



**Australian Government**  
**Department of Health**



**Australian Government**  
**Department of Agriculture**

# Consultation Paper

---

## Australia's Antimicrobial Resistance Strategy – 2020 and beyond

June 2019

## Table of contents

1. Context	1
2. Purpose	1
3. Providing a Submission	2
Questions Relating to Submissions	2
Important Information - Privacy and Your Personal Information	2
4. ASTAG Consultation	2
5. Future Direction of the Strategy	4
Incorporating Environment into the next AMR Strategy	4
6. Vision & Goal	6
7. Objectives	6
Objective One: Increase awareness and understanding of antimicrobial resistance, its implications and actions to combat it, through effective communication, education and training.	6
Objective Two: Implement effective antimicrobial stewardship practices across human health and animal care settings to ensure the appropriate and judicious prescribing, dispensing and administering of antimicrobials.	8
Objective Three: Develop nationally coordinated One Health surveillance of antimicrobial resistance and antimicrobial usage.	11
Objective Four: Improve infection prevention and control measures across human health and animal care settings to help prevent infections and the spread of resistance.	14
Objective Five: Agree a national research agenda and promote investment in the discovery and development of new products and approaches to prevent, detect and contain antimicrobial resistance.	16
Objective Six: Strengthen international partnerships and collaboration on regional and global efforts to respond to antimicrobial resistance.	18
Objective Seven: Establish and support clear governance arrangements at the local, jurisdictional, national and international levels to ensure leadership, engagement and accountability for actions to combat antimicrobial resistance.	20
8. Sector Specific Roles and Responsibilities	22
The Public Sector	23
The Private Sector	23
The Research Community	23
Professionals	23
Society	23
9. Stocktake of Activities	23

# Australia's Antimicrobial Resistance Strategy – 2020 and beyond

## Consultation Paper

### 1. Context

In June 2015, the Australian Government released *Australia's First National Antimicrobial Resistance Strategy 2015-2019* (the *First Strategy*) which is closely aligned with the World Health Organization's (WHO) *Global Action Plan on Antimicrobial Resistance*. (AMR)

Australia's response to AMR recognises the need for action in all sectors where antimicrobials are used – a One Health approach. The One Health concept recognises that human, animal and ecosystem health are inextricably linked and that achieving optimal health outcomes for people and animals requires the cooperation of the human health, veterinary health, and environmental health communities.

#### **Antimicrobial resistance (AMR)**

"Antimicrobial resistance happens when microorganisms (such as bacteria, fungi, viruses, and parasites) change when they are exposed to antimicrobial drugs (such as antibiotics, antifungals, antivirals, antimalarials, and anthelmintics). Microorganisms that develop antimicrobial resistance are sometimes referred to as "superbugs". (World Health Organization)

The Implementation Plan (the Plan) to support the *First Strategy* was released in November 2016. The Plan outlines specific focus areas for action, and included a stocktake of activities being undertaken by stakeholders that contribute to the achievement of the objectives.

Published in November 2017, the first Progress Report highlights some of the activities undertaken in Australia in the first two years of the Strategy (2015-2017), as well as challenges and areas for continued or future action.

The work to address AMR in Australia is being jointly led by the Department of Health and the Department of Agriculture and Water Resources on behalf of the Australian Government. The Australian Government is supported by the Australian Strategic and Technical Advisory Group (ASTAG). The ASTAG includes representatives from across the fields of human health, animal health, food, agriculture and the environment.

More information on Australia's response to AMR can be found at [amr.gov.au](http://amr.gov.au).

### 2. Purpose

The purpose of this consultation paper is to seek stakeholder feedback to inform both the preparation of a final progress report under the *First Strategy*, and the drafting of Australia's next AMR Strategy for 2020 and beyond.

This consultation paper seeks stakeholder feedback on:

- Australia's current vision and goal;
- each of the seven current objectives to determine Australia's achievements, challenges and next steps;
- a stocktake of activities under each of the objectives; and
- sector specific roles and responsibilities.

Specific questions are included throughout the consultation paper. These are intended as a guide to stimulate your thinking but do not limit the feedback that you may provide.

Following the consultation process, the Department of Health and Department of Agriculture and Water Resources will jointly: prepare the final progress report under the *First Strategy* for publication at [amr.gov.au](http://amr.gov.au); and progress Australia's next AMR Strategy to the Council of Australian Governments (COAG), through its relevant subcommittees, for national endorsement.

It is recommended that this consultation paper is read in conjunction with:

- *Australia's First National Antimicrobial Resistance Strategy 2015-2019* (2015);
- *Implementation Plan: Australia's First National Antimicrobial Resistance Strategy 2015-2019* (2016);
- *Progress Report: Australia's First National Antimicrobial Resistance Strategy 2015-2019* (2017); and
- *AURA 2019 Third Australian report on antimicrobial use and resistance in human health* (2019).

### 3. Providing a Submission

Submissions are due by **Friday 28 June 2019** and can be provided using the Department of Health's Consultation Hub (<https://consultations.health.gov.au/>).

#### Questions Relating to Submissions

Any questions relating to submissions should be directed to [amr@health.gov.au](mailto:amr@health.gov.au).

#### Important Information - Privacy and Your Personal Information

Your personal information is protected by law, including the *Privacy Act 1988* and the Australian Privacy Principles (APP), and is being collected by the Department of Health, via the Consultation Hub, for the purposes of

conducting a consultation process in relation to the draft *Australia's Antimicrobial Resistance Strategy 2020 and beyond*.

The Department of Health will collect your personal information at the time that you provide a submission, unless you choose to make a submission anonymously, and you are not reasonably identifiable from the information provided in your submission.

If you consent, the Department of Health may, at its discretion, publish part or all of your submission on the Department of Health's website. If your submission is published, the Department of Health may identify you as the author of the submission, if you consent to being identified.

Submissions which have been published on the Department's website can be accessed by the general public, including people overseas.

You should not include information in your submission about another individual who is identified, or reasonably identifiable. If you need to include information about another individual in your submission, you will need to inform that individual of the contents of this notice, and obtain their consent to the Department of Health collecting their personal information.

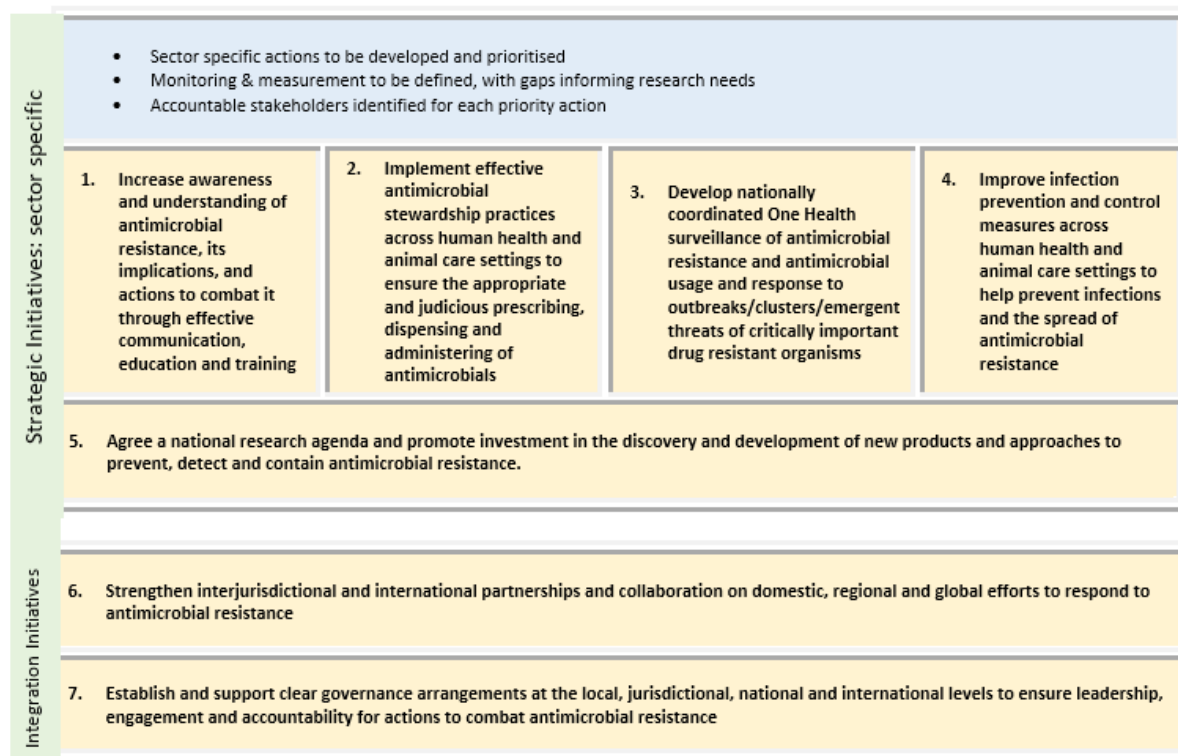
You can get more information about the way in which the Department of Health will manage your personal information, including our privacy policy, at <http://www.health.gov.au/internet/main/publishing.nsf/Content/privacy-policy>.

