

CSIRO



Australian Government

Department of Agriculture, Fisheries and Forestry

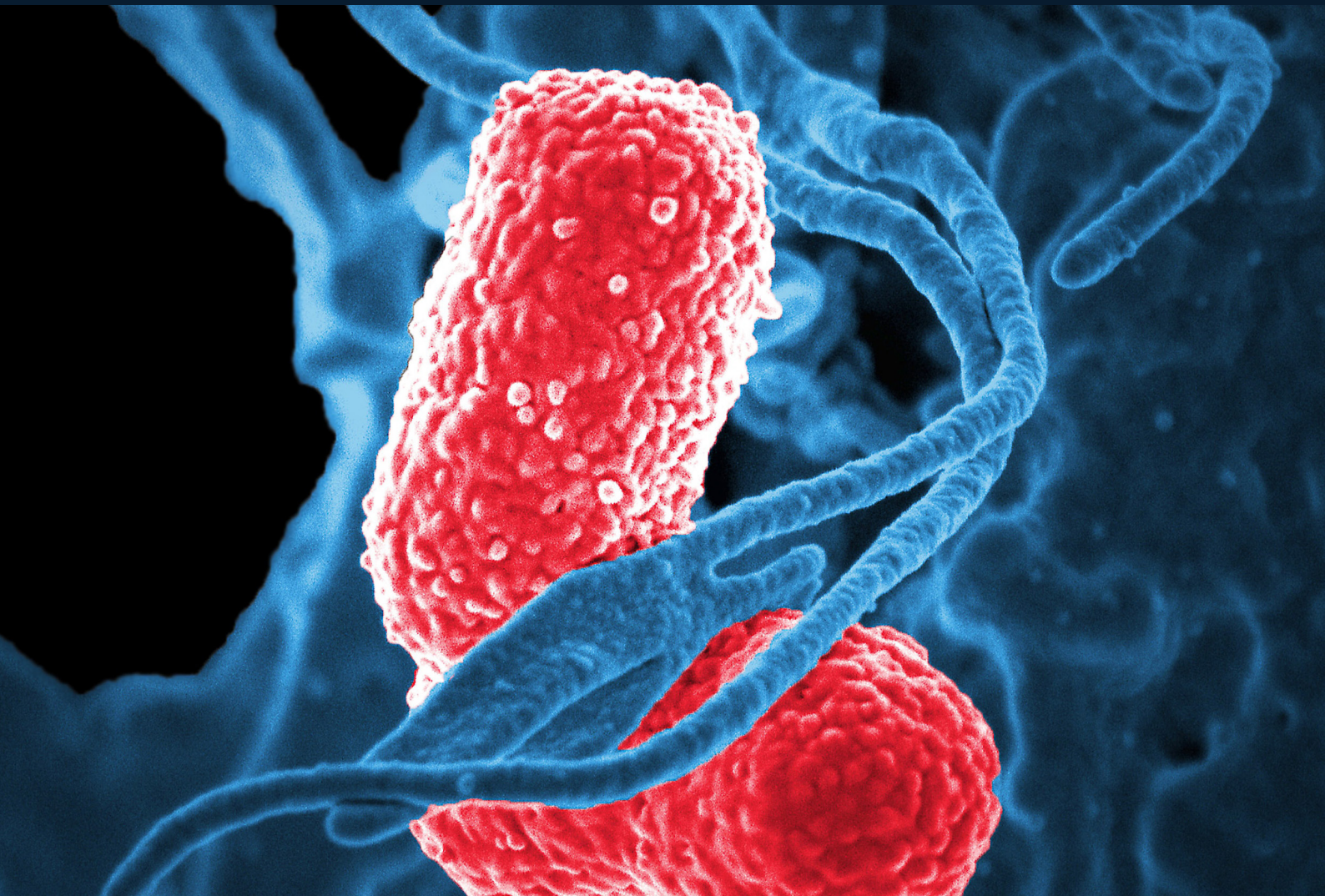
Department of Health and Aged Care

Help advance Australia's Minimising Antimicrobial Resistance Mission



The Minimising Antimicrobial Resistance Mission will work to halt the rising death rate and economic burden of antimicrobial resistance in Australia by 2030.

This will be achieved by enabling and accelerating R&D and providing pathways to market for new and emerging solutions to prevent, manage and respond to antimicrobial resistance in humans, animals and the environment.



We are facing a global health threat

The efficacy of existing antimicrobial medicines is at risk. The innovative technologies, therapies, surgeries, and treatments developed over decades could soon cease to save human and animal lives as they do now.

The problem is antimicrobial resistance (AMR).

As the widespread use, overuse and misuse of antimicrobial medicines drives the emergence of drug-resistant microbes, infections are becoming more difficult, and more costly, to treat.

Globally, AMR currently causes over 1.27M deaths per year and is associated in a further 3.6M deaths per year¹.

