Antimicrobial resistance has been on the government agenda in Australia since the early 1980s. At that time the National Health and Medical Research Council (NHMRC) established a working party composed of human and veterinary microbiologists to look at antibiotic use and, in particular, the risks of using them in stockfeed. This action was taken in response to continuing reports from overseas, particularly the United Kingdom, of resistant and multi-resistant Salmonella species being selected in food animals and spread to humans. The working party report made a number of regulatory recommendations in terms of resistance surveillance and scheduling. None of these recommendations were adopted directly, but the national regulators continued to call on NHMRC for advice and in various guises the NHMRC maintained a working group on antibiotics and resistance until 1997, when it was decided that antimicrobial resistance was no longer a priority issue. As the regulators still wished to receive advice, the Therapeutic Goods Administration (TGA) took temporary responsibility for maintaining the expertise or the working party.

Then in 1997, news emerged from Europe of an association between the use of a particular stockfeed antimicrobial, avoparcin, and vancomycin-resistant enterococci in humans. This news made it to the media and questions were raised in Canberra about its relevance to Australia, as avoparcin was widely used in food animal production in Australia. This initiated the establishment of the Joint Expert Technical Advisory Committee on Antimicrobial Resistance (JETACAR) – a committee of medical, scientific, veterinary and regulatory experts – to consider the evidence for a link between antimicrobial use in food animals and resistant bacteria threatening human health. In its report of September 1999, JETACAR concluded that the evidence strongly supported a link, but that this needed to be considered in the context of all antimicrobial resistance issues (Figure 1). It made 22 recommendations, designed to initiate an assault on resistance generally, and focusing only initially on resistance coming through the food chain. The Australian Government responded in August 2000, essentially agreeing to adopt all the recommendations; only some of the recommendations have actually been implemented.

As part of the implementation of JETACAR recommendations, two groups were established. The first was under the NHMRC as the Expert Advisory Group on Antimicrobial Resistance (EAGAR). The second was the Commonwealth interdepartmental JETACAR Implementation Group (CIJIG).

Many of the subsequent achievements in terms of control of antimicrobial resistance have been regulatory. They include:

Figure 1. The JETACAR Report.
Establishment of specific sections related to antimicrobial resistance (resistance risk assessment) in the documentation required to be submitted for the registration of new antibacterials, or for the extension of indications for registered antibacterials, by the TGA for human agents and by the Australian Pesticides and Veterinary Medicines Authority (APVMA) for veterinary agents.

Review of the scheduling of all antibacterials, with subsequent establishment of all antibacterials for human, veterinary and agricultural use as ‘prescription’ only (S4), with the exception of the stockfeed group of ionophores (which have no human analogues).

Requirement of government agencies to request advice from EAGAR, among whose roles include the review of the risk assessments and recommendations for registration emanating from the TGA and APVMA, as well as providing advice on the listing and level of access to new antibacterials on the Pharmaceutical Benefits Scheme (PBS).

Together these three points have created a gatekeeper function for the introduction and potential use of new antibacterials in Australia. They have been quite successful so far in controlling access to fluoroquinolones. Unlike almost all other countries, fluoroquinolones have been prevented from being registered for use in food producing animals in Australia, and access to fluoroquinolones, both parenteral and oral, has been restricted through the PBS. As a result, Australia has one of the lowest rates of fluoroquinolone resistance in gram-negative bacteria of anywhere in the world.

A considerable number of recommendations from JETACAR have been addressed in part. In broad terms, a number of largely pre-existing entities have been used to indicate that some parts of some recommendations have been addressed. What currently exists under the government umbrella (federal and state) is:

**Resistance surveillance**
- National Neisseria Network 4, including resistance surveillance for *Neisseria gonorrhoeae* and *meningitidis*.
- The OzFoodNet (http://www.ozfoodnet.org.au), which includes antimicrobial resistance as part of national salmonella surveillance.
- State mycobacterial reference laboratories – work cooperatively to provide ongoing surveillance of resistance in *Mycobacterium tuberculosis*.

**Antimicrobial usage surveillance**
- The TGA collects volume data on annual imports of antimicrobial for human and non-human purposes.
- The Drug Utilisation Subcommittee of the Pharmaceutical Benefits Advisory Committee regularly monitors usage of non-hospital agents.
- A national program, based on a South Australian system, of monitoring antimicrobial use in Australian hospitals.
- A single pilot study on the prevalence of resistance in indicator organisms from food animals.

**Infection prevention strategies**
- Efforts to establish a national program for infection and multi-resistant organism (MRO) surveillance in hospitals have waxed and waned over the years. The new federal Safety and Quality Commission is re-considering this recommendation. Victoria currently has the VICNIS surveillance program, and South and Western Australia have MRO surveillance programs.
- The federal government continues to strongly support the implementation of appropriate vaccines to the community.
- Producers in the intensive food animal industry are promoting the search for effective alternatives to antimicrobials.

**Education**
- The National Prescribing Service (NPS) (http://www.nps.org.au) is a federally funded organisation with the mission to improve on the quality of medicine use in Australia. The board of the NPS has been a strong supporter of rational antimicrobial use and has funded and developed a range of campaigns including annual ‘Common Colds Need Common Sense’ public education campaigns, general practitioner education and detailing programs, and a major study into the management of community-acquired pneumonia in public hospital emergency departments.
- The Therapeutic Guidelines – Antibiotic continues to be developed and updated biennially. The organisation is
independent of government, but has a long history in setting the ‘standard of care’ for antimicrobial use in the community and in hospitals. A similar product for the veterinary profession was developed by the Postgraduate Foundation in Veterinary Science of Sydney University. The penetration and utility of this product is unclear, and the current second edition is now somewhat dated.

• Attempts to encourage medical colleges to include prudent use of antimicrobial education into their training programs was unsuccessful. In contrast, the chicken and pork industries have been proactive in developing prudent use guidelines for their producers.

Research

• Individual applicants have received project grants from the NHMRC over the years. There is not a specific program focused on antimicrobial resistance.

• A number of veterinary research organisations have actively promoted and funded research activities in the food producing animal area.

Figure 2. The WHO Global Strategy.

Overall, the implementation of the JETACAR recommendations has been patchy and uncoordinated. The implementation committee (CIJIG) has effectively been disbanded. Nevertheless, the challenge of controlling antimicrobial resistance need not be a daunting one. The approach to control needs to be multifaceted, as no single strategy is known to be effective. So many different professional groups have a stake in controlling antimicrobial resistance, and coordination between the professions is essential. Neither the bacteria nor their resistance genes respect professional boundaries!

Blueprints for tackling resistance have been published by many authorities. The JETACAR report is an early version. More sophisticated versions exist, the most helpful being that produced by the World Health Organisation (WHO) (Figure 2). Other countries have started to build effective containment programs, with Denmark and Sweden leading the way. The federated nature of Australia has held back progress in the development and implementation of a national, coordinated and effective resistance containment system. The gains that have been made are in jeopardy of dissipating as more ‘exciting’ public health issues are emerging, and attention and resources are channelled elsewhere. As microbiology professionals we all have the obligation to convince our non-microbiological colleagues of the importance of containing antibiotic resistance.

References