### 4. ASTAG Consultation

In August 2018, a workshop was held to seek initial feedback from ASTAG on the next AMR Strategy.

The purpose of the workshop was to gain ASTAG members' direction on the scope and priorities for the next Strategy with a focus on what should continue and what should

**Figure 1: Proposed overarching framework for the next AMR Strategy**



change from the current Strategy. The ASTAG workshop was an important step in developing this consultation paper and setting the direction for the next AMR Strategy.

A summary of the feedback received from ASTAG is as follows:

- The Strategy should have a clear 20 year aspirational vision, with shorter-term action plans that align with Commonwealth and state and territory budget cycles (3-4 years).
- In general the seven objectives outlined in the *First Strategy* are still relevant and appropriate with the following suggestions:
  - Emphasise the importance of the national coordination of efforts under all objectives.
  - Incorporate response to outbreaks, clusters and emergent threats of critically important drug resistant organisms under the surveillance objective (Objective 3).

- Combine infection prevention and control (Objective 4) with communication, education and training (Objective 1).
- Include language that is applicable to animal health e.g. ‘biosecurity’ in addition to infection prevention and control (Objective 4).
- Include inter-jurisdictional partnerships with international partnerships (Objective 6).
- The next Strategy should be supported by a communication strategy with simple and consistent messages and should include sector specific targets and key performance indicators beneath the objectives to make them actionable (Action Plans).
- The next Strategy, while maintaining a focus on antibiotics, should be flexible to include any antimicrobial-resistant organism that is considered a priority.

- The next Strategy should also begin to explore further AMR in the environment (including wildlife) and food supply.
- The objectives of the next Strategy could fit within an overarching framework that recognises that while each sector has common areas of focus and all contribute to the AMR outcomes, they also have unique stakeholders, drivers and considerations that require sector specific plans if real change is to be achieved (Figure 1).

## 5. Future Direction of the Strategy

Since the publication of the *First Strategy*, significant progress and achievements have been made across sectors in Australia's response to AMR; however, we must continue to collaborate across sectors to identify and fill gaps, and regularly review and refine systems and processes to ensure we continue to effectively combat AMR and achieve our goal to "minimise the development and spread of antimicrobial resistance and ensure the continued availability of effective antimicrobials".

Due to the complexities and long-term goals associated with a number of the objectives and priority areas for action and in accordance with ASTAG's recommendation, the next Strategy will include a 20 year vision and be flexible enough to adapt to changing priorities over time. A longer-term vision will allow more appropriate timeframes to achieve complex activities such as the development of a fully integrated One Health AMR surveillance system across sectors. The next AMR Strategy will be supported by shorter term sector-specific Action Plans (e.g. 3-5 years), which can be developed collaboratively or individually by sectors to address relevant objectives and priority areas. Action Plans will include monitoring and evaluation plans to promote regular progress reporting and allow for a more stepped approach towards achieving the long-term objectives and priority areas of the Strategy.

### Questions for Consideration

1. Are there other focus areas beyond environment, food and other antimicrobials which should also be included in the next Strategy? If so, please explain?
2. Do you agree with the overarching framework considered by ASTAG (Figure 1)? Please explain your answer.

The *First Strategy* focused predominantly on bacterial resistance and AMR issues in human and animal health. To ensure a complete One Health approach and effective AMR control in the future, Australia will need to expand its focus to include the environment, food and other antimicrobials beyond antibiotics.

### Incorporating Environment into the next AMR Strategy

The expanded focus of the next Strategy to include the environment keeps Australia's response in step with the international response to AMR, and is ultimately required to achieve a One Health response.

Although not specifically addressed in the *First Strategy*, there is increasing acknowledgement globally that the various environmental issues associated with the emergence and spread of AMR need closer consideration. Internationally, this is demonstrated by the Food and Agriculture Organization of the United Nations (FAO)/ World Organisation for Animal Health (OIE)/ World Health Organization (WHO) tripartite partnership's increased collaboration with the United Nations Environment Programme (UNEP), to strengthen the integration of the environment in its collective work.

Emerging research indicates that biologically active pharmaceuticals are contaminating surface waters globally, especially close to population centres. These pharmaceuticals are entering aquatic food webs, potentially posing risk to the environment and human health

## Questions for Consideration

3. How do we best incorporate environment into the next AMR Strategy, which will extend over the next 20 years?
4. What are the current challenges to incorporate the environment into the next Strategy?
5. Are you aware of any organisations or experts that would be relevant to AMR and the environment context?
6. What do you consider the priority areas for action in relation to AMR and the environment?
7. Are there any existing programs/projects/policies that could provide an 'entry point' for deeper environmental impact?

for those who utilise segments of these webs for food. These pharmaceuticals include antibacterials (such as quinolones, fluoroquinolones, macrolides and tetracyclines). The presence of these in aquatic food webs and their associated long-term risks/impacts to ecosystems and humans appears to be largely unknown.

A common challenge underlying all Strategy objectives is that we need to undertake further work to better understand the risks posed by AMR in the environment and to develop sustainable mitigation technologies.

Therefore, first steps in thinking about integrating the environment into the next Strategy may be preliminary in nature. In terms of governance this may be to identify, and incorporate, environment experts into current AMR committees. In terms of surveillance, this may be to conduct further assessment to determine what AMR data from the environment is required to inform future policy. In terms of research and development, this may be to identify current research experts and activities.

The following should also be considered when developing the next Strategy:

- In the review of legislation, other potential drivers of antimicrobial resistance (AMR) such as industrial biocides and heavy metals should also be considered. Industrial biocides are used on a large scale in Australia.

Focusing on clinical and agricultural antimicrobials may not address the breadth of the problem.

- A priority is to ensure that all relevant stakeholders are informed about exposure pathways that lead to or promote antimicrobial resistance.
- In addition to the work to manage the use of antimicrobials directly in agriculture, aquaculture and human health, the entry of antimicrobials into the environment from other sources, such as from sewage treatment plants into water ways, should also be considered and risk proportionate measures developed.
- Possible controls or guidance for the application of products from sewage treatment plants (e.g. biosolids and recycled water) as well as agricultural waste (e.g. sludge) onto land should be carefully considered in the context of AMR. This should also take account of potential pathways to aquatic receptors, such as from aquaculture facilities. This issue is complex and progressing it would require identification of potential unintended consequences.

## 6. Vision & Goal

### **Australia's First National Antimicrobial Resistance Strategy 2015-2019**

#### **Vision**

A society in which antimicrobials are recognised and managed as a valuable shared resource, maintaining their efficacy so that infections to humans and animals remain treatable and communities continue to benefit from the advances that antimicrobials enable.

#### **Goal**

Minimise the development and spread of antimicrobial resistance and ensure the continued availability of effective antimicrobials.

In developing the next Strategy, it is important to consider whether Australia's long-term vision and goal for the future is still appropriate and attainable. Above is Australia's current vision and goal as published in *Australia's First National Antimicrobial Resistance Strategy 2015-2019*.

