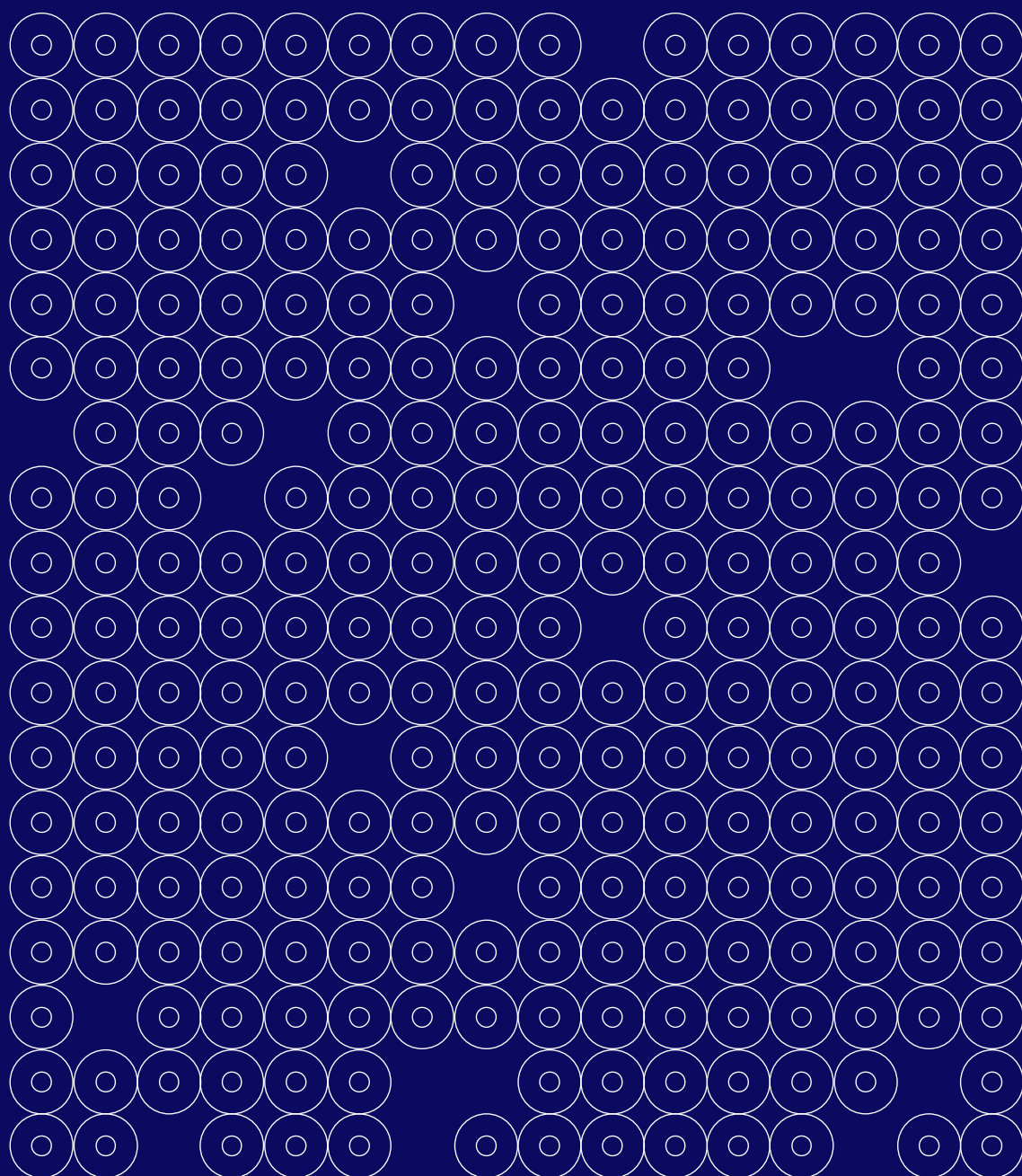


JPIAMR Activity Report 2020



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Foreword

The last year has shown that the need for science is more important than ever!

The COVID-19 pandemic has had a huge impact on all of us and tempted our patience, but at the same time made it more certain that collaboration across borders and disciplines is the way forward.

Despite these challenging times, being part of JPIAMR as an organisation supporting research and coordinating resources in the area of antimicrobial resistance is very motivating. Together, the JPIAMR member countries create opportunities and enable research with a One Health approach across the globe. Important work has been carried out, no matter of the many changes and hurdles presented in 2020, and new lessons have been drawn.

While antibiotic resistance is already a serious global challenge, we can only imagine what an “AMR-pandemic” would be like. Therefore, we need to prepare for solutions and collaborations to curb AMR on a global scale. We need to keep working forward and together.

JPIAMR has continued its work in 2020 in this spirit. We have awarded funding to seven new networks, launched a research call on water pollutants in collaboration with JPI Water and JPI Oceans, developed research infrastructure dashboards, created a new ERAnet Co-fund JPIAMR-ACTION, initiated an antifungal consultation and organised virtual meetings, scientific workshops and a series of AMR-COVID-19 webinars. In addition, we have started with the design of the JPIAMR-VRI Digital Platform.

This year JPIAMR launched a Sustainability Plan and a new Implementation Plan for the years 2021-2023. We have also advanced the design of the future One Health AMR Partnership. We keep doing what we are set do to and best at: making countries work together on AMR research with a One Health approach. We keep on working together - with you and for you.

Thank you again for your strong commitment on the AMR Challenge.

Jan-Ingvar Jönsson, Chair of JPIAMR
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 28 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 IACG, World Health Organization (WHO), the Global AMR R&D Hub, and countries outside the current membership, including the United States of America. The G20 and G7 now 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 develop the JPIAMR Virtual Research Institute.
- To promote innovation and translation of research results.
- To bridge the gap between research and policy.

Summary of JPIAMR achievements in 2020

- Development of the Implementation Plan 2021-23
- Development of the JPIAMR Sustainability Plan
- Securing the extension of the CSA EXEDRA
- Securing the extension of the ERAnet Co-fund JPI-EC-AMR
- Election of new Chair, Vice-Chair and Steering Committee
- Renewal of the Scientific Advisory Board
- Inclusion of a new antifungal expert in the Scientific Advisory Board
- Antifungal consultation to broaden the Strategic Research and Innovation Agenda
- Securing the One Health AMR Partnership as a candidate partnership in the EU framework programme Horizon Europe
 - Negotiating a CSA to prepare the AMR Partnership
 - Setting up a Partnership Task Force
 - Development of a work plan for the drafting of the AMR Partnership
 - Setting a joint working group with EJP One Health
 - Setting a discussion group with the IMI and IHI Partnership

