Developing a national surveillance system for antimicrobial use and resistance in Australia: AURA

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Australia has a high rate of antimicrobial use (AU) compared with many other countries, and increasing rates of some types of antimicrobial resistance (AMR).¹ A nationally coordinated and comprehensive surveillance system for AU and AMR will enable a better understanding of the drivers of AMR in Australia; will further inform antimicrobial stewardship; and, minimise the threat that AMR poses to health care delivery.

OBJECTIVE

To establish a comprehensive coordinated surveillance system for AU and AMR in Australia, in collaboration with existing surveillance programs. The results of surveillance will enable high-quality information and data for practice improvement, health program and policy development, and to support research priorities.

METHODS

The Australian Commission on Safety and Quality in Health Care (the Commission) undertook wide-ranging consultation, planning and development activities to review current AU and AMR surveillance systems, identify the requirements of the national system, and negotiate with a range of stakeholders to build and improve surveillance infrastructure. The planning phase for the Antimicrobial Use and Resistance Australia (AURA) Surveillance System confirmed the key elements required for a comprehensive approach to surveillance in Australia.

RESULTS

The establishment of the AURA Surveillance System focused on identifying and sourcing data which covered eight information streams. These streams focus on AU and AMR from the community and acute sectors, through the use of passive and targeted data collections. These streams are illustrated in Figure 1.

Figure 1. AURA data streams



Antimicrobial Use in Australian Hospitals: 2014 Report of the National Antimicrobial Utilisation Surveillance Program, National Antimicrobial Utilisation Surveillance Program Annual Report 2014–2015, and the Antimicrobial Prescribing Practice in Australian Hospitals: Results of the 2014 National Antimicrobial Prescribing Survey.

First National Report on Antimicrobial Use and Resistance in Australia (AURA 2016)

AURA has consolidated the information from these collections, as well as a range of other data sources (Box 1) to develop *AURA 2016: First Australian report on AU and AMR in human health.* This report describes rates and patterns for AU in hospitals, residential aged care facilities and the community, as well as data on appropriateness of use. Results demonstrate a relatively high use of antimicrobials in Australian hospitals compared to similar countries (Figure 2).

The report also provides resistance rates for a set of 13 priority organisms, and discusses key emerging issues for AU and AMR. For example, in comparison to other countries, Australia has a notably higher rate of vancomycin resistance in *Enterococcus faecium*.

Antimicrobial use in Australian hospitals has declined since 2010, in parallel with the introduction of antimicrobial stewardship programs around the same time. AURA 2016 also highlights some unique results for Australia such as the comparatively low rate of resistance to fluoroquinolones, reflecting the restricted use of this antimicrobial class in Australia compared with that of many similar countries (Figure 3).

Figure 2. Comparison of community antimicrobial use in Australia and 28 European countries, 2014



Data sources: PBS (Australia), ESAC-Net (Europe)

Figure 3. Resistance to Fluoroquinolones in invasive isolates of *Escherichia coli* in Australia and European countries, 2014



Box 1. AURA Surveillance System

Existing data collections partnering with AURA:

- Australian Group on Antimicrobial Resistance
- National Antimicrobial Prescribing Survey (NAPS) and the pilot Aged Care NAPS
- National Antimicrobial Utilisation
 Surveillance Program
- Queensland Health OrgTRx System

Additional data sources used for AURA 2016 Report:

- The National Neisseria Network
- Office of Health Protection, National Notifiable Disease Surveillance Branch
- Australian Mycobacterium Reference Laboratory Network
- Pharmaceutical Benefit Scheme and the Repatriation Pharmaceutical Benefit Scheme
- NPSMedicineWise MedicineInsight Program
- Sullivan Nicolaides Pathology

A national alert system for critical antimicrobial resistances

A new national alert system for critical antimicrobial resistances, called CARAlert, has been established. CARAlert commenced in March 2016 and will help improve the timely identification of critical antimicrobial resistances across Australia, by providing a systematic and coordinated approach to the identification and communication of information about CARs when they are confirmed.



CONCLUSION

The foundation of a comprehensive national surveillance system for AU and AMR has been established as part of the AURA Surveillance

Once the types of data needed were confirmed, AURA engaged with established programs, experts and key stakeholders. A collaborative approach was the basis for harnessing existing knowledge and expertise to improve the coverage, capture and quality of existing data collections and to inform the development of new collections where there were identified gaps. The key data collections coordinated through AURA are in Box 1.

As these collections have developed and been enhanced, AURA has published a range of national reports providing the results of analysis. The reports include:



Note: In Australia, ciprofloxacin resistance is used to represent resistance to fluoroquinolone class. Data sources: Australian Group on Antimicrobial Resistance. ESAC-Net (Europe)

Website:

http://www.safetyandquality.gov.au/antimicrobial-use-and-resistance-in-australia/

System. AURA coordinates data from a range of collections produce integrated surveillance information and reports about the current state of play, trends over time, and where feasible, the interrelationships between AMR and AU.

Further expansion and development of the AURA Surveillance System is planned, particularly focusing on increasing passive resistance and hospital antimicrobial use surveillance components.

Reference

1. Australian Commission on Safety and Quality in Health Care. AURA 2016: First Australian report on antimicrobial use and resistance in human health. Sydney: ACSQHC, 2016.

AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE



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