#### **Questions for Consideration**

8. Does the Vision remain appropriate for the next longer term Strategy? If not, do you have any suggestions for a revised 20 year vision?
9. Is a Vision and a Goal still required? If both are required, does the Goal remain appropriate, or if not, what are your suggestions for a revised goal?
10. What does success look like for Australia in responding to the threat of AMR?

## 7. Objectives

The *First Strategy's* seven objectives and priority areas for action were informed by a review of national and international literature,

expert advice and consultations with sector stakeholders. They are also consistent with the objectives of the WHO's *Global Action Plan on Antimicrobial Resistance*.

Each objective and its priority areas for action under the Strategy are discussed below, including a high level summary of what has been achieved, what the challenges have been and proposed next steps towards achieving the objectives to promote discussion on the objectives.

Stakeholders are invited to provide their input on their own achievements, challenges and next steps for relevant objectives, provide feedback on the appropriateness of the current objectives and suggest priority areas for action for consideration in the next Strategy.

#### **Questions for Consideration**

For each of the seven objectives:

11. For your organisation/sector, please describe your achievements, challenges and what you see as your next steps.
12. Is the objective still appropriate for Australia's next AMR Strategy for 2020 and beyond? If not, how would you refine it? Please consider the ASTAG consultation outcomes in your answer.
13. Are the current Priority Areas for Action under each Objective still relevant for 2020 and beyond? If not, what else would you include?

**Objective One: Increase awareness and understanding of antimicrobial resistance, its implications and actions to combat it, through effective communication, education and training.**

Effective communication, education and training remains crucial to raise awareness and understanding amongst prescribers and dispensers across human and animal health,



consumers and the general public about what can be done to combat AMR and the importance of taking action now.

### Priority Areas for Action

1.1: Strengthen consumer awareness initiatives to improve understanding of antimicrobial resistance and the importance of using antibiotics appropriately.

1.2: Increase support for human and animal health professionals in reinforcing key messages with patients and clients.

1.3: Strengthen communication and education initiatives for health professionals and health care team members.

1.4: Develop a stakeholder engagement and communication plan to support whole-of-society awareness of, and participation in implementing the Strategy.

### What have we achieved?

Australia has improved awareness and understanding of antimicrobial resistance across sectors through a variety of activities, some of which have already resulted in measurable improvements. For example:

- The Australian Government has established a One Health AMR website as a central repository for trusted information and resources related to antibiotic use and AMR.
- Across sectors, the profile of AMR has been increased through opportunities for media campaigns and advocacy, such as Antibiotic Awareness Week (AAW) and using planned events such as the agricultural field days to disseminate information.
- The Australian Chief Veterinary Officer (CVO) (and current President of the World

In 2017, The Australian Government Chief Medical Officer wrote to general practitioners in the top 30% of prescribers to seek their assistance in reducing unnecessary antibiotic prescribing. This resulted in a 12% reduction in antibiotic prescriptions filled or approximately 126,000 fewer scripts over an initial six month period.

Organisation for Animal Health (OIE) World Assembly) opened the inaugural Australian Veterinary Antimicrobial Stewardship Conference 2018, and promoted simple actions to take to reduce the threat of AMR through a jointly released communique by the Australian Government Chief Medical Officer (CMO) and the Australian CVO.

- Data from the Antimicrobial Use and Resistance in Australia (AURA) surveillance system is being used to inform public health actions such as education campaigns, National Safety and Quality Health Service (NSQHS) Standards and the systems and processes that support clinicians, hospitals, aged care homes and primary healthcare providers to prevent and control AMR in their settings.
- The CMO and CVO have directly communicated with general practitioners and veterinarians to encourage the prudent use of antimicrobials and to integrate good stewardship into their practices.
- A number of non-government organisations and researchers are undertaking activities to better understand the behavioural factors that influence antibiotic use, and conduct training activities that include education seminars, workshops and practice audits.

### What are our challenges?

We must maintain momentum and continue to raise awareness of AMR across sectors in a way

that results in behavioural changes and concrete actions to reduce antibiotic misuse and the spread of resistant organisms.

The United Nations Interagency Co-ordination Group on AMR has recently highlighted the absence of a significant civil society movement as an area of future action. Australia, like other countries could benefit from an active civil society movement which may effect change in consumer behaviour and demands in both the human and animal sectors. How to engage and mobilise civil society is a significant challenge.

Understanding of the variety of factors that influence prescribing and antibiotic use behaviours in both the human and animal sectors remains challenging. More consideration of what drives decision making, particularly by consumers, such as cultural conventions and health beliefs is required.

We need to identify further opportunities to improve AMR related education of animal health professionals and prescribers throughout their careers such as through analysis of course content offered by training providers and continuing professional development programs.

We must develop options to ensure pet owners, farmers and the general community have access to relevant reliable and targeted information about AMR, including risks and their roles and responsibilities.

We must encourage greater collaboration across professional colleges and peak groups to assist in promoting consistent AMR public health messages.

### **Where to next?**

The next strategy (beyond 2020) will build on the achievements of the *First Strategy* with enhanced engagement between the Commonwealth and State and Territory Governments and relevant sectors.

It is important to capitalise on the opportunities presented by the establishment of the One Health AMR website to better reach target audiences and explore further channels and links for communicating key AMR messages to support regular, consistent and effective information flows.

A communication strategy will be developed with simple and consistent messages and identifies target audiences across human and animal health including the companion and performance animal sectors, livestock sector, aquatic and marine animal sectors, consumers and the general public. This strategy will focus on increasing awareness of AMR and the importance of appropriate antibiotic use across sectors. A specific civil society engagement strategy will be required.

We should continue to improve engagement with health professionals in the community setting and explore the need for tailored resources and tools that might better support their role in areas such as antimicrobial stewardship, infection prevention and control, and patient education.

We should develop and implement programs to encourage ongoing animal health stakeholder engagement and feedback.

### **Objective Two: Implement effective antimicrobial stewardship practices across human health and animal care settings to ensure the appropriate and judicious prescribing, dispensing and administering of antimicrobials.**

While resistance to antimicrobials develops naturally in microorganisms, antimicrobial use accelerates this process and the inappropriate use of antibiotics is one of the main drivers for antimicrobial resistance.

In Australia, we remain high users of antibiotics, particularly in the human health community setting. We are also seeing increasing levels of AMR in some organisms; therefore, antimicrobial stewardship is important to

## Priority Areas for Action

2.1: Ensure that tailored, evidence-based antibiotic prescribing guidelines are available for all sectors.

2.2: Ensure the availability of evidence-based, best-practice and nationally consistent approaches to AMS across human health and animal care settings.

2.3: Develop tailored, evidence-based resources to support the implementation of AMS programmes.

2.4: Review existing accreditation and quality assurance programmes to ensure they appropriately support and encourage compliance with best practice AMS approaches.

2.5: Strengthen existing measures to better support appropriate and judicious use.

promote and increase the appropriate use of antimicrobials. Antimicrobial stewardship (AMS) refers to coordinated actions designed to promote an increase in the appropriate use of antimicrobials and is a key strategy to conserve the effectiveness of antibiotics.

Conversely, Australia is recognised as the fifth lowest country for antibiotic use in agriculture amongst countries examined by the United Kingdom's Review on AMR (2015).

## What have we achieved?

Across both human and animal health, multiple sectors have already contributed to improving the use of antimicrobials through a variety of activities. For example:

- In the human health setting, antibiotic prescribing guidelines are available to assist prescribers to optimise selection, dosing, route of administration, duration and timing of antimicrobial treatment, e.g. Therapeutic

Australia remains in the top 25% of countries with the highest community antibiotic use, compared with European countries and Canada.

*AURA 2019 Third Australian report on antimicrobial use and resistance in human health.*

Guidelines: Antibiotic and Australian Medicines Handbook.