- The Virtual Research Institute (JPIAMR-VRI)
 - Survey to the scientific community on digital needs
 - Design a digital mind map
 - Design data sets
 - Contract to start the development the JPIAMR-VRI Digital Platform
- JPIAMR joint calls
 - Preparation, drafting and negotiation of the ERAnet Co-fund JPIAMR-ACTION
 - Launch of a Network Plus call: seven new networks awarded funding
 - Launch of two joint transnational calls in the framework of the ERAnet Co-fund AquaticPollutants (jointly with JPI Water and JPI Oceans)
 - Update of the JPIAMR Call Procedures
 - Development of a joint project extension policy
- International collaboration
 - New member Moldova
 - Membership discussions with Chile and Uruguay
 - WHO - provide input to the concept paper of a new initiative on developing a One Health Research Agenda, collaborate in the new exercise/report regarding fungal pathogens
 - Series of joint webinars with GARDP, Carb-X, Wellcome, and Novo Repair Fund
 - JPIAMR representation in international AMR events
 - Continued interaction with key stakeholders
- JPIAMR workshops
 - Series of three webinars AMR research in a post-pandemic world
 - Workshop on Interventions to Reduce the Development and Transmission of AMR
 - AMR Surveillance Networks Workshop
- Evaluation activities
 - Launch of three new dashboards on AMR research resources, services and infrastructures
 - Mid-term and final evaluation monitoring of the JPIAMR funded projects
 - Compilation of JPIAMR funded project publications (over 200 scientific publications + policy papers)
 - Compilation of projects data for ERA-LEARN and EC Data Collection for Calls and Projects
 - Collection and publication on national members' AMR plans and research programmes
 - Collaboration with the Global AMR R&D Hub to develop the research funding dashboard
 - Mapping surveillance projects and networks
- Communications
 - Evaluation exercise of JPIAMR website
 - Development of new communication materials and virtual formats
 - Increase social media efforts
 - Dissemination of projects outputs

JPIAMR governance

The current governance and management structure of JPIAMR is composed of the following bodies according to the [JPIAMR Terms of Reference](#):

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

JPIAMR Management Board

The [JPIAMR Management Board](#) (MB) is the main decision making body of JPIAMR. Each of the 28 member countries can have two representatives on the MB with a governmental mandate. The European Commission is a non-voting member of the JPIAMR MB. The MB meets formally twice per year and in 2020 both meetings (March and October) were held online due to the COVID-19 pandemic.

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 JPIAMR Secretariat. In 2020, JPIAMR held an election for the Chair, Vice-Chair and Steering Committee. The elected representatives on the SC are Jan-Ingvar Jönsson (Chair, Sweden), Marie-Paule Kieny (Vice-Chair, France), Jonathan Pearce (United Kingdom), Richard Gordon (South Africa), Charu Kaushic (Canada) and Joachim Klein (Germany). In 2020, the SC met seven times, with all meetings conducted online due to the COVID-19 pandemic.

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 major tasks of the SAB in 2020 have been to support the preparation for the One Health AMR partnership, broaden the JPIAMR Strategic Research and Innovation Agenda to include antifungals, and develop the webinar series “AMR in a post-pandemic world”. The SAB has also provided advice to the MB regarding scientific priorities with particular focus on the workshops, the JPIAMR Virtual Research Institute and JPIAMR calls for proposals. The Netherlands Organisation for Health Research and Development (ZonMw) administers the SAB.

The members of the 2020 SAB are:

- Jean-Yves Madec, ANSES, France (Chair)
- Till Bachmann, University of Edinburgh, UK (Vice-Chair)
- Eric Brown, McMaster University, Canada
- Ana Maria de Roda Husman, RIVM Netherlands, The Netherlands
- Katherine Payne, University of Manchester, United Kingdom
- Eva Tacconelli, University of Tübingen, Germany
- Christina Greko, National Veterinary Institute, Sweden

- Jordi Vila, Hospital Clinic in Barcelona, University of Barcelona and Institute for Global Health, Spain
- Anngret Schneider, Robert Koch Institute, Germany
- Constance Schultsz, University of Amsterdam, Netherlands
- Rafael Cantón, University Hospital Ramón y Cajal and Complutense University, Spain
- Marc Lemonnier, Antabio, France
- Ramanan Laxminarayan, Center for Disease Dynamics, Economics & Policy (CDDEP) and Princeton University, USA and India
- Luísa Vieira Peixe, University of Porto, Portugal
- Ed Topp, Agriculture and Agri-Food Canada, Canada

In 2020, an election was held to include an antifungal expert in the SAB. Thomas Harrison from St Georges University of London elected with a mandate from 2021.

The JPIAMR Secretariat

The [JPIAMR Secretariat](#) is responsible for the day-to-day management of JPIAMR. It 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 players, and prepares the necessary budgetary arrangements to run the management structure. The Swedish Research Council hosts the Secretariat and in 2020 the secretariat was composed of nine full-time or part-time staff (5.5 FTEs): a Head of Secretariat, three Senior Research Officers, a Senior Analyst, a Communications Officer, a Web Administrator/Administrative Officer, a JPIAMR-VRI project manager and a Financial Officer. In 2020, the JPIAMR Secretariat hosted one intern from Karolinska Institutet as part of a career development programme.

Member Relations

The Globalisation Working Group has focused this year on the preparation and implementation of regional workshops that have been postponed (due to the pandemic) to 2021. These workshops are designed to engage globally with new countries. In 2020, new members were interviewed to better understand their interest and level of satisfaction regarding their engagement in JPIAMR.

In 2020, Moldova joined the JPIAMR consortium as a new member and discussions with Chile and Uruguay regarding membership are ongoing.

Sustainability Plan

JPIAMR's long-term *Strategic plan for 2020-2025* and *Roadmap of Actions 2019-2024* as well as the new *JPIAMR Implementation Plan 2021-2023* describe an ambitious expansion of JPIAMR's activities in several domains. It is based on the tenet that to financially support the activities a new sustainability model with associated business was needed to be developed in 2020.

The financial support of JPIAMR will be a combination of:

- Membership fees (flexible membership fee structure adapted to the engagement and income level of individual countries).
- Voluntary contributions (in-kind) from members to cover activities and secondments to the Secretariat.
- EC support for coordination costs through a CSA.

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 (according to GDP) for the year combined with support from the European Commission in the form of a Coordination and Support Action (CSA) EXEDRA. The CSA has six work packages that mirror and support the activities of the JPIAMR Working Groups for 2017 to 2020 with a budget of 2.1 M€ In 2020, the JPIAMR submitted an amendment for a no-cost extension of the EXEDRA project until the end of 2021.

JPIAMR Strategy and Collaborations

JPIAMR conduct 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 2021-23*.

New discussions for the preparation of a One Health AMR European Partnership have been initiated.

New Implementation Plan

JPIAMR has developed a new [Implementation Plan 2021-2023](#) which was drafted by the Steering Committee and the JPIAMR Secretariat with input from the MB members. The implementation plan follows the main lines of the *JPIAMR strategy 2020-2025*.

The JPIAMR Strategic Research and Innovation Agenda – antifungal consultation

The JPIAMR, with its [Strategic Research and Innovation Agenda](#) (SRIA), recognises that innovation is critically important in the field of AMR, as there is a strong need for new therapeutics, diagnostics, and innovative infection prevention and intervention measures. In 2020, the JPIAMR MB decided to expand SRIA to include antifungals. Consultations with an antifungal expert group were conducted to broaden the SRIA, and open and national consultations for the broadened text were held. The broadened SRIA will be released in 2021.

