

SUBMISSION

Submission to the Department of Agriculture, Fisheries and Forestry

Submission to Australia's Animal Sector AMR Draft Action Plan 2023- 2028

20 February 2023

The Australian Academy of Technological Sciences and Engineering (ATSE) is a Learned Academy of independent, non-political experts helping Australians understand and use technology to solve complex problems. Bringing together Australia's leading thinkers in applied science, technology and engineering, ATSE provides impartial, practical and evidence-based advice on how to achieve sustainable solutions and advance prosperity.

ATSE welcomes the opportunity to provide a submission to the draft of Australia's Animal Sector Antimicrobial Resistance (AMR) Action Plan. This submission draws upon ATSE's forthcoming report in collaboration with the Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Curbing Antimicrobial Resistance: A technology-powered, human-driven approach to combating the 'silent pandemic'*. The report is to be launched on the 28th of February 2023. ATSE presents the following recommendations for strengthening the Animal Sector AMR Action Plan:

Recommendation 1: Direct research towards understanding the drivers of the emergence, spill over and spread of zoonotic pathogens and develop solutions in accordance with a One Health framework.

Recommendation 2: Embed Traditional Knowledge in the Action Plan, in alignment with a One Health framework.

Recommendation 3: Establish an objective in the current action plan to develop a One Health competent workforce.

Combatting AMR: Expert views

AMR, resulting in the decline of the effectiveness of antimicrobials, has been declared by the World Health Organisation as one of the top 10 public health threats facing humanity (World Health Organisation, 2019). ATSE and CSIRO's report explores how inventions and applications of convergence science could mitigate the impact of AMR to safeguard human, environmental and animal health, secure our food and primary industries, support trade and market access, and transform sectors.

The report was created through consultations with technical and sector experts including more than 100 stakeholders spanning government, academia, and industry, to identify and assess the maturity of key technologies that could be used to reduce the prevalence and spread of AMR. The message was clear – there is a lack of coordination in efforts against the rise of AMR, with significant data silos across states and sectors, and a need to increase community understanding about the issues and impacts of AMR. To address AMR, there is a need for One Health data policies and standards, fit-for-purpose and sustainable funding models, and for AMR solutions to be considered a public good. The report made the following main recommendations:

1. Establish centralised coordination and leadership for AMR management across human health, animal health and environmental health sectors.
2. Streamline and optimise the commercialisation process to support Australian AMR solutions entering the market.

The findings of this report can be applied to manage and mitigate AMR, including animal AMR, as well as create the foundations for a viable marketplace for Australian innovations tackling AMR. ATSE welcomes the draft Action Plan's Objective 6 which is to identify pathways to support the translation of research findings into practical solutions to combat AMR. This aligns with the first recommendation of ATSE and CSIRO's report.

Australia has a strong research sector, with significant expertise, experience, and capacity to investigate and develop best practice solutions to Australia's biggest challenges. Fundamental AMR research, point-of-care diagnostics and vaccines were identified through consultations are priority research areas for the successful mitigation and management of AMR. ATSE suggests that these areas form the foundation of activities undertaken under Objective 6.

Undertaking a One Health approach

ATSE welcomes the draft Action Plan's Objective 1 and Objective 6, which identify the need to strengthen governance arrangements to enable effective animal sector measures that contribute to One Health goals and a strong One health research agenda. As discussed in ATSE and CSIRO's report, a coordinated and One Health informed approach is key to combatting AMR. One Health is a collaborative and multisectoral approach to achieving optimal health outcomes by recognising the interconnection between people, animals, plants, and their shared environment. A One Health approach is critical to plan and implement effective solutions to mitigate the risks of AMR.

To achieve One Health solutions, it is important to understand zoonoses and reverse zoonoses¹ in the different One Health domains. Recurring outbreaks of emerging and re-emerging zoonoses, such as ebola virus and avian virus serve as a reminder that the health of humans, animals, and the environment are interconnected and that early response to emerging zoonotic pathogens requires a coordinated, interdisciplinary, cross-sectoral approach to local, regional, and global levels. By linking humans, animals and the environment, One Health can help to address the full spectrum of disease control – from prevention to detection, preparedness, response and management – and contribute to global health security.

ATSE believes that an activity under Action Plan Objective 6 should be dedicated to researching the fundamental causes for the emergence of AMR in different animal species and the potential risks it poses to its shared ecosystems. This foundational research is necessary to the search for One health solutions to combat AMR.

Recommendation 1: Direct research towards understanding the drivers of the emergence, spill over and spread of zoonotic pathogens and develop solutions in accordance with a One Health framework.

Utilising Aboriginal and Torres Strait Islander Knowledge systems for an integrated approach

The concept of One Health aligns with a holistic view of health within Traditional Knowledge that recognises the connections between the health and well-being of animals, people, and the environment (Dudgeon et al., 2014). The draft Action Plan does not have any reference relating to Traditional Knowledge. To maximize the effectiveness of the One Health approach, Traditional Knowledge principles and inputs should be considered, in consultation with Elders, to guide the activities of the Action Plan, including in Objective 2 on prevention and control, and Objective 3 on greater engagement in the combat against resistance. ATSE also recommends that the Department consults with Aboriginal and Torres Strait Islander communities to ensure appropriate communication in public engagement activities under Objective 3.

Recommendation 2: Embed Traditional Knowledge in the Action Plan, in alignment with a One Health framework.

Promoting a One Health workforce

ATSE recommends that developing the future One Health competent workforce be added to the action plan's objectives. The ability of health systems to perform well and respond effectively to health challenges such as AMR is dependent on an appropriately skilled and well-managed health workforce.

All objectives under the Action Plan require a robust, skilled workforce, including frontline workers, digitally skilled data managers, researchers, and communications professionals. Persistent skills shortages, including in the STEM (science, technology, engineering and mathematics) sector, threaten the success of the Action Plan to tackle AMR.

For example, Action Plan activity 3.2 is to develop and implement AMR education and training resources and tools for practising veterinarians, students and paraprofessionals. Veterinarians are a crucial part of this workforce and play an important role in limiting and minimising the spread of AMR being the first point of contact for animal owners and producers seeking medical help for animals. However, recent studies reveal

¹ Zoonosis is an infectious disease that has jumped from a non-human animal to humans while reverse zoonosis is when an infectious disease transmits from humans to no-human animal (World Health Organisation, 2020).

that there are only enough veterinarians to cover 60% of the demand in Australia, and there is a reduction in student enrolment in Australian vet science programmes, with 1,890 students enrolled in 2021 - a considerable decrease from the 2,440 students enrolled in 2010 (Animal Emergency Australia, 2022). Increasing veterinarians is crucial to improve animal health outcomes and responsible usage of antibiotics leading to a decrease in the spread of AMR. There need to be strategies implemented to address the current workforce shortages and build a One Health competent workforce of tomorrow. Due to the criticality of having a skilled workforce to deliver on the plan, ATSE recommends creating an additional objective to support the development of a One Health competent workforce.

Recommendation 3: Establish an objective in the current action plan to develop a One Health competent workforce.

References

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- Dudgeon, P., Milroy, H., & Walker, R. (2014). *Working together: Aboriginal and Torres Strait Islander mental health and wellbeing principles and practice*.
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