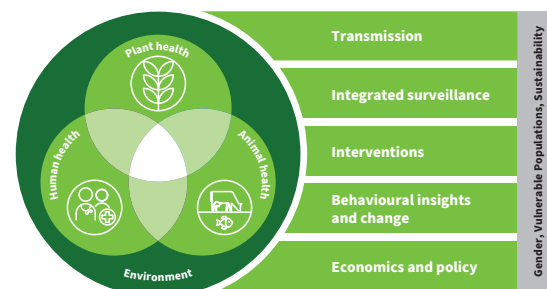


One Health Priority Research Agenda for AMR

Top 10 Overall Priority Research Areas across pillars



These 10 research areas represent the highest-ranked areas from the five pillars of the agenda and can be considered the most important, having the greatest potential for strengthening research capacity and being the most actionable, inclusive and impactful in the field of One Health AMR. They require contextualization at the regional and country level and the development of specific research questions relevant to the needs of different countries and One Health settings.

Transmission

To what extent do **various IPC practices** in One Health settings impact the development and circulation of AMR in One Health sectors?

What impacts the **transmission** of resistant microorganisms between humans, animals, plants and the environment, with a focus on conditions relevant to **LMICs**?

Integrated surveillance

What are the optimum **strategies and minimum standards** (and resources) for adequate laboratory and human resource **capacity** to establish and maintain quality integrated AMR surveillance systems at scale?

How can **existing AMR and AMU surveillance data** from humans, animals, plants and the environment be **meaningfully triangulated and/or integrated** to allow early identification of the development, escalation or circulation of resistance across One Health sectors?

Interventions

How can One Health interventions that have proven impactful for AMR control and mitigation most effectively be **translated and scaled up in different contexts or differently resourced settings**?

What **challenges** exist to the **systematic collection and analysis** of data for risk assessment and intervention impact **assessment** (epidemiological, economic, social) in LMICs?

Behavioural insights and change

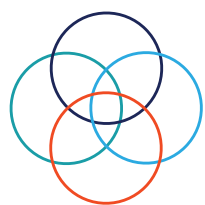
How can structural **challenges and barriers** to behaviours related to AMR be **identified, characterized and assessed** in different **sociocultural contexts**?

What **strategies** can be used to **adapt effective behavioural interventions** (e.g. immunization) from one context to another (e.g. Africa to Asia/rural to urban / human prescribers to veterinarians)?

Economics and policy

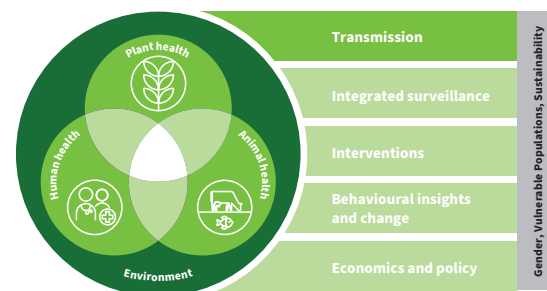
What would a One Health AMR **socioeconomic impact assessment** based on accurate and cost-effectively collected data (e.g. harmonized methodology and indicators) in **low-resource settings** optimally look like?

How can governments identify, prioritize and institutionalize the most relevant **cross-cutting, sector-specific AMR policy options** and regulatory frameworks, and **financing strategies** to sustainably tackle AMR across One Health sectors, given their different implementation challenges?



One Health Priority Research Agenda for AMR

Transmission



The Priority Research Areas on Transmission focus on generating evidence of dynamics and drivers of AMR. These areas also aim to elucidate knowledge on where interventions may be best targeted to curb the transmission of AMR and to reduce the spread of resistant microbes, particularly in the shared environment.

Methodology development

What are the low cost, high quality, high reliability methodologies that can be used to **identify and quantify sources and drivers, development, and circulation** of AMR between One Health sectors?

What are the highest quality, lowest cost, and most reliable **methods and (meta) data** for **describing and predicting** AMR transmission across One Health interfaces that could help inform policy?