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. The roadmap defines future JPIAMR research calls, network calls, strategic workshops and JPIAMR-VRI activities.



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

One Health AMR Partnership

European Partnerships are initiatives in which the European Commission and private and/or public partners commit themselves to jointly support the development and implementation of a research and innovation program. JPIAMR has been leading the discussions for the One Health AMR Partnership formally listed by the EC Horizon Europe documentation, with starting date 2024.

This co-funded partnership aims to coordinate and align activities and funding between countries as well as with the EC. The partnership will facilitate national coherence between different services and ministries with responsibility for the various aspects of AMR (e.g. human health, agriculture, environment, industry, finance). The main goal is to contribute to achieving the objectives of the *European One Health Action Plan* against AMR and the *WHO Global Action Plan on AMR*, by reducing the threat of AMR.

Within the framework of the development of the One Health AMR partnership, the following activities have been conducted and/or planned:

- Set up a new Task Force: To date there have been three meetings, several written exchanges and a permanent discussion at SC meetings. Task Force members include the SC + SAB Chair and Vice-Chair + Secretariat members
- The partnership should be based on the JPIAMR SRIA, which could be broadened to include antifungals, antivirals, and antiprotazoals
- Consultations with stakeholders by area in a One Health approach is needed
- OH AMR partnership should develop a mapping of initiatives/stakeholders in the other scientific areas and complementing them rather than covering all scientific areas within partnership. A CSA for planning the partnership has been discussed and is expected in first work programme of Horizon Europe in 2021/22.
- Synergies and alignment with the EJP One Health: In April 2020, JPIAMR co-hosted a virtual workshop with EJP One Health AMR projects and JPIAMR funded projects on animal health. Alignment of activities were discussed. JPIAMR also participates in the EJP stakeholder board meetings. The new Partnership on Animal Health has drafted a vision paper and states clearly their AMR ambitions and its complementarity with OH AMR Partnership.
- Synergies and alignment with the IHI Partnership, EPFIA, and IMI representatives: JPIAMR has initiated discussions on alignment between our AMR Partnership and the upcoming IHI Partnership. It has been agreed that strategic documents (SRIA & Roadmap and their AMR case study etc) should be exchanged and a small analysis in advance of organising a joint (JPIAMR – IHI) virtual scoping workshop for the human area therapeutics/diagnostics led by the WG Industry should be conducted. The aim would be to map interactions, scope for (funding) priorities and identify complementarities between the two Partnerships. This event is projected to be conducted in October 2021.

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: i) Build the

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

At global level, JPIAMR has continued to strengthen the following collaborations:

World Health Organisation

- Collaborate with the WHO for the development of the WHO fungal priority list and the JPIAMR antifungal research priorities
- Start collaboration in developing a “One Health Research Agenda”

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

- Co-organisation of a bootcamp at ESCMID/ASM conference on AMR drug development
- Series of webinars lead by GARDP
- Exchange of information on funding

Global AMR R&D Hub

JPIAMR is part of the Global AMR R&D Hub Stakeholder Group. JPIAMR has provided support for the development of the global research investment dashboard. JPIAMR participated as panellist in an AMR Global R&D Hub conference.

ICARS

Several contacts have been established with ICARS to develop collaboration which resulted in ICARS joining the 2021 Transmission & Interventions call supporting the participation of LMICs.

European Union and the European Commission

Several meetings have taken place with European Commission officers with a main focus on the EC support to JPIAMR activities and the design of the future potential candidate for a co-funded European Partnership, the One Health AMR Partnership. Specific points to note include:

- **Progress report EU Action Plan:** The European Commission has published its progress report on the implementation of the European One Health Action Plan against Antimicrobial Resistance. Substantial progress has been made since the last progress report published mid-2019. Many of the actions that the report highlights are JPIAMR achievements. In Section 3 on Boosting Research, JPIAMR is widely mentioned and the JPIAMR SRIA priorities and joint calls are acknowledged.
- **Audit report on European Union efforts on AMR:** The European Court of Auditors issued a new report assessing the European Commission’s and EU agencies’ management of key activities and resources to reduce AMR as well as at EU support for AMR research. The report acknowledges the support of the EU to JPIAMR and especially highlights the development of the Strategic Research Agenda.
- **EU-JAMRAI:** JPIAMR has continued collaboration in promoting their policy briefs and in the organisation of a joint workshop on AMR evidence based policy in February 2021.

- **One Health EJP:** Several contacts has been established with One Health EJP, including bilateral discussions with regards to the AMR One Health Partnership. A joint WG JPIAMR-EJP has been develop regarding the alignment of the development of the SRIAs of the two partnerships.
- **Interaction with other JPIs**
- JPIAMR has interacted regularly with the other JPI Chairs, especially with regards to the new European Partnerships. A joint Evaluation working group has been established and meets regularly. A joint call with JPI Water and JPI Oceans has been conducted.

Several bilateral meetings have taken place with the EC and IMI and its Steering Group of Infectious Diseases regarding the coordination and complementarity of funding programmes. Jonathan Pearce has continued his role as a member of this IMI Strategic Governing Group, while the Industry working group Chair and the JPIAMR Secretariat have maintained a dialog with IMI, the new IHI Partnership and future AMR activity within the Horizon Europe Framework. The Industry Relations Working Group has also provided revisions to the JPIAMR Guidelines for Applicants.

JPIAMR is also a stakeholder of the European Clinical Trial Network (ECRAID) initiative, SEDRIC network and MicrobiomeSupport. JPIAMR has also collaborated with VALUE-Dx regarding the development of a catalogue survey and the new AMR resources dashboard.

JPIAMR Joint Calls

Coordination of JPIAMR Joint Calls

JPIAMR coordinate joint calls through the implementation of the ERAnet Co-fund JPI-EC-AMR. JPI-EC-AMR has been running since 2015 and in 2020 the European Commission granted a no-cost extension until the 31st of December 2021. In 2020, 26 organisations submitted an application to the European Commission for a new ERAnet Co-fund, JPIAMR-ACTION. JPIAMR also participates with JPI WATER and JPI OCEANS in joint ERAnet Co-fund AquaticPollutants.

Core Call Steering Group

The JPIAMR Core Call Steering Group interacts to develop calls and guidelines to support the activities of Joint Call Steering Groups. Members are representatives from former and present call secretariats, and the UK. The Core Call Steering Group regularly holds teleconferences. In 2020, the Core Call Group updated the procedures documents for JPIAMR calls.

Joint Transnational Calls for Proposals

Since 2014, JPIAMR has held six joint transnational project calls and four network calls funding 61 research projects (Figure 2) and 38 networks (Figure 3) with a total investment of approximately 80M€. 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.