- A review of antibiotic listings on the Pharmaceutical Benefits Scheme (PBS) is underway to look for opportunities to support appropriate antibiotic prescribing by proposing changes to restrict or remove repeats where they are not clinically indicated.
- Tailored, evidence based resources have been developed by organisations such as the National Centre for Antimicrobial Stewardship and NPS MedicineWise, to support the implementation of stewardship programs into human health clinical practice.
- A GP AMR Expert Group has been established to identify and develop initiatives to enhance antimicrobial stewardship in the community health setting.
- Strong stewardship practices in hospital settings are mandated through accreditation standards and supported by a range of resources to initiate and sustain AMS activities, including the Antimicrobial Stewardship Clinical Care Standard, the Antimicrobial Stewardship Initiative and the Antimicrobial Stewardship in Australian Health Care 2018 guidance.
- Australia has developed a Veterinary Antimicrobial Stewardship Online Training Program on effective AMS practices for clinical veterinarians. Its extension, promotion and evaluation of education modules is currently underway.

- Australia is undertaking national harmonisation of minimum veterinary prescribing and compounding regulatory requirements for veterinary practitioners treating livestock.
- Animal industry partners have published best practice prescribing guidelines for some animals and implemented antimicrobial stewardship programs, for example:
  - *The Antimicrobial prescribing guidelines for pigs (2019)*, published by the Australian Veterinary Association and Animal Medicines Australia in partnership with Australian Pork.
  - *The Antimicrobial Stewardship Guidelines for the Australian Cattle Feedlot Industry (2018)* published by the Australian Lot Feeders Association (ALFA) in partnership with Meat and Livestock Australia.
- The Australian Veterinary Association has released factsheets, developed in conjunction with Animal Medicines Australia, about responsible antibiotic use—one for companion animals and one for livestock and horses.

### What are our challenges?

Many of the strategies used in hospital antimicrobial stewardship programs are not transferrable to community health settings, including residential aged care. The absence of the strong accreditation driver (which accelerated change in the hospital sector) and the economics of primary care are significant barriers. Innovative approaches to address these barriers to best practice prescribing and sustain antimicrobial stewardship in these settings are needed.

In hospitals there are areas of antibiotic use that need further attention, for example, continuing work towards improving the appropriateness of antibiotic prescribing in surgical prophylaxis.

Compliance with antibiotic prescribing guidelines in all human health settings continues to be an issue and barriers to their accessibility and use must continue to be explored and remedied.

In the animal health sector, there has been increased availability of evidence-based and standardised best practice prescribing guidelines for the use of antimicrobials in animal health in Australia to complement other AMS initiatives. Awareness and adoption of these guidelines remains, however, a significant challenge, particularly in companion animal sector.

Clear prescribing guidelines are required to ensure responsible use in animal health, and provide a framework for auditable record keeping, which is aligned with OIE data reporting requirements to demonstrate responsible use.

There are still some animal health sectors that don't have established AMS programs. These need to be established and consideration needs to be given to ensuring uptake and compliance. For example, incentivising the implementation of AMS programs by veterinary practices to ensure widespread uptake.

There are some challenges around the accreditation of veterinary practices to demonstrate how they are implementing the Codes of Practice and appropriate use of antimicrobials. They include identifying triggers for investigating individuals or practices and determining how stewardship and non-compliance would be measured.

### Where to next?

We should explore options to improve point of care access to, and use of, prescribing guidelines in human health settings particularly the community setting. In particular, the use of expert systems to guide electronic prescribing will be an important initiative.

Options to obtain better information on appropriateness of antibiotic use in the community setting should be explored.

It is important to continue to work with the GP AMR Expert Group and key stakeholders to identify opportunities to better support appropriate prescribing and dispensing in the community setting.

We should look for opportunities to support appropriate antibiotic prescribing in surgical prophylaxis.

Alternative models of financing and registration of new or repurposed antibiotics should be explored to remove the commercial incentive to promote use.

Options should be explored to support the implementation of AMS programs and best-practice antimicrobial use policies through accreditation of, and developing standards for, veterinary practices and supporting animal industries.

We should support current efforts to harmonise national veterinary compounding and prescribing rights to enable more effective regulation of antimicrobial use.

A focus will be on behaviour change approaches for health and animal sector prescribers, food producers, and the general public to reduce demand and use in both humans and animals.

### **Objective Three: Develop nationally coordinated One Health surveillance of antimicrobial resistance and antimicrobial usage.**

Nationally harmonised and coordinated surveillance of antimicrobial resistance (AMR) and antimicrobial usage (AU) is essential to understand the magnitude, distribution and impact of resistant organisms and antimicrobial usage, identify emerging resistance and trends, and determine associations between usage and resistance. Surveillance is needed to inform and support local strategies to improve AU, prevent and contain AMR, and improve patient outcomes by providing Australia-specific data.

### **Priority Areas for Action**

3.1: Establish the foundations for national One Health surveillance.

3.2: Agree the objectives of surveillance for each sector, ensuring they align with the overarching objectives for the national One Health surveillance system.

3.3: Develop lists of priority organisms and associated antimicrobials for national reporting.

3.4: Agree and implement a uniform standard for laboratory testing methods for antibacterial susceptibility.

3.5: Improve human health surveillance.

3.6: Improve animal health and agriculture surveillance

3.7: Investigate requirements for surveillance in food

Surveillance data provide evidence to evaluate policies, set priorities and identify where immediate action is required and where resources need to be targeted. While Australia's *First Strategy* outlined actions to guide the development of national surveillance programs across human health, animal health and animal and agriculture sectors, this objective will now consider to what extent food and environment components could be incorporated into national surveillance. The long term goal is to establish an integrated One Health surveillance system.

### **What have we achieved?**

- Governance arrangements have been put in place to ensure cross-sector collaboration and sharing of expertise to improve One Health surveillance data across Australia. This is facilitated through members' updates at meetings of the ASTAG and their working groups.

- Australia has developed a list of priority organisms for human health and associated antimicrobials for national reporting.
- Australia, through the Australian Commission on Safety and Quality in Health Care (the Commission), has established the Antimicrobial Use and Resistance in Australia (AURA) Surveillance System. AURA collects and reports human health data from partner programs across acute and community healthcare settings, and provides integrated reporting on priority organisms and antimicrobial use, and appropriateness of use, at a national level.
- The Commission has also established CARAlert, which collects data on nationally agreed priority organisms that are resistant to last-line antimicrobial agents, known as critical antimicrobial resistances (CARs). AURA reports are currently published on an annual basis.
- Four core surveillance programs provide the foundations of AURA: the Australian Group on Antimicrobial Resistance (AGAR); the National Antimicrobial Utilisation Surveillance Program (NAUSP); the National Antimicrobial Prescribing Survey (NAPS); and the Australian Passive AMR Surveillance system (using the OrgTrx IT platform).
- The Australian Government Department of Agriculture and Water Resources has completed three proof-of-concept AMR surveillance projects in the pig, chicken meat, and layer chicken industries in mid-2018. These have shown good results about the current prevalence of resistance against specified antimicrobials in one or more indicator organisms.
- The Australian Government Department of Agriculture and Water Resources has progressed an AMR survey in the Tasmania salmon industry as well as commencing activity towards AMR surveys in the Australian barramundi, and Australian chicken egg industries.
- The Imported Food Inspection Scheme tests for residues of specific antimicrobials in imported farmed seafood (nitrofurans, malachite green and fluoroquinolones) and, as of 26 April 2018, in raw meat products (fluoroquinolones, ceftiofur and virginiamycin).
- The Australian Government Department of Health is funding a literature review to determine the extent to which AMR is present in food, the extent to which food is a route of transmission of AMR and to identify gaps to inform decision making about the extent of surveillance required and future work.
- Food Standards Australia New Zealand (FSANZ) has initiated a project on AMR in the food supply chain, which aims to clarify the role of FSANZ in assessing AMR in a multiagency One Health regulatory environment, and established a framework to assess the risks of AMR in the food supply for Australian consumers.
- In both the human and animal health sectors, work is underway to determine laboratory capacities in bacterial isolation, characterisation and uniform susceptibility testing.

### **What are our challenges?**

Current gaps in surveillance and monitoring coverage, jurisdictional differences in data collection, analysis and reporting, and the use of different diagnostic systems for undertaking susceptibility testing have resulted in a fragmented picture of antimicrobial resistance and usage in Australia.

