



11 April 2018

Dr Raana Asgar
Department of Agriculture and Water Resources
GPO Box 858
CANBERRA ACT 2601

Dear Dr Asgar,

WILDLIFE HEALTH AUSTRALIA (WHA) SUBMISSION: DRAFT NATIONAL
ANTIMICROBIAL RESISTANCE STRATEGY FOR THE AUSTRALIAN ANIMAL SECTOR

Please find attached a submission regarding native wildlife, antimicrobial resistance (AMR) and the National Antimicrobial Resistance Strategy for The Australian Animal Sector (the Strategy).

The Strategy is a great initiative. We understand that the main focus must be on livestock/domestic animal health, however we note that environment and wildlife are not specifically mentioned. The environment forms another compartment that could play a role in AMR, and although its significance in relation to AMR development and transmission is not well understood, it should be considered in relation to the Strategy, in particular the identification of surveillance and research needs for wildlife within the animal health area (Objectives 4 and 7).

We are happy to discuss this submission with you face to face should you feel it would assist the writing group. Good luck with this important work and please let us know if we can help in any other way.

Best Wishes,

Rupert Woods AM
CEO, WHA

WILDLIFE HEALTH AUSTRALIA (WHA) SUBMISSION: DRAFT NATIONAL ANTIMICROBIAL RESISTANCE STRATEGY FOR THE AUSTRALIAN ANIMAL SECTOR (THE STRATEGY)

CURRENT KNOWLEDGE - ANTIMICROBIAL RESISTANCE, WILDLIFE AND PRODUCTION ANIMALS

Radhouani et al (2014) refer to AMR as an “ecological problem”, demonstrating that wildlife can act as an environmental reservoir and also a “melting pot” for bacterial resistance. The existence of AMR in a range of wildlife species is well documented overseas, and in a limited number of published cases in Australia (e.g. Sherley et al, 2000; Chen et al, 2014). A scoping review of published research evaluated the role of wildlife in transmission of AMR to the food chain and found that 309 of 866 relevant primary research articles reported AMR in wildlife, with AMR transmission reported in 110 (Greig et al, 2014). Reported risk factors for transmission of AMR/bacteria from wildlife to food animals, environmental sources or humans included presence of wild birds, shared range, and contamination of water by wildlife.

Studies in Australia found “a low but widespread prevalence of anti-microbial resistance” in an analysis of 946 strains of Enterobacteriaceae isolates from wild Australian mammals from 1993-1997 (Sherley et al, 2000). The isolates came from 77 species (14 families) collected from all jurisdictions of Australia. Chen et al (2014) found wallabies in a pristine environment and in a captive zoo situation in South Australia to be a significant reservoir of antibiotic resistance in a number of *Staphylococcus* species, with resistance to β -lactam antimicrobials in around a third of all isolates. Interestingly, multi-drug resistant staphylococci were found in free-ranging wallabies in a remote area without significant contact with humans or prior exposure to antibiotics. This finding is consistent with other studies, indicating the complex dynamics of AMR spread among wild populations (Radhouani et al, 2014).

As explained by Sherley et al (2000): “The prevalence of antibiotic resistance in environmental strains may be influenced by human antibiotic use in several ways: through the spread of resistant strains or their genes from human and agricultural systems, the evolution and selection of new resistant strains or the amplification of pre-existing resistant strains in the environment.” Wellington et al (2013) describe the reservoir of antibiotic resistance genes in the environment as a mix of naturally occurring resistance, those present in animal and human waste, and the selective effects of pollutants. Transfer of AMR between wildlife and humans and/or domestic animals could potentially occur through environmental contamination with human/animal waste, particularly in water.

As well as a potential environmental AMR reservoir to humans and domestic animals, the impact of AMR environmental contamination from treatment of livestock (Barton, 2012) should also be considered. The environment may be contaminated by veterinary antimicrobials via treatment of livestock on pasture or following application of manure from intensive livestock production. These may be cycled and re-cycled through soil, ground water, marine water, wild animals, crops, shellfish and livestock (Wellington et al, 2013).

Power et al (2013) also reported on the risk of introduction of AMR into the environment through species recovery programs, with integrons associated with clinical AMR found in 48% of faecal samples of brush-tailed rock-wallabies (*Petrogale penicillata*) in a captive breeding program, which were later released. Free-ranging wildlife populations have the potential to act as sentinels for environmental contamination and can therefore be a useful target for a surveillance program.

THE IMPORTANCE OF CONSIDERING WILDLIFE AND THE ENVIRONMENT IN A NATIONAL RESISTANCE STRATEGY FOR THE AUSTRALIAN ANIMAL SECTOR

The potential role of environmental contamination in the transfer of AMR between wildlife, domestic animals and humans has been recognised (above and Greig et al, 2014; Guenther S et al, 2011; Radhouani et al, 2014; Wellington et al, 2013). Wildlife populations have the potential to act as reservoirs for antimicrobial resistance, however the dynamics of this process and the magnitude of the risk to agriculture is poorly understood.

Emerging pathogens from wildlife are growing in significance as free-ranging wildlife populations become increasingly urbanised, resulting in greater overlap of usage of the environment, and closer direct and indirect contact with humans and domestic animals. There may be a similar effect in relation to AMR.

COMMENTS ON THE STRATEGY ITSELF

It is logical that the Strategy align with and support the framework, objectives and priority actions for the overarching National Antimicrobial Resistance Strategy 2015–2019 (the National Strategy). The Strategy is simple, clear and concise.