Operational research

To what extent do **various infection prevention and control practices** in One Health settings **impact** the development and circulation of AMR in One Health Sectors?

How can the absence or poor management of critical water **sanitation** and hygiene **infrastructure** for human/animal/plant contribute to the circulation of AMR?

How does AMR **transmission** (i.e., drivers, pathways, impact) across One Health sectors in HICs **differ** from LICs/LMICs?

How does AMR circulation across One Health Sectors vary in the case of resistance to different **critically important antimicrobials**?

What are the relative impacts of different **wastewater treatment** solutions on the development and circulation of AMR among One Health sectors?

Dynamics & drivers

What impacts the **transmission** of resistant microorganisms between humans, animals, plants, and the environment, with a focus on conditions relevant to LIC/LMICs?

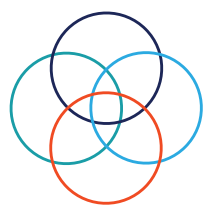
What is the contribution of aquaculture to circulation of AMR in the One Health ecosystem by different types of **aquatic farming techniques/systems**?

To what extent are human and animal **effluents and solid wastes**, and their **management and treatment**, from humans (including healthcare facilities and community settings) and from agri-food systems (including consumers) contributing to the development and circulation of AMR across One Health, **in different geographical settings**?

In different **geographical settings**, what **economic factors** affect AMU and AMR transmission between One Health sectors?

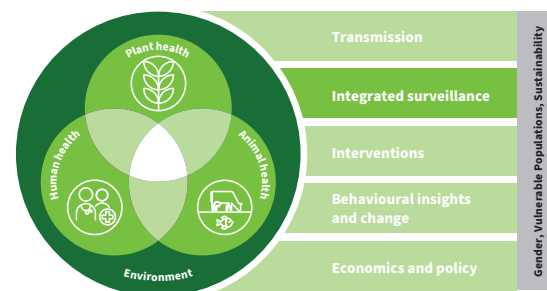
What are the most important AMR **transmission pathways** at the One Health interfaces in different settings including **LIC/LMIC settings**?

To what extent are **effluents and solid waste** from **pharmaceutical and other industrial production** sites contributing to the **circulation** of AMR across One Health in different geographical settings?



One Health Priority Research Agenda for AMR

Integrated Surveillance



The **Priority Research Areas on Integrated Surveillance** focus on cross-sector surveillance to improve common technical understanding to generate and exchange information about AMR/AMU between One Health sectors.

Methodology development

What are the optimum **strategies and minimum standards** (and resources) for adequate laboratory and human resource **capacity** to establish and maintain quality integrated AMR surveillance systems at scale?

How can **existing AMR and AMU** surveillance data from humans, animals, plants and the environment be **meaningfully triangulated and/or integrated** to allow early identification of the development, escalation or circulation of resistance across One Health?

What is the **minimum** feasible, representative and meaningful AMR/AMU monitoring/surveillance criteria and indicators package that can improve AMR/AMU monitoring across One Health in LMIC?

What are the highest-quality, lowest-cost and most reliable **approaches for sharing** integrated AMR/AMU surveillance data in a standardized **format** for different resource settings and the international community?

Which targets, methods and data-reporting formats most comprehensively characterize the **risks of evolution and circulation** of AMR across One Health sectors?

How can **priorities for implementation** of One Health integrated AMR/AMU surveillance components be identified and set and thereby address a current research gap?

How can **AMR hot spots** be proactively identified and mitigated using a One Health approach?

What are the **priority opportunities** for environmentally and financially sustainable **innovation** in integrated surveillance based on existing and emerging technology?

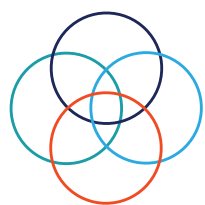
Operational research

How can the **limited availability of data** from integrated, multisectoral AMR surveillance programmes be addressed in **LMIC**?

How can the **results** of integrated One Health AMR/AMU surveillance **be used** in practice by countries/regions?