Human health AMR surveillance is not real time and not consistently linked to a public health response in jurisdictions. There is a clear need to incorporate the surveillance and response

network for important resistant organisms into the national communicable diseases surveillance framework.

This will require a reframing of the current AMR surveillance systems and consistent national commitment to the appropriate public health responses.

Establishing a national, integrated, funded, sustainable and ongoing One Health surveillance system that also caters for the notification of AMR isolates in companion animals, food and the environment remains a challenge and requires a progressive approach. Specific challenges include:

- The current lack of quantitative data on antibiotic usage per animal species and sector, as well as uncertainty about data availability and needs in the food and environment sectors.
- Surveillance of AMR and AU in animal health is not yet centrally coordinated and consists of ad hoc projects rather than systematic and ongoing surveillance.
- The extent to which AMR surveillance data are comparable in human and animal health is limited for a number of reasons including:
  - Variability in antibacterial susceptibility testing methods, interpretation and reporting standards across laboratories.
  - Fit for purpose IT infrastructure to deliver real-time access to data across all sectors (human health, food and animal health) would enable appropriate interventions and responses.

Widespread use of multiplex polymerase chain reaction for diagnostic testing in human health will mean that, without reflex organism culture and resistance testing, information about AMR is not collected. This lack of data has implications for individual patient care as well as for surveillance and public health action.

In human health, whole genome sequencing could provide AMR information in terms of the presence of resistance mechanisms, but may not always reflect the phenotypic characteristics necessary for patient care.

A more consistent, evidence-based and effective public health response to multi-drug resistant organism transmission events/outbreaks within and across jurisdictions is needed, including better linking AMR surveillance data with response strategies.

However the potential for ‘pathogenomics’ to help rapidly track resistant organisms across sectors and geographical areas is immense.

### **Where to next?**

The evolution of AMR and AU surveillance is being informed by recommendations of recent reviews, pilot programs and reports. This includes exploring options to ensure surveillance systems inform action at a local level, and that appropriate response capacity and coordination is in place.

- Further explore capability for real-time aggregation, analysis and reporting of AMR and AU.
- Use recommendations from recent reviews and reports to inform AMR and antimicrobial use surveillance in animal health.
- Explore funding options and governance arrangements for an animal health surveillance system.
- Progress the alignment of antimicrobial susceptibility testing methodology and reporting across the country. This will involve addressing the barriers for implementing consistent methods and promoting the benefits of a national approach, as well as balancing testing by genomic sequencing and polymerase chain reaction (PCR) with traditional culture and

sensitivity testing.

- Further assessment is needed to determine what AMR and AU data from the environment and food are needed to inform policy and action in Australia, and a plan developed for the staged collection and contribution of these data to a One Health surveillance system in the future.
- Develop the use of genomic surveillance to better understand the spread of AMR.
- In relation to international surveillance, we need to continue to work to ensure that Australian surveillance systems have capacity to expand Australia's contribution to the global body of surveillance data, via the WHO Global AMR Surveillance System (GLASS) (Australia is currently only contributing data on a single priority pathogen-specimen combination) and the World Organization for Animal Health (OIE) global database on the use of antimicrobial agents in animals (under development).
- Analyse the relationship between environmental, animal, food and human isolates for emerging AMR organisms through the collection of surveillance data.
- Improve understanding risk posed to human health by resistant bacteria in the food chain.

#### **Objective Four: Improve infection prevention and control measures across human health and animal care settings to help prevent infections and the spread of resistance.**

Infection prevention and control (IPC) is critical in the control of all infectious organisms. Preventing infection and its spread reduces the need for antibiotics and the opportunity for organisms to develop resistance.

#### **Priority Areas for Action**

4.1: Ensure the availability of evidence-based, best-practice and nationally consistent standards for IPC across human health and animal care settings.

4.2: Review existing accreditation and quality assurance programmes to ensure they appropriately support and encourage compliance with best practice IPC measures.

4.3: Develop additional initiatives and resources to strengthen IPC in all human health care settings.

4.4: Further develop initiatives and resources to strengthen IPC in the livestock industry.

4.5 Further develop resources to strengthen IPC in veterinary practice.

4.6 Encourage continued increases in vaccination rates to prevent infections.

This objective aims to develop additional initiatives and resources to strengthen IPC in all human care settings as well as in the livestock industry and veterinary practice.

Australia's quarantine and biosecurity laws underpin the Australian agricultural sector and protect animals from a variety of exotic pests and diseases. The introduction of food safety requirements throughout the supply chain together with industry-led national quality assurance programs ensure that meat from farms has been produced safely.

Vaccines also offer potential to reduce AMR in humans and animals by preventing infection and assisting in the eradication of some diseases and eliminating the need for some antibiotics.

#### **What have we achieved?**

- The Australian Guidelines for the Prevention



and Control of Infection in Healthcare were developed in 2010 to provide a coordinated approach to the prevention and management of healthcare-associated infections in Australia.

- All jurisdictions have shown strong leadership in implementing hospital hand hygiene guidelines, and compliance is consistently improving. The average compliance rate in June 2017 (based on nationally collected data) was 84.3%.
- The National Safety and Quality Health Service (NSQHS) has released a range of resources to support health service organisations to implement and prepare for assessment against the Standards.
- In the animal health and agriculture sectors, the Australian Veterinary Association provides guidelines with the latest information about infection control and how to deal with high risk situations.
- Meat and Livestock Australia has been involved in a project to research and develop evidence-based IPC measures for adoption into industry standards for managing infectious cattle diseases. It has also been involved in a project to assess the efficacy of different vaccination regimes in cattle.
- The University of Sydney has undertaken studies to inform infection prevention and control in veterinary practice and, together with the Centre for Veterinary Education and the Australian and New Zealand College of Veterinary Scientists, is developing eLearning resources on this issue.
- A new vaccine on the Australian market is used to treat a common cattle disease, infectious bovine kerato-conjunctivitis which has reduced the need for tetracyclines and other antibiotics in its treatment.
- Successes have also been reported in aquaculture. The Tasmanian aquaculture

industry has achieved a major reduction in antibiotic use due to the availability of new vaccines.

- Over time, the availability of surveillance data, findings from research and the development of new technologies will inform new approaches and improvements in IPC.

### **What are our challenges?**

One challenge is in ensuring that surveillance is available, timely and identifies potential outbreaks.

There is limited data available on IPC in community settings such as general practices and aged care homes on compliance. Standards are not as prescriptive as those for hospitals and do not specifically refer to the management of resistant organisms. Again, the absence of an accreditation driver for change (as in the hospital sector) is a significant disadvantage.

Data collected through AURA show that the prevalence of community-acquired resistant bacteria is increasing but we have limited understanding how transmission occurs.

The lack of substantial progress in applying existing initiatives used in human healthcare settings to animal care, and vice versa, to enhance current infection prevention and control/biosecurity approaches. Good progress has not yet been made in applying initiatives used in human healthcare settings to animal healthcare and agriculture and vice versa to enhance current IPC approaches.

Vaccines are also key in the prevention of infection but for food producing animals there is a lack of vaccine availability to prevent diseases. Australia's animal population is small and the revenue generated from potential vaccine sales would also be small. This limits access to new vaccines.

## Where to next?

There is a need to identify and implement innovative ways to maximise best practice IPC, consistent with the Australian Guidelines for the Prevention and Control of Infection in Healthcare. These could be incorporated more strongly into accreditation standards for primary care and residential aged care.

Strengthened coordination and information sharing is required between the human and animal health sectors in terms of surveillance, prevention and management.

We should explore the accreditation of veterinary practices, animal shelters and wildlife hospitals to ensure best practice IPC is implemented.

Consider incentives to improve access to, and manufacture of, animal vaccines and encourage the use of vaccines in both human and animal health as a prevention measure.

We should continue to improve quality and timeliness of surveillance data to enable the implementation of targeted and effective IPC measures, where needed.

Conduct a stocktake of current initiatives/ programs supporting the implementation of animal sector specific IPC/biosecurity measures to prevent disease (e.g. national feedlot accreditation scheme; quality assurance programs for feedlot cattle and pigs).