As one of the world's biggest health challenges, AMR urgently requires a coordinated One Health approach across the human health, animal health and environment sectors.

Solutions that focus solely on treatment and response may provide respite, but they will not stop AMR emerging.

We require a more holistic AMR management approach that includes protecting the efficacy and availability of the medicines we currently have, finding alternatives, and removing antimicrobial residues from our environment.

In addition to new preventative measures and treatments, we also need cost-effective, easy to use, and accurate diagnostic tools, and enhanced surveillance.

For the R&D community, this challenge presents unique opportunities for commercialisation, growth of new industries, and leadership to help secure a brighter future for all of humanity.

We want partners who can help address this challenge, and who can develop solutions for mitigating AMR now and into the future - through collaboration, funding, and the development of technologies, processes and policies.

Without action, by 2050 AMR is predicted to:



Deaths

Cause upward of 10 million deaths per year globally: more than cancer and diabetes combined.²



Health costs

Increase health costs in high income countries by up to 6%.³



Livestock production

Decrease global livestock production by 2.6%-7.5%.³



GDP

Cause a 5-10% reduction in Australia's annual GDP due to increased mortality and morbidity⁴



Poverty

Force 28.3 million more people into extreme poverty across the world.³



Regional cost

Cost the Western Pacific region over US\$1.35 trillion by 2030.⁵

¹ Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis, The Lancet, 2022

² The Review on Antimicrobial Resistance (2016) Tackling Drug-Resistant Infections Globally: Final Report and Recommendations.

³ Drug-resistant infections: a threat to our economic future (2016) Washington, D.C. World Bank Group.

⁴ <https://home.kpmg/content/dam/kpmg/pdf/2014/12/amr-report-final.pdf>

⁵ Reviews in Health Care 2016; 7(1): -16

Action on AMR constitutes one of the highest-yield development investments available to countries today.¹

Collaborating to curb AMR

What is the Minimising Antimicrobial Resistance Mission?

Co-designed by CSIRO, the Australian Government Department of Agriculture, Fisheries and Forestry and the Department of Health and Aged Care, and guided by *Australia's National Antimicrobial Resistance Strategy - 2020 and Beyond*, the Minimising Antimicrobial Resistance Mission (Minimising AMR Mission) will identify and prioritise the most effective technologies, processes and policies required for AMR mitigation.

This will be done across the human health, animal health and environment sectors, ensuring a 'One Health' R&D perspective.

The Mission co-creators are already funding R&D-related projects, engaging a broad cross-section of stakeholders, including industry, to ensure the best minds and resources are drawn together to make the most of this opportunity.

We are aligned with Australia's national priorities, such as the National Biosecurity Strategy, the National Reconstruction Fund, the National Preventive Health Strategy and the National Digital Health Strategy and Framework for Action, among others.

Internationally, the Mission aligns with the goals of the Food and Agriculture Organization (FAO), the World Organisation for Animal Health (WOAH), the World Health Organization (WHO), and the United Nations Environment Programme (UNEP), collectively known as the Quadripartite.

We also have alignment with the Joint Programming Initiative on Antimicrobial Resistance (JPIAMR) and many medical technology and pharmaceutical companies that are initiating action, seeking solutions and developing communication guidelines to address AMR.



¹Drug-resistant infections: a threat to our economic future (2016) Washington, D.C. World Bank Group.



Our approach

The Mission brings a unique multidisciplinary perspective across the innovation process, and will use strategy, research, development, and commercialisation to mitigate the impacts of AMR across sectors.

As a Mission partner or collaborator, you will contribute to technologies, processes and policies, and to the securing of funding for cross-organisational collaborations. You will inform governance and management, and report on aligned project progress as part of a unified effort.

The Mission can assist in the development and adoption of the necessary science, technology and engineering solutions.

“AMR is a global challenge but the work being done at home will lead the way in managing the health and environmental outcomes for millions.”

-Antimicrobial Resistance Summit, Nov 2021

What the Mission offers

The Minimising AMR Mission team will help provide partners and collaborators with:

- connections to government's policy and regulatory arms that facilitate the use and adoption of new technologies
- access to additional networks and resources
- expertise relating to value creation, capture and delivery
- marketing opportunities.

By connecting organisations addressing the challenge of AMR, the Mission can help find shared solutions through co-funded projects and collaborations with common scope and outcomes and reduce duplication of effort.

The Mission will utilise CSIRO's experience and capacity for translating research into commercial products, and its extensive expertise in the antimicrobial R&D, including drug discovery and surface technologies for use in human health, agriculture and aquaculture.