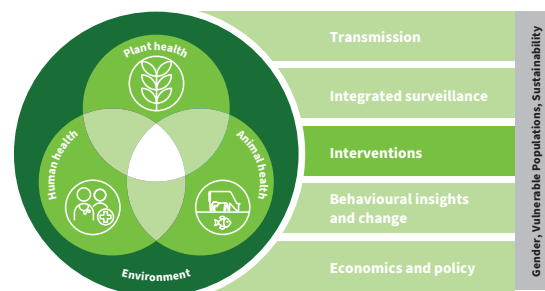
Evaluation

What are the best approaches to **monitor and evaluate** integrated One Health surveillance **frameworks** for AMR/AMU in different **LMICs**?



One Health Priority Research Agenda for AMR

Interventions



The Priority Research Areas on Interventions focus on programmes, practices, tools and activities designed to prevent, contain or reduce the incidence, prevalence and circulation of AMR, including the evaluation of their respective impact.

Methodology development

How can **research capacity in LMICs** be strengthened to catalyse **locally tailored collaboration and cooperation** between One Health-related sectors?

What **priority tools and frameworks** can assist tailoring of One Health interventions for national AMR action plans?

What **criteria** should be used to **assess** interventions that aim to prevent and control AMR at the One Health interface?

What **mix** of evidence and evaluation is needed to understand how to implement One Health AMR solutions most effectively in LMICs?

How could **implementation research** be **systematically incorporated** into the design of appropriate One Health interventions for AMR in **LMICs**?

Operational research

How can One Health interventions that have proven impactful for AMR control and mitigation most effectively be **translated and scaled up in different contexts or differently resourced settings**?

How can existing health and food production systems be **effectively integrated** and enhance One Health AMR interventions?

What are the **minimal resource** interventions required for supporting national integrated, multisectoral One Health AMR/AMU surveillance systems?

Evaluation

What **challenges** exist to the **systematic collection and analysis** of data for risk **assessment** and intervention impact assessment (epidemiological, economic, social) in LMICs?

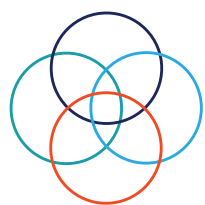
What has been the **relative impact** on AMR occurrence of: IPC, farm biosecurity, food safety, WASH and integrated pest management **measures**?

What have been the most **impactful interventions** to prevent, control and mitigate AMR at the One Health interface?

What has been the **impact** on AMR across One Health sectors of **nationwide interventions** (e.g. vaccination, creation of/improvements to sewerage systems, legislation, education)?

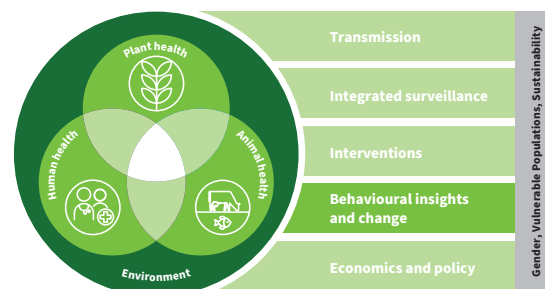
Framework conditions

How can we improve **early adaptation and innovation** for the prevention, control and mitigation of AMR across human health, animal health, plant health and the environment in **LMICs**?



One Health Priority Research Agenda for AMR

Behavioural Insights and Change



The Priority Research Areas on Behavioural Insights and Change focus on human behaviour that affects AMR on the One Health interface. They include understanding influences on human behaviour in varying contexts, such as social influences that support AMU in human, animal and plant sectors; livelihoods; and financial resources.

Methodology development

How can **structural challenges and barriers** to behaviours related to AMR be **identified, characterized and assessed** in different sociocultural contexts?

What is the role of **communication strategies** in promoting One Health AMR risk-reductive behaviours, and how can this role be leveraged?

What social/behavioural/economic strategies are most relevant for addressing One Health approaches to AMR?

Operational research

What strategies can be used to adapt effective behavioural interventions (e.g. immunization) from one context to another (e.g. Africa to Asia/ rural to urban/human prescribers to vets)?