**Objective Five: Agree a national research agenda and promote investment in the discovery and development of new products and approaches to prevent, detect and contain antimicrobial resistance.**

A strong research and development agenda is required to advance the discovery of new therapies and diagnostic technologies to better prevent infectious disease, treat resistant infections and support the development,

## Priority Areas for Action

5.1: Identify current gaps and agree national research and development priorities.

5.2: Coordinate national research activities and the sharing of information.

5.3: Explore opportunities to increase support for research and development, including incentives for greater private sector investment.

5.4: Explore opportunities to support the translation of promising research finding into new products, policies and approaches.

refinement and implementation of evidence-based practices to limit the emergence and spread of AMR.

An integrated research approach is required to identify and address gaps in evidence, cultivate collaboration and information sharing and ensure the most effective use of research and development resources.

## What have we achieved?

- Recognising that a strong research and development agenda is needed to advance the discovery of new therapies and diagnostic technologies, the Australian Government invests in AMR research and development through National Health and Medical Research Council (NHMRC) grants, the Medical Research Future Fund (MRFF) and the Cooperative Research Centres (CRC) Program.
- AMR was identified as a priority area by the Australian Medical Research Advisory Board in the Australian Medical Research and Innovation Priorities 2016-18 following extensive public consultation in 2016. The Tackling Antimicrobial Resistance initiative was subsequently established and involved

a targeted call for research worth \$5.9 million. The resulting four projects were announced in 2018 and focused on the use of metagenomics to understand carriage and transmission of antimicrobial resistance and antimicrobial use in the elderly and in residential aged care settings.

- AMR continues to be a priority of the MRFF, with One Health – Antimicrobial Resistance identified as a priority area for funding in the updated Australian Medical Research and Innovation Priorities 2018-2020.
- The Government has also announced a \$28.4 million Global Health – Tackling Antimicrobial Resistance and Drug Resistant Tuberculosis initiative with further details expected to be made available in the 2019-20 financial year.
- In the ten year period from 2009 to 2018, 299 active NHMRC grants were made that were relevant to AMR totaling over \$201.3 million when they are all completed. Categories for grants included development and biology of AMR, spread and surveillance, antimicrobial stewardship as well as the development of new antimicrobials and/or novel therapies.
- The NHMRC's Centre of Research Excellence (CRE) scheme is providing support for teams of researchers to pursue collaborative research and development capacity in different aspects of the AMR response. These include the CRE in Tuberculosis Control, CRE in Minimising Antibiotic Resistance in the Community (CRE-MARC) and the CRE in Malaria Elimination.
- Australia remains an active collaborator in advancing global research and development relating to AMR through international initiatives including the Global Antibiotic Research and Development Partnership (GARD-P) and the Global AMR R&D Hub.
- The [amr.gov.au](http://amr.gov.au) website includes an AMR activity and research directory, providing a

space for researchers and organisations to share information. The directory helps build Australia's information on AMR, which in turn will help target our efforts to strengthen Australia's response to AMR.

- A number of Australian Universities continue to undertake AMR research in areas such as the health and economic impacts of five key drug-resistant infections in Australia; the discovery of new compounds with antimicrobial properties and determining the usefulness of disinfectants in eliminating germs and bad bacteria.
- The Murdoch University is currently undertaking a project about risk management of critical antimicrobial resistant bacteria in food producing animals, which aims to optimise a microbiological enumeration assay and quantify its detection of critical AMR bacteria.
- Funded under the Australian Government's Rural Research and Development for Profit program, Australian Pork Limited is working with partners AgriFutures Australia, Murdoch University, the University of Adelaide, Tecan Australia, Thermo Fisher Scientific, Illumina and NSW Department of Primary Industries to deliver high throughput technology for defining antimicrobial resistance status in pork and chicken project.

### **What are our challenges?**

While progress has been made in increasing the level of information sharing and collaboration between Australia's research institutes, Australia lacks a national AMR research agenda, with dedicated funding, that identifies agreed research and development priorities to which institutes lend their expertise and work collaboratively to fill knowledge gaps.

Research and development need to be mapped against current AMR efforts. Such crosschecking

will provide guidance on the gaps and where the greatest impacts of new research and development investment could be achieved.

Although the AMR Activity and Research Directory on the [amr.gov.au](http://amr.gov.au) website provided a start for collaboration and information sharing, our efforts can be improved. Such efforts are required to promote efficient use of resources and minimise duplication of effort within and between all sectors (One Health), including the Australian Government, state and territory governments, non-government organisations, professional bodies and research organisations. The next Strategy will encourage the development and implementation of sector-specific action plans to ensure clear accountability and unique plans for minimising AMR.

### Where to next?

Explore the development of a national One Health AMR research agenda.

Better explore opportunities to increase support for research and development through innovative models such as push and pull incentives, fast tracking clinical trials and consideration of alternative approaches to economic evaluation.

Explore funding models to secure dedicated funding to address AMR, particularly in the animal health sector.

Promote and measure progress against the 'Australian animal sector national AMR plan 2018' and agree on future activities.

Australia will continue to support and encourage centres of research excellence, research institutes and national research funding bodies such as the NHMRC, MRFF and the Australian Research Council to work in concert to establish agreed national AMR research priorities.

Australia will continue to engage in various international research and development bodies such as the Global AMR Research and Development Hub, the Global Antibiotic

Research and Development Partnership and the Global AMR Innovation Fund. Australia will collaborate with such research groups to minimise duplication and maximise efficiency of global AMR research, including animal health research and development initiatives.

### Objective Six: Strengthen international partnerships and collaboration on regional and global efforts to respond to antimicrobial resistance.

AMR is a global issue that requires a global response. AMR potentially affects everyone, regardless of where they live, their health or economic circumstances. The increasing international movement of people, animals, food and other products increases the potential for AMR to spread rapidly across the world. Without international collaboration, the efforts of individual countries to combat AMR will be of limited value.

#### Priority Areas for Action

6.1: Active engagement with multilateral organisations and relevant forums to contribute to regional and global action on antimicrobial resistance.

6.2: Lead regional initiatives to increase capacity to respond to antimicrobial resistance.

6.3: Learn from international best practice.

6.4: Participate in international surveillance initiatives.

6.5: Establish closer ties with international collaborations to link Australia's national research agenda with what is happening internationally.

The objective to strengthen international partnerships and collaboration on regional and global efforts to respond to AMR is therefore integral to Australia's National AMR Strategy.

Australia must continue to align its efforts, wherever possible, and actively engage with other countries and multilateral organisations, particularly in the Asia-Pacific region.

### What have we achieved?

- Australia has aligned its response to AMR with the WHO Global Action Plan on AMR (GAP), and is a regular participant and contributor to the international response to AMR. Examples of Australia's international engagement on AMR include, but are not limited to:
  - The Australian Chief Veterinary Officer – who is the current President of the World Organization for Animal Health (OIE) World Assembly of Delegates – coordinates Australia's OIE work and provides regular disease reporting to improve global capability;
  - Australia's participation in the OIE's annual data collection on antimicrobial usage in animals since 2015;
  - Australia's membership of the Global AMR R&D Hub. This initiative brings together governments and foundations from different world regions, with different research potential and funding priorities, to address the global health threat of AMR; and
  - Australia's championing of international frameworks such as the WHO GAP and the Draft Global Framework for Development and Stewardship to Combat Antimicrobial Resistance, and contribution to the Codex Alimentarius Commission's Ad hoc Codex Intergovernmental Task Force on AMR.
- Australia has taken a leadership role in the Western Pacific Region, sharing information and resources with our neighbors to support regional priority actions outlined in the Action Agenda for Antimicrobial Resistance in the Western Pacific Region. For example:
  - The National Centre for Antimicrobial Stewardship (NCAS) has undertaken various regional initiatives including conducting antimicrobial stewardship gap analyses for Laos, Mongolia, Vietnam and the Philippines. It has also worked with the WHO to create an antimicrobial stewardship training framework for low and middle income countries in the Asia-Pacific region.
  - In 2017 Australia underwent a WHO Joint External Evaluation (JEE), which aimed to evaluate existing gaps in health systems and preparedness. Australia used the recommendations from the JEE to produce Australia's National Action Plan for Health Security 2019-2023 (NAPHS), and provides expertise and experience to JEEs in other countries within the immediate region.
- The Australian Government supports international AMR surveillance efforts, and has enrolled in the Global Antimicrobial Resistance Surveillance System (GLASS).
- Australia recognises that a strong research and development agenda is needed to advance the discovery of new therapies and diagnostic technologies. The Australian Government has committed over AUD\$4 million to fund two major research grants focused on AMR:
  - the 'Protecting Indonesia from the Threat of Antibiotic Resistance' (PINTAR) project will provide timely evidence on the current operations and motivations of private for-profit drug sellers in Indonesia to inform the design and implementation of a multifaceted intervention to reduce inappropriate dispensing of antibiotics without prescription; and
  - the 'V-RESIST' project will evaluate

a package of interventions to reduce inappropriate use of antibiotics in Vietnam.

