media, website, databases etc) have been mobilised to support the DESIGN OH AMR consortia in organising consultations, workshops and webinars, for example a webinar on Social sciences in AMR research on 10 January, where also JPIAMR projects were presented. The JPIAMR communication team has also been involved in developing the design guidelines for the DESIGN OHAMR project, containing templates, colours, logo updates and fonts, to be used in communications. This can be reused in a future OHAMR Partnership