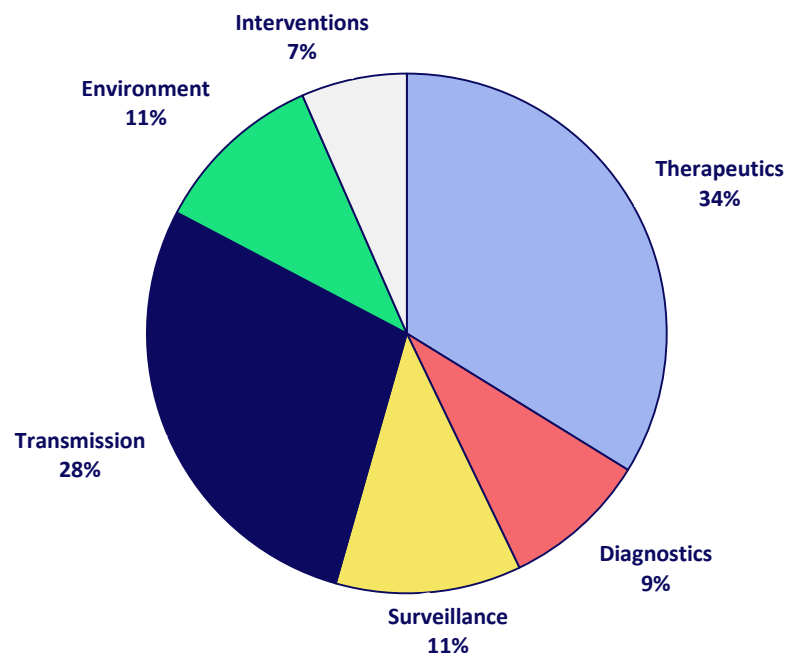


Figure 2. JPIAMR research projects funded by JPIAMR countries from 2014-2020, divided into JPIAMR-SRIA priority areas. To date, 61 research projects have been funded by JPIAMR and the financial contribution to these calls is approximately 78M€.

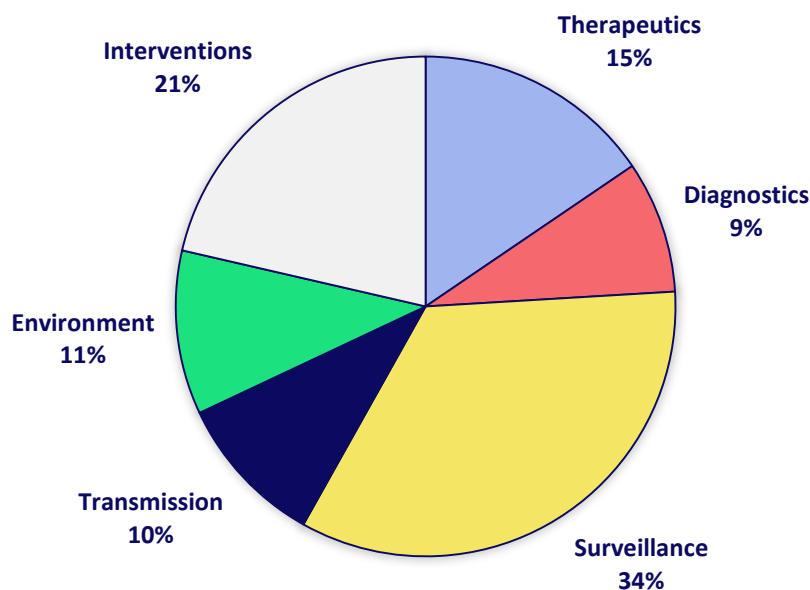


Figure 3. JPIAMR networks funded by JPIAMR countries, divided according to JPIAMR-SRIA priority areas. To date, 38 AMR networks have been funded through JPIAMR network calls. To date, the financial contribution to these calls is 2.4M€.

The Italian Ministry of Health (It-MoH) was the Joint Call Secretariat for the JPIAMR 2020 Joint Transnational Call *JPIAMR Network Plus 2020*. The call aimed to support networks to design and implement activities focusing on AMR within the domains of human health, animal health and the environment. Seven networks were awarded with a total funding amount of 0.74M€ involving 146 partners from 35 countries. The networks were encouraged to bridge multiple one health areas as needed and to consider the incorporation of their activities within the JPIAMR-Virtual Research Institute (JPIAMR-VRI). The call was launched within the framework of the ERANet Co-fund JPI-EC-AMR.

Monitoring JPIAMR-funded projects and networks - outputs

JPIAMR is continuously monitoring the results, outputs and outcomes of the funded projects and networks. A brief summary of the outputs of some of the projects and the networks as per the six JPIAMR-SRIA priority research areas are provided here.

In **therapeutics**, JPIAMR has supported translation research on discovery of new antibiotics and therapeutic alternatives, and the improvement of current antibiotics and treatment regimens against pathogens identified in the WHO Priority Pathogens List. Three projects, [NACPLI](#), [noTBSec](#) and [SENBIOTAR](#) funded in the first JPIAMR call in 2014 *InnovaResistance* developed four new compounds. Two of the compounds are directed towards the treatment of infections caused by *Pseudomonas aeruginosa* and are under clinical development, another lead is to counteract β -lactam resistance and the last is directed against TB and has a patent pending. These three projects also received additional external funding to advance the academia-industry research partnership with CARB-X and TB-alliance (Figure 4). Projects, such as, [CO-ACTION](#) designed several combinations of existing antibiotics (AB) and Neglected and Disused AB (ND-AB) with increased activity against the multidrug resistant gram-negative bacteria, *Acinetobacter baumannii*, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*. One such promising combination is that of Polymyxin B with rifampicin and minocycline, which is under

further study. [ABIMMUNE](#) utilised the strategy of using immunomodulatory drugs in combination with antibiotics to treat lower respiratory tract infections and identified four leads of interest (monophosphoryl lipid A, flagellin, pioglitazone, and rapamycin) to be used in combination with antibiotics. [COMBINATORIALS](#) identified potent competence inhibitors in *Streptococcus pneumoniae*, called COM-blockers that reduce the spread of virulence factors and antibiotic resistance in bacteria. This study was published in [Cell Host & Microbe, 2020](#).

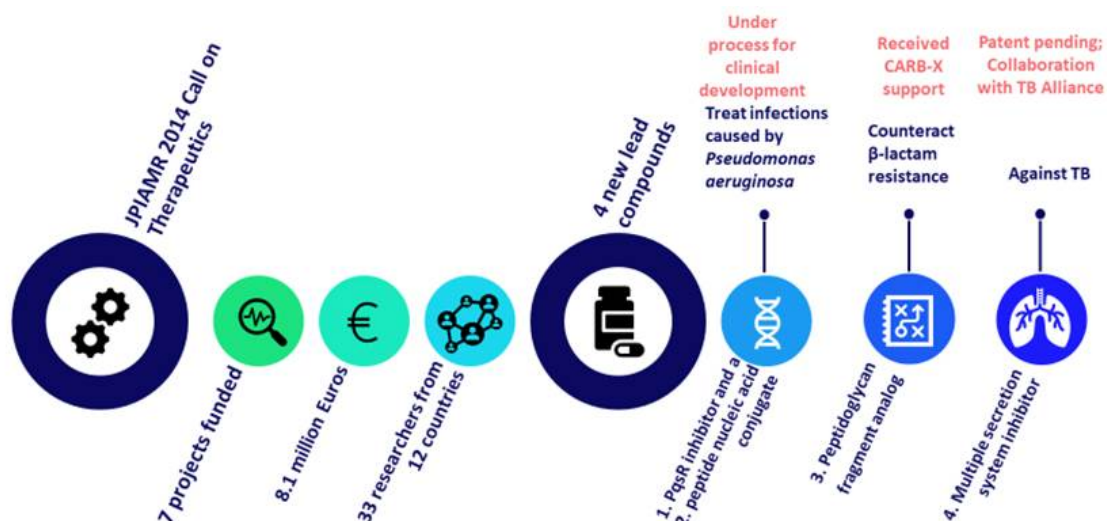


Figure 4. Moving the pipeline: outcomes of the JPIAMR first call on Therapeutics.