### **What are our challenges?**

There are many international groups and organisations that have an interest in the issue of AMR, however, many efforts and initiatives are progressing in parallel.

The challenge for Australia and the wider international community is to ensure that duplication of effort is minimised and that appropriate links are made to maximise effort. This is why engagement and collaboration with stakeholders across all levels and sectors is vital. The next Strategy will encourage the development and implementation of sector-specific action plans to ensure clear accountability and plans for addressing AMR.

A challenge for the development and implementation of AMR National Action plans in our immediate region has been the limited resources to fund them. Some countries in the Western Pacific look to Australia to provide best practice approaches and leadership to combat AMR and Australia's in-kind contributions of best practice resources and expertise are highly valued.

Australia's enrolment in GLASS will initially see data for *Neisseria gonorrhoeae* submitted to the 2019 data call. Further work is needed to determine Australia's capacity to contribute data on other priority pathogen-specimen combinations and to work with data custodians to facilitate the incremental contribution of these data to GLASS.

Australia needs to meet international reporting obligations to support global AMR mitigation. A national animal health approach is needed to collate and analyse antimicrobial use and AMR surveillance data to contribute to the OIE global surveillance system.

### **Where to next?**

The Australian Government strongly supports global action on AMR underpinned by a One Health approach and will continue its active engagement with the tripartite agencies (WHO, OIE and FAO) and other relevant international fora, to progress global and regional action on AMR.

Australia continues to fully support the WHO JEE process and use of the JEE Tool, particularly now that Australia has undergone a JEE. Australia will continue to provide expertise and experience to JEEs in other countries within the immediate region.

Australia will continue working towards being able to participate in international surveillance activities and identify additional forums to share animal health activities and initiatives at the international level.

With regard to GLASS, the Australian Government will workshop with data custodians late in 2019 to determine a process for the incremental contribution of other organisms or antimicrobial combinations.

Continue contributions, support to and collaboration with, regional governments on capacity building and development of policies, AMS and surveillance programs to address AMR in animal sectors. This will help with addressing international trade and market access issues, and create opportunities for education and training.

**Objective Seven: Establish and support clear governance arrangements at the local, jurisdictional, national and international levels to ensure leadership, engagement and accountability for actions to combat antimicrobial resistance.**

Achievement of the Strategy objectives requires a coordinated effort from a wide range of implementation partners. Stakeholders from across the Australian and state and territory

## Priority Areas for Action

7.1: Identify, establish and maintain linkages between implementation partners across all sectors.

7.2: Work with stakeholders to develop an Implementation Plan for the Strategy.

7.3: Establish baseline measures to inform monitoring and evaluation of the Strategy.

7.4: Review regulation (legislated and other) relevant to antimicrobial resistance and antibiotic usage.

governments, regulators, hospital administrators, standard-setting and accreditation bodies, the pharmaceutical industry, food animal producers and food manufacturers, agriculture, health and veterinary professionals, researchers, educators, professional bodies and consumers all have a role in ensuring actions under the Strategy are effectively implemented.

To support progress, clear lines of responsibility will be needed at the national and local levels. In addition, to foster a global approach of responsibility and accountability on combatting AMR, Australia will continue to support relevant multilateral organisations such as the WHO, OIE and FAO.

### What have we achieved?

- Australia has established the AMR Prevention and Containment Steering Group (AMRPC Steering Group) and the Australian Strategic and Technical Advisory Group on AMR (ASTAG) which remain central to the national governance arrangements for AMR.
- ASTAG continues to meet twice yearly to develop and provide expert advice to the AMRPC Steering Group on current and emerging issues, research priorities and implementation approaches to support the Strategy. Through its membership, ASTAG

strengthens linkages between governments, industry, professional bodies and other key stakeholders to support a 'One Health' response to AMR.

- The AMRPC Steering Group was responsible for the development and implementation of the First Strategy and oversaw the release of the Australian Government's 2016 Implementation Plan.
- In May 2019, the third Australian report on Antimicrobial Use and Resistance in Australia (AURA) in human health was published. Although the series of national reports is relatively immature, these initial reports provide a benchmark to inform future monitoring and evaluation of the Strategy.
- Within jurisdictions, Queensland and South Australia are developing AMR strategies. New South Wales has prepared a draft biosecurity policy on AMR, Victoria has specific state AMR webpages and undertakes advocacy work, and Western Australia held an AMR workshop in February 2019.
- On 12 October 2018, the Council of Australian Governments (COAG) Health Council agreed to move AMR from Tier 2 to Tier 1, which makes AMR "Highest Priority - Issues of national significance require cooperation of all jurisdictions" for 2019-20. This signifies the importance of a fully national approach to decision making and action. The challenge will be in ensuring clear lines of responsibility and coordinated effort across jurisdictions.

### What are our challenges?

Responding to AMR crosses multiple levels (international, national, jurisdictional and local) and multiple sectors, and ensuring clear lines of responsibility, a coordinated effort across sectors and managing commercial sensitivities will continue to be challenging. Enhanced

involvement and accountability is required at all levels and by all stakeholders to achieve Strategy objectives.

Better understanding of current regulatory arrangements and the economic impact of AMR in Australia is required to identify and prioritise areas for action.

There is a need to map the current regulatory framework against the antimicrobial supply chain and antimicrobial use/AMR trends in human and animal health to identify areas where regulation could be applied or streamlined to support efforts to reduce AMR and promote the appropriate use of antimicrobials.

Changes in government priorities require revision of governance arrangements to ensure effectiveness in driving change and supporting the implementation of priority AMR activities.

### **Where to next?**

Australia will continue to support relevant multilateral organisations such as the WHO, OIE and FAO to foster a global approach of responsibility and accountability on combatting antimicrobial resistance. This calls for clear lines of responsibility and accountability at the national, jurisdictional and local levels to support progress and requires a coordinated effort from a wide range of implementation partners to achieve the Strategy objectives.

Recognising the need for a unified national approach to addressing AMR, the next Strategy will include enhanced collaboration between the Commonwealth and states and territories. It is expected that the next Strategy will be provided to COAG for endorsement in late 2019 via responsible committees.

A monitoring and evaluation framework will accompany the next Strategy to drive accountability and stakeholders across human health, animal health, agriculture and environment sectors, will all be encouraged to

develop and implement sector specific action plans, which will provide clear accountability and plans for minimising AMR.

The Australian Government has commissioned projects to assess the economic impacts of AMR in Australia, and to review regulation (legislated and other) relevant to AMR and antibiotic usage. Once completed, the outcomes of these projects will be important to consider when developing future AMR action plans.

ASTAG membership will be reviewed to ensure it includes adequate representation from all sectors, including food and environment.

## **8. Sector Specific Roles and Responsibilities**

The success of Australia's response to AMR, and continued progress towards the objectives of the current Strategy and the next, requires a multisectoral effort. AMR is a complex issue that must be addressed in a coordinated manner, taking into account the social, economic and health needs of Australians. It is only by working together across jurisdictions and across sectors that we will be able to implement a strong national response to AMR.