What behaviours and practices of antimicrobial product **manufacturers, wholesalers and retailers** create/drive development of AMR at the One Health interface, and how can these be changed to support prevention, control and mitigation of AMR?

How can **information design sciences** (presenting information in an accessible and understandable way) be leveraged to improve effective understanding of the information across different stakeholders in the One Health AMR field?

Which **actors and which of their behaviours** are believed to contribute most to AMR prevention, control and response across One Health sectors?

Which strategies can improve community ownership and build consensus for AMR interventions directed at rationalizing the use of antimicrobials across sectors?

What **methods and tools** are needed to translate **gender and vulnerable group** considerations into inclusive behaviours related to AMR across One Health sectors.

What are the barriers or drivers to translating behavioural insights and change findings into policy and implementation in different settings?

How can **gender and vulnerable group-sensitive** behaviour change **methods** be integrated into One Health strategies for the prevention, control and mitigation of AMR?

Dynamics and drivers

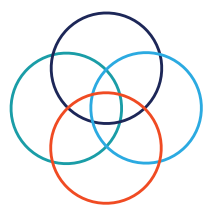
What role do people's **attitudes and understanding of health and well-being** (for humans, animals, plants and the environment) play in influencing their attitudes and behaviour with respect to AMU and AMR?

What are the drivers of human exposure to AMR in diverse workplaces, communities and occupations across One Health sectors from a behavioural insights and change point of view?

Evaluation

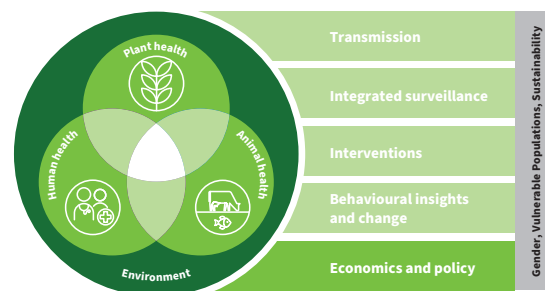
What is the impact of incentives and disincentives (financial and nonfinancial) on AMR-relevant behaviour change across sectors and in different settings (e.g. diverse geographical contexts)?

What lessons can we learn from COVID-19 regarding behaviour change that can be adapted for the One Health approach to AMR?



One Health Priority Research Agenda for AMR

Economics and Policy



The Priority Research Areas on Economics and Policy focus on investment and action in AMR prevention and control from a One Health perspective. They include policy, governance, legislative and regulatory instruments; cross-sector processes and strategies affecting AMR and also cost effectiveness and financial sustainability.

Methodology development

What would a One Health AMR **socioeconomic impact assessment** based on accurate and cost-effectively collected data (e.g. harmonized methodology and indicators) in **low-resource settings** optimally look like?

How can governments identify, prioritize and institutionalize the most relevant cross-cutting, sector-specific AMR **policy options** and regulatory frameworks, and **financing strategies** to sustainably tackle AMR across One Health sectors, given their different implementation challenges?

Which **innovative** (either new or adapted) **methods** that lead to actions are needed for the **evaluation of AMR prevention and control** across One Health sectors in LMICs, with a focus on low-cost, high-quality, high reliability policy relevance?

What is the **optimal financial resource strategy** that will **sustain** support for **One Health AMR interventions**?

What would a harmonized conceptual **framework, method and key indicators** that systematically include **equity** considerations in One Health AMR policies optimally look like?

Operational research

How can operational and/or implementation research systematically **capture learning from AMR NAP** implementation practice and serve as the basis for **improvement** at the country, regional and global level (for instance identification and development of impactful policies and legislation)?

How can appropriate and acceptable **AMU or AMR reduction indicators or targets** for national governments or sectors be developed, reached and reported?

What **impacts** can **national and subnational policies** have on AMR prevention, control and response across One Health sectors, and how should they be measured?

Evaluation

What lessons and synergies for AMR reduction **can be learnt** and leveraged from other **policy initiatives** (e.g. climate change, fisheries management) to tackle **collective action problems**?

How should governments **incentivize and drive material and immaterial innovation** into solutions to AMR in areas where the profit motive is currently insufficient?