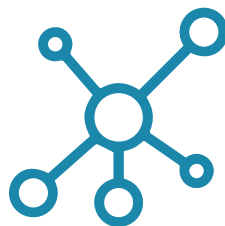
The Mission will also have the expertise of our co-creators in the Department of Agriculture, Fisheries and Forestry and the Department of Health and Aged Care to advise on development and broad implementation of solutions and insights into ongoing government initiatives concerning AMR.

“Antimicrobial resistance is a profound threat – a clear and present danger...to public health in Australia and around the world.”

-Antimicrobial Resistance Summit, Nov 2021



- Leading capabilities and infrastructure
- Lab and pilot-scale experience
- Robust business networks
- Strong intellectual property portfolio



- Connections across government to capture, analyse and apply intelligence
- Expertise on regulatory practices, policy development and implementation



- Proven new business models for collaboration (research for equity, spinouts)
- In-kind funding to help catalyse big programs of work

What we need from you

The Mission will evaluate R&D pipelines for AMR solutions from scientific discovery through to development and delivery, identifying enablers and barriers along the way.

To drive impact, guide and prioritise effort and investment, specialist partners with additional expertise will be brought on board.

Your activity alignment

The Minimising AMR Mission requires co-development; this means forming meaningful partnerships with government, industry and beyond, to provide the foundation for the initiative.

Only through a collective willingness of government, industry and research across the One Health sectors to commit \$50 - \$100 million can we effectively address AMR over the next 5 years.

We aim to establish new projects with combinations of funding, however, the value of current AMR projects are a compelling demonstration of the collective efforts to address the issue.

For example, if a partner is already investing \$5M in the development of a diagnostic device for a specific bacterial infection, this amount can be counted towards our overall target.

Your commitment

We need you to invest, collaborate, develop and fund activities that contribute towards mitigating AMR, reporting your progress towards the Mission goals.

With the formalisation of a contract or letter of intent, commitment of project alignment and/or dedicated funding, you will be joining this Australian Minimising AMR Mission. We have a number of partner models outlined below.

Together we can accelerate and champion the AMR challenge, and provide deep and comprehensive impact.

Talk to us about how your organisation can best join the Mission.

Partner models

We have a variety of ways in which your organisation can partner with the Minimising AMR Mission:

Mission co-creator



Working together to design and build the Mission and introduce into new markets

Mission partner



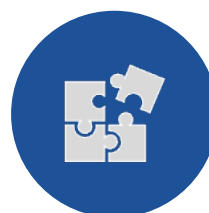
Investor: contributing investment to the Mission

Mission project partner



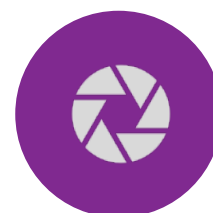
Investor: contributing investment to individual work packages or projects

Mission collaborator



Research collaborator: providing in-kind R&D towards the impact pathway

Mission delivery partner / supplier



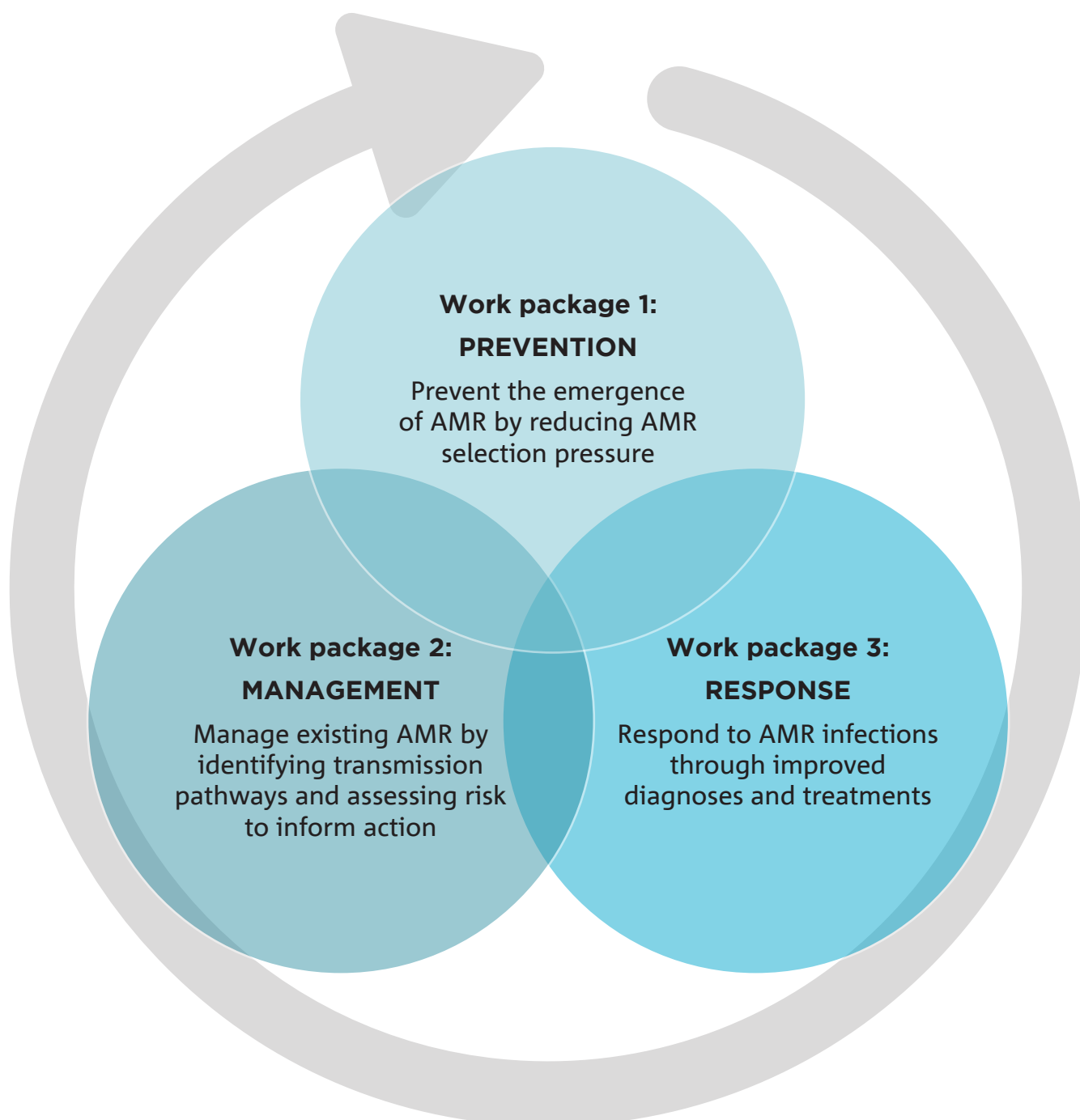
Organisations or parties that are part of the Mission value chain