### **Questions for Consideration**

14. Are there other sectors that need to be considered as part of the next Strategy?
15. What do you see as your sector's role and responsibilities in Australia's response to AMR?

Note: These questions are listed as questions 32 and 33 in the public consultation submission template and survey.

The next AMR Strategy will identify sector specific roles and the objectives and priority areas for action relevant to each sector. Sectors



can develop their own sector specific action plans under the next strategy, with some potential roles for individual sectors identified below.

### **The Public Sector**

The public sector includes all levels of government. The Australian Government can provide leadership in bringing together commonwealth, state and territory jurisdictions and industry stakeholders to collaborate and contribute to an inclusive national strategy to address AMR. The Australian Government collaborates on international initiatives and shares in the exchange of expertise and best practise policy with global partners on AMR. Actions resulting from the national Strategy are generally implemented at the state and territory level.

### **The Private Sector**

The private sector can assist as ambassadors for promoting preventative measures such as promoting the correct use of antimicrobials through product labelling by drug sponsors. Private companies can also ensure an effective supply of antimicrobial treatments and diagnostic tools.

### **The Research Community**

Research and development are key factors in a comprehensive, multisectoral approach to AMR through their role in conducting research to expand the knowledge base on AMR. Researchers can improve our understanding of antimicrobial resistance and develop new, safe and effective treatments.

### **Professionals**

Professionals can engage in and promote best practice and stewardship across the human, animal, food and environmental health sectors. They can also promote best practice infection prevention and control and antimicrobial use by health workers, veterinarians, farmers and throughout the food chain.

## **Society**

To reduce the need for, and use of, antimicrobials members of society including patients, animal owners and consumers need to gain greater understanding of AMR issues and take preventative measures. This includes understanding the risks and benefits of antimicrobials and using them only as directed as well as taking responsibility for good personal and food hygiene and infection control at home or when travelling abroad.

## **9. Stocktake of Activities**

Where relevant, please complete the Stocktake of Activities table to assist us to capture the huge amount of activity being undertaken by a wide range of organisations and sectors to address the priority areas of action outlined in the Strategy.

This information will be published in the final progress report under the *First Strategy* and assist with informing future action plans.

<b>Objective 1: Increase awareness and understanding of antimicrobial resistance, its implications and actions to combat it, through effective communication, education and training</b>					
<b>Activity</b>	<b>Responsibility – Lead</b>	<b>Key partners (include role)</b>	<b>Milestones</b>	<b>Expected Outcome/s</b>	<b>Links with other Strategy Objectives</b>
Priority Action Area 1.1 – Strengthen consumer awareness initiatives to improve understanding of antimicrobial resistance and the importance of using antibiotics appropriately					
Priority Action Area 1.2 – Increase support for human and animal health professionals in reinforcing key messages with patients and clients					
Priority Action Area 1.3 – Strengthen communication and education initiatives for health professionals and team members					
Priority Action Area 1.4 – Develop a stakeholder engagement and communication plan to support whole-of-society awareness of, and participation in, implementation of the Strategy					

<b>Objective 2: Implement effective antimicrobial stewardship practices across human health and animal care settings to ensure the appropriate and judicious prescribing, dispensing and administering of antimicrobials</b>						
<b>Activity</b>	<b>Responsibility – Lead</b>	<b>Key partners (include role)</b>	<b>Milestones</b>	<b>Expected Outcome/s</b>	<b>Links with other Strategy Objectives</b>	
Priority Action Area 2.1 - Ensure that tailored, evidence-based antibiotic prescribing guidelines are available for all sectors						
Priority Action Area 2.2 – Ensure the availability of evidence-based, best practice and nationally consistent approaches to AMS across human health and animal health sectors						
Priority Action Area 2.3 – Develop tailored, evidence-based resources to support the implementation of AMS programmes						
Priority Action Area 2.4 – Review existing accreditation and quality assurance programmes to ensure they appropriately support and encourage compliance with best practice AMS approaches						
Priority Action Area 2.5 – Strengthen existing measures to better support appropriate and judicious use of antibiotics						

Objective 3: Develop nationally coordinated One Health surveillance of antimicrobial resistance and antimicrobial usage					
Activity	Responsibility – Lead	Key partners (include role)	Milestones	Expected Outcome/s	Links with other Strategy Objectives
Priority Action Area 3.1 – Establish the foundations for national One Health Surveillance					
Priority Action Area 3.2 – Agree the objectives of surveillance for each sector, ensuring they align with the overarching objectives for the national One Health surveillance system					
Priority Action Area 3.3 – Develop lists of priority organisms and associated antimicrobials for national reporting					
Priority Action Area 3.4 – Agree and implement a uniform standard for laboratory testing methods for resistance susceptibility					
Priority Action Area 3.5 – Improve human health surveillance					
Priority Action Area 3.6 – Improve animal health and agriculture surveillance					
Priority Action Area 3.7 – Investigate requirements for surveillance in food					

Objective 4: Improve infection prevention and control measures across human health and animal care settings to help prevent infections and the spread of resistance					
Activity	Responsibility – Lead	Key partners (include role)	Milestones	Expected Outcome/s	Links with other Strategy Objectives
Priority Action Area 4.1 – Ensure availability of evidence-based, best-practice and nationally consistent standards for IPC across human health and animal care settings					
Priority Action Area 4.2 - Review existing accreditation and quality assurance programmes to ensure they appropriately support and encourage compliance with best practice IPC measures					
Priority Action Area 4.3 - Develop additional initiatives and resources to strengthen IPC in all human health care settings					
Priority Action Area 4.4 - Further develop initiatives and resources to strengthen IPC in the livestock industry					
Priority Action Area 4.5 - Further develop resources to strengthen IPC in veterinary practice					
Priority Action Area 4.6 – Encourage continued increases in vaccination rates to prevent infections					

<b>Objective 5: Agree a national research agenda and promote investment in the discovery and development of new products and approaches to prevent, detect and contain antimicrobial resistance</b>					
<b>Activity</b>	<b>Responsibility – Lead</b>	<b>Key partners (include role)</b>	<b>Milestones</b>	<b>Expected Outcome/s</b>	<b>Links with other Strategy objectives</b>
Priority Action Area 5.1 - Identify current gaps and agree national research and development priorities					
Priority Action Area 5.2 – Coordinate national research activities and the sharing of information					
Priority Action Area 5.3 – Explore opportunities to increase support for research and development, including incentives for greater private sector engagement					
Priority Action Area 5.4 – Explore opportunities to support the translation of promising research findings into new products, policies and approaches					

<b>Objective 6: Strengthen international partnerships and collaboration on regional and global efforts to respond to antimicrobial resistance</b>					
<b>Activity</b>	<b>Responsibility – Lead</b>	<b>Key partners (include role)</b>	<b>Milestones</b>	<b>Expected Outcome/s</b>	<b>Links with other Strategy objectives</b>
Priority Action Area 6.1 – Active engagement with multilateral organisations and relevant forums to contribute to global action on antimicrobial resistance					
Priority Action Area 6.2 – Lead regional initiatives to increase capacity to respond to antimicrobial resistance					
Priority Action Area 6.3 – Learn from international best practice					
Priority Action Area 6.4 – Participate in international surveillance initiatives					
Priority Action Area 6.5 – Establish closer ties with international collaborations to link Australia's national research agenda with what is happening internationally					

Objective 7: Establish and support clear governance arrangements at the local, jurisdictional, national and international levels to ensure leadership, engagement and accountability for actions to combat antimicrobial resistance					
Activity	Responsibility – Lead	Key partners (include role)	Milestones	Expected Outcome/s	Links with other Strategy objectives
Priority Action Area 7.1 – Identify, establish and maintain linkages between implementation partners across all sectors					
Priority Action Area 7.2 – Work with stakeholders to develop an Implementation Plan for the Strategy					
Priority Action Area 7.3 – Establish baseline measures to inform monitoring and evaluation of the Strategy					
Priority Action Area 7.4 – Review regulation (legislated and other) relevant to antimicrobial resistance and antibiotic usage					