JPIAMR also supported research networks. One network involves small and medium-size biopharmaceutical companies (SMEs) for establishing new policies on economic incentives in order to better sustain the innovation efforts of the SMEs in developing innovative products to combat AMR ([BEAM Alliance](#)). Another network is working to design a framework to streamline regulatory processes for novel therapeutics ([IRAAD](#)) and another network is working to foster collaborations between industry and academia to identify technical solutions to improve antibiotic development ([TRANSLOCATION-transfer](#)).

To date, the JPIAMR funded projects and networks have produced more than 200 research publications. The entire list can be accessed on the JPIAMR [website](#). In addition to scientific articles JPIAMR supported projects have also published white papers, policy recommendations and technical standards and reports.

The funded network [VetCast](#) published a [position paper](#) on the definition of clinical breakpoints for drugs licensed for veterinary medicine. The network [AACTING](#) created systems for quantification of antimicrobial usage and published guidelines on best practices for collecting, analysing, benchmarking and reporting herd-level AMU for awareness raising and promoting stewardship (<http://www.aacting.org/guidelines/>). They also created an overview of existing farm-level AMU monitoring systems (<http://www.aacting.org/monitoring-systems/>).

The network, [AMR-RDT](#), published recommendations in the [European Journal of Clinical Microbiology & Infectious Diseases, 2019](#) on a 'mix-and-match' package for the implementation of point-of-care testing (PoCT). The mix-and-match implementation package is designed to encourage the implementation of rapid infectious disease and

antimicrobial resistance PoCT in transnational medical environments for use in the fight against increasing antimicrobial resistance.

The network “CoEval-AMR” evaluated three available tools that covered AMR surveillance and One Health aspects to varying degrees and published a guidance in [Clinical Microbiology and Infection, 2020](#) to select a fit-for-purpose surveillance tool. Performing evaluations, as presented in the publication, and consecutively adjusting integrated AMR surveillance activities and national action plans will contribute to effective antimicrobial treatment options for humans and animals in the future.

The project, [AB-Assistant](#), designed a smartphone application to evaluate the impact of digital antimicrobial stewardship on quantity and quality of antimicrobial drug prescribing for the hospital setting. The study is registered for an international randomised, multicentre, clinical trial. (ClinicalTrials.gov registry; [NCT03793946](#)).

The [AMResilience consortium](#) is building a database of interventions for AMR. An open access One Health learning platform on interventions for AMR would be useful to a broad range of stakeholders, including health-care professionals, public health practitioners, policy makers, industries, and consumer groups. It would not only provide the possibility of complementing published sources with new information, but also enable the exchange of ideas through online community tools. Recently the consortium published a review article in [The Lancet Infectious Diseases, 2020](#).

The [ARCH Network](#) supported in the JPIAMR 2018 Network Call on “Surveillance” has published the white paper series in the [Journal of Antimicrobial Chemotherapy](#) on implementation of One Health antimicrobial stewardship (AMS) programmes linked to surveillance of antimicrobial resistance (AMR) and antimicrobial usage (AMU). The four white papers provide consensus-based practical guidance to any stakeholder looking to establish or implement AMS activities under heterogeneous economic settings that include low- and medium-income countries as well as in context with limited expertise in surveillance/AMS. Guidance is provided as a list of actions tailored for different settings: hospital, outpatient, long-term care facility; or veterinary, and focuses on three main topics: 1) AMS leadership and accountability; 2) surveillance of AMU for AMS; 3) surveillance of AMR for AMS.

Strategic Workshops

[JPIAMR workshops](#) bring together experts from all relevant fields relating to a specific topic to map the research landscape and identify knowledge gaps. All workshops produce reports and recommendations to JPIAMR. In 2020, JPIAMR organised three strategic workshops, including a webinar series “AMR research in a post-pandemic world”, Interventions to Reduce the Development and Transmission of AMR and a workshop for the Surveillance Networks funded under the JPIAMR seventh joint call “Working to Improve Surveillance”.

AMR research in a post-pandemic world

JPIAMR organised a webinar series of three webinars to highlight and clarify the importance of antimicrobial resistance (AMR) research in the context of the current COVID-19 pandemic and future viral pandemics (Figur 5). The three webinars were:

Have antibiotics been use appropriately in the COVID-19 pandemic?

Moderator: Jesús Rodríguez Baño (ES) and Panellists: Gian Maria Rossolini (IT), Constance Schultsz (NL), Evelina Tacconelli (IT), Srinivas Murthy (CA), Norio Ohmagari (JP) and Alison Holmes (UK).

Facilitating AMR research in the COVID-19 pandemic.

Moderator: Till Bachmann (UK) and Panellists: Rafael Canton (ES), Adam Roberts (UK), Birgitta Henriques Normark (SE), Neil Clancy (US), George Haringhuizen (NL), Herman Goossens (BE) and Benedikt Huttner (WHO).

How do we simultaneously manage the acute COVID-19 pandemic and escalating antibiotic resistance?

Moderator: Constance Schultsz (University of Amsterdam) and Panellists: Charu Kaushic (GloPID-R), Steven Hoffman (Global Strategy Lab), Margo Warren (Access to Medicine Foundation), Ghada Zoubiane (ICARS), Sabiha Essack (University of KwaZulu-Natal), Otto Cars (ReAct) and Ramanan Laxminarayan (CDDEP & Princeton University).

The outputs of the webinars have been compiled into a manuscript that is hoped to be published in 2021.

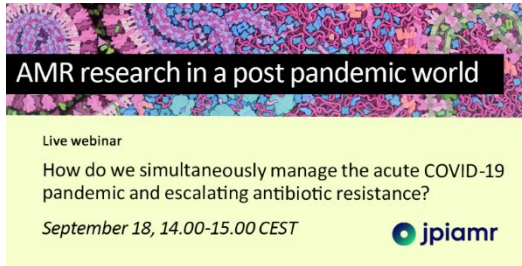
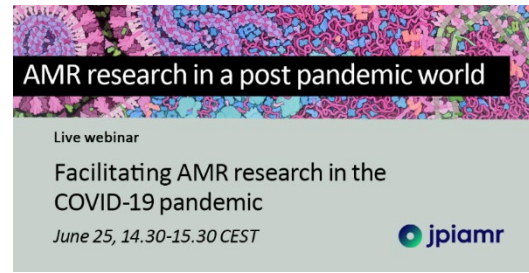


Figure 5. Banners from the JPIAMR social media campaign advertising the webinar series *AMR research in a post pandemic world*.