Our work package structure

The Mission will operate under three work packages, defined by their ultimate outcomes but with natural cross-over:

1. prevention
2. management
3. response

The aim of these work packages is to consolidate and align efforts to promote cross-sectorial innovation, avoid duplication and identify products and services to curb antimicrobial resistance in the next decade.



Work package 1: Prevention

Work package 1 is focused on preventing the emergence of AMR by reducing AMR selection pressure.

Reduce antimicrobial use by developing alternatives



Optimise antibiotic use, handling and disposal



Major products and services include:

- development of antimicrobial alternatives such as vaccines and immune stimulants
- improved biosecurity, infection prevention and control, pathogen remediation
- appropriate prescribing, dispensing, and disposal of antimicrobials

The benefits

Fewer human and animal infections through optimised use of antimicrobials* and their alternatives



Reduced presence of AMR in the environment



Reduced need for antimicrobials to treat, control and prevent infections in humans and animals



Increased effective lifespan of new and existing antimicrobials



* The right patient, the right drug, the right dose, the right route, the right time.

Work package 2: Management

Work package 2 is focused on managing existing AMR by locating antimicrobial-resistant genes, and identifying transmission pathways.

Detect and quantify AMR risks



Enable use of data to manage AMR



Inform mitigation options to reduce AMR



Major products and services include:

- quantification of AMR indicators in non-clinical environments
- data standardisation, integration, analysis including artificial intelligence and machine learning, privacy, visualisation
- development of decision-support tools

The benefits

More effective and comprehensive data collection and sharing



Impact of existing AMR reduced by effective monitoring, analytics and visualisation tools



Tools to predict emerging AMR and identifying priority areas for action



Work package 3: Response

Work package 3 is focused on responding to AMR infections by more accurate and timely diagnoses and treatment.

Improve diagnosis



Improve treatment



Major products and services include:

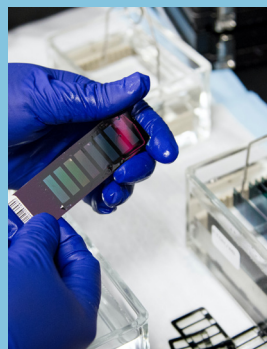
- technology to rapidly detect types of infection and AMR
- modified treatment regimens
- new antimicrobials and repurposed medicines

The benefits

Agribusiness protected through use of faster, better, and cheaper diagnostics



Improved human and animal health outcomes through tailored treatments and judicious use of antimicrobials



Join us

Securing a future where antimicrobials still save lives.

We are working to halt the rising death rate and economic burden of antimicrobial resistance in Australia by 2030.

To achieve this we will enable and accelerate R&D to prevent, manage, and respond to antimicrobial resistance in humans, animals and the environment.

In doing so, we will safeguard human and animal health, secure our food and primary industries, and support trade and market access.

Contact us to see how we can work together

csiro.au/amr

amrmission@csiro.au

Watch: Antimicrobial Resistance at CSIRO