We understand that the main focus of the Strategy must be on livestock/domestic animal health, however we note that environment and wildlife are not specifically mentioned. The environment forms another compartment that could play a role in AMR, and although its significance in relation to AMR development and transmission is not well understood, it should be considered in relation to the Strategy, in particular the identification of surveillance and research needs for the animal health area (Objectives 4 and 7 - below).

WILDLIFE PRIORITIES FOR AMR AND PRODUCTION ANIMALS

For Wildlife, the priority is research to better understand how resistant bacteria move between wildlife, the environment, food producing animals (and humans) and the relative importance of these groups in the maintenance and dispersal of AMR. Surveillance and research for the production animal sector could include:

- investigation of the extent of AMR within the Australian free-ranging wildlife population, the environment and interaction and impact upon domestic animals
- usage of antimicrobials for the treatment of wildlife cases presenting to zoo hospitals, wildlife rehabilitation centres and private veterinary clinics and their impact upon AMR and its transmission to domestic animals and the environment.

An important question is whether surveillance is required in wild animal populations, what this might look like and whether the value proposition holds (i.e. that this would assist in identifying, articulating and managing the overall risk to production animals and people).

REGARDING THE CONTRIBUTION THAT WHA MAY MAKE TO THE STRATEGY

WHA coordinates a number of national wildlife disease surveillance programs, including the General Wildlife Disease Surveillance Program, the Zoo Based Wildlife Disease Surveillance Program, and the Sentinel Clinic Wildlife Disease Surveillance Program. WHA also coordinates a national Universities Focus Group, which represents universities conducting research in diseases of wildlife, a Bat Health Focus Group and a Zoo Animal Health Reference Group. WHA-coordinated surveillance programs operate at a national level, providing a link between organisations at a local and jurisdictional level, and between government and non-government organisations.

Wildlife health data captured through the surveillance programs coordinated by WHA are managed through a national web-based database known as eWHIS (the 'electronic Wildlife Health Information System'). The data in eWHIS are available to inform policy and management decisions by relevant authorities, for international reporting, and to protect Australia's trade, human health, livestock health and biodiversity. The surveillance programs and eWHIS database have the capacity to capture national data on the occurrence of AMR in free-ranging wildlife. Several cases of multi-resistant bacterial infections in free-ranging wildlife have already been reported through the Zoo Based Wildlife Disease Surveillance Program. This has prompted WHA to recognise the need to raise awareness of AMR in free-ranging animals and encourage further reporting.

WHA is the peak body for wildlife health in Australia and networks with a wide range of stakeholders including representatives from federal, state and territory conservation, agriculture and human health agencies and industries, wildlife health professionals, universities, zoos, private practitioners, wildlife carer groups, hunters and fishers, and diagnostic pathology services. WHA primarily does this through expert focus groups, surveillance programs, and a weekly email Digest that reaches over 750 subscribers with an interest in wildlife health. Establishing linkages with WHA and associated groups and stakeholders may assist in expanding the scope of the Strategy to address AMR issues associated with wildlife and the environment should the writing group chose to do so.

The current focus of WHA activities is in supporting biosecurity agencies in their efforts to better manage the adverse impacts of diseases with wildlife as part of their epidemiology on Australia's agricultural systems and production animals. For WHA to better support AMR activities, however, the input, resourcing and guidance of Health and Environment would be required.

REFERENCES

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ABOUT WILDLIFE HEALTH AUSTRALIA

Wildlife Health Australia (WHA) is the peak body for wildlife health in Australia and operates nationally. The head office is located in Sydney, NSW.

WHA activities focus on the increasing risk of emergency and emerging diseases that can spill over from wild animals and impact on Australia's trade, human health, biodiversity and tourism. We provide a framework that allows Australia to better identify, assess, articulate and manage these risks. We provide the framework for Australia's general wildlife health surveillance system.

Our mission is to develop strong partnerships in order to better manage the adverse effects of wildlife diseases on Australia's animal health industries, human health, biodiversity, trade and tourism.

WHA directly supports the Animal Health Committee (AHC), Animal Health Australia (AHA), the Animal Health Policy Branch and the Office of the Chief Veterinary Officer (OCVO) within the Australian Government Department of Agriculture and Water Resources (DAWR) and Australian governments in their efforts to better prepare and protect Australia against the adverse effects of wildlife diseases. It provides priorities in wildlife disease work, administers Australia's general wildlife disease surveillance system as well as facilitating and coordinating targeted projects. Wildlife health intelligence collected through the National Wildlife Health Information System (eWHIS: <http://www.wildlifehealthaustralia.com.au>) administered by WHA is provided to members of AHC and the Australian Government DAWR, and Departments of Health (DoH) and Environment and Energy (DoEE), on issues of potential national interest, potential emerging issues and significant disease outbreaks in wildlife. The information is provided in line with the agreed policy for data security. WHA supports the National Animal Health Information System (NAHIS) by provision of quarterly reporting and the Australian Chief Veterinary Officer by hosting the World Organization for Animal Health (OIE) Wildlife Health Focal Point. WHA also provides Australia's representative to the International Union for the Conservation of Nature Species Survival Commission Wildlife Health Specialist Group (IUCN SSC WHSG).

WHA is administered under good corporate governance principles. An elected management group, chaired by an appointment from DAWR, and including an AHC representative provides strategic direction and advice to a small team, which oversees the running of WHA. It is important to note that WHA involves almost every agency or organisation (both government and NGO) that has a stake or interest in animal and wildlife health issues in Australia. There are over 40 member organisations and more than 750 wildlife health professionals and others from around Australia and the rest of the world who have an interest in diseases with feral animals or wildlife as part of their ecology that may impact on Australia's trade, human health and biodiversity.

More information on WHA is available at: <http://www.wildlifehealthaustralia.com.au>.