Interventions to Reduce the Development and Transmission of AMR

On 3-4 November 2020, the JPIAMR workshop “Interventions to Reduce the Development and Transmission of AMR” was held online (Figure 6). The workshop was originally planned to be held in Paris on April 22-23, 2020, but was delayed and organised as a virtual event due to the COVID-19 pandemic. The workshop was organised and delivered by the French National Research Agency (ANR) with support from an organising committee made up of Member State representatives (UK, France), SAB members and the JPIAMR Secretariat. The objectives of this workshop were to showcase 29 projects funded by JPIAMR on the themes of AMR transmission and interventions to control AMR in 2016 and 2017, offer a networking opportunity to researchers and enable scoping for the next call for proposals on “One Health interventions to prevent or reduce the development and transmission of antimicrobial resistance.”



Figure 6. Banner from the JPIAMR social media campaign advertising the workshop *Interventions to Reduce the Development and Transmission of AMR*.

More than 400 participants from five continents registered for the workshop. The speakers were researchers representing 27 out of the 29 JPIAMR funded projects from the third and fifth JPIAMR calls. Moderators were SAB members and AMR experts. During the five scientific sessions and panel discussions, project outputs, challenges and gaps in AMR transmission and intervention were discussed in the light of future funding. In the final session, the new ERAnet Co-fund JPIAMR-ACTION was presented, followed by a scoping panel discussion. The workshop report can be found [here](#).

Surveillance Networks

An in-person final workshop for Networks was planned to take place in June 2020 in Edinburgh, UK. However, due to the COVID-19 pandemic, the Surveillance Networks that were funded under the seventh JPIAMR call met online to present their work to date.

International Events with JPIAMR Participation in 2020

Despite the COVID-19 pandemic, JPIAMR has participated in many events in 2020. The following table (Table 1) outlines the international events in which JPIAMR has been represented, through either participation or attendance.

Table 1. International events with JPIAMR Representation 2020.

Event	Location	Date
EJP One Health workshop	Online	13 January
ERA-LEARN workshop on monitoring and evaluation of P2Ps	Manchester	28 January
EU-Openscreen platform meeting	Online	28 January
Meeting with Access to Medicines Foundation	Stockholm	12 February
Education MoU Task Force meeting	Online	13 February
MicrobiomeSupport Workshop	Brussels	4 March
European Public Health Alliance (EPHA) discussion	Online	20 March
AMR Fighter Coalition workshop	Online	9 April
Global Hub Dashboard launch feedback meeting	Online	27 April
OH EJP Cogwheel workshop	Online	28 April
BEAM alliance meeting	Online	8 May
JPI Monitoring & Evaluation Taskforce meeting	Online	11 May
OH EJP Stakeholder meeting	Online	26 May
Water International Workshop	Online	26 May
PEW Trust meeting	Online	28 May
JPIAMR WHO meeting on antifungals	Online	9 June
JPI Monitoring & Evaluation Taskforce meeting	Online	23 June
ERA-LEARN Expert Interviews on Globalisation of EC Partnerships	Online	2 July
Launch new AMR fund webinar	Online	9 July
IST Conference	Online	20 August
EU R&D days	Online	22-24 September
JPI Monitoring & Evaluation Taskforce meeting	Online	28 September
WHO meeting on antifungals	Online	8 October
OH EJP stakeholder meeting	Online	12 October
JPI Monitoring & Evaluation Taskforce meeting	Online	19 October
Tripartite OPS-FAO-OIE workshop on molecular surveillance in Latin America	Online	27 October
FAIR data in AMR research community	Online	30 October
PEW meeting on SPARK	Online	5 November
FAIR Data and AMR meeting	Online	5 November
RA CoBioTech: 2nd Biotech HUB-Meeting	Online	10-11 November
IMI IPC SGG Meeting	Online	12 November
MicrobiomeSupport Trans-sectorial workshop	Online	16-17 November
Global AMR R&D Hub's virtual conference	Online	2 December
ERA Learn workshop on project management	Online	16 December
JPIs Chairs meeting on Partnerships	Online	18 December

JPIAMR AMR Resources

JPIAMR-Virtual Research Institute

The JPIAMR-Virtual Research Institute (JPIAMR-VRI) is a virtual platform to connect research networks and research performing institutes/centres to implement Antimicrobial Resistance One Health collaborative research on the JPIAMR Strategic Research Agenda priority topics. The JPIAMR-VRI platform intends to provide an unprecedented level of knowledge exchange, research coordination, and sharing of resources, data, and research results, as well as increasing capacity. It fosters coordination, collaboration and alignment of national strategies and programmes in further developing AMR research.

In 2020, strategic progress in the development of the JPIAMR-VRI have occurred, including:

- JPIAMR-VRI contribution agreement
- Agreement obtained by the Management Board to move into development of the Phase 0 of the JPIAMR-VRI Digital Platform
- Development of the JPIAMR-VRI Digital Platform
- Launch of the Network Plus funding opportunity with a JPIAMR-VRI component
- Continued discussion with the Pew Charitable Trust about their SPARK platform
- Contract signed with OntoForce to develop the JPIAMR-VRI Digital Platform Phase 0
- Development of the Digital Platform Phase 0 with the consultant (OntoForce)
- Meeting with experts on selection of AMR dataset
- Draft of the Survey on available resources, platforms and tools to be sent out Q1-2021
- Continued interactions with JPIAMR-VRI funded Networks
- Continuous development of the JPIAMR-VRI Communication material and preparation for launch of JPIAMR-VRI Digital Platform by May-June 2021

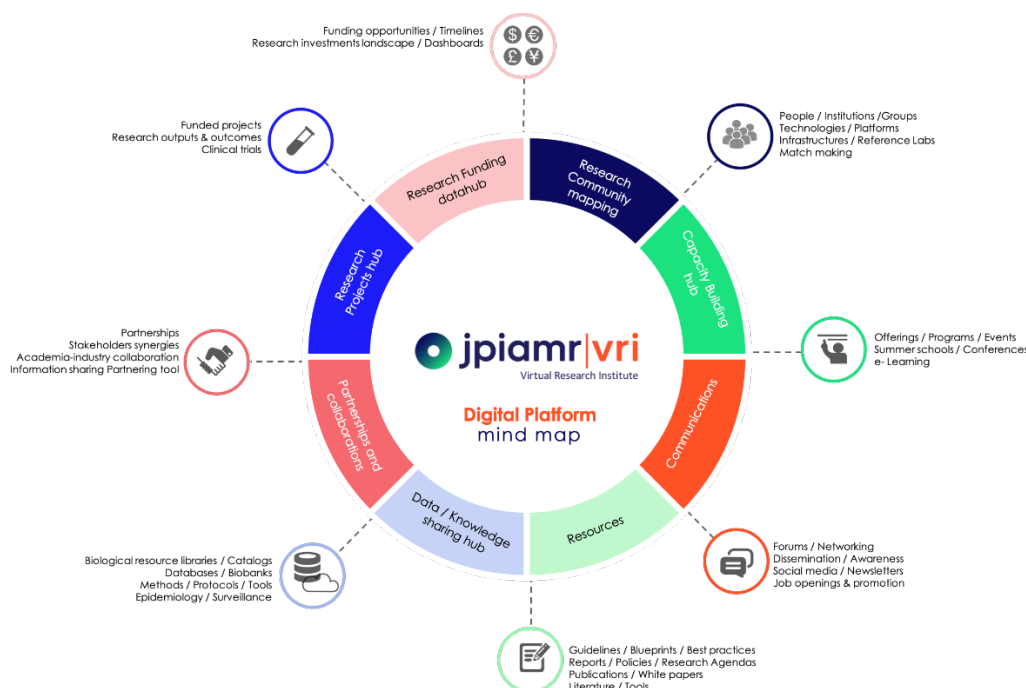


Figure 7. JPIAMR-VRI Digital Platform mind map.

AMR research funding dashboard

JPIAMR undertook a mapping exercise in 2017 to obtain a comprehensive picture of the AMR research funding landscape within JPIAMR member countries. In early 2019, a report on the mapping¹ and a dynamic dashboard with visual analytics of the dataset was made publicly available on JPIAMR webpage.

In 2018, the Global AMR R&D Hub was mandated to collect and present information on AMR R&D investments, products and market interventions that will serve as a resource to support evidence-based decision-making regarding where efforts and resources may be best allocated in AMR R&D. In 2020, the Global AMR R&D Hub published information on AMR R&D investments, products in the pipeline and push and pull incentives across three different galleries in their [Dynamic Dashboard](#). JPIAMR was actively engaged in the development of the investment gallery dashboard of the Global AMR R&D Hub by providing inputs, sharing experiences. The dashboard captures AMR R&D investments since 2017 and builds on from the timeline of JPIAMR's research funding dashboard.

In light of the recent developments of the Global AMR R&D Hub's dashboards, the MB decided to discontinue JPIAMR's AMR research funding dashboard published on the webpage to avoid any duplication of efforts for overlapping activities. Instead, JPIAMR will provide the web links to the dashboards of the Global AMR R&D hub on the JPIAMR AMR mapping webpage (<https://www.jpiamr.eu/activities/mapping-activities/>) to redirect the users. The Global AMR R&D hub will mutually link to the JPIAMR AMR Research Infrastructure Dashboards on their website.

JPIAMR will also develop a new dashboard on the JPIAMR-funded projects to provide detailed information on research investments by JPIAMR under the six-priority research areas assigned in the JPIAMR SRIA.

AMR Research Infrastructure dashboard

JPIAMR launched a suite of dashboards to provide an overview of AMR specific collections of biological materials, databases and research infrastructure services. JPIAMR, in collaboration with the IMI-consortium [VALUE-Dx](#), collected information through a survey on existing resources and services that are relevant for AMR research from all the One Health domains. This will contribute to improving findability, reusability and sustainability of resources and services for the AMR research community.

JPIAMR translated this overview into [interactive dashboards](#).

- [Overview dashboard on AMR Resources and Services](#)

The overview is further elaborated in the following categories with detailed information in three separate dashboards:

- [Dashboard on Biobank and its associated database](#): comprises collections of biological materials and their associated databases.
- [Dashboard on Non-sample-databases](#): comprises collection of databases on medical records, registry and other relevant datasets.

¹ <https://www.jpiamr.eu/wp-content/uploads/2019/02/Mapping-of-AMR-research-funding-2017-report.pdf>

- [Dashboard on Research Infrastructure Services](#): comprises services offered by research infrastructures for managing and using the collections and databases.

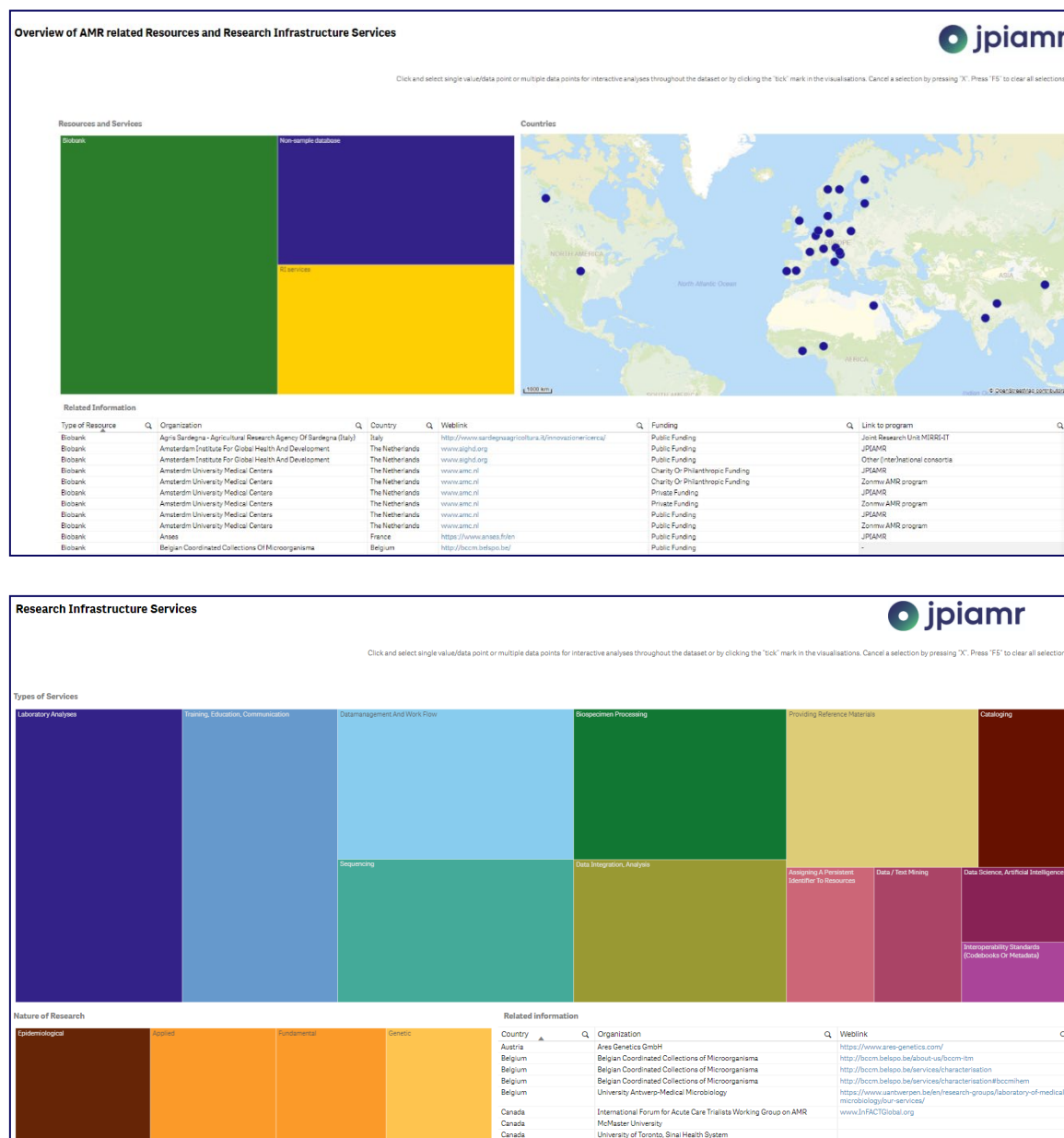


Figure 8. JPIAMR Research Infrastructure dashboards.

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 2019-2020. Here are a few selected actions and activities of JPIAMR members:

- The [Canadian Antimicrobial Resistance Surveillance System \(CARSS\) Report](#) has been published that provides a detailed assessment of AMR in Canada including information on the amount of antimicrobials used in humans and animals.
- France and Germany launched joint call for projects on antimicrobial resistance (AMR) where each committed up to 3.5 million euros to accelerate efforts based on a “One-Health” approach. The call is intended to address unmet needs within the AMR field.
- Ireland published the Annual report 2019 on the National healthcare quality reporting system (Healthcare Associated infections and antibiotic consumption).
- The National Research Institute for Infectious Disease under the Korean Centre for Disease Control (KCDC) is established and a new action plan for containment of AMR is under preparation.
- A new national strategy on AMR is being developed by Norway, jointly by the Ministry of Health and Care Services, Ministry of Food and Agriculture, Ministry of Trade, Industry and Fisheries and Ministry of Climate and Environment.
- Spain has launched a knowledge sharing platform for researchers on AMR and antibiotics (<http://www.resistenciaantibioticos.es/en/user>).
- The Netherlands published the NethMap report 2020 on consumption of antimicrobial agents and AMR among medically important bacteria and MARAN report 2020 on “Monitoring of AMR and Antibiotic Usage in Animals” in the Netherlands in 2019.
- The UK [launched](#) the antibiotic procurement model in 2020 and AMR programme of UK Food Standards Agency.

National AMR activity one-pagers with updated information have been created and are available on the JPIAMR website (<https://www.jpiamr.eu/activities/alignment-actions/alignment-plan/>).

JPIAMR Communication

In 2020, JPIAMR had a communications plan and strategy that outlined much of the communications for the year. The year started as a “normal” year but the context for operations and communications shifted due to the COVID-19 pandemic. Even so, JPIAMR communications was well suited to support operations since JPIAMR had already had deployed a “digital first” strategy, and many meetings, and communications, were already digital. However, activities like workshops moved online and a major shift of the context for social media communications became clear during the year. The planned communications activities were carried out with quite a few creative additions due to changing conditions.

During 2020, three joint transnational calls were launched and communicated according to plans. The calls were launched with tailored images for each call (Figure 8), social media outreach activities together with newsletters and news updates. The three calls for 2020 included the Network Plus 2020, the AquaticPollutants co-funded call and the Aquatic Pollutants call on *Research on knowledge transfer*. The two AquaticPollutants calls were communicated separately. The knowledge transfer call objective was to realise a better and wider dissemination and develop new innovative methods to support the transfer of research and the uptake of results into the public and administrative sector, policy, industry or economy. A joint webinar on March 30th presented the “Aquatic Pollutants” calls to researchers.



Figure 9. JPIAMR 2020 call communications material.

During 2020, the workshops that JPIAMR had planned to both attend and run for 2020 were moved online due to the COVID-19 pandemic and morphed into digital only webinars or workshops. JPIAMR also initiated and launched webinars. Webinars together with video created more impact than physical events.

Some of the specific JPIAMR digital events that were conducted in 2020 include:

- The workshop “Interventions to reduce the development and transmission of AMR” was hosted by ANR / Agence Nationale de la Recherche. The event was successful with the registration of 400 participants.
- A series of webinars were launched between June-September 2020 and were titled AMR in a post pandemic world. A combination of live webinars on Zoom, live broadcast on Facebook and recordings shared on the JPIAMR YouTube channel garnered an impressive total number of viewers (About 1 600 views and some 350 participants online). A trailer for the webinar series resulted in 160 views on the JPIAMR Facebook page.

Table 2. Social media engagement JPIAMR online workshop and webinars 2020.

	Facebook engagements	Twitter engagements	LinkedIn impressions	Twitter impressions
Webinars on AMR and COVID-19 (impact June-October 2020)	1 420	3 000	3 440	180 000
Workshop on transmission (impact July-September 2020)	112	900	1 900	36 700

European Antibiotic Awareness Day 2020

The European Antibiotic Awareness Day was held on November 18, 2020. On this date many organisation launched communications about projects, achievements, etc. JPIAMR communicated results of the call Network Plus 2020 and the pre-announcement of the 13th call “One Health Interventions to prevent or reduce the development and Transmission of AMR”. For this call, funders in advance received a communications pack to align communications and better reach out in national contexts with clear and consistent messages about the call. A new image provided an opportunity for funder to insert their own logo. (Figure 10).



Figure 10. The call image for the JPIAMR 13th call. The templates provided to participating agencies enabled the funder logo to be included, as seen in this example with funding from ICARS in Denmark.

New format communicates published research funded via JPIAMR.

To more frequently highlight published research articles, a set of design templates have been developed to frame information about results from JPIAMR-funded projects. During the autumn of 2020, several articles have been communicated in this way, with the aim to disseminate AMR-research. (Figure 11)

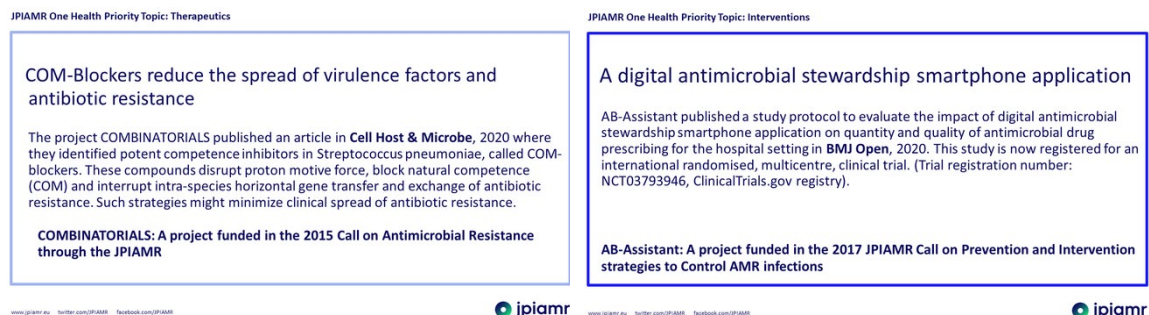


Figure 11. Design templates for the communication of results from JPIAMR funded projects.

Other highlights from 2020 with regards to communication include:

- JPIAMR participated in the jury to pick the new global AMR-symbol. A competition hosted by EU-JAMRAI. More here: <https://eu-jamrai.eu/antibiotic-resistance-symbol/>
- JPIAMR communicated a set of new dashboards of AMR Resources and Services.
- JPIAMR communicated information regarding the member state and open consultations to identify antifungal research priorities in order to broaden the current JPIAMR Strategic Research Innovation Agenda (SRIA).
- A short survey about the JPIAMR-VRI was communicated in May, 2020.
- JPIAMR increased the number of followers in social media. Twitter now exceeds 3000 followers, Facebook 410 and LinkedIn 350 followers.